



European Information System on Electromagnetic Fields Exposure and Health Impacts

On behalf of DG SANCO

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Executive summary

JRC developed during 2003-2004 the EIS-EMF project on behalf of DG SANCO with the overall objective of promoting cooperation among policy makers on public health and EMF risk communication issues in the EU.

The continuing and increasing public concern over EMF related issues highlights the need to take a fresh look at approaches to risk communication with a view to identifying effective new initiatives. JRC through EIS-EMF provides scientific and technical support to EU policies in the area of EMF and health, on behalf of DG SANCO and other DG (RES, ENTR, ENV, EMPL, etc).

The key achievements of the project include the development and demonstration of a prototype concept comprising:

- A network of EU policy makers on EMF issues
- An operational science/policy interface
- Communication tools

This prototype EIS-EMF concept develops and provides a common information basis to decision makers and the public across the EU, which is reliable, relevant, balanced, user-friendly, up-to-date and timely. To this end, the members of the a network of policy makers, which acts as the EIS-EMF Advisory Board, and the European Commission carry out a systematic information exchange. The JRC coordinates this information exchange in the frame of thematic activities and technical working groups. These undertakings constitute the work programme of the EIS-EMF. Advisory Board members make proposals and advise the JRC in the planning of the work programme, and contribute to its execution.

The establishment of an operational science/policy interface was achieved in co-operation with EMF-NET, a FP6 co-ordination action that networks key scientists with the main task to analyse and interpret the scientific evidence on the possible health impacts of exposure to electromagnetic fields.

Communication tools developed and demonstrated by the EIS-EMF include:

- The “EU Country Reports on EMF and Health Issues” presenting a concise and thorough review of national approaches, regulatory measures, and actions in the area of EMF, and potential health risks.
- The “EU Database on EMF exposure measurements and assessments”. The feasibility of such a database was investigated and its further development is proposed to play an “observatory” function of EMF exposure in the EU, to promote common standards, and to become a reference for comparability for compliance with standards across the EU.
- A web-based gateway to all relevant information on EMF exposure and public health protection, and risk communication issues across the EU.

In collaboration with EMF-NET, JRC organised in July 2004 a workshop on EMF risk perception and risk communication, and a preparatory meeting for the “Stakeholder dialogue”, both with broad stakeholder and expert participation. During these events and further contacts, EIS-EMF has established an intensive co-operation with WHO, ICNIRP, COST 281 and EMF-NET resulting in a coordinated agenda for activities for the year 2005. One tangible result of this international collaboration is the “EMF Coordination Meeting” at DG SANCO, in Luxembourg the 31st January 2005. In this meeting the organisation of two high-level workshops (see below) was discussed.

The Advisory Board members met twice in 2004 (the 12th July and 28th October) and established a detailed agreement on the terms of reference for the future operation of the EIS-EMF, its work programme and objectives. Main elements of this work-program are:

- The country reports/gateway
- The EU database on EMF measurements
- The organisation of workshops on key themes

On this basis, and through the continuing operation and upgrading of the information system, EIS-EMF future activities will fully implement the systematic information exchange between the EC and EU national administrations, the expert community, and representative stakeholders.

Regarding the 2005 work-program, the Advisory Board specified two workshops to be organised by the EIS-EMF in co-operation with with WHO, ICNIRP, COST 281 and EMF-NET:

- a) “Analysis and interpretation of ‘scientific evidence’ on EMF exposure and health effects for EU policy-making”
- b) “EMF Risk communication in the EU – Case studies”

1. Rationale & objectives of EIS-EMF

There is a growing public concern on the potential adverse health effects of human exposure to electromagnetic fields. Particularly from GSM base stations whose number will increase even more to implement the latest 3-G developments (UMTS), and from other new wireless technologies entering all our domains of activity. Scientific uncertainties over the possible health impacts of EMF, and the inability of the scientific community to clearly identify and characterize potential risks are inducing public debate. Misrepresentation of scientific uncertainties in identifying and quantifying health risks – particularly in the long term – may be contributing to public fears.

In answer to these concerns, the EC recommended the implementation of exposure limits (EC99/519) providing minimum requirements for health protection of the general population across EU. EC continue working towards reduction of public exposure to EMF, towards common standards and for the harmonisation of norms covering all devices emitting EMF. In addition, EC supports further research to keep exposure limits under review according to the best available scientific evidence. In this light, it has been a targeted R&D planning and funding by FP5 and FP6 at EU level, and by Member States at national level. As a result, various ongoing R&D activities are expected to provide data to clarify this state of things. In order to integrate the emerging scientific results into policy-making priorities, two major projects the JRC/EIS-EMF and the EMF-NET FP6 Coordination Action have been funded by the European Commission and are currently in operation.

The European Information System on Electromagnetic Fields (EIS-EMF) is an activity of the Institute of Health and Consumer Protection at the Joint Research Centre of the European Commission, and carried out on behalf of DG-SANCO. EIS-EMF is a policy-driven/support project, providing information and risk communication contents.

The basic objectives of the EIS-EMF project are:

- To promote cooperation among policy makers on public health and EMF issues in the EU.
- To network relevant national authorities, and exchange information and experiences on the implementation of policies.
- To develop common approaches and coordinated actions in EMF risk communication across the EU, and to improve risk communication based on scientific evidence and best practices.
- To establish a dialogue with key stakeholders, NGOs, social partners, academia, and international organisations.

For this purpose EIS-EMF:

- Established a EU-wide network of policy-makers and experts to exchange information and assess strategies on how information on EMF exposure can be used in national policy making and in risk communication.

- Developed and is implementing a web-based gateway to all relevant information on EMF exposure and public health protection, and risk communication issues across the EU.
- Implements on annual basis a work-programme of thematic activities on EMF risk communication.
- Promotes common practices and harmonised tools for the dissemination of information to stakeholders and EU citizens.

2. EIS-EMF concept and prototype development

High-quality and comprehensive information is needed to identify appropriate policy options in EMF and public health, and to support their implementation. It is also essential to respond to public questions and concerns, and to define a clear strategy for the effective communication of any potential risks.

Effective risk communication, moreover, must include as fundamental building blocks: the development of a common knowledge base on the current scientific evidence, the implementation of coordinated actions and a shared strategy, the systematic monitoring and understanding of the public perception of risk, the involvement of all concerned parties, and not least the existence of comparable EMF exposure data and assessments.

2.1 Prototype description & development

The EIS-EMF project has proposed a concept and developed a prototype in order to contribute to the definition of such a concerted strategy, and to the development of a programme for effective risk communication on EMF and health across the EU.

During 2003-2004, the EIS-EMF concept was developed and demonstrated:

A first element is to ensure that a common information basis is provided to decision makers and the public across the EU, which is reliable, user-friendly, up-to-date and timely. In this direction, an essential part of the EIS-EMF project is the current development (and the expected full operation by mid 2005) of a Web-based information platform on public health issues related to EMF exposure, and the comprehensive inventory of national activities on EMF through “Country reports” across the EU, and the promotion of comparable standards on exposure data and assessments through the “EU Database on EMF exposure measurements and assessments” activity.

A second element of the EIS-EMF concept is to promote and facilitate a systematic exchange of information between the EC and EU national administrations, the expert community, and representative stakeholders from industry, NGOs and consumers’ associations. The JRC coordinates this information exchange, which is carried out in the frame of thematic activities and workshops, and the networking of the various relevant actors and institutions in the governmental, non-governmental and private sectors, and by the implementation of a “stakeholder dialogue” on EMF and health issues. These undertakings constitute the work-programme of the EIS-EMF.

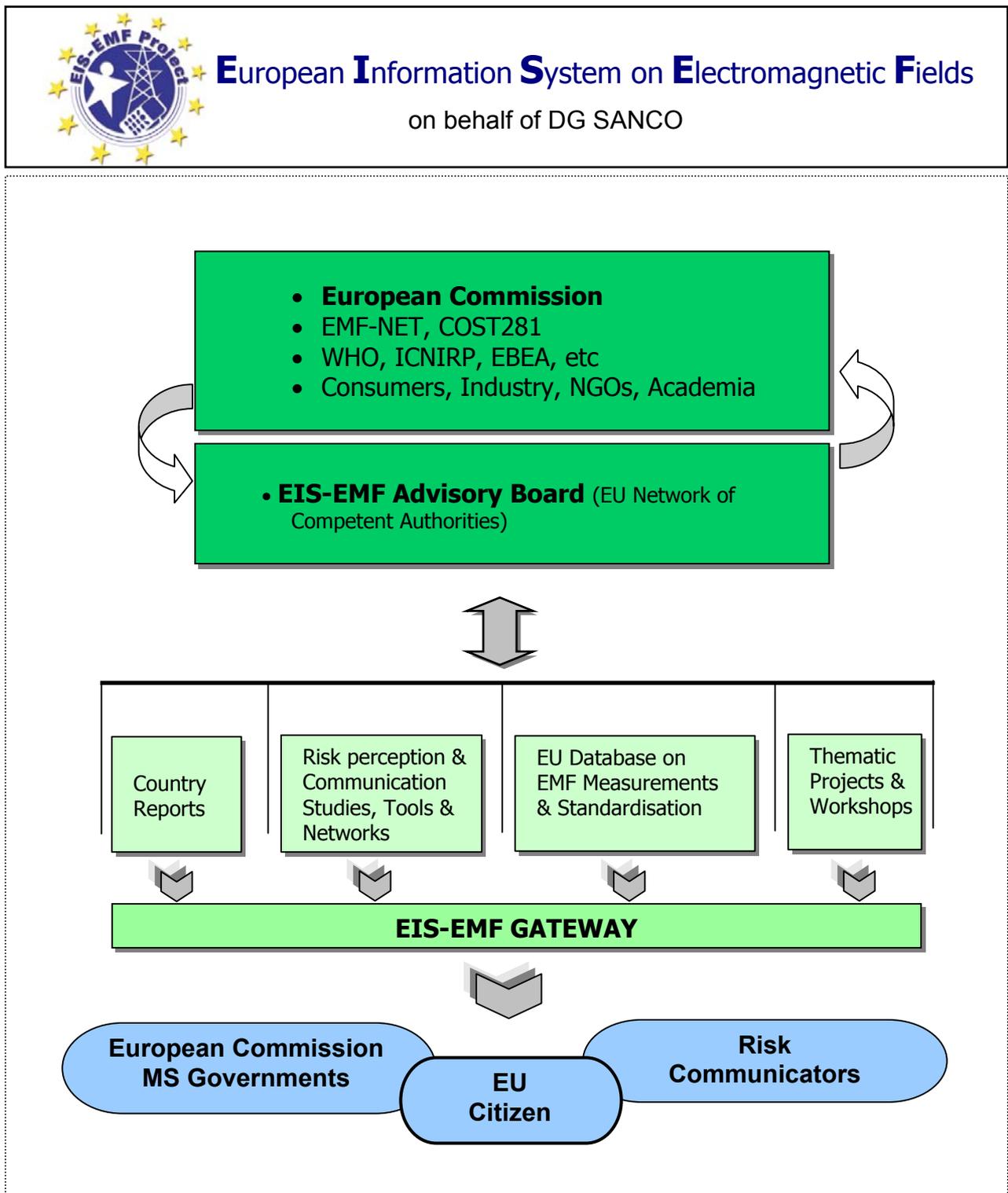


Fig. 1. Project Structure

As described in the schematic structure of the project presented in fig. 1, EIS-EMF includes an advisory board and several committees of thematic experts. The advisory board ensures that the project planning and execution respond to the needs of the European Commission and of Member States. The Advisory Board of EIS-EMF constitutes a high level network of European competent Authorities (25 members), acting as focal points representing all relevant national administrations with responsibilities on EMF and Health issues.

EIS-EMF supports the effective coordination with various EU and international organisations and projects, and in particular has developed close links and collaboration with EMF-NET, COST 281, WHO EMF-Project, and ICNIRP.

2.2 Feasibility & user requirements

Feasibility of the EIS-EMF concept has been demonstrated by the implementation, during 2004, of the project management structure, the identification of the project “users” and “user requirements”, by the detailed specification of the EIS-EMF work-programme and deliverables, and by the conception and development of a user-friendly web-based information system for the information exchange and the dissemination of the results.

The Advisory Board members met twice in 2004 and established a detailed agreement on the terms of reference for the operation of the EIS-EMF and its work programme (see [Annex 4](#) and [Annex 7](#)). The user group categories for the EIS-EMF project include the national focal points from EU member states (network of competent authorities at the projects’ advisory board), European Commission services and scientific committees, EU and international organisations and projects on EMF and health, thematic networks of experts, industry, NGOs, risk communicators, and EU citizens.

Renowned specialists participant at the EMF-NET and COST281 Actions, CENELEC, as well as other EU research institutions, universities, and international organisations, are part of EIS-EMF thematic networks of experts. The list of most of the participants at the EIS-EMF project is included at the end of [Annex 6](#) (“[List of participants](#)” at the EIS-EMF kick-off meeting, EMF risk perception and communication workshop, and preparatory “Stakeholder dialogue” meeting, 12-14 July 2004).

User requirements and expectations from EIS-EMF were identified through the active involvement of all concerned stakeholders listed above. Consultation took place in the form of direct contacts, meetings and workshops organised by JRC, or other EC services (see section 4), and through EIS-EMF participation in various coordination and technical meetings on EMF and health (see section 5). Users’ requests constitute the stated objectives of the EIS-EMF as described in section 1, and most of them have been developed and are in the implementation phase (see section 3).

Another important contribution of EIS-EMF is to provide a forum to examine, together with the Advisory Board and representative stakeholders and experts, the reports and up-to-date analysis and interpretation on EMF and health presented by competent advisory bodies and organisations, most particularly by EMF-NET, in order to respond to specific public concerns and identify suitable policy options (see section 3.5 and working paper “Issue reports, Stakeholder dialogue & References database” included in [Annex 6 \(A6.2\)](#)). This working paper describes the proposed operational setting identifying the various stages and basic responsibilities for the production, reviewing and validation of “issue reports” between EMF-NET and EIS-EMF, and the foreseen involvement of the EC Scientific Committees, and of a representative “stakeholder dialogue”.

During 2004, JRC/EIS-EMF participated in the EMF-NET project, a FP6 co-ordination action with the main task to analyse and interpret the scientific evidence on the possible health impacts of exposure to electromagnetic fields. In collaboration with EMF-NET, JRC organised in July 2004 a “Stakeholder dialogue” meeting and a workshop on EMF risk perception and communication across the EU, both with broad stakeholder and expert participation. During these events and further contacts, EIS-EMF has been establishing with WHO, ICNIRP, COST 281 and EMF-NET an intensive co-operation and a coordinated agenda for activities for the year 2005.

3. EIS-EMF Prototype demonstration and deliverables

Following the development of a prototype concept, the key achievements in 2004 were:

- The establishment of the Advisory Board, which constitutes a high level network of European competent Authorities on EMF and Health.
- The development of the “EU Country Reports on EMF and Health Issues” which currently reviewed by Advisory Board and will be published by the middle of 2005.
- The feasibility study of a “EU Database on EMF exposure measurements and assessments”.
- The development of a web-based gateway to all relevant information on EMF exposure and public health protection, and risk communication issues across the EU.
- Interface EIS-EMF/EMF-NET (FP6 Co-ordination Action) and international collaboration.

3.1 Advisory board: Mission and role

The Advisory Board constitutes a high level network of European competent Authorities on EMF and Health related issues, with the basic task of exchanging information and assess strategies on how information on EMF exposure can be used in national policy making and in risk communication.

To achieve its objectives the EIS-EMF must ensure that a common information basis is provided to decision makers and the public across the EU, which is reliable, relevant, balanced, user-friendly, up-to-date and timely. To this end, the members of the Advisory Board and the European Commission will carry out a systematic information exchange. The JRC will coordinate this information exchange. It will be carried out in the frame of thematic activities and technical working groups. These undertakings constitute the work-program of the EIS-EMF.

The mission of the Advisory Board is to advise the EIS-EMF project to fulfill its objectives, in particular the development and implementation of a EU-wide programme on EMF risk communication. The Terms of Reference for the Advisory Board were fully agreed during the 2nd Advisory board meeting 28th October 2004. [Annex 1](#) presents the Advisory board – Mission statement and composition.

In particular, each Advisory Board member must identify the national network of relevant authorities on EMF and Health issues, and guarantee that the regional level is covered. Full members represent their respective national administrations and will act as focal points for the national network of competent authorities on EMF and Health issues – this is a crucial requirement that needs to be fulfilled. DG SANCO and the JRC will contact the competent national authorities to complete the list of representatives from all 25 Member States.

During the 2nd Advisory Board meeting 28th October 2004 (see minutes in [Annex 4](#)) a detailed agreement on the terms of reference for the operation of the EIS-EMF was reached, and the project's work programme for 2005 was revised and adopted. The main activities and topics of this work programme are presented in [Annex 7](#).

3.2 EU Country reports on EMF and health issues

The production and periodic update of “EU Country reports on EMF and Health Issues” is a basic responsibility of the JRC/EIS-EMF. For this task the JRC enjoys the full support from the national representatives at the advisory board, and the collaboration of the respective national networks of competent authorities. All this information will be summarised and made available at the EIS-EMF web-based gateway (EIS-EMF website address: <http://www.jrc.cec.int/eis-emf>)

The aim of the country reports is to present in a single document and a common layout, a concise and thorough:

- Inventory of the relevant players, actions, sources of information, key documents, regulation(s), parliamentary questions/answers, R&D actions, press articles, and databases in the area of EMF and health across Europe, from national authorities, industry, academia, NGOs, etc.
- Explanatory information on the institutional roles of the various national authorities involved on EMF and Public Health issues.
- Case Studies
- Appraisal of risk communication and policy implementation experiences collected at national, regional, local levels.

All country reports are also collected in a single document, including all necessary and relevant information on EMF and health issues from each Member State across the EU, and giving summary description and comments on the various actors and sources. [Annex 2](#) gives the first draft of the “Country Reports on EMF and Health: Sources, Regulations, and Risk Communication Approaches”, with the initial contributions from seventeen national representatives from EU Member States, and Switzerland. The preliminary structure and proposed layout of the reports as presented at the 1st advisory board meeting (12th July 2004) is included in [Annex 6](#) (in [A6.1](#)). The final structure and common layout for the reports was agreed during at the 2nd advisory board meeting (28th October 2004) and it is included with the reports’ “first draft” in [Annex 2](#).

The JRC is actively seeking the participation of all EU member states in the EIS-EMF activities. Those not represented at the moment are essentially national authorities and experts from the new member states.

Milestones:

- Preliminary Country reports submitted in July 2004 and edited into a single document (28th October)
- Discussion and development of common layout (October-November 2004)
- Final contributions from Advisory Board (end January 2005)
- Review by JRC and issue of the first draft (end February 2005)
- Submission and discussion of a final draft version in the next AB meeting (May 2005)

3.3 EU Database on EMF exposure measurements and assessments

Several important activities on EMF risk communication and “human exposure to EMFs” have been implemented in many countries in the EU. The development of a “EU database on EMF measurements and assessments” includes, as a first step and as a complement to the “Country reports”, the systematic inventory of these activities, of the various existing communication channels and national data sources.

A feasibility study on the need and development of such a database, in the radio frequency range, was carried out in collaboration between the JRC and Seibersdorf Research of the Austrian Research Centre. Annex 6 (in [A6.3](#)) includes the “Technical Annex” prepared in December 2003, which formed the basis for this study. The study consists of two parts, the first and the largest part, “Status Report on National Sources of RF EMF Exposure of the General Population”, is included with this document ([Annex 3](#)). It presents the inventory and evaluation of data sources, communication initiatives, and legal requirements across Europe. The second part is a shorter follow up document, discussing in more detail the results and conclusions from the “Status Report”, and developing some recommendations for further developments (deadline for the first draft is May 2005).

This “Status report” is a source document giving a concise review of the available information on exposure data of the general population with respect to fixed installations of mobile communication networks and broadcasting within most EU countries (23 Member States), plus Switzerland and Liechtenstein. The document also summarises for each country, the legal requirements as well as the initiatives and projects in this area. The information was obtained by Internet searches as well as by questionnaires sent to specialists in the target countries. Key aspects of this review are: (a) The identification of sources of information, purpose and availability of RF-EMF data at the national levels, (b) the analysis and comparison of the various measurement and assessment protocols, and (c) the evaluation of the potential use of the data for risk assessment and risk communication purposes.

The full report (parts 1 and 2) will form the basis for a proposal for funding by the EC (from the IDA Programme, of the Enterprise Directorate) on the development and implementation of a Database on EMF Exposure data across EU, to promote common exposure measurement and assessment standards. Such EU database may provide: (1) an “observatory” function of EMF exposure in the EU, (2) a reference for comparability across EU, and for EMF source apportionment; and (3) the basic contents for risk assessment and communication. It could also provide an essential input for large-scale health impact and epidemiological studies, and form the infrastructure for a long-term EU wide monitoring activity.

This database would facilitate the exchange of EMF data and information among member states, and complement the EIS-EMF gateway by holding a greater range of documents & relevant data on EMF & health issues from national and regional administrations, government agencies, industry, etc. The suitability of such a proposal will be discussed at the next Advisory Board meeting in May 2005.

3.4 Web-based gateway

An essential part of the EIS-EMF project is the development and implementation of a Web-based information platform on public health issues related to EMF exposure, which is being carried out in parallel to the EU “Country reports” activity. The basic approach is to constitute a single Web-tool linking all major European and worldwide information sources on risk communication in the area of Human Exposure to EMF.

The gateway structure consists of multiple interconnections between menus listing key actors, institutions, organizations, and pointing to various information categories and actions (legislation, technical information, studies, research, etc). It will provide links to all relevant sites, to documents and reports on health impact studies, to regulations, risk communication studies and tools, EMF measurements and exposure, technical standards, etc. In addition, it will give access to deliverables from the EIS-EMF work programme, including “country reports”, conference reports and workshop reports from meetings organised or supported by the EIS-EMF. In general, every piece of information generated by the project will contribute to the web-system and information platform. It will identify key documents and publications and increasingly provide electronic versions of them. It may also provide automatic or full translations for a number of selected documents.

Milestones:

- AB members provide information on a) national networks and b) country reports (January/February 2005)
- JRC implements this information into the “Gateway” and provides access to AB members before the AB meeting in May 2005
- Discussion & evaluation of Gateway in AB Meeting in May 2005
- Gateway “fine-tuning”, further development and updating (from June 2005 onwards)

3.5 Interface EIS-EMF/EMF-NET and international collaboration

The JRC/EIS-EMF has played a leading role in the designing and definition of the EMF-NET FP6 Coordination Action that started in March 2004. The EMF-NET consortium is constituted by experts from almost all scientific & technical activities in the area of bio-electromagnetics in Europe, with the main task of reviewing and interpreting the evidence on the possible health impacts of exposure to electromagnetic fields. As a major consortium partner, EIS-EMF basic task is to “support informed decision-making for regulation and risk communication, and to identify & address industry concerns”, in this capacity EIS-EMF:

- o Develops and maintains the EMF-NET website (it was made public on 15th May 2004, <http://www.jrc.cec.eu.int/emf-net/>).

- Provides support for the information exchange platform and document management among the EMF-NET partners (based on EC CIRCA resource).
- Assists in the production and review of the “issue reports” on EMF and health that are the main output of EMF-NET.
- Promotes together with EMF-NET the so-called “stakeholder dialogue” in EMF and health for a systematic and transparent exchange of views between NGOs, national authorities, industry associations and other concerned – and representative – stakeholders.

It is on this basis that the EIS-EMF benefits from the timely and robust infrastructure of EMF-NET as the key element for developing risk communication contents and tools. The working paper, defining the “Interface between JRC EIS-EMF & FP6 EMF-NET” and describing the two projects’ collaboration on “Issue reports, Stakeholder dialogue & References database” (final version of July 2004) is included in Annex 6 ([A6.2](#)).

Furthermore, during the year 2004, JRC/EIS-EMF has developed close links with various EU funded projects and international organisations. In particular a first coordination meeting among WHO-EMF, ICNIRP, EMF-NET, COST281, and EIS-EMF was held at the WHO headquarters in Geneva the 11th October 2004, with the objective of establishing an effective coordination of activities in 2005, and to develop combined actions and workshops, particularly to present and discuss the scientific evidence on potential health effects of human exposure to EMF. Also agreed in this meeting was the need for close collaboration on risk perception and risk communication activities, between the JRC and the WHO. A follow up meeting to establish a tangible collaboration for the year 2005 (for the organisation of two workshops at the initiative of JRC/EIS-EMF, see outlines attached in [Annex 5](#)) was convened by the JRC/EIS-EMF on behalf of DG SANCO in Luxembourg, 31st January 2005.

4. Project meetings and workshops

4.1 Advisory board meetings

The Advisory Board members met twice in 2004 (12th July and 28th October). After the initial gathering during the project kick-off on July, the second meeting on October established in a well defined basis the terms of reference for the operation of the EIS-EMF and its work programme. The minutes of the 2nd advisory board meeting of 28th October 2004 are included with this report ([Annex 4](#)).

4.2 Kick-off meeting, 1st Workshop on EMF risk perception and risk communication, and “Stakeholder dialogue” on EMF and health

In July 2004 we hold at the JRC in Ispra a three-day kick-off meeting of the EIS-EMF project. A handout that included meeting agendas, list of participants, and accompanying working documents is attached to this report (as sub-annexes to [Annex 6](#)). Meeting agendas and overview of events are presented in [A6.4](#). The first day (12th July) was about the EIS-EMF Project presentation and the establishment of the Advisory Board. Participants are representatives from Member States authorities responsible for EMF & Health, from other national and international organizations and experts from Academia.

The second day (13th July) took place the Workshop: “EMF Risk Perception and Risk Communication: Tools, Experiences and Strategies” and roundtable discussion. Participants to the AB meeting and representative stakeholders were invited to attend the Workshop. The basic objective of the workshop is to make stakeholders, experts, and decision-makers, fully aware of the need and benefits of risk perception studies for optimising risk communication at EU level. The first draft of the “Proceedings of the Workshop on EMF Risk Perception and Risk Communication: Tools, Experiences and Strategies” has been finalized, and a EUR Report will be published in May 2005. EMF-NET has also expressed the interest to publish, before end 2005, of a book with these proceedings. The abstracts of presentations at the workshop are included in [Annex 6](#) (also in [A6.4](#)).

The third day (14th July), in collaboration with EMF-NET, JRC organised the preparatory meeting for the “Stakeholder dialogue” on EMF & Health effects. The objective was to establish a systematic and transparent exchange of views between NGOs, Authorities, Industry Associations and other concerned – and representative – stakeholders.

4.3 Coordination meetings with DG SANCO

Brussels, 15th March 2004: EMF Coordination meeting at the request of G. Gallo of DG SANCO, and the JRC/EIS-EMF. Other participants: M. Wilkki (DG RES), D. Papameletiou (JRC), C. del Pozo (JRC). Apologies for absence, M. Bogers (DG ENTR).

Luxembourg, 14th October 2004: Progress report and coordination of the EIS-EMF Project with A. Doronzo of DG SANCO. Other participants: G. Gallo (DG SANCO), D. Papameletiou (JRC), C. del Pozo (JRC).

Luxembourg, 31st January 2005: EMF Coordination meeting organised by JRC on behalf of DG SANCO. Participants: from international organisations and EU projects, M. Repacholi (WHO), P. Vecchia (ICNIRP), N. Leitgeb (COST281), and P. Ravazzani (EMF-NET). From the European Commission, J. Ryan from DG SANCO (together with two members of the Scientific Committee on Health and Environmental Risks, as observers), D. Papameletiou and C. del Pozo from the JRC. Also participating by video-conference link: M. Wilkki (DG RES), M. Bogers (DG ENTR), and L. Bontoux (DG JRC).

The purpose of the meeting was to discuss co-ordination and collaboration issues concerning our various activities dealing with EMF exposure and health issues, and risk communication initiatives. In particular, the organisation by the JRC of two high-level workshops, during 2005, with the participation and support from the other EC services and EMF-NET, COST281, WHO, and ICNIRP (see next paragraph 5.4). Meeting agenda and proposed workshop outlines are included in [Annex 5](#).

4.4 Proposed risk communication and “scientific evidence” workshops

Following proposals by the JRC and EMF-NET, there was general agreement at the last advisory board of EIS-EMF (28th October 2004) on the necessity and opportunity of the organization of a high-level Workshop on the current status of “scientific evidence” on health impacts of EMF. The workshop will be centred on the presentation of the “Key Interpretation Reports” produced by EMF-NET. This workshop may represent the first venue to communicate and discuss the analysis and interpretation of the up-to-date scientific evidence to the Network of European competent Authorities on EMF and health, and to a selected audience of experts and stakeholders.

The advisory board also requested EIS-EMF to organise a workshop on EMF communication initiatives across the EU. The main objective of the workshop is to identify and discuss key risk communication experiences and initiatives that were milestones in EMF policy making across the EU, and eventually worldwide. On this basis the workshop will provide an overview of the relevant national initiatives, promote the exchange of information and experiences, and assist stakeholders in the conception of future communication actions.

In both cases the collaboration with other EU funded projects and relevant international bodies and organisations (and particularly EMF-NET, COST281, WHO, ICNIRP) are highly desirable and their participation has been confirmed. The outlines for the two proposed workshops: (1) “EMF Risk communication in the EU – Case studies”, and (2) “Analysis and interpretation of ‘scientific evidence’ on EMF exposure and health effects for EU policy-making”, are included in [Annex 5](#) (in sub-annexes [A5.1](#) and [A5.2](#)).

Milestones:

- Organisation of a Workshop on EMF Risk Communication in the EU – Case Studies (possibly 2/3 days, by July 2005).
- The JRC will publish a report on the status of EMF risk communication in the EU on the basis of the workshop results and the country reports (December 2005).
- Organisation with EMF-NET of a Workshop on “Analysis and interpretation “Scientific Evidence” (2/3 days, by November 2005).
- As a follow up activity, and in close coordination with other EC services (particularly with DG RES, DG ENTR, and DG SANCO), this last workshop may form the basis for the organization by the European Commission of a high-level EU “Presidency Conference” on EMF exposure and health effects in mid 2006.

5. Participation at technical and coordination meetings on EMF and health (2003-2004)

- 1) Combined 6th International Congress of the European Bio-Electromagnetic Association (EBEA, 13-15 November 2003) and the 5th COST 281 Workshop (15-16 November 2003), at Budapest, Hungary. Power-point presentation of the EIS-EMF Project.
- 2) France-Telecom R&D Meeting on Interaction of EMF radiation with people, 18 December 2003. Invited talk: “The European Information System on Electromagnetic Fields (EIS-EMF): An Overview”.
- 3) Conference on “Mobile Communications: Health, Environment and Society”, Brussels, 20-21 January 2004. Participate at general round-table discussions.
- 4) CENELEC- Technical Committee on EMFs in the Human Environment (TC 106X): Meeting at Mainz, 28-29 January 2004. Participate at review of draft proposal: “Product standard to demonstrate the compliance of fixed equipment for radio transmission intended for use of wireless telecommunication networks with the basic restrictions or the

reference levels related to general public exposure to radio frequency electromagnetic fields (110 MHz - 40 GHz)". JRC is a member of the working group of technical committee TC106X.

- 5) COST Workshop (18-19 March 2004) and EMF-NET Steering Committee kick-off meeting (20 March 2004). Workshop on "Potential bioeffects of new technologies, in particular in the UHF range (300 MHz – 3 GHz)". EIS-EMF is a member of the EMF-NET steering committee. Two presentations by EIS-EMF: "Developing the interface between JRC/EIS-EMF and FP6 EMF NET", and "CIRCA 3.2. General Presentation".
- 6) DG-Research Meeting on EMF and Health, 29-30 April 2004 in Brussels. The basic purpose was to bring together FP5 and FP6 EMF projects, and EC officials & related activities (at SANCO, ENTR, INFOS, ENV, EMPL, JRC) to hear the latest results from researchers and experts in the area of EMF & Health, and to exchange views and information. EIS-EMF participation in the meetings was at two levels, first as a member in the panel representing the EC concerned parties, and second to give a power-point presentation "EIS-EMF project current status and actions".
- 7) CENELEC- Technical Committee on EMFs in the Human Environment (TC 106X): Meeting in London, 25-26 May 2004. Participate at review of draft proposal: "Basic standard for the in-situ measurement of electromagnetic field strength related to human exposure in the vicinity of base stations". JRC is a member of the working group of technical committee TC106X.
- 8) WHO Workshop: Sensitivity of Children to EMF Exposure (9-10 June 2004), and participation at the Working group meeting (11 June 2004), in Istanbul, Turkey. EIS-EMF is a member of the TWG on Dosimetry and Exposure Assessment.
- 9) COST 281 Workshop on RF Exposure Assessment, and EMF-NET FP6 CA coordination meeting, in Paris 20-21 September 2004. EIS-EMF is a member of the EMF-NET steering committee. EIS-EMF also contributed to the workshop presentation "Mobile Telecommunications Monitoring in Europe" by G. Neubauer of the Austrian Research Centre.
- 10) Second Mobile Communications Seminar, 23-24 September 2004, Brussels. The seminar was jointly organised by the European Commission, the GSM Association and the MMF (Mobile Manufacturers Forum). Invited talk on the risk communication initiatives by the EIS-EMF (European Information on EMF).
- 11) Coordination meeting between EMF-NET, WHO, COST, ICNIRP and EIS-EMF, at the WHO Headquarters in Geneva, 11 October 2004. To discuss international collaboration, and define the relationship between the various projects to avoid unnecessary overlapping.
- 12) International Conference on Electromagnetic Fields: From Bioeffects – To Legislation, 8-9 November 2004 in Ljubljana – Slovenia. Invited talk: "Outline and main actions of EIS-EMF".

- 13) “11ème Journée: Interactions des ondes RF avec les personnes – Etat de la connaissance”, France Telecom R&D, Issy Moulineaux, France 17 December 2004. Invited talk on the recent initiatives and developments of the JRC/EIS-EMF Project.

6. Conclusion and recommendations

A prototype concept for a European Information System on EMF and Health related issues (EIS-EMF) in support to EU policies and risk communication was developed and demonstrated. Its basic component is a network of European competent Authorities on EMF and Health. The members of the network act as the Advisory Board of the EIS-EMF and at the same time they are using the EIS-EMF tools to exchange information and assess strategies on how information on EMF exposure can be used in national policy making and in risk communication. Authorities from Member States, the expert community, and other stakeholders have provided strong support and feedback, and their ample participation in the JRC initiatives.

Feasibility of the EIS-EMF concept has been demonstrated by the implementation, during 2004, of the project management structure, the identification of the project “users” and “user requirements”, by the detailed specification of the EIS-EMF work programme, and the pilot testing of EIS-EMF tools:

- EU country reports/web based gateway
- EU database on EMF measurements
- Science/policy interface on EMF and health issues

On this basis, the Advisory Board discussed and proposed a detailed future work programme, which is presented in [Annex 7](#). Future activities should guarantee the continuing operation and periodic upgrading of the information system, and the further development of the systematic exchange of information between the EC and EU national administrations, expert community, and representative stakeholders. For 2005, this work programme includes the organisation of two workshops that are specified in more detail below.

(1) Organisation of a workshop on EMF risk communication in the EU

Risk communication in the EU has been significantly hampered by the absence of a clear strategy to promote cooperation among policy makers to exchange experiences, and to develop common approaches and coordinated communication actions on public health and EMF issues. Many risk communication initiatives have been implemented at national level across the EU and there is indeed a great interest in learning about their objectives and outcome, on how similar issues were tackled in different countries, and different administrative, legislative and socio-economic contexts.

The main objective of the workshop is to identify and discuss key risk communication experiences and initiatives that were milestones in EMF policy making across the EU and eventually worldwide. These may include:

- Establishment of official (government) or independent committees,
- Parliamentary hearings, questions and responses,
- Public hearings and consultations (Stewart report, Zmirou report etc),
- Round table discussions at local and regional levels with participation of citizens, NGOs, industry, academia etc
- Information campaigns (TV, radio, press, leaflets, fact sheets, web sites etc.)
- Measurement campaigns and communication of the results
- Surveys/studies, perception research, pro-active R&D etc

In these lines, the workshop will provide an overview of all relevant national initiatives, promote the exchange of information and experiences, and assist stakeholders in the conception of future communication actions.

(2) Organisation of a workshop on the analysis and interpretation of ‘scientific evidence’ on EMF exposure and health effects for EU policy-making

Currently there is a significant amount of novel R&D results emerging from EU funded research and a number of other international initiatives that are offered for consideration to policy makers. These research results are being analysed systematically by EMF-NET. The first interpretation reports are expected by the end of 2005 and this workshop may represent the first venue to communicate and discuss the analysis and interpretation to the Network of European competent Authorities on EMF and health, and to a selected audience of experts and stakeholders.

This workshop is intended to form the basis for the organization by the European Commission of a high-level EU “Presidency Conference” on the ‘scientific evidence’ of EMF exposure and health effects in mid 2006.

The workshop will be centred on the presentation of the “Key Interpretation Reports” produced by EMF-NET. These reports are state of knowledge reports providing authoritative evaluation and interpretation on possible health effects from EMF exposure. The workshop will include extensive question time and round table discussions with the objective of examining the reports and up-to-date evidence presented, to respond to specific public concerns and to identify possible policy making needs. Discussion of the results and conclusions from recent EU (FP5) funded research projects, and other relevant international studies and scientific reviews will also be included.

Presentations may take the form of “interpretation” reviews that summarise and integrate various more specific, scientific “issues” associated with any topics focusing the public interest and requiring informed policy-making and answers. As an example of interpretation issues, and by not means an exhaustive list, we have: EMF hypersensitivity, possible children higher sensitivity and vulnerability to EMF, EMF and childhood cancer, EMF genotoxicity, ELF and health (power lines and residential exposure), RF and mobile telephony, base stations and handsets; potential long-term effects and whole-body exposure, etc.

ANNEX 1. Advisory Board -Mission Statement

EIS-EMF Advisory Board

Mission Statement

Introduction

The Advisory Board constitutes a high level network of European competent Authorities on EMF and Health related issues, to exchange information and assess strategies on how information on EMF exposure can be used in national policy making and in risk communication.

To achieve its objectives the EIS-EMF must ensure that a common information basis is provided to decision makers and the public across the EU, which is reliable, relevant, balanced, user-friendly, up-to-date and timely. To this end, the members of the Advisory Board and the European Commission will carry out a systematic information exchange. The JRC will coordinate this information exchange. It will be carried out in the frame of thematic activities and technical working groups. These undertakings constitute the work-program of the EIS-EMF. Advisory Board members will make proposals and advise the JRC in the planning of the work programme, and contribute to its execution.

I. Mission Statement

The mission of the Advisory Board is to advise the EIS-EMF project to fulfill its objectives, in particular the development and implementation of a EU-wide programme on EMF risk communication.

II. Composition

Principally 25 full members who are representing the Member States, one per Member State, constitute the Advisory Board.

Member States may propose delegations of more than one person, under the leadership of the full member. The full member will act as a focal point for the national network of competent authorities on EMF and Health issues.

The Advisory Board may also include as Associate Members representatives from relevant international Organisations and activities in the area of EMF and Health such as EMF-NET, COST281, ICNIRP, WHO, EBEA, etc; and European consumer protection associations and social partners. Industry representatives and representative stakeholders may participate as observers.

III. Modus Operandi

The European Commission will chair the Advisory Board. The JRC will provide the technical secretariat.

The Commission will reimburse the expenses of only one representative per Member State.

III.1 Advisory Board Meetings

The Advisory Board will meet twice a year to establish and review the work-programme and deliverables of the EIS-EMF.

In these meetings the Advisory Board may be requested to contribute in the identification of meaningful issues of public concern and policy relevance on EMF & Health related matters. This may require the discussion of the risk communication aspects of scientific evidence on potential health impacts and also of the response to specific issues generating public concerns, and the analysis of possible policy options.

III.2 Development of the national focal point function

Each Advisory Board member should identify the national network of relevant authorities on EMF and Health issues, and guarantee that the regional level is covered. The function of the national focal point includes the establishment of an information flow within its network on the matters under discussion in the Advisory Board and to provide feedback. The JRC will supply the infrastructure in support of this information exchange.

III.3 Contribution to the development and maintenance of the EIS-EMF Gateway

The core activity of EIS-EMF is to develop a web based gateway to all relevant information sources and materials on “public health & EMF” across the EU. The members of the Advisory Board contribute with information, at least twice a year, for the periodic updating of the country reports, which constitute the backbone of the EIS-EMF gateway.

III.4 Contribution to EIS-EMF thematic activities

The overall design and planning of thematic activities of the EIS-EMF will be focused on the key priority needs that will be agreed among the members of the Advisory Board, depending on the availability of resources at national and at EU levels.

ANNEX 2. Country Reports on EMF and Health: Sources, Regulations, and Risk Communication Approaches

European Information System on Electromagnetic Fields Exposure and Health Impacts

On behalf of DG SANCO

Country Reports on EMF and Health: Sources, Regulations, and Risk Communication Approaches

FIRST DRAFT

**With contributions from National Representatives from
EU Member States and Switzerland**

February 2005



**EUROPEAN COMMISSION
DIRECTORATE GENERAL JRC
JOINT RESEARCH CENTRE
Institute for Health and Consumer Protection
Physical and Chemical Exposure Unit**

List of Contributors

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4. [Danish report \(Lis Keiding\)](#)
5. [Finland Report \(Maila Hietanen, Kari Jokela, and Jukka Juutilainen\)](#)
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15. [Swedish report \(Lars Mjones and Kjell Hansson Mild\)](#)
16. [Swiss report \(Mirjana Moser\)](#)
17. [The Netherlands report \(Ginevra Delfini and Eric van Rongen\)](#)
18. [UK report \(Graham Worsley and Alastair McKinlay\)](#)

Country Reports on EMF & Health

(Web-Gateway to National EMF Activities)

This document presents the contributions from the EIS-EMF Advisory Board members and supporting experts to the “National Reports on EMF and Health: Sources, Regulations, and Risk Communication Approaches”. These reports from a number of EU countries (seventeen) plus Switzerland, give an overview of the various countries legislative initiatives, regulations, and relevant actions in the field of EMF & Health, and risk communication approach and channels. The reports include, at various degrees of detail, the list of relevant regulatory bodies, and other institutions and organisations having a role in the EMF & Environment and Public Health debate. They will form the basis for the production and periodic updating of comprehensive country-specific reports on EMF at the European level. The aim is to present in a single document, and a common lay-out, a concise and thorough inventory of the relevant players, actions, norms and regulations, sources of information and databases in the area of EMF across Europe, from national authorities, industry, academia, NGOs, etc. The contributions can also be found in the “Country Reports “ section at the EIS-EMF Website, <http://www.jrc.cec.eu.int/eis-emf>).

Introduction

Rationale & Objectives

The basic objective of these reports is to present a concise and thorough review of national approaches, regulatory measures, and actions in the area of EMF, the associated environmental and health impacts, and potential risks. This is, we believe, an unique and much needed undertaking, aiming at summarising and presenting in a single document and a common lay-out, a concise and thorough inventory of the relevant players, institutions, actions, norms and regulations, sources of information and databases in the area of EMF across Europe, from national authorities, industry, academia, NGOs, etc.

Exposure from EMF fields is an unavoidable fact of life, and understanding the potential adverse health effects and the environmental impacts and risks, is a priority. Up-to-date, high quality information is needed to support policy-making as well as for the setting of comprehensive and well-funded regulations, of EMF exposure conditions and limits. Transparency in the decision making process requires active citizen involvement and unrestricted public access to information; information has to be thorough, clearly summarized, and trustworthy.

This is a complex task involving multiple and heterogeneous actors, and a multitude of sources of information, different viewpoints, and at times competing and conflicting findings and arguments. One essential initiative, in providing such information, is the systematic production – and periodic updating – of EU wide country-specific reports on EMF and health.

Reports structure and content - Common Layout

The contributions from “policy-making” members of the advisory board (in collaboration with national supporting experts) are presented in this document. The reports from sixteen EU countries plus Switzerland, give an overview of the various countries legislative initiatives, regulations, and relevant actions in the field of EMF & Health, and risk communication approach and channels. The reports include, at various degrees of detail, the list of relevant regulatory bodies, and other institutions and organisations having a role in the EMF & Environment and Public Health debate.

These first contributions form the basis for the production and periodic updating (once a year) of comprehensive country-specific reports on EMF at the European level. The full frequency range between 0 and 300 GHz is considered. Only summary information, links to information sources and databases, and contact addresses are considered; and when it applies the list include:

- (1) Key actors, Organisations & www sites,
- (2) Specific responsibilities and functions,
- (3) Regulatory tools and/or relevant initiatives, and
- (4) Key documents and publications

List of topics and information categories – Proposed common layout

1. Inventory of national key actors and initiatives on EMF & Health

1.1 Relevant actors, roles and responsibilities. Institutions and organizations at governmental, industry and NGO levels

- 1.1.1 Authorities (Regulatory bodies, Health authorities, etc) and governmental advisory institutions
- 1.1.2 Industry (Telecommunications, Mobile telephony, Power Grid operators, etc)
- 1.1.3 NGOs (Consumer associations, citizen advisory and special interest groups, etc).
- 1.1.4 Academia, research institutions, and professional associations

1.2 Information sources. Relevant publications and documents & contact points (Key dissemination documents and scientific evidence reports & interpretation, etc)

1.3 Legislation & Regulations. Existing as well as planned initiatives. (Network planning, base station siting, exposure compliance, etc)

2. Risk communication strategies, channels and risk management initiatives

2.1 Risk communication tools and initiatives: information campaigns, workshops, surveys, leaflets, newsletters, etc

- 2.1.1 Governmental Institutions
- 2.1.2 Industry
- 2.1.3 NGOs
- 2.1.4 Academia

2.2 Public perception of EMF risk, surveys, publications, and monitoring activities

2.2.1 Governmental Institutions

2.2.2 Industry

2.2.3 NGOs

2.2.4 Academia

2.3 Risk perception and risk communication studies and research

3. Summary overview of research support to EMF & Health. Main research topics

3.1 Government supported research

3.2 Industry supported research

3.3 Other research (comment on quality assurance if considered necessary)

4. Data and databases on EMF sources and exposure

4.1 EMF sources and exposure data across full frequency range

4.2 Exposure monitoring and compliance measurements

1. AUSTRIAN Report

J.K. Hohenberg and K. Stangl

Federal Ministry of Agriculture, Forestry, Environment and Water Management
Dept. Radiation Protection

All the issues in this report focus on the general public, and do not deal with occupational exposure which area is regulated by the directive 2004/40/EC of the European Parliament and of the council of 29 April 2004.

1.1 Inventory of national key actors and initiatives on EMF & Health

1.1.1 Relevant actors, roles and responsibilities. Institutions and organizations at governmental, industry and NGO levels

1.1.1.1 Authorities and advisory institutions (regulatory bodies, Health authorities, electricity distribution, broadcasting and telecommunications)

The four governmental authorities with a responsibility for EMF and health are the following (**national network**):

- Federal Ministry for Transport, Innovation and Technology (BMVIT)

The BMVIT is responsible for the licensing, the regulation and the control of the construction and the operation of radio and telecommunication systems.

<http://www.bmvit.gv.at/>

- Federal Ministry of Health and Women (BMGF)

The BMGF is responsible for public health and is dealing with topics like the interaction of EMF with medical devices (e.g. electronic implants), or the application of EMF in medicine.

<http://www.bmgf.gv.at>

- Federal Ministry of Economics and Labour (BMWA)

The BMWA is responsible for occupational exposure, for the licensing, the regulation and the control of the construction and the operation of power lines and for the licensing of EMF applications in industrial undertakings.

<http://www.bmwa.gv.at>

- Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW)

Dep. of Radiation Protection

Finally in order to realise an overall regulation regarding EMF and health protection, the BMLFUW plans to create an act on the “Protection of health against the hazards of non-ionising radiation” based on the outcome of the EMF project of the WHO.

<http://www.lebensministerium.at/umwelt>

1.1.1.2 Industry (Telecommunications, Mobile telephony, Power Grid operators, etc.)

- Forum Mobilkommunikation (FMK)

The FMK is an umbrella organisation founded by the Austrian network providers, mobile phone manufacturers and the Association of the Austrian Electrical and Electronics Industries (FEEL).

<http://www.fmk.at>

- Five mobile communication operators are active in Austria (percentage of mobile phone users, march 2003, source: FMK):

Mobilkom Austria	http://mobilkomaustria.at	44,5 %
T-Mobile	http://www.t-mobile.at	29,5 %
ONE	http://one.at	20,2 %
Teling	http://www.teling.at	5,8 %
Hutchison3G	http://www.drei.at	

- Austrian association of electricity companies (VEÖ)

The VEÖ is the pressure group of the Austrian electricity industry (producers, distributors and dealers). The association has almost 130 member organisations, which account for more than 90% of Austrian electricity generation. The VEÖ represents Austria in EURELECTRIC.

<http://www.veoe.at>

VERBUND-Austrian Power Grid AG (APG) is Austria's leading electricity transporter
<http://www.verbund.at/at/apg/>.

- Association of the Austrian electrical and electronics industries (FEEL)

The FEEL represents the interests of all Austrian companies that manufacture electrical and electronic products on industrial basis, offer system solutions or supply services.

<http://www.feel.at>

1.1.1.3 Academia, NGOs, and Professional Associations (consumer associations, citizen advisory and special interest groups, research institutions, etc)

- Austrian Research Centers Seibersdorf (ARCS):

<http://www.arcs.ac.at>

DI Georg Neubauer

- Institute of Clinical Engineering, Graz University of Technology

<http://www.kht.tugraz.at>

Prof. Norbert Leitgeb

- Department of occupational Medicine, Medical university Vienna

<http://www.univie.ac.at/Innere-Med-4/Arbeitsmedizin>

Prof. Hugo Rüdiger

- Institute of Environmental Health, Department for Occupational and Social Hygiene

<http://www.univie.ac.at/umwelthygiene/>

Prof. Michael Kundi

- The Austrian Standards Institute provides standards for the purpose of ensuring safety and health in cooperation with technical committees (TC) and working groups.
- The Association of consumer information (Verein für Konsumenteninformation, VKI): is mostly concerned with pricing and to a lesser extent with the health issues of mobile telephony.

1.1.2 Information sources. Relevant publications and documents & contact points (key dissemination documents and scientific evidence reports & interpretation, etc).

Since the early eighties the department of radiation protection has regularly ordered studies about the different applications that generate non-ionising radiation and the arising exposures in Austria. Furthermore the studies reviewed and evaluated the scientific publications dealing with EMF and health.

“Studie dokumentierter Forschungsergebnisse über die Wirkung elektromagnetischer Felder: Teil 1: Niederfrequente elektrische und magnetische Felder; Teil 2: Hochfrequente elektromagnetische Felder; Teil.3: Wissenschaftliche Veröffentlichungen und relevante Dokumente“1997

Very recently a new review of the scientific literature about the effects of ELF-EMF by the ARCS has been financed by the BMLFUW, the BMWA and the Industry (VEÖ, FEEI). The results of the study will be summarized and published in a booklet for the general public.

The already mentioned Forum Mobilkommunikation (FMK), an umbrella organisation founded by the mobile phone providers is a contact point providing information and documents about the mobile telephony and health issue.

1.1.3 Legislation, regulations and guidelines. Existing as well as planned initiatives. (Network planning, base station siting, exposure compliance)

The Telecommunication act (Telekommunikationsgesetz BGBl I Nr. 70/2003) provides a legal framework for the construction and operation of telecommunication and radio systems. It should assure the protection of human health by demanding that the communication systems have to be in accordance with the technical state of the art and that they have to fulfill the recommendations of the Council of the European Union. However, there are no limits embodied in the telecommunication law.

The Austrian mobile telecommunication operators have concluded an agreement with the association of the municipalities (Gemeindebund) in 2001. They committed themselves to provide the citizens with general and technical information, before the construction of a base station in order to guarantee more transparency for the population. http://www.fmk.at/medieninfo/bildmaterial/010829_Vereinbarung_Gemeindebund_final_version_.pdf (in German)

The legal framework for the construction and operation of power lines and electrical installations and devices is the Act on electrical engineering and the act for high-voltage power lines.

Also the Trade, Commerce and Industry Regulation Act enable the protection of the general public in this field.

The mentioned legal framework allows individual administrative decisions.

Exposure limits for low- and high frequency electromagnetic fields are established in the ÖNORM S1119 for the low frequency range and the ÖNORM S1120 for the high frequency range issued by the Austrian Standards Institute. A revision of these documents is ongoing and a new unified ÖNORM for the whole frequency range is expected to be issued by the end of this year. The exposure limits will be harmonised with the values proposed by the ICNIRP. An ÖNORM is not legally binding, but defines the state of the art and experts use them in administrative proceedings and they can be imposed by official notifications.

- ÖNORM S 1119 (VORNORM January 1994): Low-frequency electric and magnetic fields - Permissible limits of exposure for the protection of persons in the frequency range 0 Hz to 30 kHz.
- ÖNORM S 1120 (VORNORM July 1992): Microwave and radio frequency electromagnetic fields - Permissible limits of exposure for the protection of persons in the frequency range 30 kHz to 300 GHz.

Available at: Österreichisches Normungsinstitut, Heinestraße 38, 1021 Vienna,
Tel.: +43 222 26 75 35 www.on-norm.at

Until now no specific law for the protection of health from electromagnetic fields has been created in Austria. According to the program of the government from 2003 a radiation protection law to protect the population from the hazards of non-ionising radiation should be based on the outcome of the EMF project of the WHO.

1.2 Risk communication strategies, channels and risk management initiatives

1.2.1 Risk Communication tools and initiatives: information campaigns, workshops, surveys, leaflets, newsletters etc

1.2.1.1 Governmental Institutions

In 1997 an international seminar entitled: “Risk perception, risk communication and its application to EMF exposure” was held in Vienna. The WHO, ICNIRP and the German, Austrian and Japanese government sponsored the Seminar. The proceedings are available at ICNIRP: R. Matthes, J.H. Bernhardt, M. H. Repacholi (eds.) 1998, ISBN 3-9804789-4-7.

A scientific advisory board for radio communication (Wissenschaftlicher Beirat Funk, WBF), which is located at the Austrian Research Centres Seibersdorf (ARCS) has been created by Prof. Vana (Atomic Institute of the Austrian Universities) and the Ministry for Transport, Innovation and Technology. The members of the advisory board, which are specialists, had to review the scientific literature concerning RF and possible health effects. The experts concluded that the research performed to date gives no evidence of a relationship between RF exposure from mobile telephony and any adverse health effect.

The Ministry of Health and Women has published a booklet about “electromagnetic compatibility of medical devices” and plans another one about wireless local area network (WLAN).

“Elektromagnetische Felder und Wellen”: a multimedia CD-ROM, supported by the Ministry of education, science and culture (BMBWK) and produced by the Technical University of Graz (Institut für technische Anlagen).

1.2.1.2 Industry

The most active organisation in Austria with respect to risk communication is the “FMK” (Forum Mobile Kommunikation), which is an umbrella organisation founded by the Austrian network providers, mobile phone manufacturers and the Association of the Austrian Electrical and Electronics Industries (FEEL). The FMK sees its role as a mediator between the Industry and public interests. Activities of the FMK include the editing of scientific literature for the general public, the production and distribution of information material, the initiation of symposia, expert hearings and information events. It is a reliable information centre for the public, the media and public institutions.

Information about health issues and EMF in flyers and on web sites from electricity providers:

- <http://www.verbund.at/at/apg/faq/gesundheit.htm>
- <http://www.salzburg-ag.at/content/default.asp?Mainid=1&kapitel=1&l3menu=315>
- <http://www.tirag.at/index.php?rubrik=strom&content=uenetz&menu=emfelder>

1.2.1.3 NGOs

PMI (Plattform Mobilfunk Initiative)

<http://www.plattform-mobilfunk-initiativen.at/>

Ärztinnen und Ärzte für eine gesunde Umwelt (AGU)

<http://members.nexta.at/aegu/index.htm>

1.3 Summary overview of research support to EMF & Health. Main research topics

Research Activities of ARC Seibersdorf in the field of EMF (G. Neubauer)

The business unit Mobile Communications Safety of ARC Seibersdorf research runs an EMC Test Laboratory, which is accredited by the Austrian Ministry of Economic Affairs. Staff members of the Information Technologies Division have been engaging in EMF-related research for 20 years. The research projects range from literature evaluations regarding the biological effects of electromagnetic fields, conducted for the Austrian government as well as for industry and utility companies, to measurements of SAR due to mobile phones in human tissue. The ARCS participates in the PERFORM-A project funded by the EU, as an assistant partner involved in dosimetry. The project focuses at the investigation of EMF carcinogenicity. Seibersdorf research is currently leading the EUREKA project BASEXPO dedicated to the development of procedures for assessing human exposure to electromagnetic radiation of base stations together with 7 international partners and an international study on the feasibility of future epidemiological studies on health effects of mobile telephone base stations also with 7

international partners from the field of dosimetry and epidemiology. Other ongoing projects performed in close co-operation with partners from medicine and biology focus on e.g. in vitro immunological tests, human brain functions or DNA integrity.

Research activities at the Institute of Clinical Engineering at Graz University of Technology (N. Leitgeb)

The Institute of Clinical Engineering participates in several European Network activities such as heading COST Action 281. In addition it participates in leading committees in EMF-NET and EIS-EMF and plays an active role in radiation protection such as heading the committee of non-ionising radiation protection of the German commission of radiation protection. Its research activities concentrate on the following projects:

- 1) Project EPROS (Electrosensitives and protected sleep)
- 2) Project CHIEF (Children's Exposure to Electromagnetic Fields): Physiologic and dosimetric assessment of specific aspects of children in relation to exposures against electric and magnetic fields.
- 3) Project electromagnetic hypersensitivity: Quantitative assessment of electromagnetic hypersensitivity in relation to normal reactions and its relation to the development of non-specific health symptoms
- 4) Project EXIMA (Exposures to inhomogeneous electric and magnetic fields): Dosimetric assessment of exposures to inhomogeneous electric and magnetic field sources in relation to existing EMF limits. Numerical simulation of inhomogeneous exposure conditions and verification by measurement.
- 5) Project EBEG: Collection, measurement and assessment of EMF emission data of relevant electrical appliances and development of dosimetric and metrological approaches applicable for practical use to check for compliance of inhomogeneous fields with existing homogenous-field- based exposure limits.

Government supported research:

Project EPROS (Electrosensitives and protected sleep): Investigation of sleep disorders associated with telecommunication base stations, using a double blind crossover design to quantitatively assess sleep impairment at different RF-EMF- protected exposure conditions (Prof. Norbert Leitgeb, TU Graz). <http://www.kht.tugraz.at/home.swf>.

An already mentioned review about the scientific literature dealing with the effects of ELF-EMF by the ARCS, financed by the BMLFUW, the BMWA and the Industry (VEÖ, FEEI) is in progress.

Industry supported research:

The Austrian electricity founded an Energy Research Association (Energieforschungsgemeinschaft, EFG), which co-ordinates joint Austrian electricity industry projects in the areas of research, development and environmental protection.

<http://www.veoe.at/10.html?&L=2>

Development of a plant test system to investigate the biological effects of electric and magnetic fields (ARC Seibersdorf)

The possible role of electromagnetic fields in the development of arterioscleroses (Prof Wick, University of Innsbruck)

Review about the scientific literature, dealing with the possible susceptibility of electronic implants to external electric, magnetic and electromagnetic fields from 0 Hz to 30 kHz (ARC Seibersdorf)

Project EMIS, electric and magnetic fields from power grids and current densities in the body (N. Leitgeb, TU Graz)

1.4 Data and databases on EMF sources and exposure

Up to now there is no database available with the exposure of the general public in Austria. The FMK is maintaining a register of antenna sites: radio and television stations and base stations (GSM and UMTS). The register is available for the public and includes information about the geographic location and the transmitting power: in the case of base stations the input power of the antenna (categories low, middle and high); in the case of television/radio stations the power output is available www.senderkataster.at.

In Austria the federal state of Styria investigated in a three year long running project the immission caused by base stations on the surrounding schools, kinder gardens, hospitals and residential homes for the elderly. The obtained results confirmed the measurement data gained by the IZMF in different European cities showing that the immission are below the limits of ICNIRP. <http://www.umwelt.steiermark.at>

The government of the city of Salzburg and the regional sanitary administration demanded on behalf of the precautionary principle an assessment value of $1\text{mW}/\text{m}^2$ for the sum of emissions from mobile radio transmission equipment. In 2001 the Swiss Federal Office of Communication performed in collaboration with ARCS measurements in the city of Salzburg in order to verify this "Salzburger Modell". "The measurements, as well as the exposure situations simulated using computers, thus indicate clearly that an exposure value of $1\text{mW}/\text{m}^2$ cannot be complied with, for people living near antenna installations in an urban area, for technical and operational reasons."

(<http://www.bakom.ch/en/funk/elektromagnetisch/immission/index.html>)

For compliance measurements of electromagnetic fields Austria has 3 accredited institutions:

- ARC Seibersdorf Research GmbH, Information Technologies
<http://www.arcs.ac.at/it/itm>, e.g. Electromagnetic compatibility of devices. Further services: Exposure assessment in electromagnetic fields, Radiofrequency dosimetry, and susceptibility of electronic implants
- TGM (Versuchsanstalt für Elektrotechnik und Elektronik):
<http://www.tgm.ac.at/VA/FBEE.html>, e.g.: "Electro smog" measurements, measurement of electromagnetic field around base stations

- TÜV Österreich: <http://www.tuev.at/go/index.pl?l=uk&seite=service>, e.g.:
Electromagnetic compatibility; measurements of HF field strength around base stations, television and radio stations

The **AUVA** (Allgemeine Unfallversicherungsanstalt) is the social insurance for occupational risks for employed persons and students. One of the main duties lies in the prevention of occupational accidents. In the field of EMF two booklets have been published:

“Mobilfunkanlagen” (<http://www.auva.sozvers.at/media/52940.PDF>), and

“EMF am Arbeitsplatz” <http://www.auva.at/mediaDB/48669.PDF>. Furthermore measurements of EMF and assessment of the safety has been carried out.

2. BELGIUM Report

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Introduction

Belgium is situated in the west of Europe, bordered to the north by the Netherlands, to the east by Germany and the Grand Duchy of Luxembourg and to the south and the west by France. Although its surface (area) of 32,545 km² makes it a small country, its location has made it the economic and urban nerve centre of Europe.

As illustrated in figure 1, Belgium is a federal state with four different political organisations or governments, each of which has certain specific responsibilities.

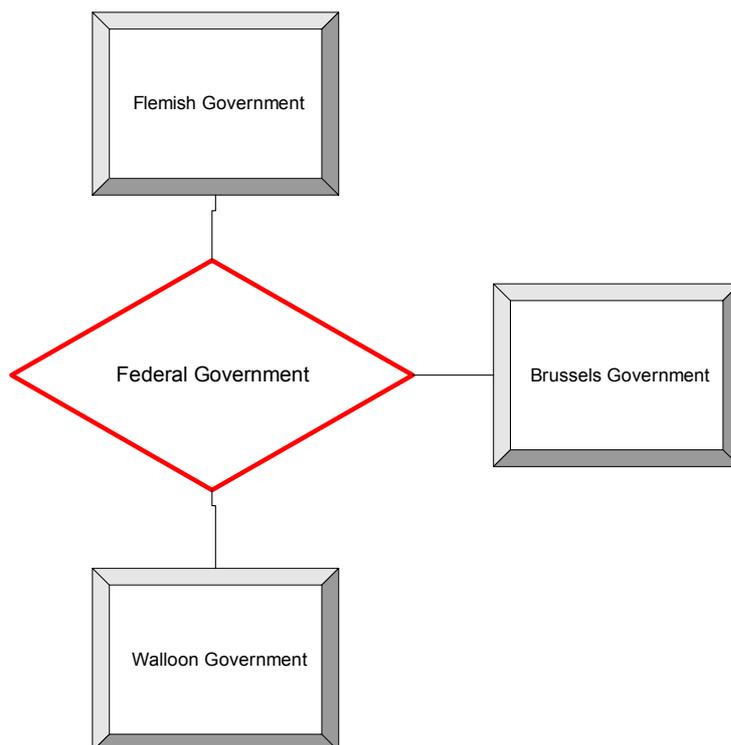


Figure 1: Political or governmental organisation of Belgium

All issues of this report will be based on the governmental organisations. It means that, where it will be necessary the inventory of the national key initiatives on EMF will be split up into Federal, Flemish, Walloon and Brussels specific activities.

2.1. Inventory of national key actors and initiatives on EMF & Health

2.1.1 Relevant actors, roles and responsibilities. Institutions and organisations at governmental, industry and NGO levels

2.1.1.1 Authorities (Regulatory bodies, Health authorities, etc) and governmental advisory institutions

Relevant actors	Roles and responsibilities
The FG is responsible for the legislation of national standards. It falls under the jurisdiction of the Federal Services of Environment which acts under the responsibility of the Ministry of Social Affairs, Public Health and Environment (environment.fgov.be)	Standards on: - ELF electric field of power lines - Electromagnetic waves between 10 MHz and 10 GHz No standard on the ELF magnetic field GSM and Health http://www.infogsm.be/ With special attention for GSM and youngsters
The Health Council http://www.health.fgov.be/CSH_HGR/	The Health Council" was established in 1849 to provide the government with a consultative body for all health related matters and, more especially, to promote public health The council is composed of 5 divisions treating chemical and physical environmental agents. The division number 5 which concerns the “ physical agents” is composed of two subdivisions: - 5.1 concerning ‘Ionising radiations’ - 5.2 concerning ‘Non-ionising radiations (NIR)*’ The permanent working ^a group of NIR consists of 14 persons.
The Belgian Institute for Postal services and Telecommunications (BIPT) http://www.telonline.be/general/BIPT.html BIPT Website	Established by the Act of 21 March 1991, BIPT is the regulatory body of the postal and telecommunications sector in Belgium. The Institute started its activities in 1993 and these have become increasingly important, as the market has opened up to competition. The Institute is responsible for strategic, regulatory and operational tasks, tasks regarding the settlement of disputes between operators and regulation of the whole sector. The settlement of disputes between the operators and their clientele is not part of those tasks. Only the mediation service is considered competent to solve those problems. BIPT is a type A semi-governmental body (Article 1(1), A, of the 16 March 1954 Act on the supervision of certain public-interest bodies). The Institute is represented and managed by the Minister with competence for telecommunications affairs. The Act lies down that the Minister performs all administrative acts, whereas the senior civil servant to whom the Minister has delegated his powers exercises day-to-day management.
Flemish Environmental Authority [De Vlaamse milieuoeverheid] http://milieuinfo.be/versie2/zoeken.cgi...	Gives an overview of the most principle institutions within the Flemish environmental authority.
Flemish Environment Agency (Vlaamse Milieumaatschappij (VMM) www.vmm.be	VMM is one of the Flemish public agencies whose research and measurements determine the preparation and orientation of the Flemish Environmental management.

Flemish Environmental Administration [AMINAL is de Administratie Milieu-, Natuur-, Land- en Waterbeheer van het Ministerie van de Vlaamse Gemeenschap] http://www.mina.be	AMINAL is the administration of the Flemish Minister and plays a central role in the preparation, the execution and the evaluation of the Flemish Environment management
Walloon Environmental Administration (Direction générale des Ressources naturelles et de l'Environnement – DGRNE) http://mrw.wallonie.be/dgrne/	The DGRNE is the administration of the Walloon region and plays a central role in the evaluation of the Environment management
The Brussels Institute for Management of the Environment (Institut bruxellois pour la gestion de l'environnement –IBGE - Brussels Instituut voor Milieubeheer - B.I.M.) http://www.ibgebim.be/	The IBGE-BIM is the administration of the environment and energy of the Brussels Region. The IBGE-BIM is also involved in research, planification and expertise in the environment area
OTHER ???	To complete later

^ahttp://www.health.fgov.be/CSH_HGR/Nederlands/Structure/Permanente%20werkgroep/WG_5_NIR.htm

2.1.1.2 Industry (Telecommunications, Mobile telephony, Power Grid operators, etc)

Company name	Activity description	Additional information
TELonline http://www.telonline.be/who.html	TELonline is a young and dynamic company, active in the world of telecommunication. We have contacts with the most important telephone- & internet providers in Belgium and the USA. At this time, we offer the services of about 8 phone & internet providers in Belgium and 10-tal international providers	Belgian providers: Belgian Telecom, LCR Telecom, NETnet, Phone-Plus, Sun Telecom, Tele-West, Tellink, Tiscali, Toledo, United Telecom... International providers: ACCXX, Action, Buyers Online, Cable & Wireless, Power Net Global, TELCan, Telesys, United World Telecom, WorldXchange, WorldValue Telecom,...
Telenet http://www.telonline.be/general/Telenet.html	Offers telecommunication services in Flanders over its cable network. It is the same cable that has been used for your TV and radio signals, which can provide phone & internet applications into your home.	
GSM-operator/providers	In Belgium are 3 GSM-operators active: Proximus: http://www.proximus.be/index_en.html	NETWORK INFORMATION 1° Belgacom Mobile (PROXIMUS) – Network Information Operator Name Belgacom Mobile

	<p>Mobistar: http://www.mobistar.be/en/index.htm</p> <p>Base: http://www.base.be/en/index.html</p>	<p>Network Name PROXIMUS</p> <p>Network Type GSM 900/1800</p> <p>Handset Code BEL PROXI</p> <p>Network Code 206 01</p> <p>Network Status Live January 1994</p> <p>2° MOBISTAR</p> <p>Operator Name Mobistar S.A.</p> <p>Network Name Mobistar</p> <p>Network Type GSM 900</p> <p>Handset Code mobi*</p> <p>Network Code 206 10</p> <p>Network Status Live August 1996</p> <p>2° BASE</p> <p>Operator Name BASE NV/SA</p> <p>Network Name BASE</p> <p>Network Type GSM 1800</p> <p>Handset Code BASE</p> <p>Network Code 206 20</p> <p>Network Status Live March 1999</p>
<p>ELIA (www.elia.be): Distribution of electricity</p>	<p>Elia operates the Belgian high-voltage grid (380 kV to 26 kV), consisting of overhead lines, underground cables and other equipment necessary to enable the transmission of electricity (e.g. transformers). The grid is operated from the control centres or 'dispatchings'.</p>	<p>Annual and Activity Report 2003^e</p>
<p>SPE – Public Electricity Supplier http://www.electricite.be/en/index.html</p>	<p>SPE is the Belgian public power producer. It builds, operates and maintains power plants.</p>	
<p>Electrabel - energy supplier http://www.electrabel.be/homepage/index_en.asp</p>		

http://www.elia.be/english/pdf/Activiteitenverslag_EN_LR2003.pdf

2.1.1.3 NGOs (Consumer associations, citizen advisory and special interest groups, etc).

Name	Activity description	Publications
TEST AANKOOP http://www.test-aankoop.be/	Belgian Consumer association	Elektromagnetische straling van GSM's, [Electromagnetic radiation of GSMs, June 2003] ^f GSM et Radiations Electromagnétiques – Il n'a y pas péril pour vos cerveaux - June 2004

^f <http://www.test-aankoop.be/map/src/307451/year/2004/month/6/magazine/0.htm>

2.1.1.4 Academia, research institutions, and professional associations

Name	Activity description	Publications
Belgian Universities research institutions	Ulg: http://www.ulg.ac.be/ UG: http://www.rug.ac.be/ KUL: http://www.kuleuven.ac.be/ ULB: http://www.ulb.ac.be/ VUB: http://www.vub.ac.be/ ISSeP: http://www.issep.be/public.asp Vito: www.vito.be .	Reports & publications not available in digital version Champs électromagnétiques et téléphonie mobile – Juin 2003 - PIRARD W. (www.issep.be) – only available in French and German Various publications on field strength measurements results available on the ISSeP web site.
BBEMG Belgian BioElectroMagnetic Group http://www.bbemg.ulg.ac.be/english/	The BBEMG, created in 1995, is a research group composed of <u>nine teams of research</u> involved for several years in the study of the biomedical effects of electromagnetic fields. The BBEMG is interested particularly in the effects of electric fields and magnetic induction generated by the transport and the use of the electric power in our everyday life or in our place of work (50 Hz). .	Reports and publications: see publication link (English link still under construction) Belgian links <u>CEB</u> : Belgian Electrotechnical Committee (http://www.bec-ceb.be/) <u>Belgian National Committee Cigre</u> : International Council on Large Electric Systems (http://www.cigre.be/) <u>InfoGSM</u> : site du Gouvernement Fédéral Belge (http://www.infogsm.be/fr/index.html) <u>SSMG</u> : Société Scientifique de Médecine Générale (http://www.ssmg.be/new/index.php)

2.1.2 Information sources. Relevant publications and documents & contact points (Key dissemination documents and scientific evidence reports & interpretation, etc)

➤ Report of Flemish Environment Agency - Vlaamse Milieumaatschappij (VMM)

Decat G, Peeters E., Smolders R., Bossuyt M (2003) Time series and GIS-model for mapping the B-field exposure of power lines. [Tijdsreeks en GIS-model om de blootstelling van de bevolking aan het 50 Hz magnetisch veld gegenereerd door bovengrondse hoogspanningslijnen in Vlaanderen in kaart te brengen.]

<http://www.vmm.be/servlet/be.coi.gw.servlet.MainServlet/standard?toDo=open&id=3102&&>

Decat G., Martens L., Olivier C., Bossuyt M. (2003) Basic document on non-ionising radiation.

[MIRA (2003) Milieu- en natuurrapport Vlaanderen, Achtergronddocument 2003, 2.21 Niet-ioniserende straling] Vlaamse Milieumaatschappij, <http://www.milieurapport.be>

<http://www.vmm.be/servlet/be.coi.gw.servlet.MainServlet/standard?toDo=open&id=1524&&>

Olivier C., Martens L., Decat G., Bossuyt M., (2003) MIRA-T2003 Synthèse rapport niet-ioniserende straling. [Short report on non-ionising radiation]^d

MIRA (2003) Milieu- en natuurrapport Vlaanderen, ^d

<http://www.vmm.be/servlet/be.coi.gw.servlet.MainServlet/standard?toDo=open&id=1523&&>

➤ Report of Flemish Environmental Administration - Administratie Milieu-, Natuur-, Land- en Waterbeheer van het Ministerie van de Vlaamse Gemeenschap (AMINAL)

Verschaeve L, Decat G, Maes A., (2004) Inventory of exposure levels of all NIR-sources and biological effects [INVENTARISATIE VAN BLOOTSTELLINGSNIVEAUS VAN NIET-IONISERENDE ELEKTROMAGNETISCHE STRALING VOOR DE BEVOLKING IN VLAANDEREN, LITERATUURSTUDIE .

http://www.mina.be/uploads/MG_Inventarisatie_van_blootstellingsniveaus_van_nis_2004.pdf

Decat G., Polders C., Deckx L. (running investigation) Measurement strategy, modeling and measuring the exposure to micro-cells, pico-cells, GSM, EAS, DC and ELF electromagnetic field in public transport and other public sectors. [Inventariseren van blootstellingsniveaus van niet-ioniserende elektromagnetische straling voor de bevolking in Vlaandere: Deel II. Meetstrategie & Modelleren en metingen]. (Running investigation by order of AMINAL and that among others will be published in 2006 on Internet)

➤ Report of Walloon Environmental Administration - Direction générale des Ressources naturelles et de l'Environnement (DGRNE)

Pirard W. (2000) Champs électromagnétiques à proximité des antennes-relais de mobilophonie - Rapport final - Mai 2000 (www.issep.be). Only available in French

2.1.3 Legislation & Regulations. Existing as well as planned initiatives. (Network planning, base station siting, exposure compliance, etc)

The Belgian legislation includes standards on:

- ELF electric field of power lines: Ministry order 1988 [Besluit van de Minister van Economische Zaken, belast met het toezicht op de lijnen voor transport en verdeling van elektrische energie (MB van 7 mei 1987, BS 14-5-1987 - art 1 vervangen bij MB 20-4-1988, BS 6-5-1988)]

- Electromagnetic waves between 10 MHz and 10 GHz of base stations: Royal decree of April, 29 2001 [Koninklijk besluit van 29 april 2001 houdend de normering van zendmasten voor elektromagnetsiche golven tussen 10 MHz en 10 GHz, gewijzigd door het Koninklijk besluit van 21 december 2001]

N.B.: The State Council has pronounced, on December 15 2004, a judgment that cancels the Royal decree of April 29 2001. As a consequence, there is, presently, in Belgium, no standards regarding the exposure to high frequency E.M. fields.

<http://www.bipt.be/Legislation/telecoms/kb21122001.pdf>

No standard on the ELF magnetic field but a general rule on electrical installations for the protection against biological effects of electric and magnetic fields: article 139, modified by Royal decree 22-12-1999, BS 9/2/1995. It states that the Ministry of Energy is authorized to take measures for the protection against ELF electric and magnetic fields [Artikel 139 van het Algemeen Reglement op de elektrische installaties (zoals gewijzigd bij KB 22-12-1994, BS 9-2-1995)]

2.2 Risk communication strategies, channels and risk management initiatives

2.2.1 Risk communication tools and initiatives: information campaigns, workshops, surveys, leaflets, newsletters, etc

In Belgium there are no risk communication (RC) tools nor initiatives based on organised information campaigns. The RC is organised on free initiative of certain bodies at certain occasions. Moreover, there are no publications, special workshops, leaflets or newsletters concerning EMF-RC.

2.2.2 Public perception of EMF risk, surveys, publications, and monitoring activities

It seems that no study on public perception of EMF risk has been carried out in Belgium.

2.2.3 Risk perception and risk communication studies and research

See point 2.2 above.

2.3 Summary overview of research support to EMF & Health. Main research topics

2.3.1 Government supported research

Decat G, Peeters E., Smolders R., Bossuyt M (2003) Time series and GIS-model for mapping the B-field exposure of power lines. [Tijdsreeks en GIS-model om de blootstelling van de bevolking aan het 50 Hz magnetisch veld gegenereerd door bovengrondse hoogspanningslijnen in Vlaanderen in kaart te brengen.]

<http://www.vmm.be/servlet/be.coi.gw.servlet.MainServlet/standard?toDo=open&id=3102&&>

Decat G., Martens L., Olivier C., Bossuyt M. (2003) Basic document on non-ionising radiation.

[MIRA (2003) Milieu- en natuurrapport Vlaanderen, Achtergronddocument 2003, 2.21 Niet-ioniserende straling] Vlaamse Milieumaatschappij, <http://www.milieurapport.be>
<http://www.vmm.be/servlet/be.coi.gw.servlet.MainServlet/standard?toDo=open&id=1524&&>

Olivier C., Martens L., Decat G., Bossuyt M., (2003) MIRA-T2003 Synthese rapport niet-ioniserende straling. [Short report on non-ionising radiation]^d
MIRA (2003) Milieu- en natuurrapport Vlaanderen,^d
<http://www.vmm.be/servlet/be.coi.gw.servlet.MainServlet/standard?toDo=open&id=1523&&>

Verschaeve L, Decat G, Maes A., (2004) Inventory of exposure levels of all NIR-sources and biological effects [INVENTARISATIE VAN BLOOTSTELLINGSNIVEAUS VAN NIET-IONISERENDE ELEKTROMAGNETISCHE STRALING VOOR DE BEVOLKING IN VLAANDEREN, LITERATUURSTUDIE .
http://www.mina.be/uploads/MG_Inventarisatie_van_blootstellingsniveaus_van_nis_2004.pdf

Decat G., Polders C., Deckx L. (running investigation) Measurement strategy, modeling and measuring the exposure to micro-cells, pico-cells, GSM, EAS, DC and ELF electromagnetic field in public transport and other public sectors. [Inventariseren van blootstellingsniveaus van niet-ioniserende elektromagnetische straling voor de bevolking in Vlaandere: Deel II. Meetstrategie & Modelling en metingen]. (Running investigation by order of AMINAL and that among others will be published in 2006 on Internet)

Pirard W. (2000) Champs électromagnétiques à proximité des antennes-relais de mobilophonie - Rapport final - Mai 2000 (www.issep.be). Only available in French

2.3.2 Industry supported research. None

2.3.3 Other research. None

2.4 Data and databases on EMF sources and exposure

2.4.1 EMF sources and exposure data across full frequency range

➤ Report of Flemish Environment Agency - Vlaamse Milieumaatschappij (VMM)

Decat G, Peeters E., Smolders R., Bossuyt M (2003) Time series and GIS-model for mapping the B-field exposure of power lines. [Tijdsreeks en GIS-model om de blootstelling van de bevolking aan het 50 Hz magnetisch veld gegenereerd door bovengrondse hoogspanningslijnen in Vlaanderen in kaart te brengen.]

<http://www.vmm.be/servlet/be.coi.gw.servlet.MainServlet/standard?toDo=open&id=3102&&>

Decat G., Martens L., Olivier C., Bossuyt M. (2003) Basic document on non-ionising radiation. [MIRA (2003) Milieu- en natuurrapport Vlaanderen, Achtergronddocument 2003, 2.21 Niet-ioniserende straling] Vlaamse Milieumaatschappij, <http://www.milieurapport.be>
<http://www.vmm.be/servlet/be.coi.gw.servlet.MainServlet/standard?toDo=open&id=1524&&>

Olivier C., Martens L., Decat G., Bossuyt M., (2003) MIRA-T2003 Synthese rapport niet-ioniserende straling. [Short report on non-ionising radiation]^d
MIRA (2003) Milieu- en natuurrapport Vlaanderen,^d

<http://www.vmm.be/servlet/be.coi.gw.servlet.MainServlet/standard?toDo=open&id=1523&&>

➤ **Report of Flemish Environmental Administration - Administratie Milieu-, Natuur-, Land- en Waterbeheer van het Ministerie van de Vlaamse Gemeenschap (AMINAL)**

Verschaeve L, Decat G, Maes A., (2004) Inventory of exposure levels of all NIR-sources and biological effects [INVENTARISATIE VAN BLOOTSTELLINGSNIVEAUS VAN NIET-IONISERENDE ELEKTROMAGNETISCHE STRALING VOOR DE BEVOLKING IN VLAANDEREN, LITERATUURSTUDIE .

http://www.mina.be/uploads/MG_Inventarisatie_van_blootstellingsniveaus_van_nirs_2004.pdf

Decat G., Polders C., Deckx L. (running investigation) Measurement strategy, modeling and measuring the exposure to micro-cells, pico-cells, GSM, EAS, DC and ELF electromagnetic field in public transport and other public sectors. [Inventariseren van blootstellingsniveaus van niet-ioniserende elektromagnetische straling voor de bevolking in Vlaandere: Deel II. Meetstrategie & Modelling en metingen]. (Running investigation by order of AMINAL and that among others will be published in 2006 on Internet)

➤ **Report of Walloon Environmental Administration - Direction générale des Ressources naturelles et de l'Environnement (DGRNE)**

Pirard W. (2000) Champs électromagnétiques à proximité des antennes-relais de mobilophonie - Rapport final - Mai 2000 (www.issep.be). Only available in French

➤ **Reports of the Belgian Institute for Postal services and Telecommunications (BIPT)**

Are published on www.bipt.be

➤ **Reports of the Belgian Institute for Postal services and Telecommunications**

➤ **Technical information, geographic distribution**

a) Power lines: Is published in the “Annual and Activity Report 2003 of ELIA” (see §1.1.2 Industry).

b) Mobile phone base stations:

Base station technical information, geographic distribution BIPT: (www.bipt.be)

2.4.2 Exposure monitoring and compliance measurements

Many residential and dynamic exposure monitoring data on the ELF electric and mainly magnetic fields are available in Vito. However they are not in digital version.

3. CZECH REPUBLIC Report

Luděk Pekárek

National Reference Laboratory en EMF
Prague, CZECH REPUBLIC

3.1 Relevant regulatory bodies: specific responsibilities and functions, regulatory tools and initiatives, key documents and publications

Czech Republic adopted without any change the EMF exposure guidelines of the International Commission on Non-Ionizing Radiation Protection – ICNIRP – (published in 1995 and 1998), in a Governmental Regulation (Order No 480/2000 Coll., On protection of health against the non-ionizing radiation). The regulation is mandatory and sets basic limit values and reference values for employees as well as for general public. The Regulation has been in force from January 2001.

The chief responsibility for enforcing the requirements of the Regulation is on the Ministry of Public Health. All other ministries applied their comments during the preparation of the Regulation. No changes have been introduced into the governmental document since 2001.

Czech Republic is divided into thirteen rather autonomous regions with their own executive bodies (Hygienic Stations), which care for compliance of all requirements of the governmental regulation No 480/2000 Coll. Hygienic stations are controlled by the chief hygienist of the Czech Republic, the deputy minister MUDr. Michael Vít, PhD., in charge of the Department of Hygiene and Epidemiology of the Ministry of Health of the Czech Republic. The executive director of the department is Dr. Karla Říhová. For the discipline relevant to the EMF health protection, the Reference Laboratory on Non-Ionizing Electromagnetic Fields and Radiation was established, with doc. RNDr. Luděk Pekárek, DSc. in charge of the Laboratory.

The Laboratory is the advisory office for the deputy minister and for the director of the Department of Hygiene and Epidemiology. The Laboratory prepares documents for the ministry, organises seminars and consultations, issues texts (“Informations of NRL”) published (in Czech) on the web: (http://www.hygp Praha.cz/odborv/hyg_prace.htm). As well as communicates with TV and press, realizes specialized measurements and arranges consultations and lectures for specialists from the official regional bodies engaged in the measurements of electromagnetic field levels in working places and in environment. One of the duties of the Laboratory is monitoring of the development of scientific knowledge about the interaction of electromagnetic fields with living tissue and keeping contact with relevant international bodies.

Engaged in general epidemiological research is the central Institute of Public Health (Director MUDr. Jaroslav Volf, PhD). All aspects of risk evaluation and risk assessment at work are solved in the department of Prof. MUDr. Miroslav Cikrt, DSc., from the same institute. In Prague, the regional hygienic office is the Prague Hygienic Station (Director MUDr. Vladimír Polanecký).

Contact addresses:

Ministry of Health:

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Fax: +420 2 2497 2111
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tis@mzcr.cz (Public Relations dept.)

National Reference Laboratory on Non-Ionizing EMF and Radiation:
Rybalkova 39, 101 00 Praha 10
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National Institute of Public Health:
Šrobárova 48, 100 42 Praha 10
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Prague Hygienic Station:

Rytířská 12, 110 00 Praha 1
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Fax: +420 224 212 335
E-mail: sekretariat@hygpraha.cz

3.1.1 Responsibility for fulfilling the requirements of the Governmental Regulation - Order No. 480/2000 Coll.

According to the law, the person or company which uses a device which emits non-ionizing radiation (electromagnetic field) of the frequency covered by the Regulation is obliged to make such arrangements, that no person could be exposed more than allowed by the set limits. In addition, in urban areas, the user of a device serving to the wireless public communication (chiefly the BTS) is obliged to provide the regional authority with a calculation or measurement showing in advance that, in accessible places, the installed transmitter would expose no persons beyond the limits. Further limitations may be put on the construction and location of the device (antennas, towers) by the local authorities in connection of preservation the view of historical buildings, landscape and with similar aspects. The regional or local hygienic stations spread densely through the country control the compliance with the regulations. Substantial sanctions and ban of the operation of the device can be imposed on the company or person, who does not fulfill the Governmental regulation.

Additional requirements, e.g. special rules about places where transmitters must not be built, have not been introduced. In case of fears or misunderstandings, the people in the neighborhood of the proposed transmitter are explained how the radiation propagates and what intensities can

be expected in their flats and in the streets. In most cases it helps to sooth people afraid of cancer and of other risks announced similarly as in all other countries by the media. Ex post measurements are often demanded and realized to remove concerns of the people living in the neighborhood. If the exposure limits are not exceeded in accessible places and the construction of the transmitter is agreed with the owner of the building or of the ground, any pretension of neighbors and public in general are not supported by law and can be negotiated only on the basis of consensus between the company and citizens.

3.1.2 Our experience with introducing ICNIRP guidelines

The previous Czech (Czechoslovak) EMF limits (Order No 408/1990) were much more stringent than the present ones, and it was not an easy task to switch to milder ones. We hope, that our experience with replacing the standard based on COMECOM limits by the standard based on ICNIRP guidelines may be useful for other countries, too.

3.1.2.1 History

The very low limits, especially for long-term exposure of general public, were introduced in Czechoslovakia in early seventieths, and in 1990 they were issued as a Ministry order. Difficulties soon appeared: for instance, TV and FM transmitters installed on the new TV tower in Prague were not allowed to broadcast for several months, as the limit for 24 hours' resident exposure (0.01 W/m^2 for the frequency range 30 MHz – 300 MHz) was slightly exceeded on a nearby square, and the ban was lifted only after the power radiated by these transmitters was lowered. Later, under heavy propaganda in media approaching sometimes hysteria, people became afraid of alleged malignant influence of base stations for mobile telephones, too. With this bias, and in truly democratic conditions in the country, the existing EMF limits had to be changed to milder ones. The change was inevitable, as even any use of a mobile telephone exceeded the power densities allowed by the 1990 Czech regulations. Moreover, no limits were given for frequencies lower than 60 kHz, and SAR for high frequency limits was not introduced at all in the old regulations.

3.1.2.2 Decisive arguments

The information that WHO supported the ICNIRP guidelines convinced most of the people engaged in the health service, that the ICNIRP limits are sufficiently safe to protect human health. It appeared very useful, too, to describe the experiments on SAR and to show the large safety factors chosen for the SAR limits. Also, the ICNIRP arguments explaining why only short-term effects were considered for the limits were important during the discussions. Information about these topics has been placed on the web sites, and seminars dealing with the planned change to ICNIRP limits were organized with people engaged in the Czech public health service. In spite of strong opposition coming chiefly from the authors of the 1990 limits, and in spite of several petitions of protesting citizens living near the TV and BTS transmitters, Czech government accepted at 22. November 2000 the ICNIRP limits for the official document, without any change. Special care was taken to explain the groups writing petitions why the new regulation is safe, on which scientific results the limits are based, and how the assessment of all work published on the relevant topics has been made by ICNIRP.

3.2 Present state of application of the new EMF regulations in Czech Republic

Application of the ICNIRP limits is now progressing without substantial difficulties. Certainly, the members of the National reference laboratory spend quite a lot of time answering telephone

calls by citizens afraid of the radiation of nearby base stations or asking about the distance from power lines which is safe for permanent living. The well known reports on childhood leukaemia allegedly connected with magnetic fields near power lines is now the most frequent question, and the ICNIRP assessment of this stuff is not always accepted now, when the EMF appeared on the list of possibly carcinogenic agents. Nevertheless, the well-known ICNIRP statement, that its guidelines would be changed without delay, if any established scientific evidence would appear showing that the limits are not safe enough, appeared to be a very strong argument in these discussions. So only smaller part of callers remained unconvinced and became difficult with writing complaints to state institutions and to the government. Such conflicts usually ended with in-place-measurements, which (till now without exception) showed field intensities safely below the reference levels at accessible places.

The chief effort of the hygienic service is now directed to working places. As far as no hygienic regulations for human exposure to low frequency fields existed in the country before January 2001, measurements of low frequency magnetic fields have been organized in places, where exposures higher than the limit could not be excluded. They included, e. g., facilities using high currents for induction heating or melting, some sorts of electric welding, pulsed fields used for creating permanent magnets, high power stations rectifying current for trains or trams. It appeared, that the ICNIRP reference levels were sometimes exceeded in such places, but the basic limits (induced current densities in the body of the exposed person) were usually satisfied, so that restrictive measures for the work were necessary only in exceptional cases. Fortunately, the WHO Fact Sheet No 201 claimed no health risk coming from VDU units or TV sets, so questions about this stuff are now rare.

3.2.1 Complications

The government (Czech Ministry of Health) has been applying the „philosophy“ that the regulation of EMF exposure (and similarly of exposure to chemical and biological agents) must be based on the established scientific facts, with relevant safety factors. Then, further lowering the exposure limits for „sensitive regions“ or so is not regarded as useful. As in most other countries, reports are common on TV, radio, in press and especially on web sites, claiming danger coming from mobile telephones and other transmitters or from household facilities and electric wiring. This propaganda is usually not very effective, unless reported as a quite new discovery made by Swedish, British, American, German or other scientists. There is no „trade mark“ for the term „scientist“, and, unfortunately, even scientists (without double quotes) sometimes make unwise claims on this issue. Again, the reference to ICNIRP did help much, though not always. Especially difficult is to explain, why, in some EU countries, limits much lower than those of ICNIRP have been introduced as obligatory governmental regulations. As in any other European country, people in Czech Republic are sensitive to health issues. From the experience with the “EMF-hypersensitivity” issue it is well known, that the fear and anxiety induced by alarming claims can lead to serious health problems experienced by persons living in a flat with negligible field intensity. So effective rejecting of alarming claims is certainly an important part of the public health care.

3.2.2 Importance of showing numbers

Most persons afraid of the electromagnetic radiation emitted by base stations and by other transmitters are open to reasonable arguments. Showing the field intensities quantitatively and giving the percentage of the reference levels achieved in the discussed situation has always been more convincing, than claiming the field intensity (power density) to be low or below the limit

without quantifying the difference. In most situations found in flats and on streets, the high frequency fields are lower than 0,1 % of the reference level for power density, and this number is usually convincing enough.

3.2.3 On the word „Electrosmog“

This term, though used in double quotes in texts issued by WHO or by other official bodies, does not properly reflect the situation met with electromagnetic fields. It is true, that the number of EMF sources in cities is high and rises still, but the steep decrease of the field with distance from the source makes the situation quite different from the situation observed with the true smog. Again, the quantitative approach for characterisation of the electromagnetic fields generated by transmitters is highly informative. It is a general physical law, that at a sufficient distance from any high frequency transmitter, the power density S of the emitted electromagnetic wave is inversely proportional to the square of the distance from the antenna. The numerical value of S is given by the simple formula $S = P \cdot 10^{(dBi/10)} / (4\pi \cdot r^2)$. (If the power P feeding the antenna is in watts and the distance in meters, the resultant power density S is in W/m^2 .) For a typical base station antenna, $P = 30$ W, gain = 17 dBi, and the ICNIRP reference level for general public (for 900 MHz) is fulfilled at the distance $r = 5$ m in the height of the antenna, in the direction of its maximum emission. In all other directions and heights this distance is even smaller. So in places, where the waves from different transmitters meet, their power densities are small and their sum is negligible even if the number of sources is large and usable frequency bands are overcrowded. The latter is, of course, a technical problem. From the directional diagrams of the antennas used for the base stations, it can also be easily inferred, that a ban to place the antennas on the roofs of schools or kindergartens is groundless, as the radiation of the directional antenna propagating downwards is extremely small.

Similarly, the field surrounding household appliances as TV sets, vacuum cleaners, refrigerators etc. falls steeply with distance from the source, and the idea that the room is filled by “electrosmog” if all the appliances are on is groundless.

3.2.4 Calculations and measurements

Much effort has been expended calculating the field levels around the base station antennas and near other sources of electromagnetic fields. Due to changing power emitted by some types of sources (the basic telephone stations belong to such sources), calculation of the field around the antennas is often more reliable than measurement: the microwave power feeding the antenna cannot be made higher than the maximum output power of the used generator. From the number of channels used for the given antenna the maximum power lead to the antenna is easily obtained, and the maximum emission into different direction can be found using a suitable graphical program. Discussions about the changing transmitted power become irrelevant in that case. Similarly, without evaluating records of long-term measurements, the (rotating) magnetic vector near a three-phase 50 Hz power line can be calculated for the maximum transported power or, if needed, the mean value for one day or for one year can be found using the record of the power station about the time course of the transmitted power in different times of the day or year.

Of course, in more complicated cases, measurement is the only liable way to find the field intensity and to evaluate the exposure. The Reference laboratory and several regional stations have got equipment for measurements in the necessary frequency range. Method of integral filtration of a digitally recorded field signal was developed in NRL, suitable for evaluation of

human exposure to periodic low frequency fields with non-sinusoidal shape and to non-periodic pulses and jumps. The ICNIRP statement published in 2003 was used to construct a computer program for that purpose.

Several hundred of workplaces, flats, streets and free landscape areas were measured in Czech Republic during the past four years by the Reference Laboratory, Institute of Public Health and by regional hygienic offices. Only in small number of workplaces the basic limits were exceeded and measures had to be taken to comply with the regulations. Most of the measurements in workplaces were undertaken on request of the companies. In flats, measurements were usually made in connection with complaints of people living in sight of the BTS antennas and suffering from health troubles, which they attributed to the electromagnetic field emitted by the antennas. Power densities by two or more orders of magnitude lower were found in such flats without any exception, confirming the point of view that their health symptoms were of purely psychosomatic nature.

3.3 Research activities

There are several groups of researchers in different institutions of Czech Republic working on problems connected with the interaction of electromagnetic fields with living matter. No preference is given to their results before the results obtained and published in other parts of the world. If necessary, the authors are encouraged to send their results to an international journal and wait for the appraisal. It is our philosophy, that results obtained in our country should be poured into the common pool of world's scientific knowledge and, for setting the hygienic limits, assessed by a recognized scientific body as ICNIRP, together with the results coming from all other places of the world.

4. DANISH Report

Lis Keiding

Center of Health Promotion and Prevention
National Board of Health, Denmark

4.1 Inventory of national key actors and initiatives on EMF & Health

4.1.1 Relevant actors, roles and responsibilities. Institutions and organizations at governmental, industry and NGO levels

4.1.1.1 Authorities (Regulatory bodies, Health authorities, etc) and governmental advisory institutions.

The Danish National Board of Health is responsible for giving advice on health aspects of exposure of the population to electromagnetic fields to those authorities regulating devices or products giving rise to EMF. The Danish Working Environment Authority regulates the occupational exposure. This division of responsibility and regulatory interventions is in function for the entire range considered in the present document (0 to 300 GHz). The Danish National Board of Health has established an Expert Panel specifically focused on RF exposure in the light of the ongoing debate about possible health effects caused by exposure in this frequency band. In addition the Board has engaged one scientific consultant who is responsible for the surveillance of the scientific literature. Regarding ELF, the Danish Safety Technology Authority is responsible for the security of electricity in Denmark including production, transmission, distribution and use of electricity. They attend an inspectorate as well as an advisory role on electricity.

4.1.1.2 Industry (Telecommunications, Mobile telephony, Power Grid operators, etc)

The mobile telephone operators, which deliver services in Denmark, are organised in a collaboration labelled the Danish Telecommunication www.teleindustrien.dk. The Danish IT and telecom regulator has not registered EMF measurement data pertaining exposure of the general public due to mobile base station because the providers themselves must ensure, according to the legal requirements, that their installations do not pose a risk for health of the public.

Following Power Grid operators operate in Denmark: Elforsyningen Nordvendsyssel, Frederikshavns Kommunale Elforsyning, Brønderslev og oplands Elforsyning, Sæby Kommunal Elforsyning, Elforsyningen Sydvestsyssel, Læsø Kommunenet, Elforsyningen AKE net, HEF Himmerlands Elforsyning, Han Herreds Elektricitetsforsyning, Aars Elforsyning A/S, NRGi A/S, Nordthy Strømforsyning, Thy-Mors Energi A/S, EnergiMidt Net A/S, Hurup Elværk, NOE Nordvestjysk Elforsyning A.m.b.a, Vestforsyning Net A/S, Struer Forsyning Elnet A/S, Energi Viborg, Bjerringbro Elværk, Kjellerup El forsyning, Energi Hobro Net, ELRO Net A/S, Energi Randers Net, Hammel Elforsyning, GaltenElværk A/S, Brabrand Net A/S, Viby Net A/S, Østjysk Energi A/S, Energi Horsens Net A/S, MES Net A/S, Ikastværkerne, EnergiGruppen

Jylland, RAH Net A/S, Videbæk Energiforsyning, Ringkøbing Kommunale Elforsyning, Skjern Kommunale Elværk, Tarm Elværk Net, VOS Vejle Oplands Strømforsyning Amba, GEV Net A/S, Sydvest Energi, Tre-for El-net A/S, Energiselskabet Sønderjylland, Energi Fyn Net A/S, Ravdex A/S, Odense Elforsyning Net A/S, Nyborg Forsyning og Service A/S, Faaborg Elforsyning A/S Netvirksomhed, SEF Net A/S, LEF Net A/S, Ærø Elforsyning Netvirksomhed A/S, Rødby Elværk, SEAS, Nakskov Kommunale Elværk, Maribo Elforsyning, Østkraft Net A/S, Vordingborg Elnet A/S, Næstved Elforsyning, Korsør kommunale Værker, Slagelses Kommunes Elforsyning, NVE Net A/S, Køge Kommunale El-, Varme- og Antenneforsyning, NesaNet A/S, Nykøbing Sj. Kommunale Elforsyning, Roskilde Elforsyning, Hilderød Elforsyning, Københavns Energi, Frederiksberg Forsyning, Helsingør Elforsyning Net, Vordingborg Elnet, Christiansø Elværk Net, Elselskabet SEV, Grønlands Energiforsyning. A map of the operators can be found on this page:

<http://www.elfor.dk/Web/Indhold/Find+dit+elnetselskab/Kort+over+netselskaber>.

4.1.1.3 NGOs (Consumer associations, citizen advisory and special interest groups, etc).

The Information Centre for Environment and Health www.miljoegsundhed.dk has produced specific information pages on the Internet, which focuses on research and the public debate about the localization of mobile telephone antennas. Another major player is the Danish Consumers Council www.fbr.dk, which publishes a magazine and advocate for consumer viewpoints. In Denmark there is an organisation for hypersensitive persons, The Danish Association for the Electro-sensitive www.el-allergi.dk, which focuses on perception of 'allergic' and other health effects caused by exposure to electricity and electromagnetic fields. Like the two other organisations mentioned above, this organisation advocates for consumer viewpoints but also advocates for a decrease in the overall exposure to electricity. Finally, Feltfri (<http://www.feltfri.dk/>), The future of our children (<http://www.voreboernsfremtid.dk/news.php>) and Cramon.dk (<http://www.cramon.dk/stopumts.asp>) emf.dk are NGOs against mobile phones and mobile masts.

4.1.1.4 Academia, research institutions, and professional associations

The most active group in Denmark is situated at the Danish Institute for Cancer Epidemiology. This group has published epidemiological studies in this area for more than ten years. In June 2001, the Head of the Institute, Dr. Jørgen H. Olsen chaired the epidemiology group at the WHO-IARC Monography evaluation of the carcinogenicity of electromagnetic fields in the extreme low frequency area. You may find more information at www.cancer.dk or identify Danish epidemiological studies at PubMed or Medline by searching for publications of Olsen J. and Johansen C. Another research group is situated at Aalborg University. This group has conducted a number of studies focused on the development of antennas and propagation but also on exposure assessment of the population from mobile telephones and base stations. You may find more information at <http://cpk.auc.dk/antennas/index.html>

4.1.2 Information sources. Relevant publications and documents & contact points

An Expert Group on Non-ionising Radiation, put down by the Danish Ministry of Health, has from 1994-96 published a row of reports on magnetic fields. These are the SEIIS Report No.1. Report on the risk of cancer in children living in homes exposed to 50 Hz magnetic fields from high-voltage lines. The SEIIS Report No.2. Report on the risk of cancer among persons occupationally exposed to extremely low frequency magnetic fields. The SEIIS Report No.3. Sundhedsmæssige risici ved eksponering for elektromagnetiske felter i radiofrekvensområdet. Furthermore, Johansen C. has done a doctoral dissertation on Electromagnetic fields and health

effects – epidemiological studies of cancer, diseases of the central nervous system and arrhythmia-related heart disease. The Danish National Board of Health acts a point of contact. On the web page www.sst.dk information on magnetic fields is available.

Finally, the Danish IT- and Telecommunication Regulator, NITA, has set up a public database on the Internet giving the position of the antenna masts for nearly all the radio base stations in Denmark. Excluded from the database are only antenna masts, which are vital for national security, i.e. defense, police etc. The database includes all existing and planned antenna masts and is being continuously updated. The database covers antenna masts for GSM, 3G, FWA, Microwave Relay Links, Land Mobile systems, TETRA, TV, FM-broadcast, Satellite Earth Stations etc.

The antenna mast database can be found at the following Internet address: <http://www.mastedatabase.dk>. The database is only available in Danish, and there is no plan for making an English version. The database is based on a GIS-system giving the antenna mast positions on a normal geographic map. The user can key in a specific address, and as the result he or she will get a map - with the given address at the centre of map - and with all existing and planned antenna masts up to a user selected distance from the address. Each antenna mast is colour coded, indicating the type of radio system. By double-clicking on a specific antenna mast icon on the map the basic technical information for the mast and the name of the operator will be shown.

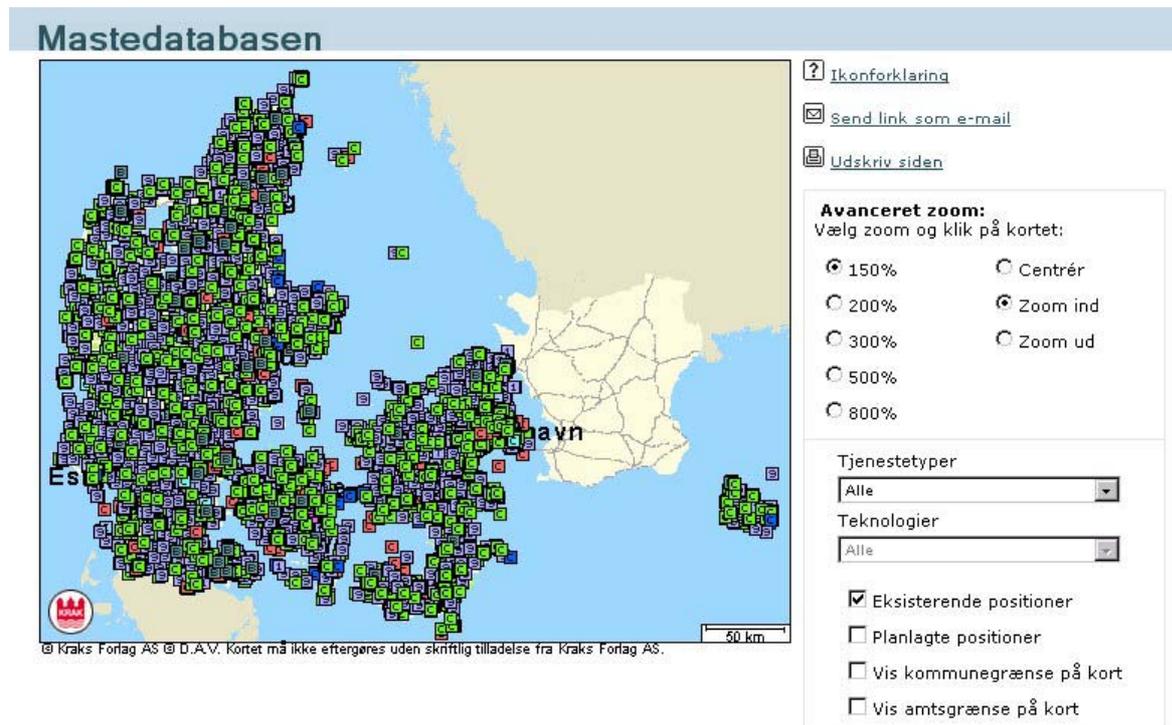


Figure DK-1 Web interface of the Mastedatabasen

4.1.3 Legislation & Regulations. Existing as well as planned initiatives

In Denmark mobile phone base stations are regulated according to the provisions of the R&TTE-directive 1999/5/EC (Directive 1999/5/EC of the European Parliament and of the Council of 9

March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity). As a prerequisite for setting up and using a mobile phone base station the operator must ensure, that the specific station does not present a health risk for the general public. The harmonized European EMF-standard published under the R&TTE-DIRECTIVE specifies limits and measurements. Network planning, base station siting and exposure compliance is regulated by a combination of plan authorities in each of the 275 municipalities of Denmark and The National IT and Telecom Agency.

Regarding ELF, a specific assessment must be made whenever a major line is to be established. In this assessment partly a weighting of electric supply reliability and economy in the light of the assignments of the high voltage system, and partly a weighting of various nature interests, etc. and a weighting of these conditions against alternative possibilities and the expenses connected hereto must be included. By this assessment it is also of essential importance how the electric plants are formed, and how it is fitted into the landscape. To assure that these criteria are met, the Danish Energy Authority and the planning division of the Association of County Councils in Denmark must be heard before planning the establishment of new electricity lines.

4.2 Risk communication strategies, channels and risk management initiatives

4.2.1 Risk communication tools and initiatives: information campaigns, workshops, surveys, newsletters, etc.

4.2.1.1 Governmental Institutions

The Danish government implements measures to inform the public about knowledge on health impacts of electromagnetic fields. The National Board of Health performs risk assessments and gives advice to relevant ministries on health aspects of electromagnetic fields. The Danish National Board of Health has information on electromagnetic fields on its homepage. Furthermore the Danish National Board of Health has in November 2003 sent out an information letter to all municipalities in Denmark on knowledge about antennas for mobile communication and health.

The letter can be found on http://www.sst.dk/upload/brev_til_kommunalbestyrelser.pdf. The Information Centre for Environment and Health also produces information material concerning mobile telephones and health for Danish consumer.

4.2.1.2 Industry

The mobile telephone sector produces information material concerning mobile telephones and health for Danish consumer.

4.2.1.3 NGOs

For the time being there are no relevant initiatives from the NGOs.

4.2.1.3 Academia

For the time being there are no relevant initiatives from academia.

4.2.2 Public perception of EMF risk, surveys, publications, and monitoring activities

4.2.2.1 Governmental Institutions

The Information Centre for Environment and Health has done a public perception measuring on non-ionising radiation from mobile phones and masts. The results are that a third of the Danish population is worried about the radiation and 40% do not feel that they have been informed sufficiently on the issue (the report can be found on this site:

http://miljoeogsundhed.dk/artikel_disc.asp?artikelID=4645. (in Danish).

4.2.2.2 Industry

No relevant activities

4.2.2.3 NGOs

No relevant activities

4.2.2.4 Academia

No relevant activities

4.2.3 Risk perception and risk communication studies and research

Ivar Sønbo Kristiansen, University of Southern Denmark, will lead a coming project on risk perception of mobile masts and mobile phones. The aim is to understand the worries of people in order to be able to communicate the risks better.

4.3 Summary overview of research support to EMF & Health

4.3.1 Government supported research

The Danish Research Agency is supporting five research projects on non-ionising radiation. The first project will examine the effects of low static magnetic fields and RF-exposure on biochemical reactions by the radical pair mechanism, the only known potentially active mechanism. The project is led by Assistant Professor, dr.scient. Jørgen Boiden Pedersen, Physics Department, University of Southern Denmark. Web: <http://www.fysik.sdu.dk>.

The second project is a PET Study on the Cerebro-metabolic Effects of Non-ionising Radiation from Mobile Phones. Professor, M.D. Albert Gjedde, PET Centre, and Hospital of Aarhus lead the project. Web: <http://www.auh.dk/akh/afd/pet/dk/index.htm>. The third project is an experimental study of mobile base station related radio-frequency electromagnetic radiation in healthy adults and adolescents. Assistant Professor Søren Kjærgaard, Institute of Environmental and Occupational Medicine, University of Aarhus leads the study. Web: <http://www.mil.au.dk>.

The fourth project will study the health aspects of radio frequency electromagnetic fields. It includes three studies (1) a Nordic study of the association between use of mobile phones and risk for cancer, especially focusing on children; (2) an investigation of the risk for cancer and CNS disorders in a cohort of 420 000 Danes and (3) a prospective, international study of the association between mobile phone use and risk for cancer as well as other diseases including CNS disorders. Director of the Danish Institute of Cancer Epidemiology, M.D., DMSc. Jørgen H. Olsen, and Danish Cancer Society leads the project.

Web address:

<http://www.cancer.dk/epi+research/news/use+of+mobile+phones+and+risk+for+cancer.asp>

The fifth study will be studying the semen quality and reproductive hormones among young Danish mobile phone users. The study is led by MD, PhD. Niels Jørgensen, Clinic for growth and Reproduction, GR5064, H: S Rigshospitalet. Web: <http://www.growth-reproduction.dk/>.

In 2003, Aalborg University performed a project illustrating the EMF levels for 3G, GSM and FM/TV Broadcast base stations around the city of Aalborg. The purpose of the project was to assess the radiation arising from UMTS base stations and its comparison with radiation from other sources such as GSM or FM/TV broadcast. The principal objective of the project was to measure the radiation from UMTS antenna masts. Based on the ICNIRP reference values, the radiation from a mobile phone was compared with that from a mast with a single antenna, both compared as local SAR values. Also included was an evaluation of the radiation from another person's mobile phone, a radiation that is typically 10,000 times smaller than from the person's own phone. Other sources of low power radiation were also measured, indicating that 3G radiations was at the same level as FM radio, GSM 900 and 1800, except near a 3G antenna. The report is written in Danish and includes an abstract in English. It can be found in the Internet address: <http://auaw2.aua.auc.dk/fak-tekn/mobilmast.doc> ("Radiation from antenna masts", Feb 2004).

4.3.2 No industry supported research

4.3.3 No other research

4.4 Data and databases on EMF sources and exposure

All municipalities are currently developing a geographical information system (GIS), which will inform citizens of the exact localization of RF sources including FM antennas, broadcasting systems and mobile telephone antennas. This GIS is a part of an increased awareness in the public of the potential exposure but also mirrors new possibilities for dissemination of public exposure information by the Internet. All citizens may demand information from the utility companies in Denmark about exposure from 50 Hz high currency overhead power lines (60 to 400 kV). Most utility companies conduct direct measurements free of charge.

5. FINLAND Report

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Finnish Institute of Occupational Health (FIOH), Helsinki

Kari Jokela

Radiation and Nuclear Safety Authority (STUK), Helsinki

Jukka Juutilainen

University of Kuopio, Kuopio

5.1 Inventory of national organizations on EMF and Health

5.1.1 Governmental health authorities and institutes

Ministry of Social Affairs and Health, Department of Preventive Social and Health Policy and Department of Labour Protection, Helsinki, Finland www.stm.fi
STUK- Radiation and Nuclear Safety Authority, www.stuk.fi
Finnish Institute of Occupational Health (FIOH), www.ttl.fi

5.1.2 Legislation & Regulations

The first EMF regulations were focused to industrial EMF sources. As early as in 1985, a *Decision on high-frequency equipment and control thereof (473/85)* was given by the Council of Ministers.

In 1991, Ministry of Social Affairs and Health confirmed a *Decision on limiting exposure to non-ionising radiation (1474/91)*

EU Council Recommendation 1999/519/EY) was published as the *Ordinance on limiting exposure of the general public to non-ionising radiation (294/2002)* in 2002.

The third part of the EU Physical Agents Directive, which deals with limiting occupational exposure to EMFs, was published in Finnish in 2004.

5.2 Risk Communication strategies and channels

5.2.1 Communication tools and initiatives: information campaigns, workshops, surveys, leaflets, newsletters, etc

Public Seminar on Mobile Telephony and Health was organized at the Biomedicum, Helsinki University, in October 2003. Ref: Juutilainen J, Kumlin T, Eds. Proceedings of the Final Seminar of the Finnish National Research Programme 1998 – 2003.

5.2.2 Public perception of EMF risk, surveys publications, and monitoring activities

Recent publications on EMF safety:

- Safe use of mobile phones in hospitals, FIOH and VTT (2000)
- Mobile phones and hypersensitivity, FIOH (2000)
- Electromagnetic fields in the work environment - Guidance for occupational exposure assessment, FIOH (2002)
- Radiation Safety of Pulsed Radars, STUK (2003)
- Radiation Safety during Work on Masts at FM and TV Stations, STUK (2003)
- Public exposure to low frequency electric and magnetic fields in Finland, Technical University of Tampere, (2003)

5.3 Summary overview of research support to EMF & Health

During the past 10 years, a series of national research programmes have been carried out in Finland. The first programme “Biological effects of electromagnetic fields” was conducted in 1994-1997 as a part of the European COST244 and 244bis Actions. The second research programme followed it, “Electromagnetic fields from mobile telephones as a possible health risk” during 1998 - 2000. These programmes included studies on computational modelling of EMF exposure conditions, and on possible cancer-related effects of EMF exposure using both epidemiological methods and animal studies. In addition, possible effects on human volunteers were studied, such as neurophysiological effects and hypersensitivity symptoms. The programmes also included development of exposure systems for animal and cell culture studies, as well as using *in vitro* methods for testing the relationship between bio effects and modulation parameters.

The third [National Research Project](#) “Health Risk Assessment of Wireless Communication” (LaVita; “Langattoman viestinnän terveysturvien arviointi”) was conducted in 2000-2003. This programme aimed at improving dosimetry and modelling of electromagnetic field exposure of humans and cell cultures, developing reliable biomarkers for electromagnetic field effects, providing tumour micro arrays for the international study of mobile phones and brain tumours, and investigating the effects of radio frequency electromagnetic fields on cognition and brain function, on human circulatory responses, on persons wearing cardiac pacemakers, on hearing and balance and on basic cellular responses to electromagnetic field exposure in yeast and mammalian cells.

This project was part of the European collaborative Action COST281 “Potential Health Implications from Mobile Communication Systems” (<http://www.cost281.org/>).

While the previous Finnish research programmes and other recent studies have produced a lot of useful data for risk assessment of RF fields from wireless communication systems, there are still many open questions. Therefore, a new programme was started in 2004 titled "[HERMO](#): Health Risk Assessment of Mobile Communications" The aims of the present research co-operation are:

1. To study repeatability, mechanisms and relevance to human health of reported low-level effects of RF fields
2. To study acute and chronic effects of RF fields on the nervous system and sensory organs
3. To investigate the effects of RF fields on children

4. To provide high-quality data for cancer risk assessment of RF fields
5. To improve dosimetry and to provide dosimetric support for biological studies
6. To study the dosimetry of RF fields near metallic implants
7. To provide materials for risk communication on RF fields

All national programmes have been funded through the [National Technology Agency \(TEKES\)](#). The programmes have also been supported by mobile phone manufacturers (Nokia, Benefon), Finnish network operators (Sonera, Elisa, Radiolinja, Finnish 2G) and international organizations (MMF, GSM Association, FGF).

Research Institutions and Contact Persons:

Finnish Institute of Occupational Health (FIOH), <http://www.ttl.fi>
Dr Maila Hietanen, maila.hietanen@ttl.fi

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University of Kuopio, <http://www.uku.fi>
Professor Jukka Juutilainen, jukka.juutilainen@uku.fi

University of Turku, Centre for Cognitive Neuroscience, <http://www.utu.fi/research/ccn>
Professor Heikki Hämäläinen, heikki.hamalainen@utu.fi

Tampere University of Technology, <http://www.uta.fi>
Professor Leena Korpinen, leena.korpinen@uta.fi

VTT Information Technology, <http://www.vtt.fi>
Senior Scientist Risto Pitkäaho, risto.pitkaaho@vtt.fi

5.4 Data and databases on EMF sources and exposure

Data on health effects of exposure to EMF sources will be collected within the EMF-NET by the Finnish participants (FIOH - Finnish Institute of Occupational Health, STUK- Radiation and Nuclear Safety Authority, and University of Kuopio).

6. FRENCH Report

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Agence Française de Sécurité Sanitaire Environnementale, Maisons Alfort

Frédéric Jourdan
Direction Générale de la Santé, Paris

6.1 Inventory of national key actors and initiatives on EMF & Health

6.1.1 Relevant players, roles and responsibilities. Institutions and organizations at government, industry and NGO levels

6.1.1.1 Authorities (regulatory bodies, health authorities, radio & telecommunications, governmental advisory institutions, etc.)

DiGITIP (General Directorate of Industry, Information Technologies and Postal Services) in the Ministry of Economy, Finances and Industry (www.industrie.fr / www.telecom.gouv.fr)

DGCCRF (General Directorate of Consumption, Competition and Fraud Repression) in the Ministry of Economy, Finances and Industry (<http://www.finances.gouv.fr/DGCCRF>)

Information Technologies and Communication Department in the Delegated Ministry for Research (www.recherche.gouv.fr)

DGS (General Directorate of Health) in the Ministry of Solidarity, Health and the Family (www.sante.gouv.fr)

ANFR (National Frequencies Agency / www.ANFR.fr)

The ANFR is a public administrative institution created by the Telecommunications Regulation Act of 26 July 1996. It took up its duties on January 1, 1997. The Agency checks that transmitters operate in the frequency bands that they have been allocated and that they respect exposure limits. For each new site, the operator must file a statement of compliance concerning threshold values for public exposure with the ANFR.

ART (Telecommunication Regulation Authority / www.art-telecom.fr)

Since January 5, 1997, the ART has been responsible for the implementation of all, legal, economic and technical provisions governing telecommunication activities.

AFSSE (French Agency for Environmental and Health Safety / www.afsse.fr)

The agency is a state administrative institution that was created in May of 2001. It is under the supervision of the ministers in charge of health and the environment. With the aim of protecting human health, the agency's role is to contribute to health safety in the environmental domain. On

April 16, 2003, at the request of Parliament and the Government, AFSSE published an opinion on mobile telephony and health.

UTE (Electricity and Communication Technical Union / www.ute-fr.com)

This association is in charge of the standardization of electrical equipment, in cooperation with CENELEC (European Committee for Electrotechnical Standardization) at the European level for the preparation of harmonized European standards, and in cooperation with the CEI (International Electrotechnical Commission) for the preparation of international standards. The Technical Committee 106 ensures aspects related to the preparation of standards concerning public exposure to electromagnetic fields.

6.1.1.2 Industry (telecommunications, mobile telephony, power Grid operators, etc)

AFOM (French Mobile Operators Association / www.afom.fr)

Orange (www.orange-entreprises.com)

SFR (www.sfr.com)

Bouygues Télécom (www.bouyguestelecom.fr)

6.1.1.3 NGOs and academic institutions (consumer associations, citizen advisory and special interest groups, research institutions, etc)

CSC (Consumers Safety Commission / www.securiteconso.org / www.cscnet.org)

Union Fédérale des Consommateurs – Que choisir (www.quechoisir.org)

AMF (Association of French Mayors / www.amf.asso.fr)

6.1.2 Information sources: Publications and documents

DGS (General Directorate of Health)

Report: "Mobile phones, base stations and health" (January 2001)

http://www.sante.gouv.fr/htm/dossiers/telephon_mobil/2tele.htm

OPECST (Parliamentary Office for the Evaluation of Scientific and Technical Choices)

Report on the possible impact of mobile telephony on health (November 2002)

<http://www.senat.fr/rap/r02-052/r02-052.html>

CSSPPT (High Commission for the Postal and Telecommunications Public Utilities)

Report: "Radio frequencies and health" (December 2002)

http://www.afom.fr/v2/FILE_DOWNLOAD.php?doc_ID=382&mode=directOpen

ART

INERIS study: "Telephony and health" (November 2002)

<http://www.art-telecom.fr/publications/etudes/tel-sante-nov02.htm>

ANFR

Report: "Overview of electromagnetic radiation in France. Current situation and the precaution principle" (2001)

<http://www.ANFR.fr/index.php?cat=sante&page=panorama>

Academy of Sciences (Institute of France)

Report: "Mobile communication, biologic effects" (proceedings of the April 2000 international symposium)

http://www.academie-sciences.fr/publications/colloques/colloque_mobile.htm

AFSSE

Report of an independent group of experts from the AFSSE: "Mobile telephony and health" (March 2003)

http://www.afsse.fr/documents/AFSSE_TM_experts.pdf

AFSSE opinion on mobile telephony (April 2003)

<http://www.afsse.fr/documents/AvisDef.pdf>

At the request of the ministries in charge of health and the environment, the AFSSE will produce a new expert report and a new opinion in early 2005.

A report by the steering committee of the **National Health and Environment Plan** (interdepartmental commission) was published in February 2004. It offers various recommendations about research, evaluation and risk management.

6.1.3 Legislation & Regulations

Departmental order dated May 17, 2001 (Article 17 bis) concerning the technical conditions under which electric power is distributed. It transposes into French law the recommendation dated July 12, 1999 concerning electrical power lines.

Circular dated October 16, 2001 concerning the implantation of mobile radiotelephony base stations.

Decree no. 2002-775 dated May 3, 2002: Implementation of Article L. 32 of the Posts and Telecommunications Code concerning threshold values for public exposure to electromagnetic fields emitted by telecommunication networks equipment and wireless installations. It transposes into French law the July 12, 1999 recommendation concerning all types of radio frequency transmitters.

Decree no. 2003-293 dated March 31, 2003 concerning road safety, and modifying the Code of Criminal Procedure and the Highway Code.

Decree no. 2003-961 dated October 8, 2003 concerning the evaluation of the conformity of terminal telecommunication equipment and wireless equipment, as well as conditions for start-up and use. It modifies the Posts and Telecommunications Code and transposes into French law the 1999/5 CE Directive.

Departmental order dated October 8, 2003 setting technical specifications applicable to final wireless installations.

Departmental order dated November 3, 2003 concerning *in situ* measurement protocol for checking that broadcast transmitting stations are in compliance with in terms of reference levels and public exposure to electromagnetic fields authorized by Decree no. 2002-775 dated May 3, 2002.

Law no. 2004-669 of July 9, 2004 concerning electronic communications and audio-visual communications service. The law introduces health safety into telecommunications legislation.

Law no. 2004-809 of August 9, 2004 concerning the public health policy. The law introduces two measures to enhance the information and the dialogue. The first measure gives to the prefect (local state's representative) the opportunity to ask for EMF measurements supported by the operators. The second measure gives to mayors the possibility to obtain an inventory of all telecommunication installations established on their district.

Decree of January 10, 2005 recognizing a foundation as a public utility institution (Health and Radio Frequencies Foundation).

6.2 Risk Communication: resources and strategies

6.2.1 Public perception of the risk of EMFs, studies, publications, and monitoring activities

The public still expresses concern in France about the possible risks related to mobile telephony, and in particular about radio frequencies emitted around base stations. These concerns seem to be diminishing. Several lobbying groups are very active at the local level and in the media.

6.2.2 Risk communication tools and initiatives: information campaigns, workshops, studies, leaflets, newsletters, etc.

The AFSSE and the DGS are public institutions that inform the public mainly via reports, informational documents, leaflets and their web sites (www.afsse.fr; www.sante.gouv.fr).

The three French operators have created an association, AFOM. One of the principal objectives of this association is to inform the public about mobile telephony and health. It publishes documents on its web site (www.afom.fr). In addition, the association publishes informational documents for the general public, which are available at mobile telephony points of sale. In addition, the operators signed an agreement with major French cities in order to define conditions under which base stations may be deployed and how the public is to be informed. AFOM signed a protocol of agreement with the Association of French Mayors (AMF) that defines, for all three operators, conditions under which networks may be deployed and how the public is to be informed.

Through the circular of October 16th 2001, the creation of local committee has been encouraged in order to deal with health and environmental issues. These structures are notably in charge of the public information at the local level in order to facilitate the potential conflicts due to the setting up of base stations.

Base stations requiring a work declaration or a building permit will be subject of a notice posted in the town hall and at the worksite. In addition, information related to the proposed sitting of an installation can be consulted at the town hall.

Base station locations and the results of electromagnetic field measurements can be consulted on a site run by the ANFR (www.cartoradio.fr).

At the initiative of either the mayor or the operators, informational meetings can be organized when new base stations are installed.

Finally, the operators commit themselves to respond by mail to requests for information related to base stations, proposed sittings and topics related to health and the environment.

An exhibition "Loud and Clear" (Mobile telephony: history, techniques, and uses) is at the Cité des Sciences et de l'Industrie until June 5, 2005.

6.2.3 Academic and research institutions: risk perception and risk communication studies and research

The newly founded "Health and Radio Frequencies Foundation", created at the initiative of the Ministry of Research, is responsible for managing public and private research funds for studies of the biological and medical effects of mobile telephony. These studies are carried-out by research laboratories in universities and research institutions. The foundation also has a major role in informing the public about radio frequencies and health.

In addition, a CNRS research unit, the Center for Organizational Sociology, is particularly interested in the public perception of risks related to mobile telephony base stations. It published a report in 2004 entitled "Controversies and mobilizations concerning mobile telephony base stations".

(http://www.cso.edu/upload/pdf_breves/Mobilisations%20Antennes%20Relais%20-%20Rapport%20final.pdf).

6.3 Overview of research support for EMF and health. Main research topics

Research on extremely low frequency issues is currently funded entirely by France's electric companies (EDF, RTE), whereas research on radio frequencies is funded by several sources — European programs, the MMF (Mobile Manufacturers Forum) and GSM associations, the French military research agency (DGA), the Ministry of Research, and the three French mobile telephony operators. Total funding for electromagnetic field research is around € 2 million per year (including research into dosimetry, sociology, etc.)

Currently in France, two public research teams are working on health risks related to exposure to electromagnetic fields — a 15-person team at the PIOM laboratory at Bordeaux University and three people at the INERIS. The international cancer research centre in Lyon is coordinating an international study, Interphone. In addition, several research laboratories devote a portion of their time to researching the effect of electromagnetic fields on health within the framework of national or international programs.

In terms of ELF, there is not much activity at present. There are two principle projects on a leukaemia rat model, and on the serotonin receptor 5HT1B. For RF, most research activity is devoted to mobile telephony.

There is currently a great deal of research activity in dosimetry, both on exposure systems for biological research and exposure assessment (ADONIS programme).

Epidemiological research connected with the Interphone project in its final phase, and there is an ongoing epidemiological study on radar within the military research establishment.

Laboratory research on humans, animals and cells is active, with twenty current projects, including 7 within COMOBIO+ and several within ongoing European programmes (see above).

6.3.1 Government supported research

COMOBIO bis (Mobile Communication and Biology), is a research program that includes:

- ADONIS: a research program that brings together academics and the principle French industrialists. Its goal is to increase knowledge and to draw up compliance verification methods for the third generation telecommunication systems (dosimetry). The National Telecommunication Research Network (RNRT) approved this program in 2002.
- Simulation of electromagnetic fields near radio transmitters (RNRT).
- A Priority Concerted Action (ACI), launched by the Ministry of Research, concerning the biological and health effects of mobile radiotelephony, including epidemiology (results expected in 2006). Seven research projects are financed within this framework.

A call for a targeted research project (ARC) on "Expometry and radio frequencies" (results expected in 2006) was launched by the AFSSE in order to improve understanding of the exposure of various population groups to radio frequency electromagnetic fields. Some projects are currently under evaluation.

6.3.2 National research and academic institutions

RNRT (National Telecommunication Research Network (<http://www.telecom.gouv.fr/rnrt/>))

Launched in 1998, the RNRT brings together representatives of the main players in the field of telecommunications (public laboratories, equipment suppliers, operators and authorities). It deals with questions concerning technological innovations and usage studies for the creation of new services. The ministries in charge of industry and research, as well as the French Agency finance this network for Innovation (ANVAR).

The Health and Radio Frequencies Foundation

A foundation dedicated to research into health and radio frequencies was created in January 2005 with the support of the Ministry of Research. Its activities extend to every radio frequency application, not simply mobile telephony. It is financed by the French government and industry (operators, manufacturers, broadcasters) up to 1 million €/year over 5 years.

6.3.3 Industry supported research

France Telecom's Research and Development Department has a research team, directed by J. Wiart, that is solely devoted to the health effects of radio frequency fields. This team works in connection with mobile telephony manufacturers and operators.

6.4 Data and databases on EMF sources and exposure

6.4.1 EMF source and exposure data across the full range of frequencies

The National Frequencies Agency (ANFR) has created a web site with maps and data about radio frequency transmitters (www.cartoradio.fr).

Cartoradio indexes and locates on a map the 86,000 radio frequency transmitters present in France (except those for civil aviation and defence). It represents 37,000 mobile telephony base stations, 14,000 broadcasting antennas and 35,000 other stations (such as weather radar). It also contains complete results of the measurement of wireless fields (over 5,000 at present).

6.4.2 Exposure monitoring and compliance measurements

Approximately one thousand site measurements are carried out each year by independent inspection laboratories, according to a measurement protocol defined by the ANFR, in compliance with recommendation ECC 02(04) related to the measurement of non-ionising electromagnetic radiation between 9 kHz and 300 GHz.

At <http://www.ero.dk/documentation/docs/doc98/official/Word/REC0204.doc>

The ANFR is the recipient of all these results, which are then published on the Cartoradio site and accessible to the public. These measurements are carried out either at the request of the public or randomly, within the framework of protocols of agreement between operators and municipalities. Upon written request by anyone, the operators agree to carry out estimates of the level of electromagnetic fields created by the antenna in question.

APPENDIX: Government action plan concerning mobile telephony

Progress report as of January 20, 2005 following the April 2003 opinion of the AFSSE and the proposals in the report by the Parliamentary Office for the Evaluation of Scientific and Technical Choices (OPECST, November 2002)

Topics	New measures	Timetable	Key figures
<u>I – Studies and research</u>			
Ia – Strengthen research on the biological and health effects of exposure to radio frequencies	<p>The COMOBIO program (bis) includes two sections:</p> <ul style="list-style-type: none"> • Measurement of exposure section (managed by the RNRT) <ul style="list-style-type: none"> - Dosimetry of next-generation cell phones: ADONIS program approved in 2002 by the RNRT (€0.7 million). - Simulation of electromagnetic fields near radio transmitters (€0.5 million). • Biological and health section <p>The Priority Concerted Action (ACI) launched by the Ministry of Research (€0.4 million): the biological and health effects of mobile radiotelephony, including epidemiology. The call for tender was launched on June 2, 2003. Thirteen responses were received and seven have been retained: they relate to the effect of radio frequencies on cellular models. Financing for these studies, which will last two years with results available at the end</p>	<p>Selection carried out at the beginning of 2004</p> <p>Selection carried out at autumn 2003 Results expected in 2006</p> <p>Results expected in 2005</p> <p>Declaration of public utility (DUP) dated January 10, 2005 published in the Official Journal (JO) dated January 13, 2005</p>	<p>Research Industry Health</p> <p>Research Health</p>

	<p>two years with results available at the end of 2005, is about to be delegated. The research foundation (see below) will take over from the ACI.</p> <p>At the international level, France is associated with the INTERPHONE program (epidemiological study of the risk of cancer following exposure to mobile phone radiation), run by the International Agency for Cancer Research (IARC).</p> <p>Establishment by the MRNT of the new "Health and Radio Frequencies Foundation". This foundation is dedicated to promoting research into the health impact of radio frequencies, while guaranteeing the researcher independence from the operators. Founding board members include the three mobile telephony operators, equipment suppliers (Alcatel, Ericsson and Motorola France) and the television operators TDF and Towercast. Financing: €1 million over 5 years.</p> <p>A call for a targeted research project (ARC) on "Expometry and radio frequencies" (results expected in 2006) was launched by the AFSSE in order to improve understanding of the exposure of various population groups to radio frequency electromagnetic fields.</p> <p>The seventh PCRD plans to increase understanding of exposure in the area of radio frequencies in order to define common procedures for the epidemiological feasibility studies at the European level (need for common protocols for measuring exposure and epidemiological study procedures, and the need to pool results at the European level).</p>	<p>Minimum five years' duration (2010)</p> <p>Results expected in 2006</p>	
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Ib – Periodic updating of scientific knowledge	Mission entrusted to AFSSE (Article 19 III of law no. 2001-624 of July 17, 2001 which contains various social, educational and cultural clauses), which drew up the report that was published on April 17, 2003 (saisine DGS/D4E dated November 12, 2002) and which is in charge of permanent scientific surveillance on the topic. The next update will establish links with similar European projects, take into account new technologies, and study the feasibility of replicating the TNO study.	Q1 2005	Health Ministry of ecology (AFSSE)
II – Exposure level regulations			
Ila – Reducing public exposure to electromagnetic fields and exposure levels during mobile phone use	<p>1 – Supplement to decree no. 02-775 dated May 2002 based on European recommendation 99/519/CE dated July 12, 1999 concerning the thresholds of public exposure to electromagnetic fields.</p> <p>A decree by the Council of State "concerning the evaluation of the conformity of terminal telecommunication equipment and wireless equipment, as well as conditions for start-up and use". It modifies the Posts and Telecommunications Code and transposes into French law the 1999/5 CE Directive.</p> <p>A departmental order "setting technical specifications applicable to final wireless installations" made in application of this decree sets specific absorption rate (SAR) threshold values for equipment that will be used in France.</p> <p>2 – Continuation of definition of harmonized standards concerning basic human health requirements so that the entire spectrum of wireless equipment is covered:</p> <p>Harmonized standards, references to which were published in the European Union Official Journal, were defined by CENELEC (European Committee for Electrotechnical Standardization) within the framework of the implementation of Directive 1999/05/CE. It concerns:</p> <ul style="list-style-type: none"> - <u>Mobile phones</u>: EN 50360: 2001 and EN 50361: 2001 - <u>Base stations</u>: EN 50385: 2002 - Low power and short-range 	<p>Decree no. 2003-961 dated October 8, 2003 published on October 9, 2003</p> <p>Departmental order dated October 8, 2003 published in the Official Journal dated October 9, 2003</p> <p>Second departmental order dated October 8, 2003, published in the Official Journal dated October 9, 2003</p>	<p>Industry Health</p> <p>Industry Health</p> <p>European Commission Follow up industry</p> <p>Industry (ANFR)</p> <p>Industry</p> <p>Industry Consumptio</p>

	<p><u>equipment</u>: EN 50371: 2002, 50364: 2001 (EAS, RFID...)</p> <p>These Community standards allow manufacturers that apply them to check the conformity of their products with the central requirement related to human health called for in Directive 1999/05/CE.</p> <p>Complete the SAR measurement standard in order to integrate:</p> <ul style="list-style-type: none"> - The concept of electromagnetic yield - Pedestrian kits - Hand position <p>3 – Mandatory mention of the SAR in the user's guide for every mobile phone:</p> <p>A departmental order "concerning consumer information relative to final wireless equipment, in application of the Article R.20-10 of the Posts and Telecommunications Code", in application of the decree transposing the so-called "R and TTE" Directive known makes this mention mandatory.</p> <p>4 – Alerting users of final wireless equipment to precautions for use:</p> <p>The above-mentioned departmental order makes it mandatory to include information in the user's guide for final wireless equipment used in France: safety information concerning users and non-users of this equipment (hospitals, planes, etc.); recommendations for use in order to reduce exposure to electromagnetic fields (e.g. using the phone under good reception conditions).</p> <p>5 – Encouraging that pedestrian kits be included when mobile phones are sold:</p> <p>Pedestrian kits would decrease public exposure to electromagnetic fields. This only concerns equipment sold without subscription, because mobile telephone operators already provide a free hand kit with every phone.</p> <p>The European Commission is rather favourable to a voluntary approach (reservations of the DiGITIP concerning the mandatory supply of pedestrian kits).</p> <p>6 – Revising the October 16, 2001 circular in order to widen the field of application to mobile telephony and all the wireless stations, including new</p>	<p>n</p> <p>During 2005</p>	<p>Industry Consumption</p> <p>Health Industry ANFR Ministry of Ecology Equipment</p>
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	technologies (UMTS, BLR, etc.)		
Iib – Checking exposure levels	<p>1- Regulation framework concerning verification of compliance with respect to human exposure levels</p> <p>The transposition of the new Community framework on electronic communications into the legislative section of the Posts and Telecommunications Code completes legislation concerning the public protection from electromagnetic fields:</p> <ul style="list-style-type: none"> - The ANFR competencies will include verification of compliance with threshold values of public exposure to electromagnetic fields. - The organizations, which take in situ measurements of public exposure levels, will have to meet quality requirements defined by a departmental order, particularly accreditation by COFRAC or an equivalent European organization. <p>The monitoring authorities of the final wireless equipment market will ensure that SAR and the precautions for use appear in the explanatory leaflet. Laboratories appointed by the Minister of Industry will make spot checks.</p> <p>2- Measurement of radio frequencies emitted by base stations.</p> <p>The ANFR drew up a protocol for <i>in situ</i> measurements in accordance with the requirements of recommendation ECC (02)04. In application of Article 5 of decree no. 02-775 dated May 3, 2002, references of this national protocol must be published in the <i>Official Journal</i>. In parallel, the CENELEC has developed a measurement standard based on recommendation ECC (02)04, in order to harmonize measurement procedures within the EU.</p> <p>Possibility for the prefect to ask for electromagnetic field measurements. This measure has been added to the Health Code (Article L 1333-23) via public health law (by amendment) and needs a departmental order to be operational.</p> <p>Continuation and annual publication of a series of electromagnetic fields measurements (approximately one thousand measurements annually, coordinated by the ANFR, to be integrated in the map base) according to</p>	<p>Law no.669 of July 9, 2004</p> <p>(Departmental Council of July 30, 2003)</p> <p>Departmental order no.2003-961 of October 8, 2003 published the October 9, 2003</p> <p>Departmental order of November 3, 2003, Official Journal of November 15, 2003</p> <p>March 2005</p>	<p>Industry</p> <p>ANFR</p> <p>ANFR, DGDDI, ART, DGCCRF Industry</p> <p>Industry</p> <p>Health Industry</p> <p>ANFR</p>

	<p>the measurement protocol defined by the departmental order dated November 3, 2003.</p> <p>After three years of existence, the ANFR's Cartoradio database contains more than 5,000 <i>in situ</i> measurements.</p>		
<p>IIc – Worker protection: in particular, establishment of threshold exposure values and shutdown of base stations during interventions by maintenance personnel</p>	<p>Directive 2004/40/CE dated April 29, 2004, published in the EU Official Journal on April 30, concerning worker protection against risks due to exposure to electromagnetic fields.</p> <p>This European Parliament and Council directive concerns minimum safety and health regulations related to the workers' exposure to risks due to physical factors (electromagnetic fields).</p> <p>Provisions are now taken into account by the operators, on the basis of a standardized provision (Standard ENV 50 166-2) in their maintenance protocols. The circular dated October 16, 2001 managed by the DGS and related to the installation of mobile radio telephony base stations gives further information, by designating all persons as the public, including professionals from other corporations who are not commissioned by the operator.</p>	<p>Transposition timeframe: 2008</p>	<p>Work</p>
<p>III – Informing the public and local authorities</p>			
<p>IIIa – Systematizing and supporting advisory committees (under the administration of a prefect)</p>	<p>Implementation of the October 16, 2001 circular, point 3: updating the circular dated October 16, 2001 (in progress, in particular the updating of the appendices) and prefect follow-up.</p> <p>Twenty committees (administered by a prefect) were created.</p>	<p>2005</p>	<p>Interior Health ANFR Ministry of Ecology Equipment</p>
<p>IIIb – The mandatory (or strongly encouraged) creation of information and dialogue guidelines between operators and the public authorities.</p> <p>Drawing up a model guideline</p>	<p>Drawing up a national reference document between town halls or departments and telecommunication operators, including a multi-criteria evaluation grid (OPECST proposal).</p> <p>Local or departmental guidelines based on very diverse criteria are currently being created (40 charters have already been signed), creating confusion and a lack of visibility of national objectives.</p> <p>A best practice guide for mayors and operators was jointly drawn up by the Association of French Mayors (AMF) and the French Mobile Operators Association (AFOM). Its goal is to</p>	<p>This reference document may be included in the appendix of the new circular that will modify the circular dated October 16, 2001.</p>	<p>Interior Industry Health ANFR Ministry of Ecology</p>

	formalize at the national level the common commitments of mobile operators concerning the installation of base stations.		
IIIc – Encouraging transparency and informing people	<p>1- Informing local representatives about installations of wireless equipment:</p> <p>The law related to public health policy modified the Posts and Electronic Communications Code, by requiring every wireless station owner to transmit, to mayors requesting it, a file establishing the list of every wireless installation the owner operates within the territory of the requesting community.</p> <p>2- Informing the public about wireless stations located on French territory and about measurements of fields:</p> <p>The ANFR collects the results of measurements made by laboratories, using the <i>in situ</i> measurement protocol defined by the departmental order dated November 3, 2003. These results are accessible on the agency's web site (Cartoradio) and complete the map base of wireless installations (excluding those of the Ministry of Defence and the Ministry of the Interior) that the agency has made available to the public.</p>	March 2005	Health Industry ANFR
III d – Informing car drivers	Renewing and reinforcing information and mobilisation campaigns, which are underway.		DSCR Interior
IIIe – Distributing an informational document for the general public concerning the use of mobile phones, to teach users how to act cautiously	<p>Ten thousand copies of a document for the general public (specifically concerning mobile phones) were distributed in March 2002. The document was also available on the Ministry of Health's web site. It synthesizes various health and safety recommendations. This document will be published again on a much wider scale in 2005.</p> <p>A more technical document is being developed for the DDASS and DRASS, which may be distributed to physicians. The sanitary engineers of the DRASS have been trained as inter-regional coordinators concerning mobile telephony. Informational documents are published and updated on the Intranet of the Ministry of Health.</p>	2005?	Health INPES AFSSE Health
III f – Information about the risks	Periodic organization by the government of information about the		Health AFSSE

related to the development of wireless communications and their social impact	current state of knowledge, within the framework of the National Health and Environment Plan. Ensuring training for the medical professions in electromagnetic fields (via the AFSSE web site).		INPES Ministry of Ecology
IV – A reminder: enforcing the Highway Code and cracking down on the use of phones while driving	The CISR of December 2002 has decided to crack down more severely on the use of mobile phones while driving.	Carried out (departmental order dated March 31, 2003): forbidding holding of a mobile phone in the hand while driving.	DSCR Interior Justice

7. GERMAN Report

A.Böttger

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

E. Vogel

Bavarian State Ministry for the Environment, Health and Consumer Safety

7.1 Relevant regulatory bodies

Within the government the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU, www.bmu.de) is responsible for the protection of the public against electromagnetic fields. Its subordinate federal authority, the Federal Office for Radiation Protection (BfS, www.bfs.de) deals e.g. with public information, research programmes and preparation of reports.

The German Commission on Radiation Safety SSK is counselling the BMU on questions of radiation protection. It consists of a permanent committee and several committees appointed for specific tasks. Committee A 6 is responsible for non-ionising radiation.

The Regulation Authority for Telecommunication and Post (RegTP, www.regtp.de) is a subordinate federal authority of the Federal Ministry of Economics and Labour. The RegTP is responsible e.g. for the allocation of frequencies and questions of compliance of high frequency emitters with the limit values. It also runs regular measurement campaigns.

7.1.1 Legal situation in general:

a) General Public:

In December 1996 a German Ordinance (26th Ordinance Implementing the Federal Emission Control Act (EMF Ordinance - 26th BImSchV) of December 16th 1996) (attachment 1) was passed, adopting international recommendations (of the International Commission on Non-Ionising Radiation Protection (ICNIRP), the World Health Organization (WHO) and the national Radiation Protection Commission (SSK)) for the general public.

For the purpose of this Ordinance:

1. High frequency installations shall mean stationary radio frequency transmitting installations with a transmission power of 10 watt EIRP (equivalent isotropic radiation power) or more which generate electromagnetic fields in the frequency range from 10 MHz to 300,000 MHz;
2. Low frequency installations shall mean stationary installations for transformation and transmission of electricity:
 - Overhead power transmission lines and underground cables with a frequency of 50 Hz and a voltage of 1000 V or more,

- Traction power trunk lines and traction power overhead lines including transformer and switchgear systems with a frequency of 16 2/3 Hz or 50 Hz,
- Electric transformer installations including switchgear units with a frequency of 50 Hz and a high-side voltage of 1000 V or more.

(Note: In 1996 no other solid recommendations on limits to protect public were available.)

On the basis of the Act on radio equipment and telecommunication terminal equipment the order on the procedure for providing proof as regards limiting exposure to electromagnetic fields run into force. In this order the site certification procedure is regulated (attachment 2).

b) Occupational Exposure

The German Accident Prevention and Insurance Association (Berufsgenossenschaft) have issued a regulation on limit values for occupational exposure in 2002. This is not a law but practically has the status of an order. It recommends the same basic values for occupational exposure as ICNIRP does; however, due to a slightly different model the reference levels differ a bit. The Directive of the European Parliament and of the Council on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields and waves) will be implemented in Germany.

Legal situation – latest developments:

The discussions on possible health effects of high frequency electromagnetic fields are going on in Germany. The Radiation Protection Commission (Strahlenschutzkommission [SSK]) finished a recommendation on “Limit Values and Precautionary measures for the Protection of the General Public against Electromagnetic Fields” in 2001. The SSK distinguishes between the following definitions of the categories scientific evidence, scientifically - grounded suspicion and scientific indication:

- An interrelation between an impairment of health and electromagnetic fields is **scientifically proven** if scientific studies of research groups show this connection independently of each other and the scientific overall picture supports the existence of a causal connection.
- There is a **scientifically based suspicion** regarding an interrelation between an impairment of health and electromagnetic fields if the results of confirmed scientific investigations show an interrelation but all the scientific investigations do not sufficiently support the existence of a causal interrelation. The number and consistency of the scientific works available determine the extent of the scientific suspicion.
- There are **scientific indications** if single investigations indicating to an interrelation between an impairment of health and electromagnetic fields have not been confirmed by investigations independently of each other and are not supported by the scientific overall picture.

The Radiation Protection Commission is aware of the fact that the evaluation of the state of knowledge also includes subjective judgements. To take into account the spectrum of opinions it also consulted other (external) experts. Since a complete consensus can hardly be achieved among scientists, the judgement of acknowledged expert bodies that have made themselves available to the scientific discourse has particularly highly been evaluated.

Some results of the evaluation of the Radiation Protection Commission (SSK):

- The SSK comes to the conclusion that even after the assessment of the recent scientific literature, there is no evidence of current scientific knowledge in view of proven impairments of health to challenge the scientific assessment underlying the protective concepts of ICNIRP or the EC Council Recommendation.
- The SSK considers the present concept of limit values, consisting of basic restrictions and the limit values derived under “worst case” exposure conditions to be suitable and flexible enough to protect from impairments of health occurring from exposures in everyday life.
- The SSK recommends that the development of devices and mounting of installations require the minimisation of exposures as a quality criterion. It points out that - contrary to public concern which refers particularly to site-specific fixed installations – particularly the emission from devices due to electromagnetic fields, e.g. in domestic devices or mobile phone products for consumers, should be regarded under the viewpoint of precautionary health protection, because here a high exposure of a user can easily be assumed.
- The SSK recommends taking measures for the minimisation of exposures from electric, magnetic and electromagnetic fields within the scope of technical and economical possibilities. This is particularly required for the areas where persons stay regularly for a longer time period. The procedures should correspond to the state-of-the-art of technology (e.g. in electrical installations).

An English translation is available (in the German “Country Report” folder at the EIS-EMF website).

7.1.2 Legal situation - steps to be followed before an antenna is built

The operator of a high-frequency installation shall notify the competent authority thereof no later than two weeks before putting it into operation or making any major alterations; such notification shall be accompanied by the site certificate to be issued by the Federal Post and Telecommunications Agency in accordance with telecommunications regulations

Additionally the antenna has to obey the building laws, which may differ in the different Länder. In some Länder Usually antennas measuring less than 10 m with a supply unit of less than 10 m³ do not need a building permit.

7.1.3 Other major German institutions having a role in the EMF debate

- Forschungsgemeinschaft Funk: www.fgf.de
- Informationszentrum Mobilfunk www.izmf.de
- Wissenschaftsladen Bonn e.V. , Beratungs- und Messestelle Elektrosmog www.wilabonn.de/645_525.htm?h201
- Ecolog-Institut in Hannover www.ecolog-institut.de
- HESE (human, ecological, social, economical) Projekt: www.hese-project.org
- Nova-Institut www.nova-institut.de
- Bürgerwelle (German activist group) www.buergerwelle.de

- German Association of Engineers: www.vdi.de

7.2 Risk communication approaches

Some of the research money mentioned above is directed into investigations on risk communication: E.g. The group MUT of the Juelich Research Center has lead and will lead several investigations

Information material (written and on internet) is provided by all the institutions mentioned in the section “Research”, as well as by the institutions listed above in the section “Other...”

7.2.1 Risk communication - special procedures in Germany

In December 2001 the mobile phone network providers signed a self-commitment containing the following:

I. Measures from the Government:

- a) Endorse the limit values that are established in the ordinance on electromagnetic fields from 1996. Basis for this decision was the mentioned recommendation of the Radiation Protection Commission.
- b) Intensifying EMF research different Ministries will spend more than 20 Million Euros in different areas of research. Besides health effects will be investigated as well as techniques to reduce EMF fields strength.
- c) Implementing a database to contain all approved base stations (Open access to the public since spring 2004).
- d) Information of the public on new results in EMF research.
- e) Federal government will evaluate experience with the self-commitment of the mobile net providers.

II. Self-commitment of the mobile network providers

- f) Improvement of the information for local authorities on the development of mobile networks and information of people living close to base stations. Participation of local authorities in the planning and sitting of base stations.
- g) Site sharing of different net providers.
- h) Reconsider sitting of base stations if Kindergartens and schools are affected.
- i) Labelling of handsets: Network provider will encourage mobile manufacturers to give good and easily accessible information of SAR values.
- j) Intensifying research: Network providers have announced to support the research program of the Federal Ministry of the Environment with an additional 8.5 Million Euro.
- k) The network providers will support the implementation of a network of mobile and stationary measuring facilities with 1.5 Million Euros.

Network provider shall report about the experience with this commitment once a year to the federal government. An independent surveyor will prepare the report. During the first year the participation of the public in the development of networks was very rare but during the second year there are some signs detectable that this will happen more and more.

At about the same time a much more detailed treaty between the mobile phone providers, the representatives of the Bavarian communities and the Bavarian Environmental Ministry has been signed. Accordingly in communities with more than 50 000 inhabitants a round table is set up in order to discuss and plan the mobile phone net across the community. In smaller communities the providers have to announce a future building plan and the community may provide 3 options for sitting, which are then discussed within a given dialogue frame.

Due to this more detailed framework for dialogue processes, participation of the communities in the sitting process is more pronounced than elsewhere.

7.3 Research

Following the recommendation of the national radiation protection commission the German RF-research programme was initiated by the Federal Ministry for the Environment, Nature Conservation and Nuclear Safety: 8.5 Million Euro will be spend in the years 2002 to 2005 to get more knowledge on effects of HF electromagnetic fields. The program will cover all fields of research. Laboratory studies as well as epidemiology studies and research in risk communication (www.emf-forschungsprogramm.de). In 2001 network providers have announced to support the research program of the Federal Ministry of the Environment with an additional 8.5 Million Euro.

The following other German institutions do have additional research budget for studies (health, technical questions and/or risk communication) on EMF:

- Federal Ministry of Economics and Labour
- Regulation Authority for Telecommunication and Post
- Federal Institute for Occupational Safety and Health
- Environmental Ministries of: Bavaria, Baden Wuerttemberg, Lower Saxonia, North-Rhine-Westphalia
- Forschungsgemeinschaft Funk
- Informationszentrum Mobilfunk

Attachments:

They are included in the German “Country Report” folder at the JRC/EIS-EMF website <http://www.jrc.cec.eu.int/eis-emf>.

(1) 26th Ordinance Implementing the Federal Emission Control Act (EMF Ordinance - 26th BImSchV) of December 16th 1996

(2) Order on the procedure for providing proof as regards limiting exposure to electromagnetic fields

8. GREEK Report

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Greek Atomic Energy Commission
Ministry of Development

E. Vafeidou
Head of the Physical Agents Determination Department
Centre for Occupational Health and Safety
Ministry of Employment and Social Protection

T. Samaras
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Department of Physics
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8.1 Inventory of national key actors and initiatives on EMF & Health

8.1.1 Main actors, roles and responsibilities. Legislation & Regulations

a. Exposure of the general public

Greece has implemented legally binding measures for the protection of the public from exposure to electromagnetic fields by putting into force two national legislative acts concerning low frequency electric and magnetic field sources and all kinds of land-based antenna stations, entitled:

- a) “Protection measures for the exposure of the general public to all land based antenna stations” (Act No.1105/Vol. B/6-9-2000), Common Ministerial Decision of the Ministries of a) Development, b) Transport and Communications, c) Health and Welfare and d) Environment, Physical Planning and Public Works.
- b) “Protection measures for the exposure of the general public to all low frequency electric and magnetic fields emitting devices” (Act No.512/Vol.B/25-4-2002), Common Ministerial Decision of the Ministries of a) Development, b) Health and Welfare and c) Environment, Physical Planning and Public Works.

In these new legislative acts, the basic restrictions and the reference levels set in the Council Recommendation (1999/519/EC) concerning the frequency range of 0 Hz - 300 GHz, have been implemented. However, in the case of antenna stations the Greek legislation applied additional safety parameters to the allowed EMF-exposure levels. Hence, the safety limits for the exposure of the general public to all land based antenna installations are set to 80% of the reference levels

while in the case of extremely low frequency fields the exact reference levels were set as the safety limits.

The competent national authority for the protection of the general public and the environment against artificially produced non-ionising radiation is the Greek Atomic Energy Commission (E.E.A.E.), which lies under the Ministry of Development. (E.E.A.E., www.eeae.gr).

The additional specific points that are included in the Greek legislative acts are highlighted right below.

According to these:

The E.E.A.E.:

- Publishes prototype technical studies-notes for all kinds of antennas (such technical notes have been published for mobile phone base stations, earth satellite stations and microwave antennas, <http://www.eeae.gr/el/services/templates/>)
- Defines the measurements protocol based on international standards
- Organises educational programs for the personnel of all public sector and all interested groups concerning the protection of the general public to electromagnetic fields, informs and replies to requests from the public authorities and citizens about the possible health hazards induced by non- ionising radiation.
- Provides all details concerning the authorisation of teams that perform measurements in all non-ionising radiation installations and controls the measurements procedure.

The levels of the emitted electromagnetic fields from all kind of antenna stations are regularly monitored, in order to ensure compliance with the safety limits for the public or, if this is not the case, to ensure that all necessary protection measures around an antenna base station, are being taken in every case. Therefore, for every land based antenna installation, a proper technical study for its electromagnetic emissions must be prepared by the owner and should be submitted to E.E.A.E. in order to prove that there are no places accessible to the general public where the exposure levels exceed the 80 % of the reference levels, stated in the recommendation of the E.U. E.E.A.E. gives, after examination, its expert opinion to the authority which manages and monitors the frequencies spectrum and issues the licenses for the antenna installations. This authority is the National Telecommunications and Post Commission (E.E.T.T., www.eett.gr).

The E.E.A.E. also carries out measurements in all kinds of non-ionising radiation facilities in order to monitor whether the general public exposure limits are being adhered to. It must be stated here that from the year 2000 until today, the non - ionising radiation office of the E.E.A.E. has performed over 1200 inspections and measurements at various sites in Greece, where all kinds of non - ionising radiation facilities are installed. The major part of this information is in the form of written measurement reports that have already been delivered to the authorities or persons who asked for these measurements, but are also available to everyone interested. Soon all this information about the already measured sites as long as the results for every new measured mobile phone base station will be posted to the web page of E.E.A.E.

The two competent authorities in Greece, for the provision of information to everybody interested on exposure and technical data on licensed fixed radio transmitters, is the E.E.A.E. and the E.E.T.T., respectively.

Measurements in antenna stations according to the legislation, may also be performed by the Ministry for the Environment, Physical Planning and Public Works, the Ministry of Health and Welfare and the Ministry of Transport and Communications or other, authorised by the E.E.A.E., laboratories (e.g. University laboratories).

Concerning low frequency emitting sources, the national legislation accordingly defines that the E.E.A.E. also carries out measurements in facilities of this kind in order to monitor whether the general public exposure limits are being adhered to. Measurements in low frequency sources may also be performed by the Ministry for the Environment, Physical Planning and Public Works, the Ministry of Health and Welfare or other, authorised by the E.E.A.E., laboratories.

b. Exposure of the workers

At present in Greece there are no specific regulations concerning the occupational exposure to EMF. The protection of workers is ensured by the general in force legislation.

The Ministry of Employment and Social Protection (M.E.S.P.) has taken part with a representative (national expert) in all the meetings of the Social Questions Working Party for the elaboration of the Directive 2004/40/EC of the European Parliament and the Council on the protection of workers from risks to their health and safety arising from exposure to electromagnetic fields (0 Hz to 300 GHz) during their work.

The Ministry (M.E.S.P.) will soon start the harmonization procedure of the national legislation with the new Directive.

The Centre for Occupational Health and Safety of the Ministry of Employment and Social Protection (<http://www.osh.gr>) is equipped with all the necessary measuring equipment for static, low and high frequency electric and magnetic fields up to 40 GHz. Members of the Physical Agents Determination Department of the Centre for Occupational Health and Safety has conducted a significant number of measurements of occupational exposure in different types of working environment.

As there are no statutory requirements in Greece yet, aiming at protecting professionally exposed personnel against EMF exposure, the measured values of the various physical quantities were up to now compared with the ICNIRP reference levels, which have been introduced as action values in the recent Directive.

The Ministry (M.E.S.P.) will try to collaborate with other Institutions to run a research programme for the evaluation of non-ionising radiation from various sources (devices, facilities) installed in occupational environments. The scope of this programme shall be the depiction of the existing exposure conditions of the workers in various enterprises of different branches all over Greece.

c. Contact information

Public Authorities

Greek Atomic Energy Commission
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National Telecommunications & Post Commission
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8.2 Risk communication strategies, channels and risk management initiatives

The E.E.A.E. is responsible for providing information to all interested public groups for matters concerning the health effects of electromagnetic fields. To this end, the E.E.A.E. has published a 16 - page informative brochure entitled: “Non-ionising radiations: Mobile phones and base stations” (http://www.eeae.gr/el/services/info_material/), distributed freely to all interested parties. The E.E.A.E. also organises or participates in lectures; courses and workshops open to the local authorities, the public and the media. Some major risk communication events have been the organisation of 5 one-day workshops, in the years 2001-2003, entitled: “Exposure of the general public from mobile phones base stations” open to the local authorities, the public and the media, organised by the Ministry of Transport and Communications, the National Committee of Post and Telecommunications, the EEAE and/or the municipal authorities (proceedings from some of these workshops have been published as booklets and are freely distributed from the National Telecommunications and Post Commission, E.E.T.T.).

It must be also stated that the E.E.A.E. was recently financed by the General Secretariat of Research and Technology of the Ministry of Development in order to produce informative material in electronic and paper format (cd-roms and brochures) and to organise workshops for

specially selected target groups (representatives of the ministries, the local authorities and the media) for matters concerning EMFs and Health. The scope of organising such workshops is to inform and train persons able to form a “critical mass” necessary for further dissemination of this information to the general public.

It should be underlined also that there are currently two web sites, where the general public can acquire information about exposure to the non-ionising radiation of mobile phone base stations (based on actual continuous and spot measurements) that are developed by University laboratories with the financial support of mobile operators:

- i) http://rel.physics.auth.gr/Measurements/Main_Entry.htm
- ii) <http://www.hermes-program.gr/> (where all the contact persons and details of the university laboratories involved can be found)

This information serves as a response to the constantly increasing public concern about exposure to electromagnetic fields. The information provided concerns electromagnetic fields in general covering a big portion of the frequency spectrum and not only mobile communications systems. Moreover, the provided information in the above mentioned sites, include technical information about the equipment and the procedures used and, most of all, they refer to the national and European legislation on exposure to electromagnetic fields.

The mobile operators have also published brochures and provide information concerning mobile telephony and health on their web sites (www.vodafone.gr, www.tim.com.gr, www.cosmote.gr).

Finally it must be stated that a new monitoring program at national level with the participation of most of the stakeholders is envisaged.

8.3 Research activities on EMF matters

Research actions and programmes concerning biological effects, dosimetry and exposure assessment to electromagnetic fields are mainly being performed in universities and research centers and are funded by the Greek government, the European Community and other international sources.

A list of the on going (January 2005) research projects is given below:

Project title	Project acronym	Funding	Starting date (duration)	Greek participants
IN VIVO RESEARCH ON POSSIBLE HEALTH EFFECTS RELATED TO MOBILE TELEPHONES AND BASE STATIONS (Carcinogenicity Studies in Rodents)	PERFORM-A	European Union (FP5)	1 March 2000 (60 months)	Aristotle University of Thessaloniki, Radiocommunications Laboratory

POTENTIAL ADVERSE EFFECTS OF GSM CELLULAR PHONES ON HEARING	GUARD	European Union (FP5)	1 January 2002 (36 months)	District General Hospital of Thessaloniki AHEPA
PROJECT FOR SYSTEMATIC MEASUREMENTS AND MONITORING OF THE ELECTROMAGNETIC RADIATION	HERMES	National (Private, VODAFONE)	29 November 2002 (Ongoing)	1. Nat. Tech. Univ. of Athens Mobile Radiocommunications Laboratory 2. Aristotle University of Thessaloniki, Radiocommunications Laboratory
BESTIMMUNG DER EXPOSITIONSVERTEILUNG VON HF FELDERN IM MENSCHLICHEN KÖRPER UNTER BERÜCKSICHTIGUNG KLEINER STRUKTUREN UND THERMOPHYSIOLOGISCH RELEVANTER PARAMETER		International (State)	11 November 2002 (24 months)	Aristotle University of Thessaloniki, Radiocommunications Laboratory
ELECTROMAGNETIC RADIATION MEASUREMENTS IN CITIES OF CENTRAL MACEDONIA AND THRACE		National (Private, TIM)	14 May 2003 (Ongoing)	Aristotle University of Thessaloniki, Radiocommunications Laboratory
DEVELOPMENT OF PROCEDURES FOR ASSESSING ELECTROMAGNETIC EXPOSURE FROM BODY-MOUNTED WEARABLE & PORTABLE TELECOM EQUIPMENT	SARSYS-BW1	National (EUREKA)	16 June 2003 (24 months)	Aristotle University of Thessaloniki, Radiocommunications Laboratory
ASSESSING HUMAN EXPOSURE TO ELECTROMAGNETIC RADIATION OF BASE STATIONS	BASEXPO	International (EUREKA)	1 October 2003 (24 months)	Aristotle University of Thessaloniki, Radiocommunications Laboratory
INTEGRATED COMPUTATIONAL AND EXPERIMENTAL STUDY OF EFFECTS ON HUMANS FROM THE RADIATION OF CONTEMPORARY WIRELESS SYSTEMS		National (Private and State)	1 June 2002 (36 months)	Aristotle University of Thessaloniki Radar and Microwaves Unit

9. HUNGARIAN Report

.György Thuróczy

National Public Health Centre
National Research Institute for Radiobiology and Radiohygiene

9.1 Inventory of national key initiatives on EMF

9.1.1 Authorities

The involved authorities on the health issue of EMF in Hungary are the follows:

- *Ministry of Health*: responsible for the regulation on the exposure limits of electromagnetic fields
- *National Public Health and Medical Officers Service*: responsible for the application of the limits and the implementation of the EMF sources in the workplaces and the environment
- *National Public Health Centre- National Research Institute for Radiobiology and Radiohygiene*: governmental advisory research institution, responsible for the scientific background of the EMF issues from science to risk communication
- *Ministry of Environment and Water*: responsible for the environmental issues of the EMF exposure
- *Ministry of Informatics and Communications*: responsible for the implementation of EMF sources of the telecommunication industry and broadcast systems. Including base stations, radio and TV broadcast systems, radio navigation and wireless telecommunication.

Ministry of Economic Affairs and Transport: responsible for the implementation of electric power systems, including power lines, distribution systems, and power plants

Legislation and Regulations:

Former legislation and standards on EMF:

Hungarian Standard Institution released the first Hungarian EMF standard in 1986. Title: “Safety levels of high frequency electromagnetic fields” (*MSZ 16260-86*). The standard was modified in 1993 in the frequency range 30 kHz to 300 MHz. The *expiration date* of the Hungarian EMF standard (*MSZ 16260-86*) was the *end of 2001*. The values of permissible levels between *300 MHz-300 GHz* were *stricter* than the ICNIRP/EU reference levels. In the frequency range *30 kHz-300 MHz* the reference levels are *close to the ICNIRP/EU* values after a modification in 1993. The standard has been officially withdrawn in 2004.

The *Ministry of Transportation and Telecommunications* issued an *Ordinance* about the installation process of base stations (BS) in May 1 2000. (*9/2000 Ordinance by Minister of Transportation and Telecommunications*) The ordinance includes a request about the *main technical data* of the planned bases stations (BS) by the operators as the input of a Certification Report of Radiohygiene (*Report*) issued by the public health authority. In case of rooftop installation, when the antenna sited below 4 m high from the roof level, the BS is excluded from any authorization process (in this case many times the operators apply for the *Report* voluntary). The ordinance has been withdrawn in 2002.

Current regulations

1) The *Ministry of Health, Social and Family Affairs* released a new ordinance on the public limits of EMF exposure between 0 Hz- to 300 GHz in 2004. The number of ordinance: 63/2004 (VII.26) ESzCsM Ordinance. The Ordinance is mandatory. Published in 26.07.2004, put in force 04.08.2004. The Ordinance fully adopted the 1999/519/EC recommendations. The limits are the same as the 1999/519/EC recommendations (basic limits, and reference levels), using the same tables. The new Ordinance includes the limits only for the public. The government withdrew the former Ordinance.

Comment: The former *Ordinance* issued in 2000 on the reference levels of RF emitted by the *radio communication masts* (base station) including more strict reference levels than issued by the EU Recommendation in the frequency range from 30 MHz to 60 GHz (*32/2000 Ordinance by Minister of Health*).

2) The *Hungarian Ministry of Informatics and Communications* released recently a modification in one of the ordinance relevant to the radio permission of the implementation new radio stations (i.e. base stations, broadcast systems etc.) According to the new modification any new radio station need an expert report of radiohygiene when the radiated RF power emitted by the *stations higher than 400 W ERP toward any direction* and the stations will be planned in the residential living and/or resting area. The ordinance was published and put into power in 2003 April.1. (Revised in 2004 as the *6/2004 Ordinances of Ministry of Informatics and Communications*).

Planned initiatives:

The limits for workers will be put in an ordinance according to the 40/2004 EU Directive within 2 years. Until the limits of 40/2004 Directive will be used, but not mandatory.

9.1.2 Industry

Telecommunication and Mobile industry:

In Hungary works four networks provider. The penetration of mobile users within the whole population is more than 80% (8,5 million subscribers in 2004 December). The operation of GSM 900 system has been started in 1994 the GSM 1800 in 1999. From the beginning of 2001 all three digital GSM provider have been licensed in operation on both GSM bands. The UMTS network will be introduced in the next year (2005).

Electric Power Industry

Power Grid Operators, electric energy market

The main national power grid operator is the Hungarian Power Companies Ltd (MVM Rt). The primary task of MVM Rt is to purchase electricity from Hungarian power stations and abroad, and sell it on to the distribution companies via its supply network. The MVM Rt is active in the generation of electrical energy, international trade, the development and operation of the national grid and dispatch. The operation and development of the power transmission network is the task of transmission lines operator OVIT Rt. MVM carries out its duties in compliance with the regulatory system in force, electricity laws and other related legislation.

There are several electric power supplier operator companies. A milestone of the Hungarian energy management was the partial opening, the liberalisation of the electric energy market on the 1st of January 2003. Since that time consumers over the annual consumption of 6,5 GWh are free to select their supplier. The main operator in Hungary is the ELMŰ Rt.

9.1.3 NGOs

The Scientific Association for Infocommunication (HTE) has created an ad hoc EMF working group of professionals from various disciplines. It was established about 5 years ago. The group is a non-governmental organisation, unlike similar bodies in other states. It is concerned with the effects of electromagnetic fields on human beings, both in terms of low frequency fields and high frequency radiation. The results of the group's work so far are: pamphlet titled "*Our lives and the mobile telephone*", printed on hardcopy and introduced on website (<http://www.szezam.hu/hthemobil/>). A poster for children distributed to, and displayed in schools, in Hungary with website support (<http://www.szezam.hu/hthemobil/>). As the group is non-Governmental when there are Government funded bodies in other states, one of its main functions is to encourage Government decision-makers, whether at national or local level, to carry out work on EMF issues. This could include gathering information, funding research, providing information to users and the wider public, and making proposals on actions to be taken.

9.2 Risk Communication strategies and channels

9.2.1 Tools and initiatives

In 2003 the *Ministry of Health, Social and Family Affairs*, the Ministry of Environment and Water and the *Ministry of Economic Affairs and Transport* published a short leaflet about the public exposure to RF emitted by mobile base stations.

The *National Public Health Centre - National Research Institute for Radiobiology and Radiohygiene* is active on the EMF survey measurements in the environment and living areas. The places where any survey or expert report have been released are on the Internet website of the institute. The institute has more than thousand measurement sites mainly around mobile base stations. Much information has been released about the EMF and health toward the electronic and written media.

9.2.2 Public perception on EMF risk

The public concern is continuously permanent. The main issue is the mobile base stations. The second topic of the public concerns is the electric power transformers. In Hungary it is typical that 10/04kV transformer stations are installed in the basement or ground floor of multi-storey

apartment buildings. Magnetic fields up to several tens of μT have been measured in apartments or offices located close to transformers. Residents are concerned about the possible health effects of magnetic fields

9.3 Summary and overview of research areas, topics and support

9.3.1 Government supported research

In Hungary there is no National EMF Project. The volume governmental support for EMF research is very limited. There are some small projects supported by the government:

- Genotoxic studies on 50 Hz ELF magnetic fields. Evaluation of DNA damage by alkaline Comet-assay in-vitro on human lymphocytes exposure to ELF magnetic field (*National Research Institute for Radiobiology and Radiohygiene - NIRR*)
- ELF-EMF exposure survey of residential transformer stations and solution for mitigation (*NIRR*)
- Study the possible effects of *in vivo* 900/1800 MHz GSM-like microwave exposure on male reproduction by evaluate the serum testosterone level and red blood cell count of male mice (*National Institute of Chemical Safety – KBI*)

9.3.2 Supported by National Research Institutions

- Study of effects of exposure to 50 Hz magnetic field and GSM radio frequency radiation on pineal *melatonin synthesis* by perfusion system of pineal glands in vitro. (*NIRR*)
- RF exposure survey around base stations (*NIRR* and partially supported by the industry)
- Miniature E-field probes development for RF dosimetry by thick film method (*Hungarian Academy of Sciences Research Institute for Technical Physics and Materials Science – MFA*)
- Instantaneous, *in vivo* effects of GSM-like pulsed 900 MHz RF irradiation on spontaneous neural activity of medial prefrontal cortical neurons in the rat. (*NIRR, Univ. of Pécs*)

9.3.3 Research sponsored by the industry

- RF exposure survey around base stations (*NIRR* and partially supported by the mobile operators)
- ELF-EMF exposure survey of residential transformer stations and solution for mitigation (*NIRR*, partially sponsored by the industry)
- Some reports on EMF and health (*NIRR*)

9.4 Data and databases

No database exists on the EMF exposure in Hungary. The NIRR has many data about the exposure and has a database on the base station sites where any expert reports have been issued.

10. IRISH Report

Bob Hanna

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9.1 Relevant Organisations

9.1.1 Government

Department of Communications Marine & Natural Resources (29-31 Adelaide Road, Dublin 2).
See www.dcmnr.ie

Regulator. Commission for Communications Regulation (ComReg). Address: Block DEF,
Abbey Court, Irish Life Centre, Lower Abbey Street, Dublin 1. See www.comreg.ie

9.1.2 Industry

Electricity Supply Board (Lower Fitzwilliam Street, Dublin 2). See www.esb.ie

Eircom (former state telephone operator), see www.eircom.ie

Other licensed telecommunications operators as listed at <http://www.comreg.ie>

9.2 Legislation and Regulations

The Council and the European Parliament adopted the third element of the EU Physical Agents Directive, the part dealing with limiting occupational exposure to EMF, during the Irish Presidency of the EU (January to June 2004).

Relevant planning legislation applies to industry-constructed communications antennae and base stations.

ICNIRP guidelines have been adopted by Ireland, and all relevant facilities are required to comply with these.

Information and data sources, relevant publications and documents:

The Office of the Director, Communications Business & Technology at the Department of Communications, Marine & Natural Resources provides an information and advisory service to other government departments and agencies and to the general public. Standard information packs appropriate to the specific inquiry are issued; at present these exist only in hard copy, but updated information will be produced and provided through the Department's web site during 2005.

Published reports by the former Department of Energy and available through the Government Publications Office:

- Electromagnetic Fields from High Voltage Transmission Lines, 1988
- Electromagnetic Fields, 1992

The Commission for Communications Regulation maintains location information on all mobile base stations, and the results of a national programme of radiation emissions at antenna sites, on its web site

The Electricity Supply Board has published and distributed an information leaflet entitled: “Electric and Magnetic Fields in the Environment”. This is also available on the organisation’s web site: www.esb.ie

9.3 Research

The Irish government is a subscribing supporter of the World Health Organisation’s International EMF Project, and participates in COST 281 and the International Committee for Electromagnetic Safety, as well as the EU JRC EMF Project.

Nationally, a programme of measurement of non-Ionising Radiation at 400 mobile phone base stations was undertaken across the country during 2003 and 2004. The results are published on www.comreg.ie.

9.4 Data and databases

Geographical location, height, ownership, and frequencies employed by every phone mast in Ireland (around 4000) available on www.comreg.ie

Interim Results of Programme of Measurement of Non-Ionising Radiation emissions available on www.comreg.ie

Limited specific programme of measurements undertaken at public request available at www.dcmnr.ie

Office of the Chief Technical Advisor, Department of Communications Marine & Natural Resources (29-31 Adelaide Road, Dublin 2). See www.dcmnr.ie

Regulator. Commission for Communications Regulation (ComReg). Address: Block DEF, Abbey Court, Irish Life Centre, Lower Abbey Street, Dublin 1. See www.comreg.ie

11. ITALIAN Report

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Introduction

Since seventies, in Italy researchers of the National Institute of Health have tackled problems regarding research, monitoring and regulations on electromagnetic (EM) fields exposure. A specific attention was also given to these topics by several institutes of research and universities. Some of these laboratories constituted the Inter-University Center for the study of the interaction between Electromagnetic Fields and Biosystems (ICEmB) to answer the need of a greater technical and scientific co-ordination.

In the nineties, a network of environmental monitoring started by the institution of Regional Agencies for the Environmental Protection (ARPA). At the same time, the increasing risk perception produced the constitution of a great number of citizens committees. Their activities, together with the actions of some environmental associations, induced the Government to issue specific regulations about EM fields exposure, significantly more restrictive respect to the limits established by the UE Recommendation.

Here, a brief report is presented on the national regulations, networks for monitoring and communication and other institutions and normative structures involved in the debate concerning bioelectromagnetic interaction.

11.1 Regulations

The growing interest of the scientific community on non-ionizing electromagnetic emissions and studies on bio-electromagnetic interaction has raised the problem of introducing specific regulations for workers and public health safety. Main purpose is to define well-assessed maximum exposure levels depending on EM field features (frequency, intensity, time of exposure) and environmental conditions (external, living).

First National regulation on population exposure to 50Hz electric and magnetic fields in external and living environments is dated 1992 (**Law Decree, 23 April 1992**). Maximum exposure levels and minimum distance between buildings and power lines were fixed.

As for the frequencies in the range between 100 kHz and 300 GHz, first National regulation for exposure levels is the **Law Decree n° 381, 10 September 1998**, which fixed the limits for electric and magnetic field intensity and power density in the far field region for broadcasting and cellular base- station sources.

Up to this date several local laws and resolutions had already been issued in:

- Regione Abruzzo: 20.09.1988, n° 83; 04.06.1991, n°20; 02.08.1997, n°77

- Regione Calabria: 03.10.1997, n°10
- Regione Emilia-Romagna: 22.02.1993, n°10
- Regione Lazio: 11.09.1989, n°56; 10.05.1990, n°42
- Regione Lombardia: 16.08.1982, n°52
- Regione Marche: 06.06.1988, n°19
- Regione Piemonte: 26.04.1984, n°23; 23.01.1989, n°6
- Regione Sardegna: 26.05.1989, n°17; 20.06.1989, n°43
- Provincia autonoma di Trento: 13.07.1995, n°7; 28.04.1997, n°9; 20.02.1998, n°1566
- Regione Umbria: 11.08.1983, n°31;
- Regione Val D'Aosta: 06.04.1998, n°11
- Regione Veneto: 06.09.1991, n°24; 30.06.1993, n°27; 09.07.1993, n°29; 17.05.1994, n°14; 23.06.1995, n°18

In 2001 a national framework regulation was issued (**22 February 2001, Law n°36**) defining the fundamental principles for workers and population safety, scientific research promotion and environmental protection and recovery.

Within this context the **Law Decree 8 July 2003** fixes the exposure limits, attention values and quality objectives for population protection from both 100 kHz to 300 GHz electromagnetic fields (G.U. 28 August 2003, n°199) and power lines frequency (50 Hz) (G.U. 29 August 2003, n°200). For the other ELF frequencies (0-100 kHz), Decree refers to UE Recommendation, 12 July 1999 published G.U.C.E. n°199, 30 July 1999.

Table I synthesizes the contents of the **Law Decree 8 July, 2003**.

Table I

Exposure limits, attention values and quality objectives fixed in Law Decree, 8 July 2003.

B= Magnetic Induction, E= Electric field, H= Magnetic field, D= Power density

<i>Law Decree</i>	<i>Frequency range</i>	<i>Exposure limits (r.m.s.)</i>	<i>Attention values (r.m.s.)</i>	<i>Quality objectives (r.m.s.)</i>
Law Decree 8 July, 2003 (G.U. 29 August 2003 n°200)	50 Hz	B: 100 μ T E: 5 kV/m	B: 10 μ T E: 5 kV/m	B: 3 μ T E: 5 kV/m
Law Decree 8 July, 2003 (G.U. 28 August 2003 n°199)	0.1 -3 MHz	H: 0.2 A/m E: 60 V/m	H: 0.016 A/m E: 6 V/m	H: 0.016 A/m E: 6 V/m
	3 -3000 MHz	H: 0.05 A/m E: 20 V/m D: 1 W/m ²	H: 0.016 A/m E: 6 V/m D: 0.10 W/m ²	H: 0.016 A/m E: 6 V/m D: 0.10 W/m ²
	3 -300 GHz	H: 0.01 A/m E: 40 V/m D: 4 W/m ²		

Links:

<http://www.ambientediritto.it/Legislazione/elettrosmog/elettrosmog.htm>

<http://www.ambientediritto.it/Giurisprudenza/ELETTROSMOG.htm>

11.2 Local and national networks for monitoring and communication

Since the 90s, a close network has been developed for the purpose of environmental monitoring and communicating. Within this framework, both local and national agencies are involved in monitoring EM fields exposure levels, data communication and information campaign to promote a widespread awareness of electromagnetic matters and public health risks.

The agencies network is made up of APAT (Agenzia per la Protezione dell'Ambiente e per i Servizi Tecnici), a national institution which coordinates the activity of local agencies ARPA (Agenzie Regionali per la Protezione dell'Ambiente) and APPA (Agenzie Provinciali per la Protezione dell'Ambiente).

Table II reports references of national and local agencies.

Table II
References for national and local agencies.

<i>Agency</i>	<i>Address</i>
APAT	Via Vitaliano Brancati, 48, 00144 Roma Tel. 06 50071, Fax 06 50072218 http://www.sinanet.apat.it/
ARPA Basilicata	Via della Fisica, 18/C-D, 85100 Potenza Tel. 0971 601091, Fax 0971 56078 http://www.arpab.it/
ARPA Calabria	Viale degli Angioini, 143, 88100 Catanzaro Tel. 0961 758611, Fax 0961 758605
ARPA Campania (in progress)	Centro Direzionale Isola E5, Via G. Porzio, 4, 80143 Napoli Tel. 081 7782111, Fax 081 7782536 http://www.arpacampania.it/
ARPA Emilia-Romagna	Via Po, 5, 40139 Bologna Tel. 051 6223811, Fax 051 543255 http://www.arpa.emr.it/
ARPA Friuli-Venezia Giulia (in progress)	Piazza Grande, 1, 33057 Palmanova (UD) Tel. 0432 922611, Fax 0432 922626 http://www.arpa.fvg.it/
ARPA Lazio	Via Garibaldi, 114, 02100 Rieti Tel. 0746 491143, Fax 0746 253212 http://www.regione.lazio.it/ambiente/agenzie/arpa.shtml
ARPA Liguria	P.zza della Vittoria, 15/C, 16121 Genova Tel. 010 5763311, Fax 010 57633224 http://www.arpal.org/
ARPA Lombardia	Viale F. Restelli, 1/A, 20124 Milano Tel. 02 696660, Fax 02 69666247 http://www.arpalombardia.it/
ARPA Marche	Via Caduti del Lavoro, 40, 60100 Ancona Tel. 071 2132711, Fax 071 2132740 http://www.arpa.marche.it/
ARPA Molise	Via Caduti del Lavoro, 40, 60100 Ancona Tel. 071 2132711, Fax 071 2132740 http://www.arpamolise.it/
ARPA Piemonte	Via della Rocca, 49, 10123 Torino

	Tel.: 011 8153222, Fax: 011 8153253 http://www.arpa.piemonte.it/
ARPA Puglia	c/o Regione Assessorato Ambiente, P.zza Moro, 37, 70100 Bari Tel. 080 5404233/36/38, Fax 080 5404189
ARPA Sardegna (in progress)	Viale Ciusa, 6, 09131 Cagliari Tel. 070 6092662 - 070 6092603, Fax 090 6092630 http://www.arpa.sardegna.it/
ARPA Sicilia	c/o Assessorato Reg.le del Territorio e dell'Ambiente Via Ugo La Malfa, 169 - 90146 Palermo Tel. 091 6968694, Fax 091 6968691 http://www.arpa.sicilia.it/index2.htm
ARPA Toscana	Via Nicola Porpora, 22, 50144 Firenze Tel. 055 3206301, Fax 055 3206329 http://www.arpat.toscana.it/
ARPA Umbria	Via Pievaiola, Loc. S. Sisto, 06132 Perugia Tel. 075 515961, Fax 075 51596235 http://www.arpa.umbria.it/
ARPA Valle d Aosta	Regione Borgnalle, 3, 11100 Aosta Tel. 0165 278511, Fax 0165 278555 http://www.arpa.vda.it
ARPA Veneto	P.le Stazione, 1 - 35131 Padova Tel. 049 8239301, Fax 049 660966 http://www.arpa.veneto.it/indice.htm
APPA Trentino	Piazza A. Vittoria, 5 - 38100 Trento Tel. 0461/497760-61, Fax 0461/497759 http://www.provincia.tn.it/appa/
APPA Alto Adige	via Amba-Alagi 5, 39100 Bolzano Tel.: 0471 / 417100, Fax: 0471 / 417119 http://www.provincia.bz.it/agenzia-ambiente/index_i.asp

On the basis of APAT monitoring data, an **Annual Report is published by Ministry of Environment** (<http://www.minambiente.it/Sito/home.asp>), reporting several indicators on the electromagnetic territorial status. These regard possible overcoming of maximum exposure levels and possible recovery actions, density and total power emission of radio-communication systems, power lines kilometeric extension.

For the purpose of EM field's levels monitoring and public information, the Ministry of Communications has promoted a "National Plan for Electromagnetic Fields Monitoring" in collaboration with the Ugo Bordoni Foundation, see:
http://www.monitoraggio.fub.it/rete_italiana.html

Within the National Plan, a "technological bus", the **Blubus**, has been equipped with measurement set-up for real-time monitoring and travels around the national territory (figure 1). Interested people can look at the collected data and be informed on the problems concerning bioelectromagnetic interaction (figure 2).



Figure 1 BluBus roadmap. Red lines indicate locations already visited, blue lines represent places to be visited.



Figure 2 BluBus activities and information campaign

Main links for general and scientific information on EM fields

- IROE-CNR sito dell'Ist. di Ricerca Onde Elettromagnetiche:
<http://www.ifac.cnr.it/pcemni/>
- Consorzio Elettra 2000 (Fondazioni Bordini e Marconi, Università di Bologna):
<http://www.elettra2000.it/>

11.3 Institutions with a role in the discussion on Bio-electromagnetic Interaction

The Ministry of Environment and the Ministry of Health, with their institutes, play the institutional role in the investigations on the action of physical agents, including EM fields. This involves discussions on risk problems and subsequently regulations. Recently, the Ministry of Communications, by means of the Ugo Bordoni Foundation, is getting involved in information campaigns dedicated to the general public, and regulatory proposals.

Here links of institutions involved in the bioelectromagnetic debate are reported:

Ministero della Salute
<http://www.ministerosalute.it/>

Istituto Superiore di Sanità
<http://www.iss.it/>

Istituto Superiore Prevenzione e Sicurezza sul Lavoro
<http://www.ispesl.it/>

Ministero dell'Ambiente e della Tutela del Territorio
<http://www.minambiente.it/Sito/home.asp>

Agenzia per la Protezione dell'Ambiente e per i Servizi Tecnici
<http://www.apat.gov.it/site/it-IT/>

Ministero delle Comunicazioni
<http://www.comunicazioni.it/it/>

Fondazione Bordoni
<http://www.fub.it/>

Moreover, several Italian institutes involved in V and VI Framework Program and European projects have displayed an articulated scientific activity on EM fields' interaction.

In particular:

- Inter-university Centre for the Study of Interactions between EM Fields and Biosystems (ICEmB) <http://www.icemb.org/> (dinzeo@die.uniroma1.it), consortium of 10 universities (University of Ancona, Bologna, Genova, Milano, Modena, Napoli, Palermo, Pavia, Roma "La Sapienza", Basilicata), research centres (CNR, ENEA, ISS, IRST) and several other university groups (University of Ferrara, Pavia, Perugia, Foggia). ICEmB is involved in the environmental monitoring of the EM fields levels, *in vitro* and *in vivo* biological studies and the related dosimetric aspects, modelling of the EM fields action on bio-electrochemical processes, therapeutic and diagnostic applications.
- Institute of Applied Physics "Nello Carrara", CNR (Firenze) <http://www.ifac.cnr.it/pcemni/> (M.bini@ifac.cnr.it), involved in all the bioelectromagnetic aspects and their divulgation.

- Section of Toxicology and Biomedical Sciences, ENEA (Roma) <http://www.enea.it/> (marino@casaccia.enea.it, lovisolo@casaccia.enea.it), provided with several biological laboratories, that have contributed to probe into bioelectromagnetic studies (*in vivo* and *in vitro*), and involved in dosimetric research on EM fields. In 1999 ENEA on behalf of Ministry of Environment coordinated a national project (ENEA, IFAC-CNR, IRST, ARPAP, ARPAT, APAT and ISS,) to design a national database of ELF and RF electromagnetic sources.
- Institute for the electromagnetic monitoring of the environment, CNR (Napoli) <http://www.irea.cnr.it/> (scarfi.mr@irea.cnr.it), involved in various bioelectromagnetic activities, in particular in *in vitro* biological investigations.
- Few months ago, the National Research Program has reached its conclusion. The program supported by the Ministry of University and Research had been coordinated by CNR and by ENEA (<http://www.emprotect.enea.it/>).

12. POLISH Report

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12.1 Inventory of national organizations on EMF and Health

Legislative initiatives in the field of EMF and health in Poland go back to 1972, when the first ordinance of the Council of Ministers on safety guidelines and permissible levels of occupational exposure to microwave (300 - 300 000 MHz) radiation was published. This ordinance established a daily dose exposure concept with time-limited exposures in particular „safety” zones (intermediate, hazardous, dangerous) and relatively low level of exposure considered as „safe” for unlimited exposures (0.1 W/m^2). Such philosophy of EMF safety guidelines with emphasis on possible health risks from long-term exposures in low-level EM fields influences all later extensions and modifications of the original act (Table I), including the presently in force ordinances of 2002 (occupational exposure) and 2003 (public exposure).

Table I. History of development of EMF standards in Poland.

Year	Legislator	Type of EMF exposure	Range covered, PELs
1972	Council of Ministers	Occupational	Microwaves 300 – 300 000 MHz Dose concept
1977	Ministry of Labour, Wages and Social Policy	Occupational	Radio- frequencies 0.1– 300 MHz Dose concept
1980	Ministry of Environment Protection	Public environmental	0 – 300 000 MHz
1994	Ministry of Labour, Wages and Social Policy	Occupational	0 – 0.1 MHz
1996	Prime Minister	Creation of inter-ministerial commission of experts for elaboration of guidelines and standards for harmful physical and chemical factors in work environment	
1998	Ministry of Environment Protection	Public, environmental	0 – 300 000 MHz
2002	Ministry of Economy, Labour and Social Policy	Occupational	0 – 300 000 MHz, Dose concept
2003	Ministry of the Environment	Public, environmental	0 – 300 000 MHz

In general, maximal permissible exposure levels (PEL) for workers, which allow for short-term exposures, are similar to those recommended by international bodies (e.g. ICNIRP), but there exists additionally a considerably lower exposure limit which is set for 8-hr (whole working shift) exposure. Still more, PELs for public (environmental) exposures are set at still lower levels, being considerably lower from those recommended by international bodies.

12.1.1 Legislation initiatives in the field of EMF and health for occupational exposures.

The Inter-ministerial Commission for Permissible Concentrations and Intensities (PCI) of Factors Harmful for Health in Work Environment has been established in 1996 by an Ordinance of Prime Minister of Poland (Journal of Laws, 1996 No. 61, pos. 284); the ordinance was modified in 1997 and 2000 (Journal of Laws No. 1997, No.124 pos. 789 and 2000 No. 8, pos. 108, respectively).

The Commission is composed of representatives of two research institutes of occupational medicine, institute of work safety, delegates of ministries and trade unions.

The Commission is responsible for:

- Analysis and judgement on proposals and elaborating of expertises related to limiting PCI of Factors Harmful for Health in Work Environment;
- Submitting for the Minister of Labour and Social Policy own conclusions concerning limiting PCI of Factors Harmful for Health in Work Environment for further actualisation.

The Commission created two working groups of cooperating experts:

1. For chemical factors (with a subgroup for industrial aerosols);
2. For physical factors, with separate subgroups for:
 - Noise;
 - Mechanic vibration;
 - Electromagnetic fields;
 - Optic radiation;
 - Microclimate.

The subgroup of experts for electromagnetic fields lists at present 9 members (from year 2000) and is affiliated at the Central Institute of Work Safety in Warsaw. After discussion of proposal of EMF safety guidelines and permissible exposure levels for workers, followed by submission of the proposal to the Ministry of Economy, Labour and Social Policy, the subgroup of experts for electromagnetic fields did not undertake activities. Ordinance of the Ministry of Economy, Labour and Social Policy of 2002 (Journal of Law 2002 No. 217, pos. 1833) established maximal PEL („dangerous” zone), and border levels for other zones (safe, intermediate, hazardous) and set the permissible daily dose of exposure, based on the above PELs.

In fact, only a border level for intermediate zone has been established by the legislator, the rest is a matter of simple calculations (maximal PEL was set as 10 times the border level for intermediate zone, „safe” zone at 1/3 of the border level for intermediate zone and daily dose is expressed as 8 times squared border level for intermediate zone). Detailed border levels of

electric (E) and magnetic (H) field components for particular frequencies of EM spectrum, as listed in the 2002 ordinance. Are summarized in Tables II and III.

Additionally, the 2002 ordinance on EMF safety in occupational exposure limits exposure to peak power density of pulse-modulated radio frequency and microwave fields (0.1 – 300 000 MHz) (Fig. 1). A comparison of Polish EMF safety limits for workers with ICNIRP recommendation (Fig. 1) reveals that for short-time exposures (of few minutes) generally stronger fields are allowable for workers in Poland than it is restricted by international recommendations. On the other side, the exposure levels during whole working shift and daily doses are considerably lower.

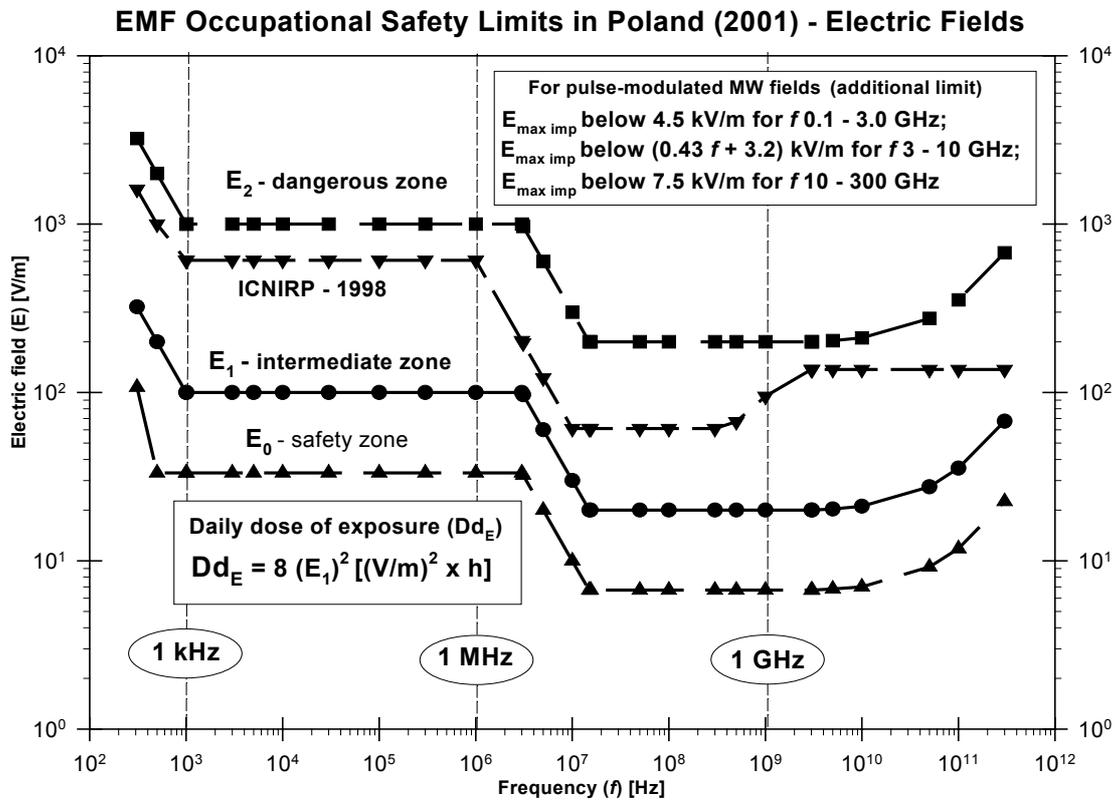
Frequency range (f)	Border intensities of electric field E (f) [V/m] for The safety zone			Permissible daily dose of electric field, $Dd_E(f)$
	Safe and intermediate	Intermediate and hazardous	Hazardous and dangerous	
0 - 0.5 Hz (static fields)	10000	20000	40000	3200 (kV/m) ² h
0.5 – 300 Hz	5000	10000	20000	800 (kV/m) ² h
0.3 – 1 kHz	100/ $3f$	100/ f	1000/ f	0.08/ f^2 (kV/m) ² h
1 kHz – 3 MHz	33.3	100	1000	0.08 (kV/m) ² h
3 – 15 MHz	100/ f	300/ f	3000/ f	0.72/ f^2 (kV/m) ² h
15 – 3000 MHz	6.66	20	200	3200 (V/m) ² h
3 – 300 GHz	0.053 f +6.5	0.16 f + 19.5	1.6 f +195	$(f/2 +55)^2$ (V/m) ² h

Table II. Border intensities of electric field E (f) in safety zones and permissible daily doses $Dd_E(f)$.

Table III. Border intensities of magnetic field H (f) in safety zones and permissible daily doses $Dd_H(f)$.

Frequency range (f)	Border intensities of magnetic field H (f) [A/m] for the safety zone			Permissible daily dose of electric field, $Dd_H(f)$
	Safe and intermediate	Intermediate and hazardous	Hazardous and dangerous	
0 - 0.5 Hz (static fields)	2666	8000	80000	512 (kA/m) ² h
0.5 – 50 Hz	66.6	200	2000	0.32 (kA/m) ² h
0.05 – 1 kHz	10/ $3f$	10/ f	100/ f	800/ f^2 (A/m) ² h
1 – 800 kHz	3.3	10	100	800 (A/m) ² h
0.8 – 150 MHz	8/ $3f$	8/ f	80/ f	512/ f^2 (A/m) ² h
150 – 3000 MHz	0.018	0.053	0.53	0.022 (A/m) ² h

Fig. 1. A comparison of permissible exposure levels for workers in Poland with ICNIRP recommendations.



12.1.2 Legislation initiatives in the field of EMF and health for public exposure

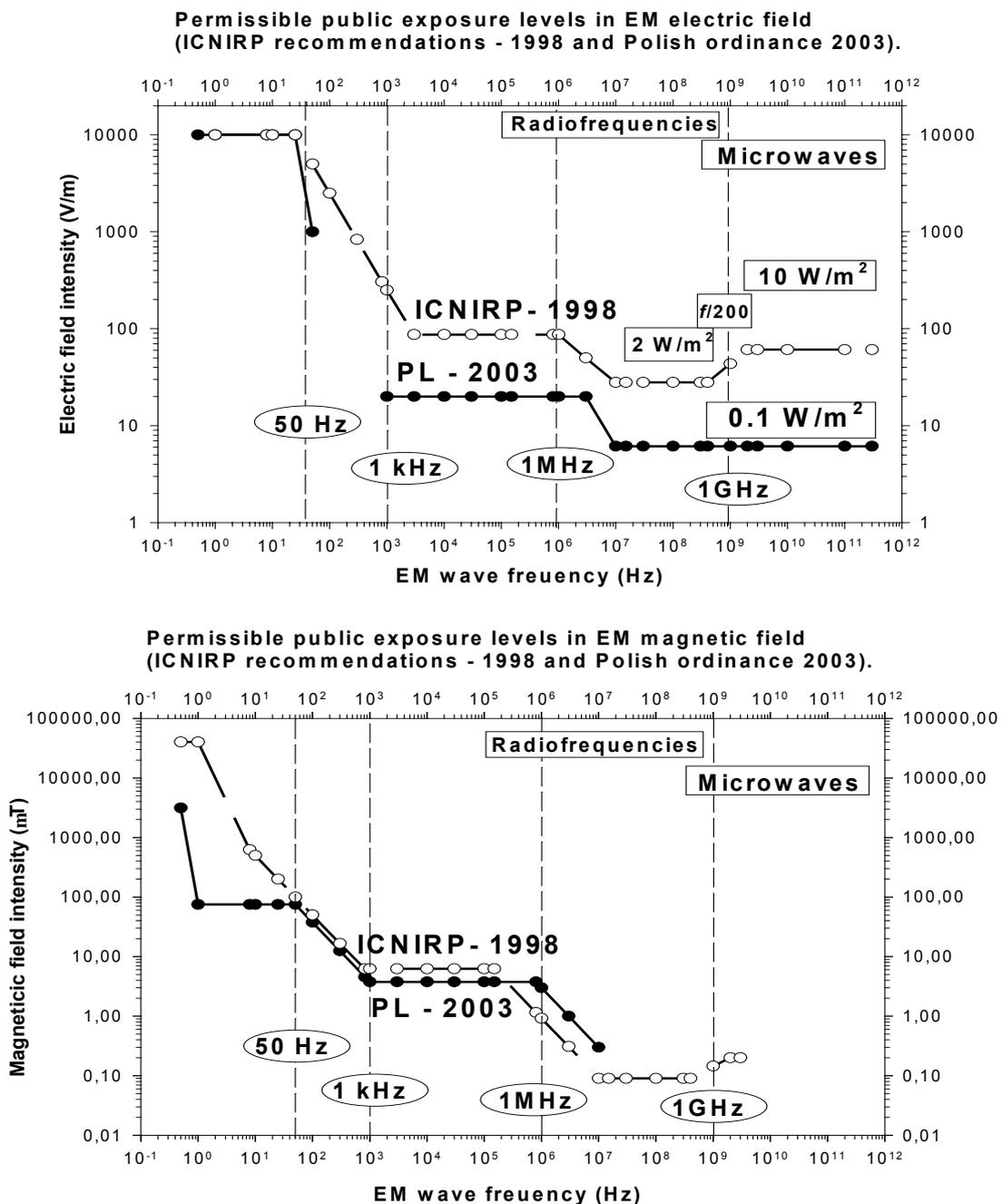
Legislation initiatives in the field of EMF and health for environment safety and public exposures are in Poland coordinated by Ministry of the Environment with very limited cooperation with institutions responsible for elaboration of occupational standards. This results e.g. in different levels for uncontrolled and unlimited („safe”) exposure of workers and lay people for particular EMF frequencies, set in EMF safety regulations of the two ministries.

Table IV. Permissible levels of EMFs in the environment in places accessible for the public.

Frequency range of EMF (f)	Physical parameter of EMF		
	Electric component	Magnetic component	Power density
0 Hz	10 kV/m	2500 A/m	
>0 – 0.5 Hz	----	2500 A/m	
>0.5 – 50 Hz	10 kV/m	60 A/m	
>0.05 – 1 kHz	---	$3/f$ A/m	
>0.001 – 0.8 MHz	20 V/m	3 A/m	
>0.1 – 0.8 MHz	20 V/m	3 A/m	
>0.8 – 3 MHz	20 V/m	$2.4/f$ A/m	
>3 – 10 MHz	6.14 V/m	$2.4/f$ A/m	
>10 – 100 MHz	6.14 V/m	----	
>100 – 300 000 MHz	----	----	0.1 W/m ²

At the Ministry of the Environment there exist no legislative commission of experts for EMF; the proposals are elaborated by invited specialists, chaired by Stefan Rozycki, Ph.D. (stefanr@post.pl) and undergo consultations with selected experts. In March 2001 an amended act entitled „The Act on Environmental Protection and Development” was introduced in Poland (Journal of Laws, 1994, No. 49, pos.196 and 2002 No 62 pos. 627). This act includes notes concerning EMF safety and demands elaboration of new regulations, which would cover all newly introduced technologies (including mobile telecommunication) and provide respective safety standards.

Fig. 2. A comparison of permissible exposure levels for the public of electric and magnetic components of EMF in recent Polish regulations (2003) and ICNIRP recommendations.



The regulation on EMF safety was elaborated in 2002 and published in 2003 in form of the Ordinance of the Ministry of the Environment on permissible levels of EMF in the environment and methods for control of compliance of these levels. Allowed levels of electric and magnetic components of EMF in the environment, in places accessible for the public are summarized in Table IV.

A comparison of permissible exposure levels for the public of electric and magnetic components of EMF in recent Polish regulations (2003) and ICNIRP recommendation (Fig. 2) reveals that for the electric field PELs are considerably lower (at least by an order of magnitude) for the range of frequencies 1 kHz – 300 000 MHz, while for the magnetic component PELs follow the ICNIRP recommendations at the range of frequencies 50 Hz – 100 MHz, by remain considerably lower for static fields and ELF (0 – 50 Hz) .

12.1.3 Links to institutions and persons for additional information

- Ministry of the Environment www.mos.gov.pl
- Inspection for Environmental Protection, www.gios.gov.pl
- Environmental EMF Safety – Stefan Rozycki, Ph.D., stefanr@post.pl
- Ministry of Economy, Labour and Social Policy, www.mpips.gov.pl
- All aspects of EMF safety – Marek Zmyslony, Ph.D., zmyslmar@imp.lodz.pl
- All aspects of EMF safety – Stanislaw Szmigielski, M.D., Ph.D., at szmigielski@wihe.waw.pl

Table V. Overview of the Institutions with decision powers in EMF-Health related matters in Poland.

Institution, address	Scope of activities	Faculty, staff
Commission on Biological Effect of Non-Ionizing Radiations (CBENIR) , Committee of Medical Physics, Polish Academy of Sciences	Initiation and coordination of research activities in bio-electromagnetism Coordination of cooperation of research groups in bio-electromagnetism at the national level	Prof. Stanislaw Szmigielski , M.D., Ph.D., chairman; Elzbieta Sobiczewska , Ph.D., secretary; 14 members
Commission on Bioelectromagnetic Problems , Polish Society of Radiation Biology	Analysis of risks from exposure to EM fields; Elaboration of occupational and public safety guidelines and permissible levels of EM exposure	Marek Zmyslony , Ph.D., chairman; 8 members
Department of Microwave Safety , Military Institute of Hygiene and Epidemiology, Warsaw	Experimental and epidemiological research on bio-effects and health risks of pulse-modulated microwave radiation; Metrology of electromagnetic fields; Elaboration of occupational and public	Prof. Stanislaw Szmigielski , M.D., Ph.D., Head of the Department; Elzbieta Sobiczewska , Ph.D., Laboratory of Bio-effects of EM Fields;

	safety guidelines and permissible levels of EM exposure	Roman Kubacki , D. Tech. Sci., Laboratory of Metrology of EM Fields
Institute of Electroenergetics , University Technical School, Wroclaw	Experimental and epidemiological research on bio-effects and health risks of power frequency EM fields (50 Hz); Advisory institution to the Ministry of Environment for health risks of power frequency EM fields (50 Hz)	Marek Szuba , D. Techn. Sci.
Central Institute of Work Safety , Warsaw	Metrology of electromagnetic fields	Jolanta Karpowicz , B, Techn.Sc.
Laboratory for Electromagnetic Hazards , Institute of Occupational Medicine, Lodz	Metrology of electromagnetic fields; Elaboration of occupational and public safety guidelines and permissible levels of EM exposure	Marek Zmyslony , Ph.D., Halina Aniolczyk , Ph.D.

12.2 Future plans of legislative initiatives, regulations, and risk communication approach.

The EMF safety regulations, which are at present in force in Poland are relatively recent and were introduced in 2002 (occupational exposure) and 2003 (public exposure), respectively. Nevertheless, it is a strong feeling of numerous bio-electromagnetic experts in this country, as well as the present authors, that these regulations require modification and at least partial harmonization with international standards (ICNIRP recommendation, EU directives on EMF safety). The most important problems to be discussed, resolved, and included in the future EMF safety regulations are:

- To create of a uniform legislative act which would cover all aspects of EMF safety, including occupational and public (environmental) exposure and methods for providing the established safety requirements
- To define limits for short-term EMF exposures (harmonized with international standards) and limits for long-term exposures (occupational and environmental), based on accepted health risks from low-level effects
- To establish whether or not the dose concept can be accepted as a basis for expression of quantity of exposure in terms of EMF safety, both in occupational and in residential (use of mobile phone terminals) exposures

In view of the above demands, a group of experts in bio-electromagnetic from Poland proposed during a national conference on bio-effects and health risks of EMFs in 2002 to organize a commission or working group for creation of novel proposals in the field of EMF safety regulations. The Commission for Bio-electromagnetic Problems (CBEMP) was organized in 2003 and affiliated at the Polish Society for Radiation Research. At present (June 2004) CBEMP lists 14 members and is chaired by Dr Marek Zmyslony of the Institute of Occupational Medicine in Lodz, Poland (zmyslmar@imp.lodz.pl). CBEMP has prepared three proposals of complex EMF safety standards and at present is working on harmonization between the proposals.

13. SLOVENIAN Report

Peter Gajšek

Institute of Non-Ionizing Radiation, Ljubljana, Slovenia

13.1 Inventory of national key initiatives on EMF

13.1.1 Relevant actors, institutions and organisations at governmental, industry and NGO levels

a) Authorities (regulatory bodies, Health authorities, governmental advisory institutions, etc)

- **Ministry of Environment**, Dunajska 45, 1000, Ljubljana, contact: Radovan Tavzes, State Secretary, tel: 386 1 4787 310, email: Radovan.Tavzes@gov.si, <http://www.gov.si/mop>
- **Ministry of Health - Radiation Protection Board of the Republic of Slovenia** - Tržaška c. 21, 1000 Ljubljana, contact: dr. Damijan Škrk, Director, tel: 386 1 4788702, email: Damijan.skrk@gov.si
- **Ministry of Information Society**, Tržaška 21, 1000 Ljubljana, Miha Usenicnik, Advisor to the Government, tel: 386 1 478 8333, Fax: 386 1 478 8142, email: miha.usenicnik@gov.si, <http://mid.gov.si>

b) Institutions and organizations at governmental, industry and NGO levels

University of Ljubljana

Faculty of Electrical Engineering:
Trzaska 25
SLO- 1000 Ljubljana

Contact: prof.dr.Damijan Miklavcic

Tel: +386-1-4768-411

Fax: +386-1-4264-630

eMail: damijan@svarun.fe.uni-lj.si

Institute of Non-Ionizing Radiation

Slovenceva 95
SLO-1000 Ljubljana

Contact: doc.dr.Peter Gajsek

Tel: +386-41-641-798

eMail: peter.gajsek@inis.si

University of Maribor

FERI
Smetanova St. 17
SLO-2000 Maribor

Contact: dr.Igor Ticar

Tel: +386 2 2221 112

eMail: ticar@uni-mb.si

Institute of Oncology
Zaloška c. 2:
SLO- 1000 Ljubljana

Contact: prof.dr.Gregor Serša
Tel:+386-1-5879 434
eMail: gsersa@onko-i.si

Health Science Center of Ljubljana

Contact: dr.Metoda Dodič Fikfak, Tel: +386 522 4334, Institut.kimdps@guest.arnes.si

c) NGOs and Academia (consumer associations, citizen advisory and special interest groups, research institutions, etc)

Slovenian Consumers' Association

Frankopanska 5
SLO-1000 Ljubljana
Home page: www.zps-zveza.si

Contact: Breda Kutin-director
Telephone: +386 (0)1 474 06 00
Fax: +386 (0)1 433 33 71
eMail: breda.kutin@zps-zveza.si

National Coordination Action (see bellow):

Project Forum EMS

Slovenceva 95
SLO-1000 Ljubljana

Coordinator: doc.dr.Peter Gajsek
Tel: +386-1-5604 743
eMail: info@forum-ems.si

13.1.2 Information and data sources. Relevant publications and documents

- Handbook on Non-Ionizing radiation and its Biological effects, Publisher: Faculty of EE, University of Ljubljana, 2000, pp 192, Language: Slovenian, Contact for copies/Internet link: www.fe.uni-lj.si
- Fact sheet: Mobile telephony and health, Publisher: Project Forum EMS, 2004, pp 20, Language: Slovenian, Contact for free copies/Internet link: www.FORUM-EMS.si
- Frequently asked Questions on Mobile telephony and health, Publisher:Project Forum EMS, 2004, pp 2, Language: Slovenian, Contact for free copies/Internet link: www.FORUM-EMS.si

13.1.3 Legislation & Regulations. Existing as well as planned initiatives

The **ordinance on EMF in living and natural environment**, which was prepared by the Ministry of Environment of the Republic of Slovenia and implemented in 1996, clearly defines the highest level of EMF exposure allowed and appropriate protective measures. The limit values of maximal field strengths of various frequencies in the environment are based on ICNIRP guidelines and on the SIST ENV 50166.

As a result of the concern about the potential health effects of electromagnetic fields, the government judges that the amount of the total knowledge now accumulating, justifies the application of protective measures in the form of environmental protection. While the scientific database is insufficient in developing limits of exposure, this strategy does not exclude other steps of reducing exposure on new installations. For new systems and installations of EMF sources in the environment the additional safety factor is introduced to the already valid limit values and represents only a political decision which does not rely on a scientific basis. Before

choosing the appropriate location for the new installation of any EMF source, the preliminary research calculations must be carried out and the minimum security distances must be determined within the limits of which no objects of special classification should be situated and no other activities allowing longer lingering of people are allowed to take place.

The Ministry of Environment is preparing the revision of the **Ordinance on EMF in living and natural environment** from 1996. The new revision that is expected before the end of 2004 will be fully harmonized with the Council Recommendation (1999/519/EC of 12 July 1999) on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz) and will implement also some precautionary measures.

The **Ministry of Health** is preparing an act on radiation protection, which will focus of surveillance on the workers and general public being exposed from non-ionising radiation. Legislation will have to be adopted anew, since it will have to be harmonised with the EU directives and the recommendations of the leading international institutions.

13.2 Risk Communication strategies and channels (Authorities, Industry, NGOs)

13.2.1 Risk communication tools and initiatives: information campaigns, workshops, surveys, leaflets, newsletters, etc.

- The mobile technologies are still of primary interest of the public and media. Disturbing messages in the media on alleged adverse health effects and lack of information (based on scientific data) of the inhabitants of surrounding areas where antennas are being installed have lead to a continuously increasing wave of concerns.
- This has led to serious attention of the three responsible ministries (**Ministry of Environment, Ministry of Health, Ministry of Information Society**) to EMF associated problems. With the strong initiative from the scientists and research institutions in cooperation with industry, network providers, representatives of local and regional authorities, non-governmental organizations and above mentioned three responsible ministries, a special coordination action - **project FORUM EMS** was launched in September 2003 to promote science based knowledge on possible effects of EMF and provide information on all aspects of the EMF in our society.
- Since than, various activities have been organized including publishing various brochures, **EMF Newsletter**, Public hearings, Open telephone, Educational workshops, Round table meetings, Scientific seminars, Media Reports and articles, Interviews with key experts (www.forum-ems.si).
- Within the project special initiative was proposed towards the implementation of the voluntary code of practice for companies that would like to build a new EMF source in the living and natural environment.

We are very happy to announce that the International Conference on EMF: From Bioeffects - To Legislation will be held in Ljubljana, Slovenia in November 8-9 2004. The need for the proposed EMF meeting has arisen as a result of concerns being expressed by a number of elected representatives, community groups, and individuals worldwide in relation to the possible effects

on health of EMF at the levels that are below the current internationally accepted guidelines. For more details see,

http://www.who.int/peh-emf/meetings/bioeffects_slovenia04/en/

13.2.2 Public perception of EMF risk, surveys and monitoring

Within the **project FORUM EMS**, a nationwide enquiry to address the following questions such as:

- Is it possible to distinguish between different EMF-risk perception groups?
- How convincing are the various arguments in the debate on mobile phone technologies and which approach of the risk communication to take?
- Does new information about EMF-risks make a difference in risk perception? Study planned for 2005?

13.3 Summary overview of research support to EMF & Health. Main areas and topics

TEST COMPLIANCE: The general activities in the field of EMS are related to test compliance of the EMF sources in living environments. In relation to the Decree on Electromagnetic Radiation in the Natural and Living Environment there are 7 different institutions that are holders of the governmental certificate for testing compliances - measurements of the EMFs in the living and natural environment. The list of those institutions could be obtained from the Environmental Agency of the Republic of Slovenia, Vojkova 1b, 1000 Ljubljana; <http://www.arso.gov.si/podro~cja/sevanja/podatki/>

RESEARCH: A joint project on RF dosimetry between Institute of Non-Ionizing Radiation and US Airforce Research Laboratory was recently completed and is ready for publication. The goal of this project was to develop a numerical technique for the computation of localised SAR, averaged over certain mass interval and identify the possible target organs, which might be more sensitive to EMFs.

The Faculty of Electrical Engineering, University of Ljubljana, is managing some research projects in the field of electro-chemotherapy and electro-genetherapy including cell electro-permeabilization and its biomedical and biotechnological applications. In addition, theoretical work is related also to the micro-dosimetry of EMF.

13.4 Data and databases

a) EMF sources and exposure data across full frequency range.

The Ministry of Environment is preparing the open database on all EMF sources that are operating in the environment in Slovenia and exceed the certain threshold in terms of nominated voltage (low frequency EMF sources) and radiated power (high frequency sources). Such a

database will offer a good background for completing the mapping of the field strengths around EMF sources in real 3-D environments.

b) Base station technical information, geographic distribution.

This is the project that will be initiated by Ministry of Environment.

c) Exposure monitoring and compliance measurements.

This project is being initiated by Ministry of Environment, Environmental Agency of the Republic of Slovenia.

14. SPANISH Report

David Sánchez-Hernández
Technical University of Carthagene

Pablo Fernández-Cid
Ministry of Industry, Tourism and Commerce

Alejandro Úbeda-Maeso
Bio-electromagnetism Lab. Hospital Ramón y Cajal,
Ministry of Health & Consumer Protection

14.1 Inventory of national key initiatives on EMF

14.1.1 Authorities (regulatory bodies, Health authorities, Radio & Telecommunications, governmental advisory institutions, etc)

Following a strong debate in the Spanish Parliament on November 1999 (File no. 161/001655) over electromagnetic fields and health, the Ministry of Science & Technology officially published in October 2000 a statement of position (*Salida 002525*) regarding the issue wherein the EC Recommendation was assumed.

The Ministry of Health and Consumer Protection published a detailed report on EMF and human health prepared by independent experts chaired by Dr. Francisco Vargas and Dr. Alejandro Úbeda in May 2001, which included conclusions and recommendations. After reviewing the huge amount of scientific information published, the Board of Independent Experts considered that exposure to EMF within the limits established in the Recommendations of the Council of Health Ministers of the European Union (CHMEU) concerning exposure of the general public to EMF from 0 Hz to 300 GHz cannot be declared to produce adverse effects on human health. Therefore, the Board concluded that fulfillment of the Council's Recommendation is sufficient to guarantee protection of the population, recommended the adoption of this Recommendation as compulsory in Spain. The report is available in both Spanish and English from the Ministry of Health web page <http://www.msc.es>

After that, the main initiative took place in September 2001 with the publication of the Royal Decree 1066/2001, regulating conditions to authorize and control radioelectric emissions of EMF throughout the country, and its practical implementation with the publication in January 2002 of the CTE/23/2002 Ministerial Order. Both regulations comply with the EMF EC Recommendation of July 1999.

The Royal Decree 1066/2001 was later amended by corrections 19998 of October 2001, 7198 and 7364 of April 2002.

The Ministerial Order CTE/23/2002 was also partially amended by correction 9436 of May 2002.

Following instructions of those two documents and their corrections, the Ministry of Health and Consumer Protection updated its report in September 1, 2003, ratifying current Spanish regulation as satisfactory for human health protection and introducing risk communication and perception issues in its recommendations as far as mobile communications is concerned.

This updated report by the Board of Experts on the topic “Updated Evaluation on EMF and Public Health” was published is available at:

http://www.msc.es/medioambient/agenfisicos/campos_em/pdf/informecem_08_2003.pdf

The Board, however, also reproduced the recommendation of 2001 that Article 25 of the *Reglamento de Líneas de Alta Tensión* (Regulation concerning high-power lines) be updated to redefine minimum safety distances between the wires and buildings, houses or private or public facilities. This recommendation has not yet been taken into account by regulatory bodies.

It is compulsory for this Ministry to issue summary updated reports on human exposure to EMF and health every three years.

Likewise, following instructions on the Spanish legislation, the Ministry of Science and Technology issues a yearly report on the authorization, installation, measurement and inspection campaigns. The first and only report up to now was published in April 2003, analysing 17.700 BTS for mobile communications and other 1.519 radio transmitters up to June 2002, were all measurements indicated emissions levels below reference levels.

Most of the documents regarding this item can be found at:

http://www.setsi.mcyt.es/movil/top_mov.htm

More information on the current flow diagram for EMF compulsory studies for base stations in Spain under the new regulation will be explained in the presentation.

National legislation has received diverse treatment on Autonomous Regional Governments. While the majority has adopted the new regulation, some Regions have published additional regulations, most of them under a trial process due to its inherent incompatibility to the National Decree.

The Spanish Autonomous Regions that have adopted additional regulations are:

Catalonia

Decree 148/2001, published in DOGC no. 3404 on 07/06/2001, modified by Decree 143/2003, Decree 267/2003 and Decree 281/2003.

<http://www.localret.es/dret/iradioc/normativa.htm>

<http://www.gencat.net/>

Castilla-la-Mancha:

Law 8/2001, published in DOCM no. 78 on 10/07/2001 and BOE no. 227 on 21/09/2001. Spanish Government initiated a trial on this Law based upon its disagreement to the Spanish Constitution (unconstitutionality), which gives full control of telecommunications

regulation to the National Government, since the Law establishes compliance limits below EC Recommendation levels.

<http://www.cortesclm.es/paginas/leyes/5/Ley08-01.htm>

Castilla y León:

Decree 267/2001, published in BOCyL no. 233 on 30/11/01. National Government on trial for this Decree.

Very recently, in March 2004 the Health and Consumer Protection Office of Castilla-León has asked the Spanish Society of Environmental Health (SESA) to pursue and study some cancer cases at a school in Valladolid following the recommendations of a specific expert panel in 2002. SESA has agreed to study the cases upon several premises, like the fact that both simulations and measurements make EMF the less likely cause of cancer, and although more measurements on ELF fields are required, they will study other risks evaluation possibilities, particularly some organic components and ionising radiation.

Navarra:

Law 10/2002, published in BOE no. 129 on 30/05/2002.

La Rioja

Decree 40/2002 for the installation of radiocommunications infrastructure

Another worrying issue is the many diverse ways local governments are addressing the issue. There are now more than 900 different local regulations in Spain, with many of them under trial for many different reasons. In view of this upcoming problem the *Federación Española de Municipios y Provincias* (Spanish Federation of Local Governments) issued in May 2002 a Reference Regulation for Local Governments regarding radiocommunications installations, which has had little success. To date, out of 862 local regulations under trial, 88 have been finalized and 79 out of these 88 have dictated in favour of mobile operators, which have recurred the rest to higher court tribunals.

After being addressed by several institutions and associations, the *Comisión del Mercado de las Telecomunicaciones* (CMT), the telecommunications control organism similar to the FCC in the USA, made a statement of position in January 2003 as a response to the National Spanish Association of Electronics Industries (ANIEL), wherein Local Governments were excluded to take any action as far as radioelectric emissions and criteria for requiring responsibility insurance are concerned, giving full regulatory control to the State (Ministry), while urban criteria affecting the installation of new BTS and the extra requirement of providing city-specific deployment plans were to some extent awarded to Local Governments providing the principle of proportionality of decisions to consequences is maintained. That gave an undefined way for future station deployment, which is yet to be solved and in fact many trials are ongoing between Local Governments and Stakeholders.

ANIEL has created a working group to promote the development of telecommunications infrastructure (CDIT), and has a web page on mobile communications and health issues.

http://www.aniel.es/telefonía_movil/web/animacion.html

In November 2003, radio-electric emissions were specifically addressed in the new General Telecommunications Law (*Ley 32/2003 General de Telecomunicaciones*), and the creation of a National Expert Round Table for the Promotion of the Information Society to deal with the EMF and Health issue and the National Radio-communications Agency was approved. To date, these two organisms are yet to be born.

Regarding Standardization Organization, the Spanish equivalent to ETSI, AENOR, created a committee on electromagnetic fields in the human environment, CTN215, which deals with the standards of CENELEC TC106X, and has been very active with two to three meetings a year and basically adopting all CENELEC standards with few comments. See <http://www.aenor.es>.

14.1.2 Industry (Telecommunications, Mobile telephony, Power Grid operators, etc.)

On July 24th, 2001, the mobile communications operators with license to operate in Spain (*Telefónica Móviles, Vodafone, Amena and Xfera*) signed an agreement of auto regulation to conform to the EC Recommendation on EMF.

After the Spanish Royal Decree, mobile communications stakeholders have had to spend over 15 M€ on the measuring campaign in 2002 to comply with the new regulation. This amount has been decreasing annually to about 2.5 M€ in 2003 and 1.5 M€ in 2004. General opinion around different operators is that this strong effort has only softened public opinion and that deployment of UMTS base stations and compliance with license-linked compulsory coverage plans is at risk.

In a detailed analysis, the Ministry of Science & Technology, in its 2002 report, inspected 847 installations. The confidence on each operator measurement data was:

- Telefónica Móviles: 98.38 %
- Vodafone: 96.50 %
- Amena: 99.29 %

All operators have included EMF information and brochures in their web pages, and free EMF information numbers and email contacts.

- Telefónica Móviles: 1437 medioambiente@tsm.es
<http://www.empresa.movistar.com/70/totalEngls.html>

- Vodafone: 607 100199,
<http://www.vodafone.es/Vodafone/LaCompanya/LaCompanya/0,2600,7590,00.html>

- Amena: Contact through form in web page
http://www.amena.com/amena/acerca_de_amena/amena_y_el_medio_ambiente/

14.1.3 NGOs and Academia (consumer associations, citizen advisory and special interest groups, research institutions, etc).

The first Spanish reports addressed to general public about electromagnetic fields and human health by research groups were:

- November 1999. Universidad Politécnica de Cartagena. Dr. David Sánchez-Hernández, Dr. Alejandro Díaz and Dr. Antonio Martínez-González (<http://www.gimre.upct.es>). Available at, <http://www.coit.es/asesoria/tecnica/tecnotas/campos.pdf>
- June 2000. Universidad Politécnica de Cataluña. Dr. Jordi Romeu and Dr. Antoni Elías (<http://www.tsc.upc.es>). Available at, <http://www.localret.es/dret/iradioc/docs/pctm.pdf>
- May 2001. Universidad Carlos III de Madrid. Dr. Emilio Olías and Juan Vázquez.
- December 2001. Universidad Complutense de Madrid. Dr. Antonio Hernando. Available at, <http://www.todocancer.org/NR/rdonlyres/150DA169-CEB9-40FE-9625-CC7AF93A2714/0/ponenciaHernando.PDF>
- January 2002. Universidad Complutense de Madrid. Dr. Antonio Hernando.

Before that, the *Ramón y Cajal Hospital* has had a continuous research activity on EMF and health, which continues now under the COST284 and other funds.

Other EMF-related research institutions representing Spain at COST281 are:

- Instituto de Física Aplicada. Consejo Superior de Investigaciones Científicas (CSIC). M. Martínez-Burdalo et al., at <http://www.ifa.csic.es>
- Departamento de Física Aplicada de la Universidad Complutense de Madrid. J.L. Sebastián et al., at <http://www.ucm.es/info/electron>
- Microwave Engineering, Radiocommunications & Electromagnetism Research Group. Universidad Politécnica de Cartagena. D. Sánchez-Hernández et al. , at <http://www.gimre.upct.es>
- Área de Toxicología. Instituto de Salud Carlos III de Madrid. B. Ribas et al. <http://www.isciii.es>
- Departamento de Tecnología Electrónica. Universidad Carlos III de Madrid. E. Olías et al., at <http://www.uc3m.es/uc3m/dpto/IN/dpin08/gsep/gsep/homepot.htm>
- Departamento de Anatomía e Histología Humana. Universidad de Zaragoza. M.J. Azanza et al., at <http://www.unizar.es>
- Asociación ITACA. Universidad Politécnica de Valencia. E. de los Reyes et al., at <http://www.itaca.upv.es>
- Departamento de Ingeniería Electrónica. Universidad Politécnica de Cataluña. EMC Group. P. Riu et al., at <http://www.upc.es/web/gcem>

Later in 2001, after an agreement with the Ministry of Science and Technology, the *Colegio Oficial de Ingenieros de Telecomunicación* (COIT), equivalent to the IEE in the UK, created a Working Group on radioelectric Emissions and published its recommendations in an extensive and multimedia work available at <http://ww.coit.es/>

The COIT, along with *Colegio Oficial de Ingenieros Técnicos de Telecomunicación* (COITT), has developed a procedure to verify all EMF emission compliance certificates before being submitted to the Ministry of Industry. The Ministry requires for all certificates to receive the OK of either COIT or COITT. Within COIT, the Association of Galicia has initiated, with support from the Regional Autonomous Government of Galicia, a web page for public queries regarding EMF and health issues.

<http://www.infonegocio.com/nortideas/telefonía.htm>

After a couple of years with fierce discussion to Spanish Regulatory Institutions against the installation of new BTS due to radioelectric emissions and public concern, in March 2003 the *Organización de Consumidores y Usuarios* (OCU), the Spanish User and Consumer Organization issued a statement, which was published in its monthly magazine, where the message transmitted to the use was one of calm and safety of citizens with current regulations. The statement was issued after a detailed study of available scientific literature and its own measuring campaign over BTS and high voltage lines. At that time there were 165 different local regulations and OCU called for a harmonization of the issue at the local level.

For more information, contact Ileana Izverniceanu: Tel. + 34 91 3000045.

Email: ileana@ocu.org

Similarly, after much interest, research and a general report in 1999, the Spanish Ombudsman Office published a specific EMF report in 2001. The report was basically orientated on high voltage lines effects on human health and some aspects of the Spanish Electric Law (*Ley 54/1997*), wherein a specific environmental-effect study is compulsory for new high voltage lines projected over more than both 15 km and 220 kV. Since the required utter regulation for this compulsory study has not yet been published, it does not come into effective way in practice, which is the subject of the Ombudsman Report.

To date the Ministry of Industry has only distributed an initial draft of the environmental-study normative for *Ley 54/1997*, wherein a corridor free of urban areas directly below these lines and with some projection on the sides is envisaged. Even if this is solved for future high voltage lines, there is a question mark on existing high voltage lines on urban areas, and this is yet to be discussed on parliament, although some Autonomous Regions, like Madrid through Decree 131/1997, have already published specific regulations for a progressive reduction of these lines and ways to move them away from urban areas. Other Regions, like *Extremadura*, *Asturias*, *Castilla-León* or *Castilla-La-Mancha*, have accepted the suggestion of the Spanish Ombudsman and have initiated public funding, limited to a few to Town Halls, for moving these lines. On the other hand, Regions like *Murcia* or *Valencia* have rejected the Ombudsman plan for existing high voltage lines, simply awaiting the normative for future lines.

More recently, the Spanish Ombudsman Office has issued a statement in 11/04/2004 wherein it is declared that the population health is appropriately protected from EMF emissions by current Spanish legislation and that concerns by general public, nearly on the verge of superstition, are not justified. See <http://www.defensordelpueblo.es>.

Apart from information provided by the Administration, an unofficial popular website with information regarding EMF is <http://www.sociedadmovil.com/smovil/index.jsp>.

14.2 Risk Communication strategies and channels (Authorities, Industry, NGOs)

13.2.1 Risk communication tools and initiatives: information campaigns, workshops, surveys, leaflets, newsletters, etc.

Regarding risk communication, the Ministry of Science and Technology, in the framework of an ongoing measuring campaign, published in October 2001 two leaflets, one on the correct use of mobile handsets to minimize exposure to EMF and another one regarding the same issue for base stations.

The two leaflets can be found at the web page for radioelectric emissions of the current Ministry of Industry, Tourism and Commerce at

http://www.setsi.mcyt.es/movil/top_mov.htm

In early 2004, the Ministries of Health and Consumer Protection, Science and Technology and Internal Affairs published a leaflet to reduce the continuously increasing mobile handset theft figures.

Apart from these leaflets, the Ministry is currently designing its risk communications campaign, and no other initiative has yet been announced.

At Regional level, the Autonomous Region of *Murcia* has published, in co-operation with the Technical University of Carthagene, three detailed reports on EMF and health, for the general public, local governments and installation companies for employer's protection. The reports were made public along with the results of a measuring inspection campaign.

These reports can be found at:

http://www.coit.es/asesoria/tecnica/tecnotas/emision/4_2003/cartagena.htm

Mobile communications companies also initiated an advertising campaign on radio and TV about safety of mobile communications.

A few Town Halls have developed risk information tools regarding EMF. It is worth mentioning here the leaflet and telephone EMF-health issues information number (for one month only) set up by the Town Hall of *La Coruña*, in *Galicia*, in cooperation with *Caixanova* in February 2002. The La Coruña Scientific Museums Staff prepared the scientific information included in the leaflet.

14.2.2 Public perception of EMF risk, surveys and monitoring. Risk perception and risk communication studies/research.

The most important initiative to date was a recent nationwide survey prepared by the *Asociación Española Contra el Cáncer* (AECC), the Spanish Association against Cancer. Demoscopia a well-reputed survey-specialist company performed the survey; the results were made public by a report in an *ad-hoc* extraordinary congress with a scientific panel of the outmost quality. The

main conclusion is that, while for the general public mobile communications base stations are a synonym to cancer, with percentages increasing as user lives closer to the BTS. Yet, another conclusion is that there is no proven link between the two, and that research must continue while current legislation is adequate to protect the public health.

For more information on AECC please contact Elixabete Álvarez at elixabete.alvarez@ketchum.com, Tel. +34 91 788 32 00, Fax 91 788 32 99. <http://www.todocancer.com/ESP/Programa.htm>

14.3 Summary overview of research support to EMF & Health

14.3.1 Government supported research

Unlike specific research plans of other EU countries, Spain has not initiated a dedicated-research budget to its National R&D Plan. Due to social concerns, research support was limited to a targeted line of research within the 2003 R&D Plan in two different strategies:

1. Priority research line on the National Biomedicine 2000-2003 R&D Plan: ‘Human Pathology and its mechanisms related to exposure to toxic and contaminating agents and to radioelectric emissions and health’.
2. Priority research line on the National Information & Communications Technology 2000-2003 R&D Plan: ‘Study of possible risks from radioelectric emissions in RF receivers’.

Additionally, in the National Information & Communications Technology 2000-2003 R&D Plan Call for proposals of 2003, a specific strategic action for ‘Increasing security and confidence of citizens, users and companies on IT systems’ was approved, which was very much related to public concerns on new BTS installations.

The main public funded projects are listed below:

Research Unit BEMS. Ramón y Cajal Hospital. Madrid:

- Characterization of Exposure Levels to NIR in Occupational Hospitals Environments. A. Úbeda et al. Funded by the Health Research Department (FIS), Ministry of Health.
- Stimulation of the expression of Proteins implicated in intercellular Communication in Hepatocytes: Their modulation through NIR exposure. M.A. Trillo et al. Funded by the Health Research Department (FIS), Ministry of Health.

Microwave Engineering, Radiocommunications & Electromagnetism Research Group. Technical University of Carthagene:

- Microwave energy as an alternative to pesticides for industrial rice disinfections processes. D. Sánchez-Hernández et al. Funded by the Ministry of Science and Technology (Ref. 1FD97-2235)
- Design and production of novel antennas for third generation mobile communications base stations and handheld terminals, which reduce radio-electric emissions. D. Sánchez-

Hernández et al. Funded by the Ministry of Science and Technology (Ref. FIT-070000-2001-501)

- Production of novel antennas for third generation mobile communications base stations and handheld terminals, which reduce radio-electric emissions. D. Sánchez-Hernández et al. Funded by the Ministry of Science and Technology (Ref. FIT-070000-2002-262)

Department of Signal Theory, Technical University of Catalonia:

- Microwave imaging system in real time. Biomedical applications. Funded by the Spanish Commission of Science and Research (Ref. 1165/84)
- Microwave tomography. Differential thermography application. Funded by the Health Research Department (FIS), Ministry of Health (Ref. 84/2112)
- Use of parallel and vector computers for numerical analysis of radiant systems in realistic environments. Funded by Ministry of Science and Technology (Ref. TIC-93-0518)

Instituto de Física Aplicada. Departamento de Radiación electromagnética. CSIC:

- High frequency methods for software development for radio-communications radiant systems. M. Martínez-Burdalo et al. Funded by Ministry of Science and Technology
- Health Effects of RF-EMFs of industrial and residential utilities: molecular bio-indicators, dosimetry and morphological changes. (I) Methods of numerical prediction for electromagnetic dosimetry in human tissues. M. Martínez-Burdalo et al. Funded by the Autonomic Government of the Madrid Community.
- Dosimetry, validation and physical and biological agents on human exposure to radiofrequency EMF M. Martínez-Burdalo et al. Funded by the Ministry of Science and Technology (Ref. FIT-070000-2002-135)
- Dosimetry, validation and physical and biological agents on human exposure to radiofrequency EMF. M. Martínez-Burdalo et al. Funded by the Ministry of Science and Technology (Ref. FIT-070000-2001-442)
- Non-linear wave interactions and their applications to physics, biology and palaeontology. M. Torres Hernanz et al. Funded by the Ministry of Science and Technology (Ref. BFM2001-0202)
- Development of new EMF models in the time domain for verification of human EMF exposure standards in diverse environments. M. Martínez-Burdalo et al. Funded by the Ministry of Science and Technology (Ref. TIC2000-0698)

Departamento de Física Aplicada III. Facultad de Ciencias Físicas. Universidad Complutense:

- Health Effects of occupational environmental RF Electromagnetic fields. Molecular bio indicators, dosimetry and morphological alterations. Fariñas J. et al. Funded by the Autonomic Government of the Madrid Community.

- Determination of Metallic Ions and Metallothioneins as Bio indicators of Electromagnetic Fields Effects. (Ref. 95/0343). B. Ribas et al. Funded by the Health Research Department (FIS), Ministry of Health.
- Health Effects of Industrial and Domestic Radiofrequency Electromagnetic Fields: molecular bio indicators, dosimetry and morphologic alterations (Ref. 08.8/0002/1997). J. Fariñas-González et al. Funded by the Autonomic Government of the Madrid Community.

Jefatura del Área de Toxicología. Instituto de Salud Carlos III. Madrid:

- Genetic Instability and Genotoxicity in Tissues by the Effect of Electromagnetic Fields. B. Ribas et al. Funded by the Health Research Department (FIS), Ministry of Health.
- Dosimetry, validation and physical and biological agents on human exposure to radiofrequency EMF. B. Ribas et al. Funded by the Ministry of Science and Technology (Ref. FIT-070000-2002-135)
- Dosimetry, validation and physical and biological agents on human exposure to radiofrequency EMF. B. Ribas et al. Funded by the Ministry of Science and Technology (Ref. FIT-070000-2001-442)

Asociación ITACA. Universidad Politécnica de Valencia:

- Application of agronomical, biochemical and microwave technologies for enzymatic regulation of mushrooms. E. de los Reyes et al. Funded by Ministry of Science and Technology (Ref. ALI96-1111-C04-04)
- Microwave Energy as an alternative to the pesticides. E. de los Reyes et al. Funded by Ministry of Science and Technology (Ref. FEDER-CICYT)

Departamento de Ingeniería Electrónica. Universidad Politécnica de Cataluña. EMC Group:

- Measurement of radioelectric emissions and EMC within the Spanish Antarctic Oceanographic Research Vessels 'Hespérides'. Dr. P. Riu et al. Funded by Ministry of Science & Technology. Ref. AE98-0065.
- Development of techniques and instruments for the measurements of indoor near-field values. Application to EMC inside mobile vehicles. Dr. P. Riu et al. Funded by Ministry of Science & Technology. Ref. 2FD97-0226.

14.3.2 National Research Institutions

National research institutions usually merge efforts with its corresponding Ministry, and its additional funding is normally part of one of the projects funded by the Ministry. Other specific projects are listed below:

Research Unit BEMS. Ramón y Cajal Hospital. Madrid:

Biocompatibility in Experimental Models of Exposure to RF Electric Fields Generated by the INDIBA System for Hyperthermy. Funded by the Research Laboratory For Electro medicine INDIBA (1998-2000).

13.3.3 Industry supported research

Information on this item is limited and has been asked to industry and we were awaiting the results on the date of submission of this report.

Research Unit BEMS. Ramón y Cajal Hospital. Madrid:

- Mobile Phone RF exposure effects on the Pineal Gland activity in rats. A.Úbeda et al. Funded by Telefónica Móviles España
- *Microwave Engineering, Radiocommunications & Electromagnetism Research Group. Technical University of Carthagene:*
- Report on human exposure to EMF. D. Sánchez-Hernández et al. Funded by Siemens España S.A
- Development of technologies for new enhanced materials with special properties to electromagnetic waves. D. Sánchez-Hernández et al. Funded by Izar Construcciones Navales S.A.
- Minimisation of SAR for smart UMTS antennas using DASY-4. D. Sánchez-Hernández et al. Funded by Telefónica Móviles España
- Development of new models for the dosimetric evaluation of UMTS systems. D. Sánchez-Hernández et al. Funded by Telefónica Móviles España
- Development of a rigorous measurement procedure for mobile communications base station exposure to EMF evaluation under Royal Decree 1066/2001. D. Sánchez-Hernández et al. Funded by COIT

Instituto de Física Aplicada. Departamento de Radiación electromagnética. CSIC:

- Interaction of EM waves with obstacles and its application to an EM dosimeter in occupational environment. M. Martínez-Burdalo et al. Funded by MAPFRE-CSIC.

Jefatura del Área de Toxicología. Instituto de Salud Carlos III. Madrid:

- Incidence of Tumours, Congenital Malformations and Autoimmune Process in a Population Group Exposed to Low Frequency (50 Hz) Electromagnetic Fields. M. Gavilanes-Vázquez et al. Funded by IBERDROLA (Ref. MCB-11588-95-093)

Departamento de Tecnología Electrónica. Universidad Carlos III de Madrid:

- Evaluation of magnetic fields around base stations. E. Olías et al. Funded by Soluziona
- Evaluation of magnetic fields around base stations. E. Olías et al. Funded by Norcontrol

- Evaluation and control of EMF around base stations. E. Olías et al. Funded by Norcontrol

Asociación ITACA. Universidad Politécnica de Valencia:

- Reduction of radiation from mobile phones to users. Elías de los Reyes et al. Funded by *Ingeniería de Medidas de Antenas y Radiaciones, S. L.:*
- Applications of absorber materials in mobile phones. Elías de los Reyes et al. Funded by *Ingeniería de Medidas de Antenas y Radiaciones, S. L.*
- Development of a rigorous measurement procedure for mobile communications base station exposure to EMF evaluation under Royal Decree 1066/2001. Elías de los Reyes et al. Funded by COIT

14.4 Data and databases

14.4.1 EMF sources and exposure data across full frequency range.

The Ministry of Industry, Tourism and Commerce at http://www.setsi.mcyt.es/movil/top_mov.htm

The Regional Government of Valencia at <http://juno.disemina.gva.es/moviles/index.htm>

14.4.2 Base station technical information, geographic distribution.

The Ministry of Industry, Tourism and Commerce at http://www.setsi.mcyt.es/movil/top_mov.htm

The Regional Government of Valencia at <http://juno.disemina.gva.es/moviles/index.htm>

14.4.3 Exposure monitoring and compliance measurements.

No nation-wide exposure monitoring system is envisaged. Some public activities regarding EMF monitoring are isolated, like the one initiated by the Technical University of Valencia, which provides real-time and over-the-week and month summary results of 15 monitoring stations. See <http://www.smp.upv.es/>

For compliance measurements, the only committee that works on a standard in Spain is AENOR CTN 215. <http://www.aenor.es>

15. SWEDISH Report

Lars Mjönes
Swedish Radiation Protection Authority (SSI), Stockholm

Kjell Hansson Mild
National Institute for Working Life, Umeå

Introduction

On the Government level the Ministry of Environment is responsible for radiation protection issues and the Ministry of Industry, Employment and Communications is responsible for telecommunication issues. The Swedish Radiation Protection Authority, SSI, is the competent authority for radiation protection in Sweden, for ionising as well as non-ionising radiation; however, the Swedish Work Environment Authority handles non-ionising radiation protection in workplaces. The National Board of Health and Welfare, SoS, is the responsible central agency for health according to the Environmental Act including ecologically harmful activities. The National Institute for Working Life is a national centre of knowledge for issues concerning working life and carries out research and development regarding EMF. The National Post and Telecom Agency, PTS, is the responsible authority for electronic and postal communication and the agency that grants licenses for mobile telecommunication operation. The Swedish National Electrical Safety Board is the agency responsible for electrical safety.

15.1 Inventory of national key initiatives on EMF

15.1.1 Authorities (regulatory bodies, Health authorities, Radio & Telecommunications, governmental advisory institutions, etc)

Ministry of Environment (Miljödepartementet)

Address: SE-103 33, Stockholm, Sweden, Tel.: +46 8 405 10 00, Web: www.regeringen.se
e-mail: registrator@environment.ministry.se

Ministry of Industry, Employment and Communications (Näringsdepartementet)

Address: SE-103 33, Stockholm, Sweden, Tel.: +46 8 405 10 00, Web: www.regeringen.se
e-mail: registrator@industry.ministry.se

Swedish Radiation Protection Authority, SSI, (Statens strålskyddsinstut)

SSI is the competent authority for radiation protection in Sweden. SSI's task is to protect humans and the environment from harmful effects of radiation, both ionising and non-ionising. SSI follows the scientific progress concerning electromagnetic fields, EMF and potential health risks. The Government has instructed SSI to put forth special information and supervising efforts in order to increase the general public's knowledge of EMF. This should be done in co-operation with other concerned central authorities.

Address: SE-171 16 Stockholm, Sweden, Tel. +46 8 729 71 00, Web: www.ssi.se, e-mail: ssi@ssi.se

Contact person: Lars Mjönes, e-mail lars.mjones@ssi.se

Swedish Work Environment Authority (Arbetsmiljöverket)

The paramount objective is to reduce the risks of ill-health and accidents in the workplace and to improve the work environment in a holistic perspective, i.e. from the physical, mental, social and organisational viewpoints.

Address: SE-171 84 Solna, Sweden, Tel.: +46 8 730 90 00, Web: www.av.se, e-mail: arbetsmiljoverket@av.se Contact person: Janez Marinko, e-mail janez.marinko@av.se

National Board of Health and Welfare (Socialstyrelsen, SoS)

SoS is responsible for health safeguard in the Environmental Act, including ecologically harmful activities. SoS has also presented general advice concerning how people that claim to be electrically hypersensitive should be treated by the public medical service.

Address: SE-10630 Stockholm, Sweden, Tel.: +46 8 555 530 00, Web: www.sos.se, e-mail: socialstyrelsen@sos.se

Contact person: Bo Pettersson, e-mail bo.pettersson@sos.se

The National Institute for Working Life (Arbetslivsinstitutet)

The National Institute for Working Life is a national centre of knowledge for issues concerning working life. The Institute carries out research and development covering the whole field of working life, on commission from The Ministry of Industry, Employment and Communications.

Address: Arbetslivsinstitutet, SE-113 91 Stockholm, Sweden, Tel.: +46 8 6196700, Web: www.arbetslivsinstitutet.se, e-mail: registrator@arbetslivsinstitutet.se

Contact person: Kjell Hansson Mild, e-mail mild@niwl.se

National Post and Telecom Agency (Post- och telestyrelsen, PTS)

Monitors the electronic communications and post sectors. Electronic communication includes the telecommunications, IT and radio sectors. PTS's vision is that everyone in Sweden should have access to efficient, affordable and secure communications services.

Address: Box 5398, SE-102 49 Stockholm, Sweden, Tel.: +46 8 678 55 00, Web: www.pts.se e-mail: pts@pts.se

Contact person: Magnus Axelsson, e-mail magnus.axelsson@pts.se

Swedish National Electrical Safety Board (Elsäkerhetsverket)

Maintains and develops a high level of electrical safety. The aim is to prevent injury to persons and damage to property being by electricity. They have the task of creating a satisfactory electromagnetic environment in which different pieces of apparatus can operate without disturbing each other.

Address: Box 1371, SE-111 93 Stockholm, Sweden, Tel.: +46 8 508 905 00,

Web: www.Elsakerhetsverket.se, e-mail: elsakerhetsverket@elsakerhetsverket.se

Contact person: Ingvar Enqvist, e-mail ingvar.enqvist@elsakerhetsverket.se

15.1.2 Other organisations

Mobile phone operators:

Telia, S-123 86 Farsta, Sweden, Tel +46 8 713 1000, Web: www.telia.se

Contact person: Lars-Eric Larsson, e-mail lars-eric.larsson@teliasonera.com

Vodafone Sverige AB, S-371 80 Karlskrona, Tel +46 455 331 000, Web: www.vodafone.se e-mail: info@vodafone.se. Contact person: Åke Bergvall, e-mail

Tele2, Box 62, S- 164 94 KISTA, Tel: +46 8 5626 40 00, Web: www.tele2.se

3, Tegeluddsvägen 80, S- 111 83 Stockholm tel: +46 8 50 56 7000, Web: www.tre.se, e-mail: info@tre.se

Others:

MTB, The Swedish Association of Mobile Telecommunications Equipment Manufacturers (Mobiltelebranschen), Box 22 307, S- 104 22 Stockholm, tel +46 8 50893800, Web: www.mtb.se, e-mail: mtb@branschkansliet.se.
Contact person: Mats Holme, e-mail

The Swedish Association for the ElectroSensitive (Elöverkänsligas riksförbund), FEB, Box 6023, S-102 31 Stockholm, tel: +46 8 712 89 48, Web: www.feb.se, e-mail: info@feb.se.

15.1.3 Policies and legislations

Sweden has implemented the ICNIRP guidelines for electromagnetic fields into Swedish legislation since 2002, as “General Advice on the Limitation of Exposure of the General Public to Electromagnetic Fields”, SSI FS 2002:3 (Allmänna råd om begränsning av allmänhetens exponering för elektromagnetiska fält, SSI FS 2002:3). [LINK!](#)

SSI has issued a special regulation for drying with microwaves “The Swedish Radiation Protection Institute’s Regulations on Drying with Microwaves, SSI FS 1995:3. (Föreskrifter om torkning med mikrovågor, SSI FS 1995:3). [LINK!](#)

Since 1996 the responsible authorities has recommended a precautionary approach towards low-frequency EMF. [LINK!](#)

As the competent authority for radiation protection in Sweden, SSI is responsible for the risk assessment for electromagnetic fields. Since 2002 SSI has an international scientific advisory board on EMF, which comprises internationally recognized experts in the field. In December 2003 the advisory board presented its first in a series of annual reports on the state of the art of EMF research. The report also contained the expert group’s assessment of health risks from mobile telephony. The board stated that no breakthrough results had been presented in the past few years (since the British Stewart report) that would change the present risk assessment.

Also in December 2003 a working group engaged by the Swedish Council for Working Life and Social Research presented a report on recent research on electrical hypersensitivity. The working group pointed out that the available epidemiological studies don’t give much information to assess if exposure from mobile phones or base stations could cause different types of symptoms and that the number of experimental provocation studies is small and that only one (the dutch TNO study) has shown any correlation between radio frequency EMF and symptoms experienced by electrically hypersensitive persons.

In February 2004 SSI presented a report to the Government on the need for further information to the public about mobile phones and radiation. The assignment from the Government was

initiated by a question in parliament about the need for warning texts on mobile phones. SSI was instructed to investigate into the need for information texts for mobile phones and other hand-held terminals and if special regulations regarding the use of mobile phones are needed for children. The investigation was conducted together with other central authorities, including the National Board of Health and Welfare and the National Post and Telecom Agency. The main conclusions of the report was that there was no need for warning texts on mobile phones, but that further information about radiation and mobile phones could be useful and that this information should include information about simple ways to reduce the exposure while using a mobile phone, for instance that using a hands free device reduces the exposure to the head significantly. This information should be directed towards adults, young people and children. No special restrictions for children were suggested. SSI made three main proposals to the Government

- SSI will take the initiative to an information package from the authorities on mobile telephones, radiation and health. This package will include information on simple means to reduce the exposure when using mobile phones, this information will be addressed both to adults and children
- SSI will initiate a discussion with the industry how this information best can be distributed to the public and how SAR-values for telephones can be displayed in the shops
- A national research programme on mobile telephony and health should be launched in Sweden

So far the Government has not responded to the proposals from SSI.

SSI has initiated a meeting for the Nordic competent authorities in the EMF field to discuss mobile telephony and health. The meeting was held in Stockholm in March 2004 and the discussions at the meeting showed a high degree of agreement upon risk assessments and risk management between the Nordic authorities. It was also decided that SSI should produce a draft for a common position paper on mobile telephony and health for the Nordic authorities. The position paper will be presented in July or August 2004.

SSI has on a continuous basis participated in a consultation group on electromagnetic fields with representatives from the involved central authorities, among others the Work Environment Authority, the National Board of Housing, Building and Planning, the National Board of Health and Social Welfare, the National Post and Telecom Agency and the Swedish National Electrical Safety Board. The goal of the consultation group is to discuss common issues and to publish common information material on EMF. The authorities in the consultation group issued a common brochure *Radiation in mobile communication systems* in 2002. The brochure describes how the mobile systems work and the gives the authorities' common risk estimation.

In 1999 the Swedish Parliament approved 15 national environmental-quality objectives. The goal is that these objectives should in general be achieved within one generation, i.e. by 2020. Some examples of objectives are *a non-toxic environment, Good-quality groundwater, sustainable forests and a good built environment*. EMF is part of the national environmental-quality objective *a safe radiation environment* for which SSI is the responsible authority. The goal for EMF is: *The health risks with EMF should be continuously evaluated and necessary measures be taken as soon as such risks can be identified.*

The National Board of Health and Welfare has issued advice, primarily aimed at physicians and other medical staff, regarding the treatment of electrically hypersensitive people in the medical service *General advice on the treatment of patients who relate their problems to amalgam or electricity*, SOSFS 1998:3 (M). The Swedish Government has asked the Swedish Research Council to undertake a special investigation about the need for more resource to research on electromagnetic field and health effects. The study should deliver their proposal in November 2004.

15.2 Research activities

The Swedish part of the INTERPHONE study is ongoing. The data collection is completed but the results are not yet published. The research performed by the Salford – Persson group at Lund University on the effects of radio frequency electromagnetic fields on the brain continues. At the Chalmers Institute of Technology in Gothenburg a project has started with the aim to replicate the findings from the Salford – Persson group and in particular to study the unusual dose response relationship reported Salford-Persson group.

At Uppsala University a new project has started “The effects of 900 MHz GSM Wireless communication signals on subjective symptoms, physiological reactions, alertness, performance and sleep; an experimental provocation study”, coordinated by Prof. Bengt Arnetz. In the spring 2004 work by Bo Sernelius at Linköping University aroused a lot of interest in Swedish media. Calculations by Sernelius, who is a theoretical physicist, show a possibility that dispersion forces between for instance blood cells could be strongly enhanced by microwave radiation and that this in theory could lead to thrombosis.

The Hardell - Hansson Mild group at Örebro University is continuing its epidemiological work on mobile phones and brain tumours. Their latest study showed an increased risk for brain tumours and mobile phone use especially for the young age group. The Non-ionizing group at the National Institute from Working Life has recently completed a provocation study on person with subjective symptoms connected to mobile phone use, but no association to the RF exposure and symptoms was found. However, the sensitive persons were more sensitive to stress than the control persons. In a study of RF exposed workers the heart rate variability was studied and some deviations from normal was reported.

In the EU 6th framework coordination action project EMF-NET two Swedish institutions are involved. At the Department of Environmental Medicine, Karolinska Institute, Dr Maria Feychting will be in charge of the work package on epidemiology, and at the National Institute for Working Life Prof Kjell Hansson Mild is in charge of the work package aiming at producing a practical measurement procedure to be used in work places to show compliance with the new EU-directive on occupational exposure to electromagnetic fields.

15.3 Public concern and information activities

General information on EMF can be found at the websites of the authorities and of course also at the websites of the different commercial companies working in the telecommunication field. In Sweden the launching of the third generation mobile telephony system (UMTS) has been very fast. According to their contracts with the Post and Telecom Agency the operators have promised to cover 99.98 percent of the Swedish population by the end of 2003. In spring 2004 about 70 per

cent of the population was covered by the UMTS system. This fast launching has caused considerable concern, and opposition, among certain parts of the general population. The media coverage of the 3G 'situation' is intensive. Activist groups are active in the resistance towards the launching of the new system and sabotage against UMTS masts has occurred.

During the spring 2003 SSI developed a preliminary training program on mobile telephony, radiation and health, primarily aiming at municipal officials and politicians. A pilot training course attended by 15 officials was held in June 2003, and were received positively by the participants. According to the original plan an educational effort, arranged regionally, including all municipalities in Sweden should have been carried out during the autumn. In the beginning of summer, however, SSI was given a government assignment to investigate the need for information texts for mobile telephones and because of lack of human resources the planned set of regional training courses had to be postponed.

In June 2004 the first in a series of six regional one-day training courses, "Mobile telephony and health", was arranged by SSI and the National Board of Health and Welfare, SoS. The remaining five will be held during the autumn of 2004. The National Institute for Working Life has held a series of three local information seminars for politicians and health officials in the county of Västerbotten in northern Sweden. A continuation is planned for other parts of the country for 2005.

The expectations on SSI concerning information, guidance and education concerning non-ionising radiation, especially EMF, are very high. The public, mass media and municipal officials put a large number of questions via telephone, letters and e-mails. Almost 400 written matters and 5 000 telephone calls have been dealt with during the year 2003. In order too be able to handle the situation SSI has for many years had special telephone hours for these kinds of questions. On 20 occasions in 2003 personnel from SSI has taken part in information meetings about the development of the third generation mobile telephony system, arranged by different municipalities all over the country.

During spring 2004 the TCO Development Company has launched their labelling system TCO'01 for mobile phones. One of the criteria for complying with the TCO label is a SAR value below 0.8 W/kg. The mobile phone manufacturers have so far not shown any enthusiasm for the TCO initiative.

16. SWISS Report

Mirjana Moser

Federal Office of Public Health, Radiation Protection Division, Bern

16.1 Inventory of National Key Institutions

a) Authorities

Swiss Agency for Environment, Forests and Landscape (SAEFL). NIR Section

Head of Section: Dr Jürg Baumann (juerg.baumann@buwal.admin.ch)

The Section

- Is responsible for all matters relating to fixed installations that emit non-ionising radiation (NIR), such as mobile telephone base stations, radio transmitters and power transmission, railway power supply or radar equipment, etc.;
- Assesses the effects of NIR on the environment and human health;
- Supports the federal and cantonal authorities enforcement activities and provides appropriate aids to promote efficient and consistent enforcement;
- Is responsible for studying and assessing environmental exposure to NIR;
- Provides scientific and technical foundations for policymakers so as to promote the development of protection against NIR.

www.umwelt-schweiz.ch/buwal/eng/fachgebiete/fg_nis/index.html

Swiss Federal Office of Public Health (SFOPH). Section Physics and Biology

Head of Section: Dr Mirjana Moser (mirjana.moser@bag.admin.ch)

The section operates a competence and information centre that deals with questions concerning the impact of NIR on human health. The responsibilities of this centre are as follows

:

- Information and advice
Regular information of the public and interested parties concerning health-related aspects of NIR and recommendation of appropriate protection measures;
- Research
Participation at research projects investigating the effects of NIR on Health;
- Risk management;
Evaluation of possible health risks associated with NIR and initiation of appropriate measures
- Networking
Collaboration with its partners in Switzerland and abroad;

www.bag.admin.ch/strahlen/nonionisant/d/

(Only texts with an international scope have been included in the English version. To access the entire offer you must choose [German](#) (d) or [French](#) (f)).

Federal Office of Communication (OFCOM)

OFCOM handles questions related to telecommunication and broadcasting (radio and television).

In this sphere, OFCOM fulfils all sovereign and regulatory tasks.

www.bakom.ch/en/index.html

Swiss National Accident Insurance Fund (SNAIF)

As the most important carrier of obligatory accident insurance, SNAIF insures over 1,8 million employees in 109,207 companies against occupational and non-occupational accidents as well as against work-related illnesses. SNAIF services include prevention, insurance and rehabilitation.

<http://www.suva.ch/en/home.htm>

b) Industry

- ***Swisscom*** (telecommunication operator)
www.swisscom-mobile.ch
- ***Orange*** (telecommunication operator)
www.orange.ch
- ***Sunrise*** (telecommunication operator)
www.sunrise.ch
- ***EOS Holding*** (Transport Business Unit)
Manages its high and very high voltage transmission grid in western Switzerland, as well as energy exchanges in its regulation area. <http://eng.eosholding.ch/home/transport.htm>

c) NGO's

- ***Ärztinnen und Ärzte für Umwelt***
<http://www.aefu.ch/> (in German only)
- ***Schweizerische Energiestiftung***
<http://www.energiestiftung.ch/> (in German only)

16.2 Inventory of National Legislation, Regulation and Initiatives

Ordinance relating to Protection from Non-ionising Radiation (ONIR)

This ordinance, in force since 1999, is intended to protect the general public from harmful or undesirable non-ionising radiation. It regulates the control of emissions of electrical and magnetic fields with frequencies from 0 Hz to 300 GHz, which are generated during the course of operating stationary installations like, base station antennas or power lines. It doesn't regulate exposures like the ones from apparatus or occupational exposure. The precautionary principle has been applied for "sensitive areas" by fixing up precautionary limits for individual installations. These measures limiting emissions shall be deemed "technically and operationally feasible".

Report: "Health Protection in the Field of Non-ionising Radiation"

At the moment, an interdepartmental work group, led by the SFOPH, is extensively reviewing the situation in Switzerland regarding health protection in the field of non- ionising radiation. In a report, addressed primarily to the members of the parliament, the present situation in the fields of legislation, prevention, precaution, information and research will be laid down, the need for action recognized and some ideas for solutions presented. The end of 2004 should finish the report.

Report "Precautionary Principle in Switzerland and Internationally"

The report has been worked out by an interdepartmental group with the aim to provide a catalogue of criteria for the implementation of the PP based on prevailing law, to enable the Federal Administration to communicate the various interpretations of PP in an informed manner and to provide a guideline for Swiss delegations when conducting negotiations on international agreements.

The English version of the report can be found at:

<http://www.bag.admin.ch/themen/weitere/vorsorge/e/index.htm>

Initiative "Telecommunication Health and Environment" of the three Swiss Operators Orange, Sunrise und Swisscom

The three Swiss telecommunication operators lanced a program that contains three modules:

- Research Foundation Mobile Communication (see at "Research support")
- "Forum Mobilfunk" (see Communication)
- Ombudsman service that arbitrates and answers questions on the legal situation regarding antennas for mobile communication; their placement and possible health impacts
Web page (in German and French): www.omk.ch/ombudsstelle.html

16.3 Risk Communication Strategies and Channels

There is no national strategy on communication in the field of EMF in Switzerland. In the above-mentioned report, some basic approach regarding basic principles and stakeholder's involvement will be outdrawn.

ENVIROCOM Forum: Electrosmog: a new risk? What steps should be taken?

Europe-ENVIROCOM has organised its 4th Forum on communication in environmental issues on Friday, February 1st, 2002 in Neuchâtel (Switzerland). The theme was the electrosmog. This top-level forum was particularly intended for specialists in this field. It has been followed by an evening public discussion, filmed for the TV.

The factual results of this day are summed up in three documents: [A brief Synopsis](#), [the Neuchâtel Theses](#) and [some of the main points](#).

www.envirocom.org/forum02/gb/index.html

Forum Mobilfunk

It is an information channel of the Swiss telecommunication operators.

The relevant web page (in German and French): www.forummobil.ch/

Dialogue on sustainable Mobile Communication

Since summer 2003, the Swiss foundation "Risiko-Dialog" leads a scientifically accompanied project concerning the dialogue on sustainable mobile communication. It is aimed at improving the communication between the groups involved in the mobile communication debate.

16.4 Summary Overview of Research Support to EMF&Health. Main Areas and Topics

Proposal for a National Research Program

A proposal for a national research program has been submitted by the SAEFL. It was evaluated by the Swiss Federal Office for Education and Science and the Swiss National Science Foundation and got a good note, but the final decision was postponed till the end of the year. If accepted, the program will be fully sponsored by the government and run for approximately 3-5 years with approximate funding of 5-7 Mio. CHF.

Swiss Research Foundation on Mobile Communication

In fall 2002, the existing Research Cooperation "Sustainable Mobile Communication" was enlarged and transformed into the Swiss Research Foundation on Mobile Communication. The founding institutions and creditors of the Foundation are the Swiss operators [Orange](#), [Sunrise](#) und [Swisscom](#) as well as the [ETH Zurich](#).

The Research Foundation is wholly independent of the creditors in terms of its subject matter. It is lead by a board of renowned personalities of the scientific community (4 members) and representatives from Federal Offices, NGO's and industry (3 members). The scientific committee of the Research Foundation takes scientific project evaluation and decisions concerning support. The money for research comes from a fund. The annual research budget amounts to 550,000 CHF. In addition to the research fund, the administration, direction, and services of the Research Foundation are subsidised with 250'000 CHF per year.

Thematically, the projects may concern one or more of the following research areas (the list should not be considered as final): health, environment, landscape and aesthetic criteria, society and technology.

More about the Research Foundation and the supported projects at:

<http://www.ifh.ee.ethz.ch/Microwave/reco/index-e.html>

Research Programs by the Federal Offices

Limited research projects have being conducted by the above-mentioned Federal Offices. Corresponding information can be found at the web pages of the Offices.

Specially to be mentioned is *a replication and an extension of the TNO study* that will be carried out by the University of Zurich (Dr. Achermann), with the participation of other Swiss institutions, coordinated by the Swiss Research Foundation and financed by Swiss Federal Offices, mobile phone operators and also by some Dutch Authorities. The study should start in August 2004 and be finished within a year.

17. The NETHERLANDS Report

G. Delfini

Lodewijk van Aernsbergen, Min. VROM

E. van Rongen

Health Council of the Netherlands

17.1 Inventory of national key actors and initiatives on EMF & Health

17.1.1 Relevant actors, roles and responsibilities. Institutions and organizations at governmental, industry and NGO levels

17.1.1.1 Authorities (Regulatory bodies, Health authorities, etc) and governmental advisory institutions.

Ministry of Housing, Spatial Planning and the Environment (*Ministerie van Volkshuisvesting, Ruimtelijke Ordening and Milieubeheer* - <http://www.vrom.nl/international/>) is responsible for:

- environmental protection policy and regulations
- building permits policy and regulations
- planning of (large) infrastructures.

Ministry of Economic Affairs (*Ministerie van Economische Zaken* - <http://www.ez.nl/content.jsp?objectid=22106>) is responsible for:

- industrial activities policy and regulations in particular development of telecommunication facilities and power supply.

Ministry of Social Affairs and Employment (*Ministerie van Sociale Zaken en Werkgelegenheid* - <http://www.employment.gov.nl/>) is responsible for:

- protection of workers.

Ministry of Health, Welfare and Sport (*Ministerie van Volksgezondheid, Welzijn en Sport* - <http://www.minvws.nl/en/>) is responsible for:

- health policy and regulations.

Municipalities are responsible for the local building en infrastructural policies. In particular:

- building permits
- environmental permits.

Provincial government bodies are responsible for the regional planning and are involved in the decisions around the trajectory of power supplies (planning, EIA, permits, etc.) and large radio installations.

Netherlands Radiocommunications Agency (*Agentschap Telecom*; part of the Ministry of Economic Affairs - <http://www.agentschap-telecom.nl/>) is the government agency responsible for frequency planning and management in the Netherlands. In particular:

- frequency planning
- permits for frequency use
- enforcement of frequency use.

Office of Energy Regulation (*Dienst uitvoering en toezicht energie Dte*; part of the Ministry of Economic Affairs - <http://www.dte.nl/engels/home/index.asp>) is responsible for implementing the Electricity Act, as well as supervising compliance with this Act. In particular:

- permits for the supply of electricity to costumers
- determination of the tariff structures and conditions for the transmission of electricity.

Health Council of the Netherlands (*Gezondheidsraad* - <http://www.gr.nl/index.php?phpLang=en>). An independent scientific advisory body whose task is to advise Ministers and Parliament in the field of public health. Ministers ask the Health Council for advice on which to base policy decisions. In addition, the Health Council has an "alerting" function, which also allows it to give unsolicited advice. The underlying purpose in both cases is the improvement of public health.

National Antenna Bureau (*Nationaal Antenna Bureau*; NaBu - <http://www.antennebureau.nl/start.htm>). This is a central 'counter' for all questions about antennas and others matters concerning telecommunications. The NaBu answers questions by general public, operators and local authorities (such as local councils and provincial government bodies).

17.1.1.2 Industry (Telecommunications, Mobile telephony, Power Grid operators, etc)

MoNet. The organization of Mobile operators in the Netherlands (<http://www.monet-info.nl>) is an umbrella organization of the 5 mobile phone operators **Vodafone, Orange, T-Mobile, Telfort, KPN**. The operators work together within MoNet on subjects such as information to the public and negotiations with the authorities.

Federation of Energy Companies in the Netherlands (*EnergieNed*; an umbrella organization of power grid operators - <http://www.energiened.nl/>). This is the representative body for all companies in the Netherlands playing an active role in the production, transport, trade or supply of gas, electricity and/or heat. The Federation represents the interests of its member companies. It is the point of contact for government bodies, political parties and pressure groups representing business, consumers and environmentalists. On behalf of its members, EnergieNed maintains a dialogue at national and international levels with these stakeholders.

NOZEMA. The *Netherlands Broadcasting Transmission Company* (Nozema Services - <http://www.nozema.nl/aboutnozema/AboutNozemaIndex2.html>), is one of the organisations that transmits radio and TV signals in the Netherlands.

Broadcast Partners. An organization that transmits radio signals in the Netherlands (<http://www.broadcastpartners.nl/>).

17.1.1.3 NGOs (Consumer associations, citizen advisory and special interest groups, etc).

Monitoring Network Health and Environment (*Meldpuntennetwerk Gezondheid en milieu* (MNGM) - www.mngm.nl). An independent foundation that collects and records cases of environment-related health problems. The registration system is a concise questionnaire, providing information on both symptoms and environmental factors. Diseases are coded according to the International Classification of Primary Care system, and for environmental factors it has developed a dedicated classification system. This classification system has recently been adopted by the National Research Institute for Public Health and the Environment (RIVM). RIVM currently investigates the merits of the MNGM database and the feasibility to have public health authorities in the Netherlands implement similar registration of environment related health problems.

Netherlands Society for Nature and Environment (*Stichting Natuur en Milieu* (SNM) - <http://www.snm.nl/org/english.php>). This is an independent organization committed to building a sustainable society in which nature, the environment and the landscape are treated with care and respect. SNM tries to influence the policy-making process by conducting research, publicity campaigns and by stimulating discussion and debate. SNM mobilizes public opinion and puts pressure on key policymakers in the field of nature and environment to make sustainability a cornerstone of policy and legislation. SNM is active at the European, national and local levels, is part of a close network with other national environmental organisations and coordinates the “strategic council” of close to 30 national organizations.

Joint Health Services (*GGD* (Gemeenschappelijke Gezondheidsdienst) - <http://www.ggd.nl>). The aim of the GGDs is to realise a good health care system that is accessible to all. In addition, they focus on prevention, on stopping diseases and other problems from occurring. Through their specialists in Environmental Medicine (<http://web.inter.nl.net/users/nvmm/>) they offer advice concerning health effects of EMF exposure.

17.1.1.4 Academia, research institutions, and professional associations

National Institute for Public Health and the Environment (*Rijksinstituut voor Volksgezondheid en Milieuhygiëne* (RIVM) - <http://www.rivm.nl/en/>). The RIVM is a centre of expertise in the fields of health, nutrition and environmental protection. RIVM works mainly for the Dutch government. The results of RIVM research, monitoring, modelling and risk assessment are used to underpin policy on public health, food, safety and the environment.

TNO (at <http://www2.tno.nl/tno/index.xml>) is a research organisation that makes scientific knowledge applicable in order to strengthen the innovative capacity of business and government.

Netherlands Radiological Protection Society (*Nederlandse Vereniging voor Stralingshygiëne* (NVS) - <http://www.nvs-straling.nl>). A professional society dedicated to the protection of humans, animals, plants and goods against harmful effects of radiation. Its Non-ionizing Radiation (NIS) section deals specifically with effects of non-ionizing radiation.

Dutch Association of Environmental Medicine (*Nederlandse Vereniging voor Medische Milieukunde* (NVMM) - <http://web.inter.nl.net/users/nvmm/>). A professional society of specialists in environmental health physicians. They also deal with health effects of EMF exposure.

17.1.2 Information sources. Relevant publications and documents & contact points

Key dissemination documents and scientific evidence reports & interpretation, etc

National Antenna Bureau:

- 1) Leaflet: GSM-UMTS antennas and your health (annex 1)
- 2) Leaflet: “Playrules” voor siting of base stations (annex 2)
- 3) Leaflet: FAQ about siting of base stations (annex 3)
- 4) Website (see above).

Health Council of the Netherlands reports

- 1) Exposure to electromagnetic fields (0 Hz – 10 MHz) (annex 4)
- 2) GSM base stations (annex 5)
- 3) Electromagnetic fields: Annual update 2001 (annex 6)
- 4) Mobile telephones: an evaluation of health effects (annex 7)
- 5) Electromagnetic fields: Annual update 2003 (annex 8)
- 6) Health effects of exposure to radiofrequency electromagnetic fields: Recommendations for research (executive summary, annex 9)
- 7) TNO study on the effects of GSM and UMTS signals on well-being and cognition (annex 10).

RIVM reports

- 1) Planning new dwellings near overhead power lines (annex 11)
- 2) Magnetic fields due to overhead power lines and leukaemia in children (annex 12)
- 3) Dwellings near overhead power lines in the Netherlands (annex 13)
- 4) Overview of international policies on electromagnetic fields.

17.1.3 Legislation & Regulations. Existing as well as planned initiatives.

Network planning, base station siting, exposure compliance, etc

National Antenna Policy (*Nationaal Antennebeleid*; NAB) (annex 14). The four ministries mentioned above have been involved in the development of the NAB and are at the moment responsible for it. The NAB was finalized in December 2000 and accepted by the Parliament in May 2001. The aim of the NAB is to encourage and facilitate the provision of sufficient antenna sites within a clear framework relating to public health and the environment.

Covenant (annex 15, unofficial translation). As consequence of the NAB a covenant has been signed by the mobile phone operators, the national authorities and the organization of Dutch municipalities (VNG). In the covenant agreements are made about the discussion of a plan for placement of antennas with the local authorities, visual harmony, residents’ approval, and exposure limits. According to the NAB, the signing of the covenant made it possible to include antennas not higher than 5 meters (and under certain conditions) within the list of constructions that do not require a building permit.

Precautionary principle for power lines. Following the policy stated in the policy paper “*Dealing with risk; decide with feeling for uncertainties*” in October 2004 the dutch State Secretary for the environment and the Parliament agreed to introduce in The Netherlands a precautionary approach in the policy for power lines. According to this policy, it should be avoided to create “new” situations of prolonged exposure of children to magnetic fields from power lines in excess of 0,4 microtesla. No precautionary measure will be taken in “existing” situations. Under “new situations” is meant both the planning of new houses in the vicinity of existing power lines, and the planning of new (trajectories for) power lines in the vicinity of

existing houses. This policy has been based upon discussions with representatives of the local municipalities and regional authorities, the electricity industry and environmental organisations.

17.2 Risk communication strategies, channels and risk management initiatives

17.2.1 Risk communication tools and initiatives: information campaigns, workshops, surveys, leaflets, newsletters, etc

Governmental Institutions

National Antenna Bureau: various leaflets (see 1.2.1)

National Antenna Bureau: Toolkit National Antenna Policy for local authorities

Information is available also from the sites of the above-mentioned governmental institutions

Industry

MoNet: various leaflets EMF and health

EnergieNed: leaflet FAQ Electric and magnetic fields

NOZEMA: leaflet on RTV towers and health

NGOs

MNGM: regular Newsletter; brochures on mobile telephones en National Antenna Policy

Academia (None)

17.2.2 Public perception of EMF risk, surveys, publications, and monitoring activities

Governmental Institutions

Special effort is at the moment put in finding out what would be the most effective communication strategy for the precautionary policy for power lines. A pilot study “Citizens on power lines” indicated that a lot of people were worried. Recently a large survey of the opinions of citizens about power lines policy has been carried out (both by filling up a form and by discussions in small groups). The (preliminary) results indicate that on a general basis (answering the survey) this precautionary policy is accepted and found reasonable by the vast majority of the interviewed (90%). During the small meetings however, it appeared clear that several items needed to be addressed to in the communication (the distinction between “new” and “existing” situations e.g.)

Industry

NGOs

A MNGM: database of people with complaints attributed to EMF sources

Academia

17.3 Summary overview of research support to EMF & Health. Main research topics

Government supported research. Financial support to Swiss replication of TNO study.

Industry supported research (to be completed)

17.4 Data and databases on EMF sources and exposure

17.4.1 EMF sources and exposure data across full frequency range

A TNO report (in dutch) contains a list of most sources of RF EMF.

17.4.2 Exposure monitoring and compliance measurements

Data are available via the NaBu and will soon be published

18. UK Report

G. Worsley
Dept. of Trade and Industry, London

A. McKinlay
National Radiation Protection Board, Didcot

18.1 Relevant regulatory bodies: specific responsibilities and functions, regulatory tools and initiatives, key documents and publications

The UK has adopted the EMF exposure guidelines of the International Commission on Non-Ionising Radiation Protection (ICNIRP) exposure as described in the EU recommendation on public exposure, and other measures as described below.

The main Governmental and regulatory actors are brought together in the UK in the Interdepartmental Liaison Group in Non-Ionising Radiation (ILGNIR). This group meets every 6 months, and provides a forum for exchange of views and to provide an update on all activity e.g. in regulation, research, and public consultation. The Department of Health and the Health and Safety Executive chair it on a rotating basis. The Participants include:

The Department of Health (DoH). Responsible for public health and public health advice. Leads on implementation of the EU Recommendation on Exposure to EMF's, and liaison with WHO EMF project. Joint secretariat of Mobile Telecommunications and Health Research (MTHR) Programme (with DTI), see www.mthr.org.uk. Publications are available at www.doh.gov.uk. E.g. put "mobile phones and health" into "search" to see documents.

The Health and Safety Executive (HSE). (<http://www.hse.gov.uk/org>). Responsible for occupational exposure and for such occupational emissions as may also affect the general public. Leads on Directive 2004/40/EC on the exposure of workers to EMF.

The Department of Trade and Industry (DTI). (<http://www.dti.gov.uk/>). Responsible for liaison with industry particularly in respect of power lines and mobile telecommunications. Leads on R&TTE Directive, Low Voltage Directive, ELF regulation, liaison with EMF Net, COST 281. Joint secretariat of MTHR programme.

The Home Office. (<http://www.homeoffice.gov.uk/>) Responsible for rollout of TETRA service for Police. Online document at:

http://www.homeoffice.gov.uk/docs/dstl_tetra_8thquarter.pdf

Ministry of Defence. (<http://www.mod.uk/>). Responsible for exposure from military equipment. Online documents on exposure to EMF at:

<http://www.search.mod.uk/mod/simpleSearch?search=Exposure+to+Electromagnetic+fields&submit=Search&d=15&d=22&d=51>

Office of the Deputy Prime Minister (ODPM). Responsible for planning, particularly in respect of mobile phone base stations. Key publications: Planning Policy Guidance Note 8 on Telecommunications (PPG8), and the Code of Best Practise on Mobile Phone Network Development. See www.odpm.gov.uk and “planning” and/or search for “PPG8”.

OFCOM. Responsible for regulation of communications industries. Provides Base Station Audit programme and Sitefinder database:

http://www.ofcom.org.uk/consumer_guides/mob_phone_base_stat/?a=87101

OFGEN. Responsible for regulation of the power supply industry.

National Radiological Protection Board. This body has statutory responsibility for the provision of advice on exposure to electromagnetic fields, and on exposure guidelines. It provides the secretariat for the independent Advisory Group on Non -Ionising Radiation (AGNIR), and the technical co-ordination of the MTHR programme. It also provided the secretariat for the Independent Expert Group on Mobile Phones (IGEMP – the “Stewart Committee”).

It carries out scientific investigations covering the fields of medicine, epidemiology, biology and physics and engineering. It also carries out scientific reviews of published studies covering all of above disciplines and publishes reports and statements. NRPB is a national collaborative institute of the World Health Organization and co-operates closely with the International Commission on Non-Ionising Radiation Protection (ICNIRP). Its many publications are available, including scientific reviews and a recent review of EMF exposure guidelines at www.nrpb.org. The IEGMP (Stewart) report is available at www.iegmp.org.uk

**ANNEX 3. EU Database on EMF Measurements &
Assessments: Status Report on National Sources of RF
Exposure of the General Population**

European Information System on Electromagnetic Fields Exposure and Health Impacts

On behalf of DG SANCO

Status Report on National Sources of RF Exposure of the General Population

Feasibility Study
EU Database on RF EMF Exposure
Measurements and Assessments

Source Document

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*Seibersdorf Research
Austrian Research Centers*

C. del Pozo and D. Papameletiou

*Institute of Health and Consumer Protection
European Commission, Joint Research Centre*

December 2004

Foreword

A feasibility study on a “EU database on RF EMF exposure measurements and assessments” was carried out by Seibersdorf Research of the Austrian Research Centres, under the request and with the participation of the Joint Research Centre of the European Commission. It consists of two parts, the first and the largest part is presented here. This is a source document giving a thorough and concise review of the available information on exposure data of the general population with respect to fixed installations of mobile communication networks within EU countries (23 member states), Switzerland and Liechtenstein. The document also summarizes for each country, the legal requirements as well as the initiatives and projects in this area.

The information was obtained by Internet searches as well as by questionnaires sent to specialists in target countries. Key aspects of this review are: (a) The identification of sources of information, and purpose and availability of RF-EMF data at the national levels, (b) the analysis and comparison of the various measurement and assessment protocols, and (c) the evaluation of the potential use of the data for risk assessment and risk communication purposes. The basic topics addressed in this status report are:

1. Institutions that provide information on exposure of the general public due to mobile phone base stations (although other transmitters are also included).
2. Purposes of the information (risk assessment or communication...) and benefits envisaged.
3. How the data are presented: i.e. if the access is restricted regarding information only for specialists or also for everyone or the format it is shown to the public (internet, html, pdf files...).
4. Which methodology was used in case of performance of exposure assessment and which national or international recommendations were followed, if any?
5. An overview of the legally requirements on the provision of information on exposure or technical data on fixed radio transmitters to be fulfilled by installers. In the status report this information was increased with requirements or guidelines about protection of the public from EMF exposure.

The second part of the feasibility study is in phase of completion and constitutes a follow up document discussing in more detail the results and conclusions from this report, and giving recommendations for further developments.

Summary

The range of EMF exposure measurement and assessment methods, as well as information tools on exposure from mobile communication base stations, currently implemented within the European Union, Switzerland and Liechtenstein is quite broad, and they are most of the time very difficult to compare. Apart from the multiplicity of tools in use, it is also important to state that almost all countries in the EU develop, or have developed, projects regarding this topic. Even some smaller countries, like Malta or Liechtenstein, have ongoing projects; and among most new member States in the European Union, the situation is similar; countries like Hungary, Slovenia or the Czech Republic for instance, are implementing similar projects as well.

The purpose of these projects is in the majority of cases, to answer to public information needs. They are carried-out by national institutions with the responsibility of assessing compliance to the guidelines or recommended limits of exposure of non ionising radiation for legal (audits) or safety reasons, and generally they create specialised websites to show the results. Measurements are the most common tools used to assess the exposure of the population or to establish the compliance of a base station installation with legal requirements. Some institutions perform calculations or estimations of the EM fields as well, to provide some comparison with later measurements. Measurements are usually spot measurements, performed in a broadband or frequency selective (which is a more informative and accurate approach to assess the signals present in the environment) according to an international agreed method (the Revised ECC Recommendation (02)/04), which may be sometimes modified or adapted by the national authorities. Measurements are mostly done in the frame of campaigns (“Messreihe”, “Campagne de Mesures” or “NRPB Radio Survey”), on demand (the BIPT or the SseP in Belgium, the MIHEW in Poland or the ITK in Slovenia), preferably in sensitive places (schools, hospitals, high populated areas) but also in areas where the concerns of the population are higher (as performed by the NRPB in the United Kingdom or the MICT in Spain). The levels of radiation measured are then compared to the national or international limits of RF exposure (often the EU and ICNIRP recommendations).

Some national initiatives and projects are also dedicated to give information about new developments in communication systems and wireless technologies in answer to public concerns and questions, and focussed particularly on the levels of exposure to electromagnetic fields, health effects, and safety. Most countries, for instance, pay great attention to the concerns of people living in the vicinity of RF installations. Apart from measurements in ‘so-called’ sensitive places and in private homes or offices (like those done by the OFCOM in the United Kingdom), some institutions like the MICT in Spain for instance try to answer to individual questions from the public.

Some projects are more scientifically oriented, although the final purpose is often also the assessment of risks. Some institutions, usually public advisory agencies investigating radiation (the STUK in Finland, or the BUWAL in Switzerland) encourage studies covering a wide range of investigations (epidemiological studies, laboratory experiments...).

Often the information has more specific commercial purposes, and to show compliance to “put into service” regulations: like antenna registries displaying, with various degrees of approximation, the location of the radio frequency transmitters in an area, along with an estimation of the transmitted power. When made available by the telecommunication providers, the power is given as a value like in the case of the BAKOM in Switzerland, or as a level (high, medium, low) like in the case of the Senderkataster in Austria or the MCA in Malta, or with the results of measurements performed in the surroundings of the base station, like in the case of ANFR in France or the MICT in Spain.

Some of these systems inform about the areas of coverage and are usually enforced by telecommunication providers. A quite sophisticated example of this is the O2 geographical information system (GIS), which provides information not only on actual coverage but also on future planned extensions of the British mobile networks. In GIS systems a map is displayed and a search engine allows the user to choose the area of his interest via postcode and street name. Mixed modes are also possible, like in the website of the RegTP in Germany or the ANFR (National Agency of Frequencies) in France, in which the GIS includes both the location of the

transmitters and the results of a measurement campaign (“Messreihen” and “Campagne de Mesures”, respectively) performed to assess levels of exposure in the surroundings of the masts.

Almost all the websites include more than just the geographical information and the results of measurements. Along with technical documents, the websites usually provide tutorials on the possible risks of non-ionising radiation, the operation of the mobile communication technologies, and a section with frequently asked questions (FAQ’s) or informative brochures. Regarding technical information, the institutions provide both technical descriptions of the measurements of compliance with guidelines performed and technical papers about the new technologies. However, the measurement results that are the most common information given are not always presented in a way easy to understand for the general public.

One of the most advanced and complete approaches to assess RF exposure are the monitoring systems. A monitoring system is used to assess the field levels in certain specific locations (sensitive places close to antenna facilities) for an extended period of time. In some sites the monitoring is permanent while in others the locations are changed in a regular basis. The results of these monitoring campaigns are sent to a control station where they are processed and displayed in comparison to the limit levels. Examples of monitoring systems are the MonIT in Portugal (which includes both monitoring and spot measurements), the Hermes Project in Greece, or the SMP in Spain, where the locations of measurement are changed every two weeks.

In Table 1, below, a summary of the type of available information is shown. The table displays the number of information-providing institutions according to some pre-defined characteristics: purpose, type of data, type of system, type RF station measured, accessibility, type of measurement, location of the measurement and recommendation used.

Looking at the table we may see that the institutions responsible for the RF information projects are basically governmental or public supported: ministries, agencies that investigate electromagnetic fields or environmental and health institutes. Specialised institutions (ARCS and OFCOM, or TÜV and RegTP, etc) or Universities (Gardjola in Malta, SMP in Spain, etc) generally carry out the EMF exposure assessment, although Universities are not generally much involved in these projects. Telecommunication providers support also some projects (Gardjola Progett in Malta, or Sendekataster in Austria).

Regarding availability of the information, the results are quite clear. Many institutions provide without restriction the results of the measurements to the general public on the Internet. On the other hand, institutions that only provide partial access to the information are driven by privacy reasons: because of measurements made on demand for private institutions, or data only available for scientific purposes (accessible “only for users”) are the most common reasons.

We have to recognise, however, that the information displayed in the Internet is considerable and the approaches are well developed. As mentioned before, results of the measurements are often displayed in geographical measurement systems (GIS), with graphical interfaces, FAQ’s and fact sheets with good descriptions of the methods of measurements. Further information on RF sources, mobile communications technologies and potential health risks are also available in pdf or in html format. On some websites, research investigations about exposure to radiation from base stations are also fully accessible (ISSEP in Belgium or RegTP in Germany).

We have to point out, nevertheless, that the available information on EMF exposure provided by the various institutions in different countries is generally very difficult to compare. This is

mostly due to the lack of a common assessment protocol, and to the multiplicity of assessment and information projects and purposes. The information available is restricted to certain locations and not suitable for the assessment of personal exposure needed for epidemiological studies on possible health effects of specific RF transmitters, e.g. base stations. The legal situation is also heterogeneous: several countries have implemented the limits recommended by the EU, some have decided to implement somewhat stricter exposure limits.

Purpose of the Information
Public Information
Scientific information
Support Government
Compliance assessment
Support network providers
Type of data
pdf
gis/html
html
xls/doc
Type of system
GIS
Registry
Measurements Campaign
Audit
Monitoring
Calculation
Research reports
Measurements on demand
Other (FAQs, brochures...)
RF stations
Base Stations
TV/Radio
DECT
TETRA
Radar, μ wave, other.
Accessibility
Restricted
Public
Type of measurement
Broadband
Narrowband
Location of measurement
Sensitive places
Private homes or offices

Table 1. Number of organizations (both governmental or non-governmental) across Europe, providing various information according to: purpose, type of data, type of system, type RF station measured, accessibility, type of measurement and its location.

1. Austria

1.1 Introduction

In Austria a geographical information system was initiated by the Forum Mobilkommunikation and developed by the Federal Ministry of Traffic, Innovation and Technology. The Telecommunication law provides a legal framework for the construction and operation of telecommunication and radio systems. Exposure limits for low- and high frequency electromagnetic fields are established in the ÖNORM S1119 and the ÖNORM S1120 issued by the Austrian Standards Institute.

1.2 FMK

In Austria the Forum Mobilkommunikation (FMK, <http://www.fmk.at/>), a consortium of all the Austrian Communication companies, network providers and industries from the Association of Electric and Electronic Industry (FEEI), is the organization that deals intensively with concerns about environmental risks in communication networks.

1.2.1 Purpose of the information

The *Senderkataster* is a geographical information system developed by the Federal Ministry of Traffic, Innovation and Technology (Bundesministerium für Verkehr, Innovation und Technologie) in association with telecommunication providers (Mobilkom Austria, Teling, One, T-Mobile, 3, ORF), and other companies and research centers of information technologies (FMK, Nokia, Siemens, Alcatel, Motorola, Kapsch, Ericsson, FEEI) to provide information about the locations of fixed installed RF transmitters.

1.2.2 Availability of data

The data of the project is available in the website of the so-called SenderKataster (<http://www.senderkataster.at/>) for all the public. The browsing of the information is easy and a short explanation of the methods used is available online as well.

2.2.3 Description of Methodology

The installations included in the database are broadcast analogue transmitters (FM-Radio, Short-Wave transmitters, Medium-wave, and TV repeaters, as well as digital transmitters like Digital-Radio and TV), and cellular phone base stations (GSM and UMTS). The database presents the output power of the broadcast transmitters calculated as a sum of the output power of every antenna in the station without considering the directivity of the transmitters. In the case of the base stations, the power indicated is the input power of each antenna, supplied by the station to each sector. A total power over 100 W was never reached for any UMTS or GSM base station.

1.2.4 Status of the project

The project is still ongoing. New stations are added and data are updated every end of the quarter.

1.2.5 Display of the information

The search engine shows a map of Austria and a formulary where the location of a determined place can be sought.

The Figure AU-1 shows the display of the information in the city of Linz. Blue dots represent base stations and purple dots broadcast stations. On the left side of the screen the characteristics of every station (type and transmitting power) are displayed.

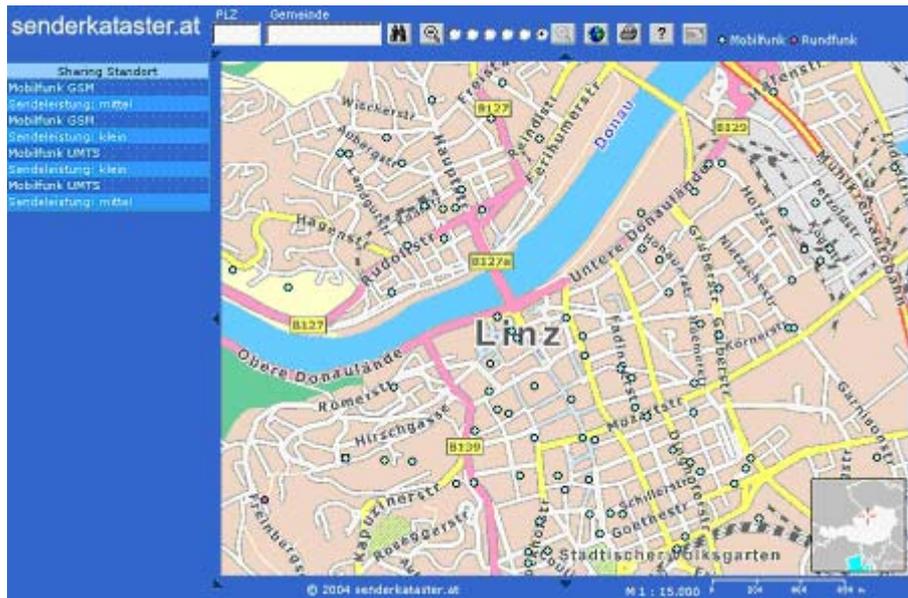


Figure AU-1. GIS search engine in the Senderkataster website.

As can be seen in the figure, the system displays the location of the stations and the transmitting power. This power is classified into three categories:

- a) 1. “klein” (little): less than 15 W.
- b) 2. “mittel” (medium): between 15 W and 50 W.
- c) 3. “groß” (big): more than 50 W transmitted power.

1.3 Umwelt Steiermark

The LUIS (Landes Umwelt Informations System, <http://www.umwelt.steiermark.at/>) of Styria performed between November 2000 and December 2003 a series of frequency selective and broadband measurements to assess the exposure of the population due to RF electromagnetic fields. The information about the project is available at the Internet where a document explains the procedures used and the results obtained.

Selective measurements

The frequency selective measurements were done in the GSM and UMTS bands, although TV and radio emissions are also considered. The procedure of measurement was based on a worst-case assessment around the spot of the measurement. Locations preferred were sensitive places, such as schools, kindergartens, hospitals or nursing homes. It was, however, also measured in places of special interest to obtain an overview of the total immissions.

The antennas used were bi-conical precision antennas types PBA 10200 and PCD 8250 from ARCS, with a frequency range 80 MHz – 2500 MHz, and ANRITSU spectrum analysers. Antennas were placed at a height 1.5 m over ground level, and measurements in three directions were made. The figure AU-2 shows the results of a set of measurements and the table AU-1 shows the detailed values of spectral power density for every frequency of interest.

The maximal value obtained in the GSM 900 MHz band (obtained in the frequency 947.8 MHz) was 1.25 mW/m² with a mean for all the values of 0.079 ± 0.203 mW/m², and in the band DCS

1800 MHz (obtained in 1847.7 MHz) was 3.52 mW/m^2 with mean $0.117 \pm 0.386 \text{ mW/m}^2$. In UMTS band, the maximal value measured was 0.001 mW/m^2 at a frequency of 2154.2 MHz.

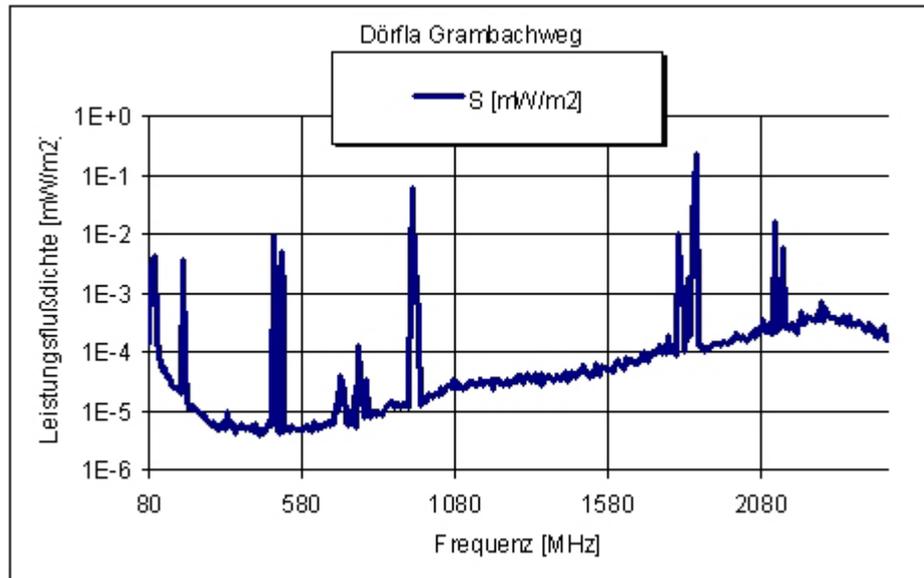


Figure AU-2. Values of spectral power density measured in Dörfla (Austria)

Frequency [MHz]	Power density [mW/m	Frequency [MHz]	Power density [mW/m
98,2	0,00428	789,6	0,0000358
189,2	0,00376	941,3	0,0643
486,4	0,00978	1808,6	0,00997
510,6	0,00506	1869,2	0,229
704,7	0,0000398	2123,9	0,0164
747,2	0,0019	2154,3	0,00588
765,4	0,000126		

Table AU-1. Spectral power density values at the frequencies of interest.

Broadband measurements

These measurements were performed since March 2002. The total exposure over the range 100 kHz to 3 GHz was measured with an E-Field probe (provided by ARCS, with a range of measurement from 0.1 mW/m^2 to 270 mW/m^2) and an electro-optical converter, built-in a plastic box to protect the meter against meteorological impacts. In the table AU-2 the results of the measurements are shown as HMWmax, or higher mean value averaged over half an hour, and the MPMW, mean value over the entire period of measurement.

Location	Date	Electric field strength [V/m]		Power density [mW/m²]	
		HMWmax	MPMW	HMWmax	MPMW
Graz Mitte	20.03.02-10.07.02	0,88	0,72	2,03	1,72
Arnfels	11.07.02-08.10.02	0,28	0,14	0,21	0,05
Leoben	10.10.02-29.01.03	0,63	0,53	1,05	0,74
Liezen	30.01.03-16.04.03	0,24	0,15	0,15	0,06
Zeltweg	17.04.03-16.07.03	0,57	0,36	0,87	0,34
Voitsberg	17.07.03-10.11.03	0,32	0,19	0,28	0,10
Weiz	11.11.03-31.12.03	0,18	0,14	0,08	0,05

Table AU-2: Results of the broadband measurements in Styria

The results were compared with the limits of the Austrian standards about exposures to EMF, the ÖNORM S 1120, showing that the values obtained were well below the limits (about 1000 times). The broadband measurements are performed continuously in different locations in Styria (during three months approximately) and the actual results of the measurements can be checked in internet in: <http://www.umwelt.steiermark.at/cms/ziel/594581/DE/>. The figures AU-3 and AU-4 show the location of such a monitoring and the temporal results of the measurements, respectively.



Figure AU-3. Broadband measurement station

1.4 Legal Requirements

Until now no specific law for the protection of health from electromagnetic fields has been enacted in Austria. According to the program of the government from 2003 a radiation protection law to protect the population from the dangers of non-ionising radiation should be based on the outcome of the EMF project of the WHO. The Telecommunication law provides a legal framework for the construction and operation of telecommunication and radio systems. It should guarantee the protection of human health by demanding that the communication systems have to be in accordance with the technical state of the art and that they have to fulfil the recommendations of the Council of the European Union. But there are no limits embodied in the telecommunication law.

The legal framework for the construction and operation of power lines and electrical installations and devices is the act on electrical engineering and the law for high-voltage power lines. Also the Trade, Commerce and Industry Regulation Act enable the protection of the general public in this field. The Act on health protection and safety at work enables the protection of workers. The mentioned legal framework allows individual administrative decisions.

The directive 2004/40/EC of the European Parliament and of the council of 29 April 2004 on the minimum health and safety requirements regarding the exposure of workers to the risks arising

from physical agents (electromagnetic fields) is under implementation into the Austrian legal framework.

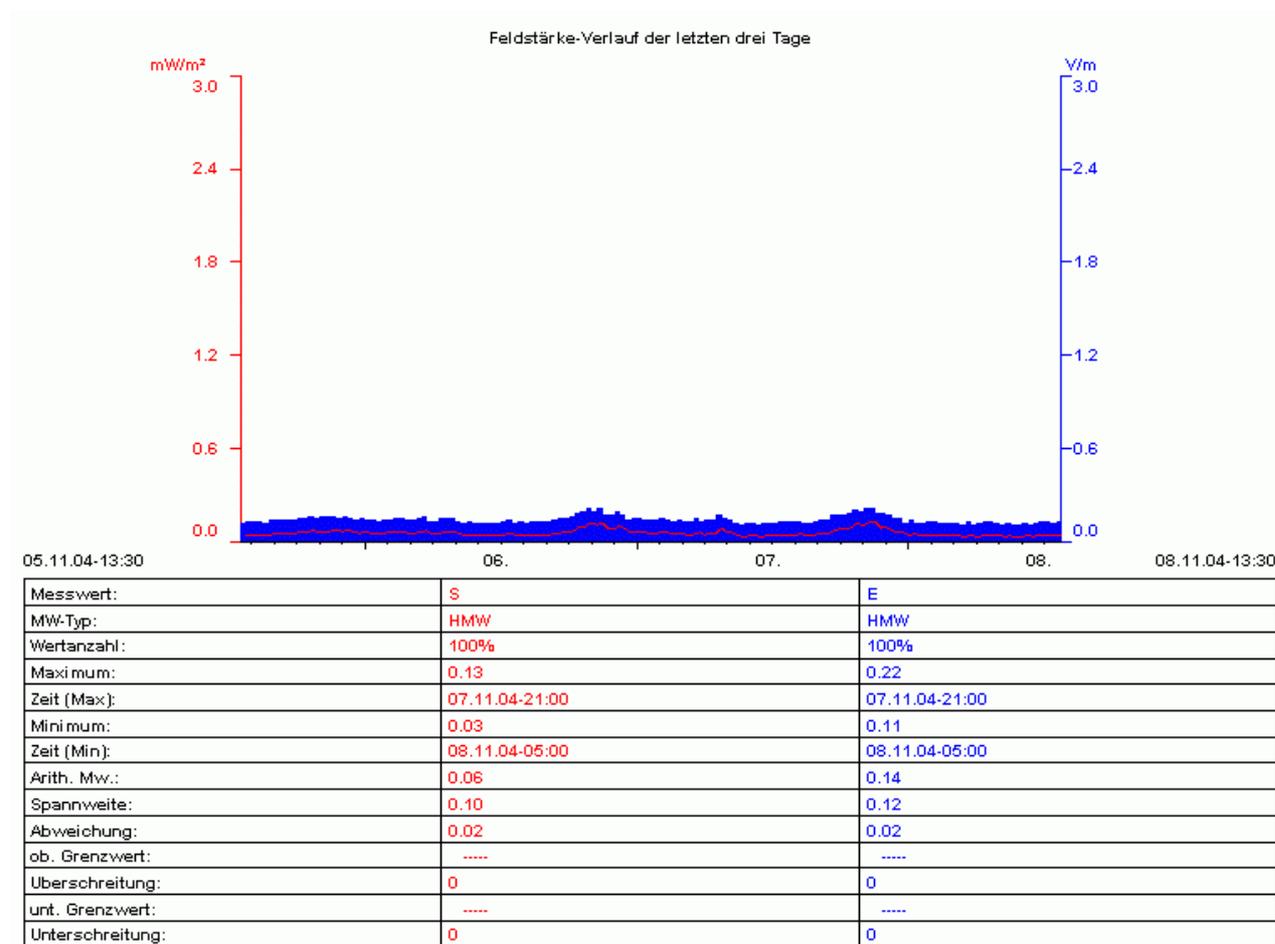


Figure AU-4. Graphic display of the results of a continuous broadband measurement.

Exposure limits for low- and high frequency electromagnetic fields are established in the ÖNORM S1119 and the ÖNORM S1120 issued by the Austrian Standards Institute. A revision of these documents is ongoing and a new unified ÖNORM can be expected by the end of this year. The exposure limits will be in accordance with the values proposed by the ICNIRP. An ÖNORM is not legally binding, but experts use them in administrative proceedings and they can be imposed by official notifications. Furthermore the Institute of General Accident Assurance (AUVA) and the department of labour safety are verifying EMF emission at working places.

2. Belgium

2.1 Introduction

In Belgium the BIPT (Belgian Institute for Postal services and Telecommunications, http://www.bipt.be/bipt_E.htm) is the regulatory body of the postal and telecommunications sector in Belgium and between other many tasks it performs measurements of exposure to non-ionising radiation from RF installations. There is another organization, the ISSeP (Institute Scientifique de Service Public), which also performs measurements, but on demand from companies or institutions.

Furthermore, in order to inform the public on matters concerning electromagnetic fields, the government has issued an information brochure, available on demand, and is preparing a website (www.health.fgov.be/CSH_HGR/, with information in English, French, Dutch and German) owned by the Health Council, about the health impact of electromagnetic fields and the measures taken to deal with this problem.

2.2 BIPT

2.2.1 Purpose of the information

Within the BIPT, the *National Spectrum Monitoring department* (NCS) is responsible for tracing and dealing with radio interference in the frequency spectrum. In essence this institution investigates complaints from the public. The BIPT is also responsible for measuring radiation emitted by GSM and other transmitting sites in the framework of the limits of exposure of the general public to electromagnetic radiation (Royal Decree of 29 April 2001 on the standardisation of transmitting antennas for electromagnetic waves between 10 MHz and 10 GHz).

Finally, NCS ensures that GSM operators comply with the conditions of their licenses. Individual problems with respect to insufficient coverage range of GSM transmitting stations at specific sites must be reported directly to the relevant operator, however. In the website, there is summary and detailed information about measurements carried out by BIPT on request of various institutions since June 2000 concerning radiation from GSM base stations. There is also a database with a defined file format concerning the measurements.

2.2.2 Availability of data

The website includes only regulatory data for commercial purposes, but both the methods of the measurements and their results can be downloaded from the Internet. The general public can contact the Office of the Minister of Consumer Affairs, Public Health and Environment for information about electromagnetic radiation.

2.2.3 Description of Methodology

The physical quantity used to describe the exposure is the electric field strength. For each base station, places in its vicinity where are likely to stay were selected. Spot measurements were done in different environments (urban, indoor, outdoor, rural or semi-urban) at a distance between 0 and 500m from the respective GSM base station; so far no information on UMTS measurements is available. The BIPT used two different measurement methods:

1. Narrow-band measurement (25 MHz frequency band) of the far-field radiated by GSM 900 and GSM 1800 base stations performed with Rohde and Schwarz FSP spectrum analyzers equipped with two dual band GSM900/GSM 1800 whip antennas in measurements in the streets (reference Mat MA712UX00), and 880 – 2175 MHz calibrated omni directional antenna of European Antennas, references EVD2-TRI-SI/704. A pre-scan of the location of the maximum field is made in order to determine the measuring position, where four frequency bands (GSM downlink, and GSM uplink for the three telecom providers) are measured during six minutes. The resultant E-field will be obtained as the root sum square of the three orthogonal directions.
2. Wideband measurement of the radiated fields in the 10 MHz - 10 GHz band made with isotropic probes that measure the field strength in three orthogonal directions and had sensitivity better than 1.5 V/m. This measuring method was developed by BIPT in the

context of the implementation of the Royal Decree of 29 April 2001, amended by the Royal Decree of 21 December 2001. The principle is to allow a quick evaluation of the field radiated in the entire 10 MHz to 10 GHz band.

Both methods are described in several pdf files with technical details of all the procedure.

Because the tests were focused on GSM base station and the fields in their vicinity, contributions from other radiation sources were probably often negligible compared to the GSM contributions. However, they were not measured and the BIPT concludes that the standard is respected in the entire frequency band.

2.2.4 Status of the project

The project is continuous, as it regulates the quality and security in the installation of antennas.

2.2.5 Display of the information

In the web page a summary graphic is also included (see Figure BE-1). It can be seen that in the majority of cases the level measured is lower than 1 V/m, and only exceptionally higher than 3V/m. Tables with the outcomes of the measurements are also available in pdf format. In these tables, the results are given in electric field intensity (dB μ V/m or V/m) and Power density (mW/m²).

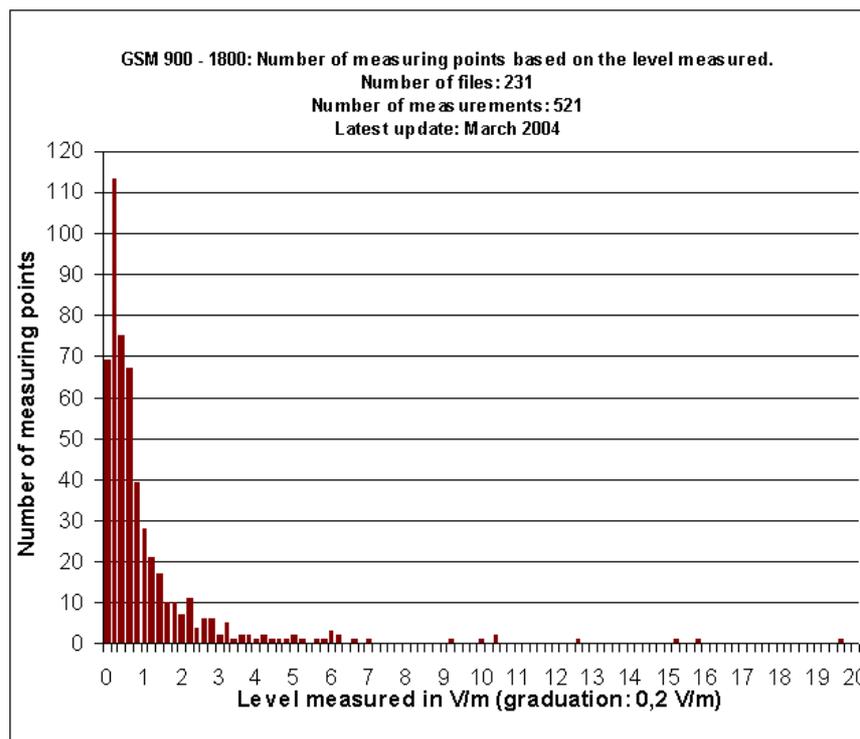


Figure BE-1. The graphic indicates the number of measuring points based on the level measured. Therefore, the first bar of the histogram indicates the number of measuring points where the level measured lies between 0 V/m and 0.2 V/m, the second one indicates the number of measuring points where the level measured lies between 0.2 V/m and 0.4 V/m

A pdf file is available with the final results of the GSM measurements, including tables with the E-field levels (in V/m and dB μ V/m) and power radiated (in mW/m²), obtained for measurements at different distances to GSM base stations. The website of the BIPT also includes a search

engine that displays the certified RF stations by entering a postal code. The information given includes address, provider, type of station and date of certification, but it does not include technical information.

2.3 ISSeP

2.3.1 Purpose of the information

The ISSeP (Institute Scientifique de Service Public, <http://www.issep.be/public.asp?id=239>) performs measurements under request of administrations, private companies or local residents, the results are only communicated to the buyer.

2.3.2 Availability of data

Nonetheless, the web site includes a bunch of publications about research on mobile communications and electromagnetic fields, for instance:

- Electromagnetic fields in the vicinity of base station antennas (Willy Pirard, “CHAMPS ELECTROMAGNETIQUES A PROXIMITE DES ANTENNES-RELAIS DE MOBILOPHONIE”). In this report, the EM fields from different types of base station installations are exhaustively investigated. Some conclusions and recommendations about the intensity of the radiation are given. The text includes an annex where the methods are further described and a summary of results and conclusions is also available in pdf. The measurements were performed with dipole antennas and spectrum analyzers at locations where maximum levels were found, but also along a trajectory measuring also the distance from the station (see Figure BE-2).

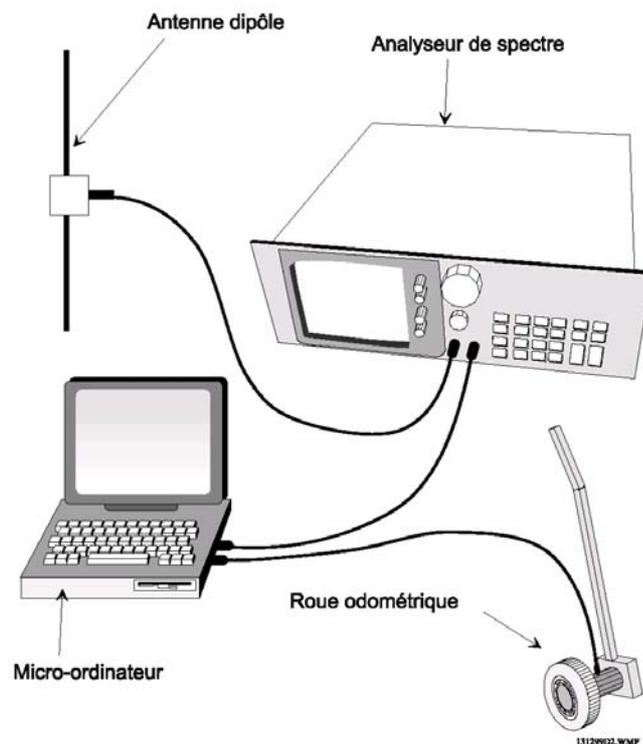


Figure BE-2. Scheme of the method used to measure EMF along a trajectory in ISSeP.

- Electromagnetic fields and mobile telephony (Willy Pirard, “CHAMPS ELECTROMAGNETIQUES ET TELEPHONIE MOBILE”). This report includes also

some field measurements and commentaries about several health aspects in relation with mobile communications (interference with pacemakers, work in the proximity of a base station, safety distances...).

- Finally there are also technical reports about GSM and other sort of investigations.

2.3.3 Description of Methodology

Generally narrow band measurements are done with a procedure very similar to the CEPT Recommendation.

2.3.4 Status of the project

Tests are done on demand.

2.3.5 Display of the information

As the information is only given to the customer, data are not published on the website.

2.4 Legal Requirements

In Belgium installation of base stations is regulated by the Royal Decree of 29 April 2000. For all antennas put into operation after 29 December 2001 it is mandatory to submit a file to the BIPT before the installation put into service is allowed. A file also has to be submitted for all antennas put into operation before 29 December 2001. The final date for their submission is 31 December 2006.

The limits of exposure for the general public are based on WHO and ICNIRP recommendations except for the frequency band from 10 MHz to 10 GHz (see the following Table BE-1). In this band Belgium has introduced a safety factor of 2, which leads to limit values of about 21 V/m at 900 MHz and 28 V/m at 1800 MHz. In some regions the limit was set to lower values, in Wallonien for instance the limit is 3 V/m.

Exposure category	Frequency range	E-field strength (V/m)	H-field strength (A/m)	B-field (mT)	Equivalent plane wave power density (W/m ²)
General public	10 MHz – 400 MHz	13.7			0.5
	0,4 – 2 GHz	0,686f ^{0,5}			f/800
	2 GHz – 10 GHz	30.7			2.5

Table BE-1. Limits of exposure of the general public in the frequency range 10 MHz to 10 GHz in Belgium

3. Czech Republic

3.1 Introduction

The National Reference Laboratory on Non-Ionizing Radiation provides information of the exposure of the general public. Since 2000 a regulation is in force that includes limits corresponding to those of the ICNIRP guidelines.

3.2 National Reference Laboratory on Non-Ionizing Radiation

The National Reference Laboratory on Non-Ionizing Radiation an agency related to the Ministry of Health is the organization that deals with information, guidelines and projects about radio

frequency exposure in the Czech Republic. At <http://www.hygp Praha.cz/odbory/>, information available only in Czech.

3.2.1 Purpose of the information

The object of the Laboratory is to provide information about the interaction of electromagnetic field with human body and of possible risks from EMF exposure; it shows the scientific results, on which the set (ICNIRP) limits are based, and demonstrates the field levels generated in different places by BTS-antennas and other sources, e.g. TV and radio broadcasting transmitters. Along with the frequency selective measurements, calculations for assessing the electromagnetic fields are made by a special computer program.

3.2.2 Availability of data

The website of the institution contains documents about exposure limits, computer simulations of power flux density isobars, principles of mobile phone transmission, etc... The data with the results of measurements and calculations are stored in the Laboratory database, and are available for anyone, who asks for them. They are presented on special seminars and for education purposes.

3.2.3 Description of Methodology

148 measurements of power density made in accessible places for general public around GSM and DCS base stations were compared with the ICNIRP reference values. The radio frequency fields are measured with the spectral analyzer Advantest U3641 with calibrated Rohde-Schwartz antenna set HE2000 using the RF module from 500 to 3000 MHz, while low frequency fields are recorded by means of a digital oscilloscope and then treated by a special program using numerical integration filtration in case of non-sinusoidal signals. Basic limits instead of reference values are used for the exposure evaluation. A summary of these measurements is depicted in Figure CZ-1.

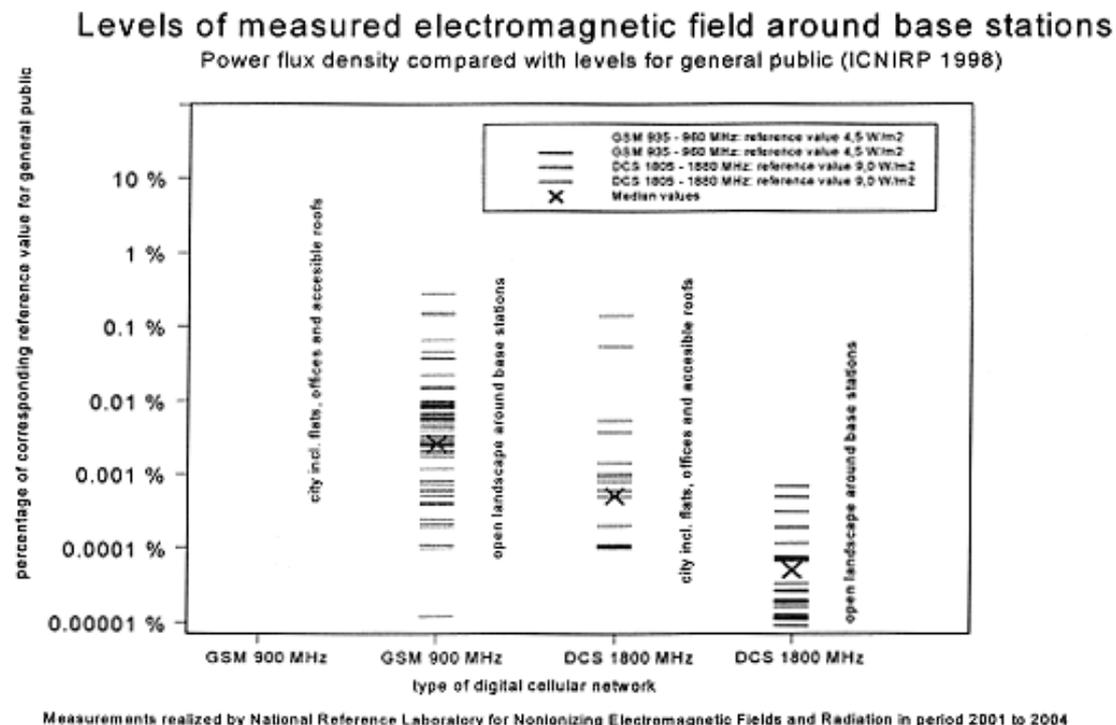


Figure CZ-1. Summary results of the measurements

3.2.4 Status of the project

The measurement project is already finished.

3.2.5 Display of the information

Protocols are printed and stored in Word format. Numerical data are usually given in Excel or in ASCII form.

3.3 Legal Requirements

The state regulation No 480/2000 "*Protection against non-ionising radiation*" has been issued by the Government of the Czech Republic in 2000 based on the ICNIRP recommendations. This regulation is in force since January 1, 2001, is valid for public and occupational exposure and contains obligations for all the operators. The compliance of RF transmitters is verified by the Hygienic service of the Ministry of Health.

4. Denmark

4.1 Introduction

The Danish IT and telecom regulator has not registered EMF measurement data pertaining exposure of the general public due to mobile base station because the providers themselves must ensure, according to the legal requirements, that their installations do not pose a risk for health of the public.

The Danish government implements also measures to inform the public about knowledge on health impacts of electromagnetic fields. The National Board of Health performs risk assessments and gives advice to relevant ministries on health aspects of electromagnetic fields. The mobile telephone sector, The Information Centre on Environment and Health and consumer associations are also producing information material concerning mobile telephones and health for Danish consumers.

4.2 Mastedatabasen

4.2.1 Purpose of the information

The Danish IT- and Telecommunication Regulator, NITA, has set up a public database on the Internet giving the position of the antenna masts for nearly all the radio base stations in Denmark. Excluded from the database are only antenna masts, which are vital for national security, i.e. defense, police etc.

4.2.2 Availability of data

The database includes all existing and planned antenna masts and is being continuously updated. The database covers antenna masts for GSM, 3G, FWA, Microwave Relay Links, Land Mobile systems, TETRA, TV, FM-broadcast, Satellite Earth Stations etc. The antenna mast database can be found at the following Internet address: <http://www.mastedatabase.dk>. The database is only available in Danish, and there is no plan for making an English version.

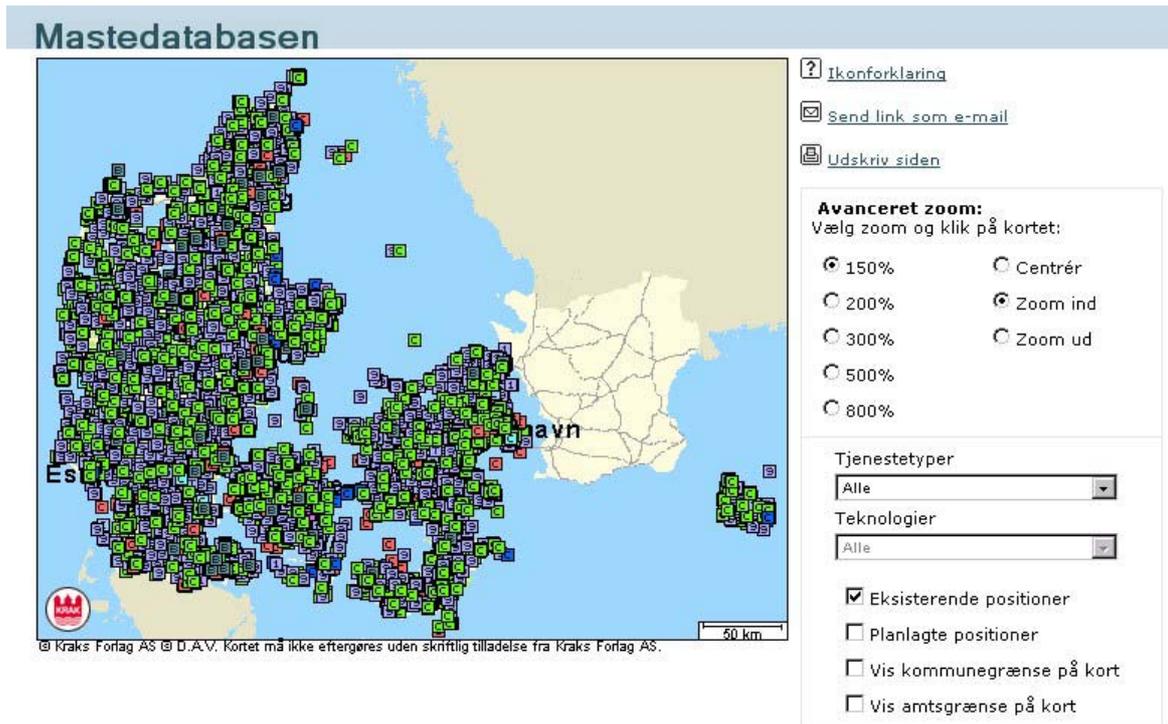


Figure DK-1 Web interface of the Mastedatabasen

4.2.3 Description of Methodology

The database is based on a GIS-system giving the antenna mast positions on a normal geographic map. The user can key in a specific address, and as the result he or she will get a map - with the given address at the centre of the map - and with all existing and planned antenna masts up to a user selected distance from the address. Each antenna mast is colour coded indicating the type of radio system. By double-clicking on a specific antenna mast icon on the map the basic technical information for the mast and the name of the operator will be shown.

4.3 Aalborg University

The Aalborg University performed in 2003 a project illustrating the EMF levels for 3G, GSM and FM/TV Broadcast base stations around the city of Aalborg.

4.3.1 Purpose of the information

The purpose of the project is the assessment of the radiation arising from UMTS base stations and its comparison with radiation from other sources such as GSM or FM/TV broadcast.

4.3.2 Availability of data

The report is written in Danish and includes an abstract in English. It can be found in the Internet address: <http://auaw2.aua.auc.dk/fak-tekn/mobilmast.doc> ("Radiation from antenna masts", Feb 2004)

4.3.3 Description of Methodology

The principal objective of the project was to measure the radiation from UMTS antenna masts. Based on the ICNIRP reference values, the radiation from a mobile phone is compared with that from a mast with a single antenna, both compared as local SAR values. Also included is an evaluation of the radiation from another person's mobile phone, a radiation which is typically 10,000 times smaller than from the person's own phone. Other sources of low power radiation

were also measured, indicating that 3G emissions were at the same level as FM radio, GSM 900 and 1800, except near a 3G antenna.

4.3.4 Status of the project

The project is finished

4.3.5 Display of the information

Information is available on pdf, with tables and graphic showing the results (all in Danish).

4.4 Legal Requirements

In Denmark mobile phone base stations are regulated according to the provisions of the R&TTE-directive 1999/5/EC (Directive 1999/5/EC of the European Parliament and of the Council of 9 March 1999 on radio equipment and telecommunications terminal equipment and the mutual recognition of their conformity). As a prerequisite for setting up and using a mobile phone base station the operator must ensure, that the specific station does not present a health risk for the general public. Limits and measurements are specified at the harmonized European EMF-standard, published under the R&TTE-directive.

5. Estonia

5.1 Legal Requirements

A regulation of the Government of Estonia on occupational health and safety limits on physical hazards and procedures for measuring them (86/188/EEC) was adopted on 22 January 2002 and entered into force on 1st June 2002. The paragraphs 10-15 of the Regulation enact limits of the electromagnetic fields in the working environment. The National Labour Inspectorate is responsible for the implementation of this Regulation.

The Telecommunications Act issued by the Ministry of Telecommunications was adopted on 9 February 2000 and entered into force on 1st August 2000. The Act provides health protection requirements and limits of electromagnetic fields for the telecommunication installations and nets in the frequency range from 30 kHz to 300 GHz for public and occupational exposure but is not based on ICNIRP. The health protection requirements for a radio installation are specified in the Regulation of the Ministry of Social Affairs No 48 of 8 August 2000.

The Ministry of Social Affairs of Estonia has drafted a regulation for limits of electromagnetic levels in the environment and procedures for measuring them. The Regulation will harmonise the Council Recommendation 1999/51/EC of 12 July 1999. According to the draft the Regulation will enter into force on 1st May 2002 and will annul old regulations and standards (Decree No 2971-84 of 28 February 1984 and Decree No 2963-84 of 19 January 1984) regarding electromagnetic radiation. The Health Protection Inspectorate will implement the new Regulation.

All requirements enacted in above-mentioned legal acts are compulsory. In Estonia there are no regional variations regarding the protection of public against electromagnetic fields. No additional safety parameters have been implemented. State supervision bodies for electromagnetic fields are the Health Protection Inspectorate and the National Labour Inspectorate.

6. Finland

6.1 Introduction

The Radiation and Nuclear Safety Authority (STUK, www.stuk.fi) and the Finnish Institute of Occupational Health (FIOH, www.ttl.fi) are the Finnish authorities responsible for aspects of non ionizing radiation. Additionally, universities (like Kuopio and Jyväskylä) try to inform and make people aware of the risks posed by radiation from base stations and mobile phones.

6.2 STUK and FIOH

6.2.1 Purpose of the Information

The purpose of these organizations is to give advice to the public and provide risk communication.

6.2.2 Availability of Data

Very few measurements are available. In STUK's website description of some ongoing projects regarding mobile phone use and health risk is available, as well as safety guidelines about non ionizing radiation. There have been also information campaigns, interviews were given and articles provided to the media on the safety of electromagnetic fields from mobile phones and power lines. Information was provided in writing, by telephone and via the Internet to members of the public, NGOs, radiation users and politicians. At the request of the Director General of STUK, a memorandum was compiled outlining the opinions of STUK on radiation from mobile phones and their base stations.

The FIOH a report addresses the risks of electromagnetic fields in the work environment but not about public exposures.

6.2.3 Description of Methodology

The STUK performs spot measurements at the request of concerned people using frequency selective equipment.

6.2.4 Status of the project

No measurement project itself has been defined.

6.2.4 Display of the information

Any information has been made available to the public at the moment.

6.3 Legal Requirements

The Ministry of Social Affairs and Health issued the "Decision on limiting exposure to non-ionising radiation (1474/91)" in 1991 for occupational exposure in the frequency range from 100 kHz - 300 GHz and the "Ordinance on non-ionising radiation control (EU Council Recommend. 1999/519/EY)" in 2002 for public exposure in the frequency range from 0 Hz - 300 GHz. The present valid limit values orientate on ICNIRP guidelines. Presently, a working group elaborates new recommendations for limit values, which base on the actual ICNIRP values and on the recommendations of the European Council.

Regarding base stations, the Council of Ministers Decision No 473 (1985) regulates high-frequency equipment and control thereof.

7. France

7.1 Introduction

Information on the exposure of the public has been made available by the ANFR. Since 2002 a decree containing the same limits as the ICNIRP guidelines regulates the exposure of the population. The French Government, provides also information about risk of exposure and complete reports from experts in the website of the Ministry of Health and Social Protection (www.sante.gouv.fr/). The report of Dr Zmirou et al is (“Telephones Mobiles et Sante”, 2001) of special interest, because it reviews the current state of research about RF and health risks, gives recommendations to reduce the public exposure and informs of the priorities that should be given to future research on these topics.

7.2 National Agency of Frequencies, ANFR

The Agence Nationale des Frequences (www.anfr.fr) is the French institution that defends the investment and industrial interests of France and Europe with the objective of managing and regulating the frequency spectrum.

7.2.1 Purpose of the information

The ANFR includes in its website two projects about RF transmitting stations:

1. Cartoradio (<http://www.cartoradio.fr/netenmap.php?cmd=zoomfull>), a geographical information system, which shows the location of all the RF stations (mobile telephony, TV/Radio and other stations) in the French territory.
2. Campagne de Mesures (<http://www.anfr.fr/index.php?cat=sante&page=mesures>) also included in the former, which is a campaign of research and measurement of radiation from telecommunication stations in different locations in France.

While Cartoradio shows the location and characteristics of telephony, radio/TV and other stations installed and functioning in France with industrial purposes in maps, the Campaign of Measurements provides information about the exposure of the general public to electromagnetic fields in order to allow comparison with the limits.

7.2.2 Availability of data

The ANFR includes easy control and free access to both projects in the same search engine (see Figure FR-1) for the general public. Along with these databases the website includes information about regulations, reports about non ionizing radiation and health, standards and legal requirements, and a list of the societies that can perform the measurements of quality and safety for the installation of RF stations. There are also brochures about electromagnetic fields and health risks (generally non ionizing radiation and particularly about mobile telephony base stations and risks for health). The companies send measurement data with a specific format in an Excel table.

7.2.3 Description of Methodology

The French measurement protocol is based on the ECC recommendation (02)04, considering three decision levels, performing first a broadband scanning with isotropic probes, than a selective frequency check in those places where the first decision level (fields higher than 0.28 V/m) is exceeded, and a detailed analysis when the second decision level (> 2.8 V/m) is also exceeded. In Table FR-1 a more detailed description of the frequency bands investigated and the decision levels.

Frequency bands	Services	Minimum reference le	Decision level
9 kHz - 30 MHz	Services HF	28 V/m	0,3 V/m
30 MHz - 87,5 MHz	PMR	28 V/m	0,3 V/m
87,5 MHz - 108 MHz	FM	28 V/m	0,3 V/m
108 MHz – 880 MHz (hors TV)	PMR - BALISES	28 V/m	0,3 V/m
47 – 68 MHz; 174 223 MHz	TV	28 V/m	0,3 V/m
470 – 830 MHz			
880 MHz - 960 MHz	GSM 900	40,4 V/m	0,4 V/m
960 MHz - 1710 MHz	RADARS - DAB	42,6 V/m	0,4 V/m
1710 MHz - 1880 MHz	GSM 1800	56,8 V/m	0,6 V/m
1880 - 1900 MHz	DECT	59,6 V/m	0,6 V/m
1900 - 2200 MHz	UMTS	59,9 V/m	0,6 V/m
2200 - 3000 MHz	RADARS - BLR – F	61 V/m	0,6 V/m

Table FR-1. Frequency bands and services measured in the frame of the Champagne de Measurement project.

Spot measurements were done in the vicinity of GSM-base stations and radio and TV transmitters, both in the inside and outside from houses. The antennas used were a magnetic loop for HF, broadband dipole antennas (log-periodic), bi-conic antennas, 3-axes selective probes and selective antennas for narrow band measurements. The website includes many documents with the protocol of measure, guidelines, devices used, companies involved in the measurement and other topics related to the measurement.



Figure FR-1. Web interface of the GIS systems Cartoradio and Campagne de Mesures

7.2.4 Status of the project

Exposure assessment is ongoing and there is no finalization date. Agreements between cities and telecom operators specify regular exposure assessment campaigns. There is also a request from public to get continuous measurement campaigns.

7.2.5 Display of the information

Both databases can be accessed in Internet with a GIS as shown in Figure FR-1. When a location is chosen, the GIS will show the RF stations and spot measurements in the proximities. The characteristics of each one can be then accessed (see Figure FR-2 and Figure FR-3). The database from measurements is also accessible separately in the “Campagne de Mesures” website, which also includes further explanations of the procedures and general information about EMF radiation.

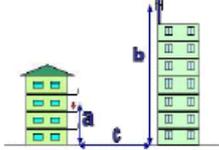
Identification de la station	
N° d'identification : 121646	
Code INSEE et Nom Commune : 28085 / CHARTRES	
Accord ANFR pour l'implantation : 15/10/03	
Accord ANFR dernière modification :	
Caractéristiques radioélectriques	
Hauteur max. des antennes / sol : 50 m	
Système	Bande de fréquences
2 RP	75.2 à 77.475 MHz
2 RP	80 à 82.475 MHz

Figure FR-2. Table of results with the identification of a RF installation.

Situation et caractéristiques du point de mesure

Localisation précise du point de mesure	Caractéristiques du point de mesure
N°: Rue: Maurice Viollette	Mesures à l'intérieur
Place/Autre: Résidence Pierre de Coubertin - Bât. C	Appartement/Pavillon/Bureau
Code postal: 28600	Latitude: 48° 25' 52" N
Ville: Luisant	Longitude: 1° 28' 52" E

Proximité d'émetteurs visibles



Synthèse des résultats

Valeur limite respectée	Le champ Electrique total du site Etotal est 457,9 fois plus petit que la valeur limite la plus faible.
Par fréquence: Oui Effet cumulatif: Oui	

Résultats des mesures réalisées à l'analyseur de spectre

Relevé des mesures réalisées sur toutes les fréquences dont le niveau est supérieur au 1/1000ème de la valeur limite fixée par le décret du 3 mai 2002.

Fréquence (en MHz)	Service	E _i = Champ électrique efficace moyen (en V/m)	Valeur limite (en V/m)	Niveau du Champ Electrique mesuré par rapport à la valeur limite fixée par le décret du 3 mai 2002
940,0000	GSM 900	0,0921	42,16	458 fois inférieur
Champ Electrique total du site $E_{Total} = \sqrt{\sum E_i^2}$		0,0921	42,16V/m	est la valeur limite la plus faible fixée par le décret du 3 mai 2002

Figure FR-3. Situation, characteristics and synthesis of the outcomes of a spot measurement.

7.3 Legal Requirements

The decree 2002-775 regarding public exposure to radio communication set-ups for base stations has been issued in May 2002 by the Ministry of Industry which limits are based on ICNIRP (EC 1999/519) for the frequency range from 0 Hz - 300 GHz.

Also a recommendation (Inter-ministerial Guideline as regards to mobile telephony base stations (BTS)) has been issued by the government in October 2001 with frequencies of 900 MHz and 1800 MHz for public exposure and the frequency range from 0 Hz - 300 GHz for occupational exposure according to ICNIRP (EC 2004/40). The compliance is verified through base station measurements done by ANFR (National Frequencies Agency) and/or accredited measurement institutions.

8. Germany

8.1 Introduction

In Germany the RegTP (*Regulierungsbehörde für Telekommunikation und Post*) regulates the telecommunications market. The RegTP, among other duties, has the task of control and risk communication of the telecommunication systems. In addition, there are in Germany other projects and institutions coping with the concerns of population and telecommunications, like the InformationsZentrum Mobilfunk (IZM), and perform measurements of radiation from RF antennas. The Exposure of the population is regulated by an ordinance containing the same limits of the field strengths as the ICNIRP guidelines.

8.2 RegTP

8.2.1 Purpose of the information

The RegTP, which is subordinated to the Federal Department of Economy and Work (Bundesministerium für Wirtschaft und Arbeit (BMWA)), performs audit measurements to assess the correct installation of communication antennas and provides a geographical information system with the results of this audits as well as the location of all the stations certificated by the RegTP in the EMF-Datenbank (<http://emf.regtp.de/GisInternet/>).

The project was created after the recommendation of the *Strahlenschutzkommission* (September 2001) for an independent study about the immissions of electromagnetic fields to be controlled regularly. The Databank is also an open platform with all the publications of the series of measurements performed by the German Environment Ministry (*Bundesweite Messaktion 1992, 1996/97, and 1999/2000*). The *Messaktion* was performed with the aim of providing a quality measure of the electromagnetic field exposure in order to compare the levels with the limits of national and international guidelines.

8.2.2 Availability of data

The EMF Datenbank has been used to publish the results of measurements and characteristics of base stations on the Internet with a GIS, but there are also html summaries of the Messaktion. The databank has an open interface for all users and a password-protected database for the federal institutions. The RegTP website includes also many other information about laws and regulations (in PDF and HTML format), and some brochures regarding electromagnetic compatibility (EMC) and the environment.

8.2.3 Description of Methodology

The national measurements are only indirectly connected with the RegTP's site certification procedure, which involves calculating a minimum or worst case, safety distance for each individual site, taking into account radiation from any nearby fixed radio transmitters. The cartographic EMF-Databank includes both the series of spot measurements made in 1992, 1996/97 and in 1999/2000 at more than 3000 selected places. However, as the measures from 1999/2000 were performed according to the EU Recommendation (02) 04 and not according to the German Norm DIN VDE 0848 Part 2 (10/91), which was used in the measurement campaigns of 1992 and 1996/97, the results are not comparable in the range from 0 to 10 MHz and therefore, the frequency ranges are separately analyzed (as can be seen in figure GE-1).

The selection of the places to perform the measures was done both by RegTP and Ministries. The RegTP chose the spots according to the proximity to radiofrequency installations, public places and roads, locations of special of interest such as hospitals, kindergartens or schools, and places where former measurements had been close to the safety limits (usually sites close to RF stations). The measurements were made according to a procedure accepted by both RegTP and the Environment Ministry, defined in *RegTP MV 09/EMF/3*, and only the values obtained with the determined devices and methods were included in the database. Antennas used were broadband dipoles and "Rahmenantennen" for broadband measurements, and log per antennas for narrow band.

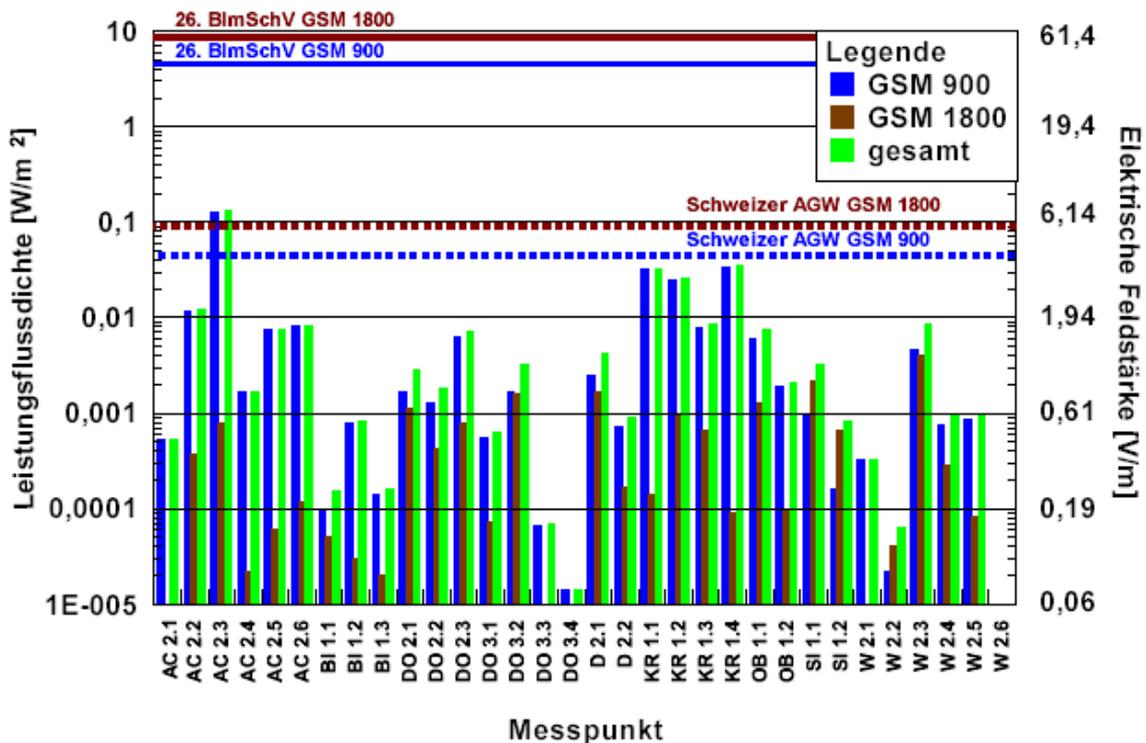


Figure GE-1: Summarized results of the 1992 Messreihe.

Within the first Messreihe (IMST 1 (1992)) the fields were measured directly in the whereabouts around base stations using the sweeping method to search for the maximum exposure values, often special places with high immissions were also investigated and both indoor and outdoor

locations were examined. The number of spot measurements was 88; the maximal and minimal values of power density obtained were, 0.14 W/m² and 0.000014 W/m², respectively, with a mean of 0.0065 W/m² and 0.0050 W/m² when maximum and minimum values were not included. The uncertainty of the measurements was stated to be 3 dB.

The measurements were performed using broadband equipment in the frequency range from 9 kHz and 1 GHz, but in addition also selective to consider separately GSM 900 and GSM 1800 contributions. The results were compared with limits of German and Swiss guidelines as depicted in the graphic GE-1. The second Messreihe (*IMST2, 1997*) was quite similar to *IMST1 (1992)*. The locations chosen were also near base stations, and sensitive places (i.e. hospitals or schools) were also added. The maximum and minimum power densities measured were 0.04 W/m² and 0.0000016 W/m², respectively. The mean value was 0.0052 W/m² and 0.0046 W/m² when not considering the extreme values.

The IMST 3 (1999-2000) series consisted of two stages:

- In the first stage, field strength levels were measured at sites where the level recorded in the 1996-1997 measurement campaigns was relatively close to the applicable limit.
- In the second stage, field strength levels were to be measured at sites chosen in conjunction with the regional environmental ministries, following enquiries from the general public. For this reasons the maximal and minimal values, 0.05 W/m² and 0.00000073 W/m², with means 0.0014 and 0.00031 W/m² are clearly below those obtained in the former series.

Lfd.Nr.	Region	Site	Maximum Value 1- [W/m ²]
1	Baden-Württemberg	Ravensburg, Sauterleutestr./Ulmenstraße	1,17E-03
2	Baden-Württemberg	Stuttgart, Robert-Bosch-Krankenhaus	1,93E-03
3	Bayern	München, Friedenheimer Brücke	1,07E-03
4	Bayern	Würzburg, Kapellenweg	4,55E-03
5	Berlin	Berlin-Wannsee, Königstr., Wannseebrücke	5,17E-03
6	Berlin	Berlin-Tiergarten, Straße des 17.Juni (Ehrenmal)	4,32E-03
7	Brandenburg	Königs-Wusterhausen, Otto-Grothewohl-Str.	3,36E-04
8	Brandenburg	Calau, Otto-Nuschke-Str. 70	2,77E-03
9	Bremen	Bremen, Kleiner-Ort, Wendeplatz	7,03E-02
10	Bremen	Bremerhaven, In den Nedderwiesen	5,95E-03
11	Hamburg	Hamburg-St.Pauli, Heiligengeistfeld	4,48E-03
12	Hamburg	Hamburg-Billstedt, Kandinskyallee	1,68E-02
13	Hessen	Frankfurt, Hauptwache	1,82E-03
14	Hessen	Wiesbaden, Luisenplatz	6,50E-04
15	Mecklenb.-Vorp.	Schwerin, Neumühle	2,38E-03
16	Mecklenb.-Vorp.	Greifswald-Schönwalde	5,95E-04
17	Niedersachsen	Hannover, Am Lindener Berge	1,31E-03
18	Niedersachsen	Göttingen-Nikolausberg, Sendestr. 17	2,76E-03
19	Nordrh.-Westfalen	Düsseldorf-Oberkassel,Rheinallee	9,66E-04

Table GE-1. Maximum values obtained in the 1992 measurement campaign from the RegTP.

8.2.4 Status of the project

The audits project is regularly updated. In 2003 the regular measurements were continued to update the pre-existing ones on a regular basis, continuing the stage two of the 1999/2000 measurements.

8.2.5 Display of the information

The results of the measurements of 1992, 1996/1997 and 1999/2000 are available in html sheets that include tables as seen in Table GE-1 for 1992 or Table GE-2 for 1999/2000.

Town	Location	Value as a		Value as a	
		Maximum Value	Fraction of Maximum Value	Maximum Value	Fraction of Maximum Value
66113 Saarbrücken	Hunsrückerstr. 7	0.0070131	143	0.0001206	8292
66117 Alt-Saarbrücken	Richtweg 2	0.0102212	98	0.0002960	3378
66280 Sulzbach-Neuweiler	Goethestr. (Parkplatz)	0.0062467	160	0.0002575	3884
66299 Friedrichsthal	Friedenstr.	0.0082297	122	0.0012246	817
66333 Völklingen	Spessartstr. 1	0.0216993	46	0.0004580	2183
66424 Homburg	Wolsifferstr. 18	0.0037078	270	0.0000774	12920
66440 Blieskastel	Bliestal-Kliniken (Parkplatz)	0.0042553	235	0.0000906	11038
66538 Spiesen-Elversbeim	Beethovenstr. 85	0.0059074	169	0.0004340	2304
66636 Tholey	Petrus-Borne-Str. 22	0.0058192	172	0.0003542	2823
66640 Namborn-Eisweiler	Heerstr.	0.0029276	342	0.0000127	78740
66693 Mettlach	St. Gangolf	0.0065712	152	0.0000132	75758
66773 Schwalbach	Hermann-Löns-/Mörikestr.	0.0072295	138	0.0000356	28090

Table GE-2. Selection of a set of measurements from the 1999/2000 campaigns. Columns 3 and 4 refer to conditions 1 and 2, and columns 5 and 6 to conditions 3 and 4.

Data are also available in the GIS, which includes both measurements from the Messaktion and the location and certification reports of the base stations. In the GIS, when a postcode or a location in Germany is selected, the outcomes for that site are shown as can be seen in Figure GE-1. The browser shows info about location, date and the institution making the measurement.

In accordance with the Council Recommendation, the levels measured are compared separately in respect of:

1. *Requirements 1 and 2.* As seen in Figure GE-2, “Bedingung 1+2” refers to the frequencies up to 10MHz whose value is obtained according to the ICNIRP formulas.
2. *Requirements 3 and 4.* This time, “Bedingung 3+4” refers to the frequencies from 100 kHz to 300 GHz whose value is also obtained according to the corresponding ICNIRP formulas.

These formulas include the contribution from all the sources of electromagnetic power measured in the location. (More deeply explained in the *ICNIRP Guidelines for limiting exposure to time varying electric, magnetic, and electromagnetic fields up to 300 GHz*).

The measured field strength level is therefore expressed as a fraction of the reference level firstly for requirements 1 and 2 and secondly for requirements 3 and 4. These two fractions may differ considerably from each other, depending on the actual levels recorded.

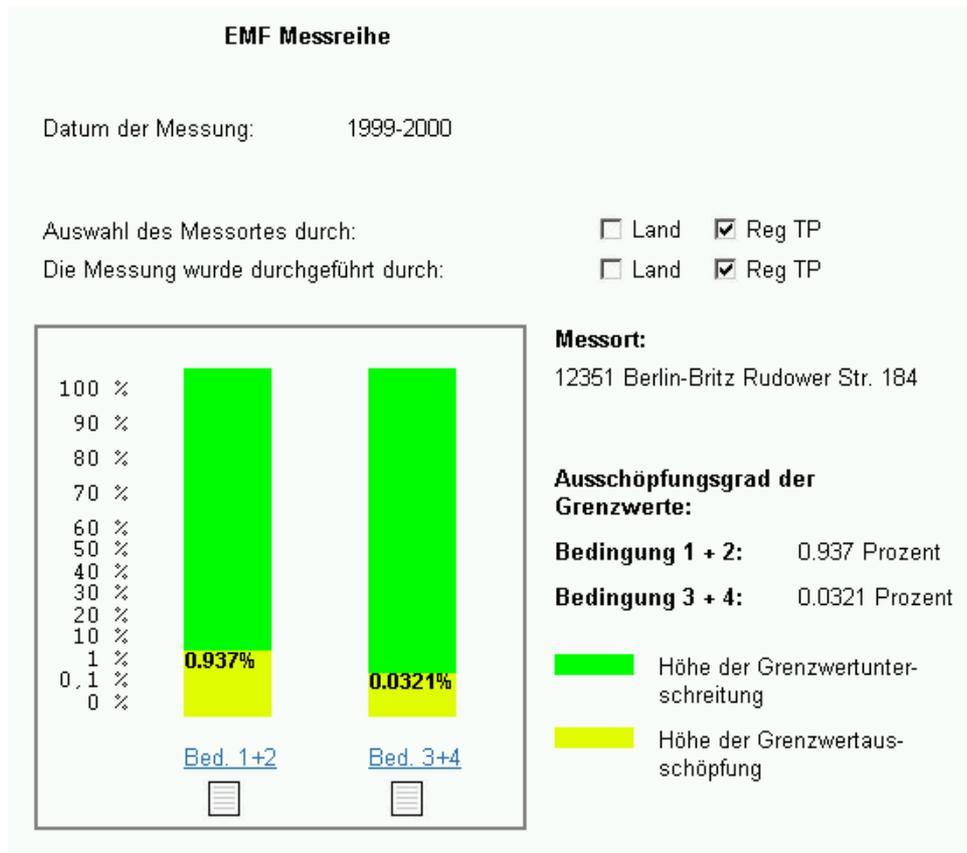


Figure GE-2. Display of the results from a spot measurement in the web site of the “EMF Messreihe”.

The Information System includes also the “Standortbescheinigung” or certification of the installation of an antenna and shows where the RF stations are located across Germany. The way data are shown when a station is selected in the map (in the EMF-Datenbank, by entering a postal code or the name of a street or a city) is depicted in Figures GE-3 and GE-4.

Standortbescheinigungs-Nr.: 621031

Bewertete Sendeantennen

Sendeantenne	Montagehöhe über Grund (m)	Hauptstrahlrichtung (HSR) in °	Sicherheitsabstand in HSR (m)	Vertikaler Sicherheitsabstand (m)
Mobilfunk	25.0	210	6.00	0.87
Mobilfunk	25.0	330	6.00	0.87
Mobilfunk	25.0	90	6.00	0.87
Mobilfunk	27.8	210	5.36	0.82
Mobilfunk	27.8	330	5.36	0.82
Mobilfunk	27.8	90	5.36	0.82

Der für jede Sendeantenne festgelegte Sicherheitsabstand gilt ab der Unterkante der Sendeantenne. Für die Beurteilung des Personenschutzes sind nur Sendeantennen relevant. Da an Standorten auch Empfangsantennen installiert sein können, kann die Anzahl der hier aufgelisteten Antennen von der Anzahl der tatsächlich am Standort installierten Antennen abweichen. Sendeanlagen die einen Reflektor und sehr geringe Sendeleistungen aufweisen, haben einen Sicherheitsabstand von 0 Meter.

Figure GE-3. Certification of conformity from a base station installation.

Standortbezogener Sicherheitsabstand

Die Sicherheitsabstände der einzelnen Sendeantennen wurden entsprechend ihrer Montage und ihrer Abstrahlrichtung bereichsbezogen (Sektor) zu standortbezogenen Sicherheitsabständen zusammengefasst. Dabei wurde auch der Einfluss der relevanten Feldstärken von umliegenden ortsfesten Funkanlagen berücksichtigt.

	In Hauptstrahlrichtung (in Meter)	In vertikaler Richtung (in Meter)	Montagehöhe der Bezugsantenne über Grund (in Meter)
Gesamtstandort	14.27	2.12	24.98

Der Standortbezogene Sicherheitsabstand ist für Standorte, für die vor dem 28.08.2002 eine Standortbescheinigung erteilt wurde, auf die unterst montierte Sendeantenne bezogen. Eine Angabe der Montagehöhe der Bezugsantenne kann aus datentechnischen Gründen für diese Standorte nicht immer erfolgen.

Figure GE-4. Minimal safety distance as stated in a “Standortbescheinigung”.

8.3 Other Projects

8.3.1 IZM, Informationszentrum Mobilfunk

The IZM (www.izmf.de) is an organization created by all the German telecommunications providers to give information about the new technologies and to answer to the public concerns and questions about communication systems. Above all, the IZM offers current facts and deepening background information to the subject of mobile phone and health. In addition the IZM gives information on the advantages and effects of the mobile communication for the society. Regarding mobile telephony and health, IZM supplies very valuable information including informative brochures, guidelines, research reports or measurement campaigns like those committed to the TÜV Nord Gruppe in 2003 and 2004 in Nordrhein-Westfalen and Hessen, respectively.

TÜV NORD Gruppe

This company performed the above-mentioned campaigns of measurements of electromagnetic fields from mobile communications stations and Radio and TV transmitters. The measurements determined the electromagnetic fields in schools and clinics at more than 100 locations, especially in the vicinity of so called sensitive places as well as kindergartens, but also in private residences. Equipment used for the measurements in Nordrhein-Westfalen was the Advantest spectrum analyser R3271A, and the Schwarzbeck field probes for electric field EFS 9221 magnetic fields FMZB 1547101. In Hessen they used FSP3 Rohde & Schwarz spectrum analysers, the same H-field probes, isotropic 3-axes E-field probes Rohde & Schwarz and software RFEX V3.20 also from Rohde & Schwarz. The procedure followed the German 26 BImSchV, ordinance in concordance with the EU-Recommendation (02) 04. Furthermore, the E DIN VDE 0848-3-1 (2002) ordinance about protection of people with medical implants was also considered.

In the federal state Nordrhein-Westfalen the campaign was performed in Bielefeld, Essen, Köln and Wuppertal in October 2003. Measurements were both broadband and frequency selective. In certain locations, the electric field component was measured in the frequency range of the mobile phone-transmitters (D- and E-network and UMTS). At certain other sites, the electric field component was determined in the frequency range 30 kHz to 2.8 GHz as well as the magnetic field component in the range from 30 kHz to 30 MHz. The measurements performed in Hessen in 2004, were carried out on one hand, similar to those in 2003 but, on the other hand, with the methods described in RegTP MV 09/EMF/3, (basically broadband measurements from 9kHz to

3GHz were made outdoors at a height 1.5 m from ground) to be compared with the results of the RegTP Messaktion. In the frame of indoor assessments DECT was also considered using narrow band measurements. The results and methods are published in PDF format in the website of the IZM.



Figure GE-5. Typical measurement scenario: In red, the 3 measurement spots that form a triangle of 1.5 meter side.

8.3.2 Funkwellen Meßprojekte, Baden-Württemberg

The Federal Bureau of Environment in Baden-Württemberg accomplished a campaign of measurements (<http://www.lfu.baden-wuerttemberg.de/lfu/abt3/funkwellen/>) in four representative places in the region, Stuttgart, Heidelberg-Mannheim, Freiburg und Oberschwaben, to assess the exposure of population to RF radiation, which of the communication systems provokes more immission, or how do the fields change in the environment. The measurements were performed in 895 sites (indoor and outdoor spots) from October 2001 to March 2003 and were carried out by the company Botonic GmbH. The procedure followed the protocols from the RegTP and BUWAL, however some changes were made. Spectrum analysers and antennas were used to perform selective frequency measurements in the bands of Amateur Radio, Radio, TV, TETRA, GSM, UMTS and radar communications (the latter ones with special procedures). The intensity of the electric field was measured to provide a direct comparison with the 26. BimSchV limit values. The evaluation of the results was compared with the EU Recommendation 1999/519/EG (also based on the ICNIRP guidelines).

The outcomes of the project can be accessed in pdf format, where the methods, materials, evaluations and conclusions are explained, or in html format on the project website. A GIS allows to select the location of a measurement and to view the results. These results are displayed as in Table GE-3 below showing the total immission (*Gesamtimmission*), which is the maximal value in the ranges 9kHz-10MHz (LMK frequency band, *Körperstromwirkung*) and 100kHz-3GHz (*Thermische Wirkung*).

In the pdf files, results are also shown in diagrams and surface plots for defined areas as can be seen in Figure GE-6. Available in pdf format are also the tables with detailed values of E-field in all the frequency bands examined.

8.3.3 Mobilfunk Messungen, Nürnberg

The Municipality of Nürnberg requested the EM Institut Regensburg for information about immission by radio frequency transmitters. The measurements were carried out in June 2003 at

selected places next to GSM and UMTS base stations using the methods described below. The principal task was to compare the measured values with the local thresholds and with the more restrictive Swiss guidelines. The parameter measured was the electric field strength.

Messpunkt Nr	2253
Gemeinde	Stuttgart
Rechtswert	3512000
Hochwert	5408000
1. Körperstromwirkung	
Summe Rundfunk LMK	0,91 %
2. Thermische Wirkung	
Rundfunk LMK	0,35 %
Rundfunk UKW	0,13 %
Fernsehen	0,04 %
Mobilfunk	0,68 %
Sonstige Sender	0,05 %
Summe thermische Wirkungen	0,78 %
3. Gesamtimmission	
maximale Grenzwertausschöpfung	0,91 %

Table GE-3. Results from a spot measurement in the Funkwellen Messprojekt, displayed as a quotient of the guidelines for limiting exposure. The values *Rechtswert* and *Hochwert* give the geographical location of the measurements.

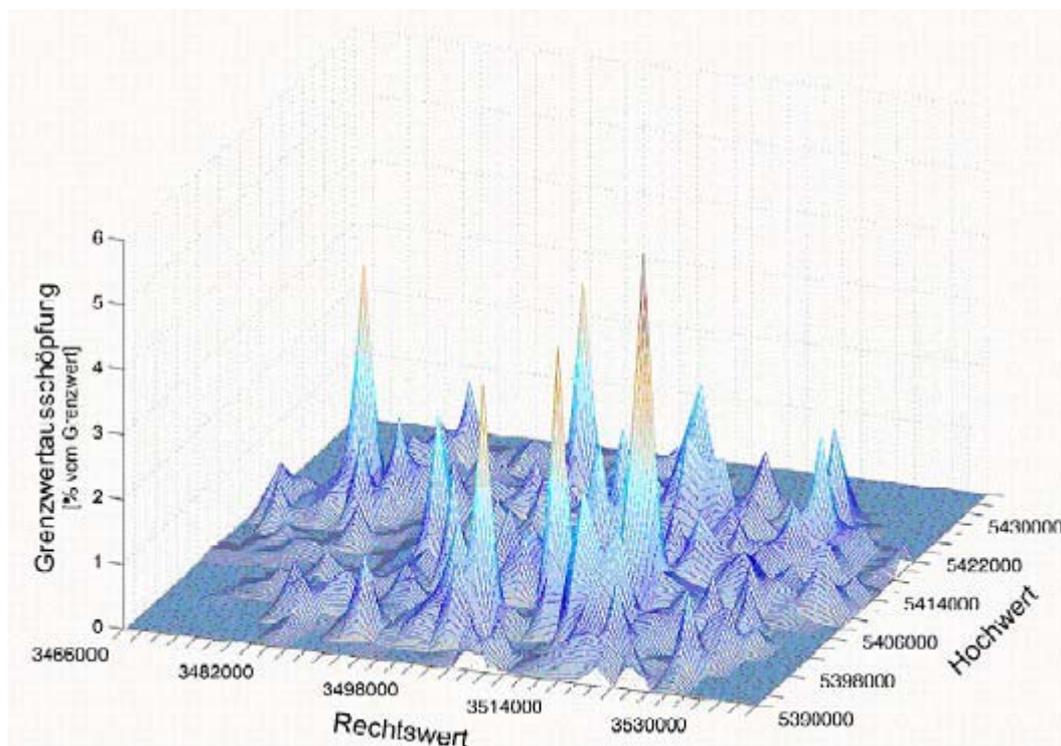


Figure GE-6 Distribution of the total radiation, expressed as a quotient of the limit value, in an area 70x44 km (70 km Rechtswert, or in the eastern direction, and 44 km Hochwert, in the northern direction) in Stuttgart.

Measurements were taken 21 places near to 10 antenna places. First there was a search for the maximum field strength to select the spot where measurements will be done. All measurements were done frequency selective with spectrum analysers in the GSM and UMTS band. No further sources were considered. Afterwards the values were compared with the limits in German

26.BimSchV and used by in Switzerland. Further analysis was done categorising the locations into sensitive (kindergarten, school, etc.) places and doing cumulative calculations.

Messpunkt Nr.	Summenfeldstärke in Prozent vom Grenzwert nach 26. BImSchV	Summenfeldstärke in Volt/m	Leistungsflussdichte (Summe) in Mikrowatt/m ²
1a	0,71 %	0,42 V/m	462,0 μ W/m ²
1b	0,37 %	0,22 V/m	126,7 μ W/m ²
2a	6,97 %	4,10 V/m	44.561,2 μ W/m ²
2b	5,01 %	3,06 V/m	24.813,5 μ W/m ²
3a	3,74 %	1,73 V/m	7.959,7 μ W/m ²

Figure GE-6. Exposure quotient, total electric field and power density in a set of locations.

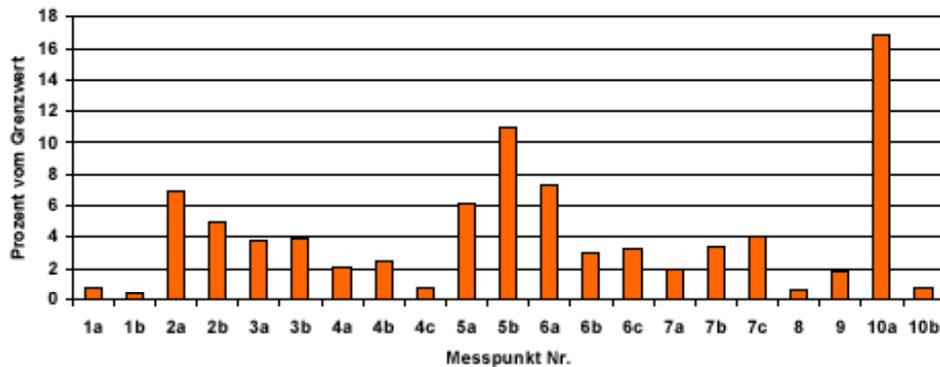


Figure GE-7. Exposure quotient of a series of spot measurements.

The immissions inside a public bus was also measured. Again electric field strength was measured using spectrum analysers and a base stations simulator.



Figure GE-8. Measurement scenario in a bus.

Inside and outside values were compared and expressed as the quotient of the limits of the guidelines of the decree 26.BimSchV. There is a report with the procedures and results publicly available as PDF:

(<http://www.umwelt.nuernberg.de/download/info/mobilfunkmessungen2003.pdf>).

8.3.4 Schleswig-Holstein

The Federal Bureau of Environment in Kiel performed together with the Ingenieurgemeinschaft für Geowissenschaften und Umwelttechnik of Munich a series of measurements of the radio frequency electromagnetic fields in the region of Schleswig-Holstein in 2000. The aim was the assessment of the public exposure to electromagnetic radiation in different environments according to the German 26 BimSchV decree. Selective frequency spot measurements were made at outdoor and indoor locations, following the German recommendation, in the frequency bands of medium wave, UKW band, TV, GSM and radar.

The results are available in pdf format (www.umwelt.schleswig-holstein.de/), and display the electromagnetic intensity in every location as a percentage of the limit value. The plots also show which percentage of this total radiation corresponds to every communication system. The report also includes measurements of radiation from electric appliances (mobile phones, baby phones, microwave ovens and DECT devices) performed in indoor scenarios.

8.4 Legal requirements

In the ordinance 26th BImSchV (*26th Ordinance Implementing the Federal Immission Control Act of 16 December 1996, 26. Verordnung zur Durchführung des Bundes-Immissionsschutzgesetzes*), which was issued on 16th December 1996 by the Federal Ministry for Environment, Nature Conservation and Nuclear Safety (BMU), are stated limits of electric and magnetic field strengths for 16 2/3 and 50 Hz and in the range from 10 MHz to 300 GHz. This ordinance is valid for the general public and is in accordance to the ICNIRP recommendations.

The 26th Ordinance Implementing the Federal Immission Control Act is only valid for transmitting stations serving industrial aims or find appropriation in commercial business companies. Transmitting stations of radio applications governed by public law are not covered. The “Order on the procedure for providing proof as regards limiting exposure to electromagnetic fields” (*BEMFV, "Verordnung über das Nachweisverfahren zur Begrenzung elektromagnetischer Felder"*), which was issued on 20th August 2002 by the Federal Ministry of Economics and Labour (BMWA), extends the application area of the Federal Immission Control Act in the way that also federal operators are incorporated. This ordinance based on the ICNIRP recommendations is also valid for the general public, but in the frequency range from 9 kHz – 300 GHz.

Frequency f [MHz]	El. field strength *) E [V/m]	Magn. field strength *) H [A/m]
10 - 400	27,5	0,073
400 - 2.000	$1,375 \times f^{1/2}$	$0,0037 \times f^{1/2}$
2.000 - 300.000	61	0,16

*) rms-value, averaged over 6-minute-intervals

Table GE-4. Limits of the 26-BimSchV in the radio frequency range of fixed transmitting stations

In Germany calculations or measurements are mandatory since 1997 before a stationary RF emitter is put into service in order to prove the compliance with the limits (Ordinance on limit values for EMF or “*Verordnung über das Nachweisverfahren zur Begrenzung elektromagnetischer Felder*”). For each emitter a form (the “*Standortbescheinigung*”) containing

the technical data and the safety distance has to be issued by the RegTP (as seen in the EMF-Datenbank) and handed in to the local authority before operation.

9. Greece

9.1 Introduction

The two principal institutions for EMF exposure aspects are the Greek Atomic Energy Commission (E.E.A.E.), which is the national competent authority for the protection of the general public and the environment against ionizing and non-ionizing radiation, and the National Telecommunications and Post Commission (EETT), which is the National Regulatory Authority that supervises and regulates the telecommunications, as well as the postal services market. Furthermore, university laboratories also provide information, by themselves or in collaboration projects with the financial support of mobile operators.

The Greek authorities have adopted the European reference levels, applying an additional safety factor of 20%.

9.2 EEAE, EETT

9.2.1 Purpose of the information

The non-ionizing radiation office of the E.E.A.E. (<http://www.eeae.gr/el/topics/index.html>) is responsible for performing controls and measurements in the environment of all kinds of non-ionizing radiation facilities, such as power lines, high voltage substations, audio, radio and television installations, mobile phone base stations, radar facilities, satellite earth stations and other microwave communication systems. The purpose is to inform the public about exposures and give a direct comparison between reference levels and measured values. However, the information provided has also a scientific role, since the presented measurements may serve as the first step to study long-term changes in the electromagnetic environment of urban areas and compare them with other areas and cases.

9.2.2 Availability of data

The major part of the information is available as written measurement reports that have already been delivered to the authorities or persons who asked for such information. They are also available to everybody interested. The results of the measurements are also being announced in one-day workshops open to everybody and those proceedings have been published and are freely distributed by the EETT (http://www.eett.gr/eng_pages/index2.htm). The information provided includes also descriptions of the procedures, national and European legislation on exposure to fields, as well as informational brochures, published together by EEAE and the network operators, entitled “*Mobile phones, base stations and health*”.

9.2.3 Description of Methodology

Spot Measurements

Starting from the year 2000 until the first six months of 2003 the non-ionizing radiation office (EEAE) has performed over 400 inspections and measurements at various places in Greece, where all kinds of non-ionizing radiation facilities are installed. In the Figure GR-1 the kind and the ratio of the performed measurements are depicted. The exposure is assessed with measurements only. The measurements are both broadband and frequency-selective. The installed area monitoring systems performs broadband measurements, but a new monitoring

system is also used, which allows continuous registration of electric field values in narrower bands (GSM-900 and GSM-1800 + UMTS). Frequency-selective equipment (spectrum analyser) is used by University laboratories for spot assessments of the exposure, taking into account international documents like the ANFR and CEPT protocols.

At the majority of all the non-ionising radiation facilities examined, no places accessible to the general public with electromagnetic field quantities in excess of the safety limits were found. In fact, the measured values at almost all of the examination points were found to be well (from tens to thousands times) below these levels. High electromagnetic field values over the safety values were certified in eight cases only. After all the necessary actions conducted from the responsible institutions, measures concerning public safety have been accomplished in all cases.

9.2.4 Status of the project

The process of exposure assessment is still ongoing with no definite date of finalization.

9.2.5 Display of the information

The data of all the EEAE measurements are saved in .txt or .csv formats. The data of the continuous measurements of the area monitoring systems are included in a database, but frequency-selective spot measurements are not part of this database. They are saved in ASCII or csv formats.

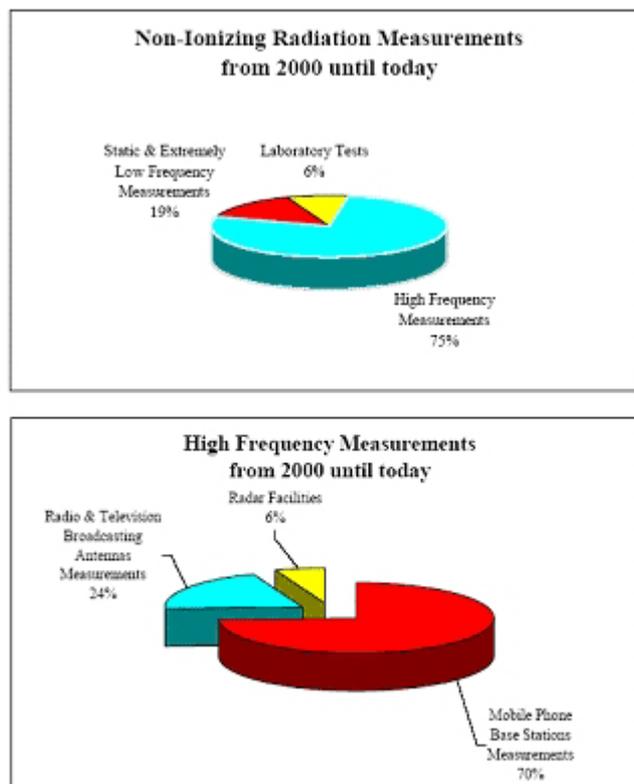


Figure GR-1. Summary graphic of the type measurements carried out by the EEAE.

9.3 University Institutes

9.3.1 Purpose of the information

The telecommunications company Vodafone, the [Mobile Radio-Communications Laboratory](#) of the [National Technical University of Athens](#) and the [Radiocommunications Laboratory](#) of the

[Aristotle University of Thessalonica](#) perform a monitoring project, called *Hermes*, in several places of the country to assess public exposure to RF radiation. The Radio-communications Laboratory of the Aristotle University of Thessalonica is also performing frequency-selective spot measurements, which aim at assessing the exposure in urban and semi-urban environments.

9.3.2 Availability of data

The data from the monitoring project (HERMES Project) are available on the Internet at the website: www.hermes-program.gr, whereas the data of the campaign of frequency selective measurements can be found at http://rcl.physics.auth.gr/Measurements/Main_Entry.htm.

9.3.3 Description of Methodology

HERMES Project

The scope of the "HERMES" project is the monitoring of the radio frequency electromagnetic radiation levels in the environment, produced by various sources, such as Radio and Television transmitters, Cellular Telephony base stations etc. The remote stations record continuously the electromagnetic radiation and transmit the data to the two central control stations, located at the Mobile Radio-Communications Laboratory of the National Technical University of Athens and at the Radiocommunications Laboratory of the Aristotle University of Thessalonica. The received data is processed and published on the Internet in comprehensive way using the public format at the website www.hermes-program.gr.

The system comprises of:

- (a) The remote monitoring stations, which are currently mainly located in schools and perform measurements of RF radiation levels and,
- (b) The central control station, which are located in the two University Laboratories participating in the project. These stations are responsible for the control of the monitoring stations and the publication of the measurement results on the web.

The communication between the remote monitoring stations and the computer of the central control station is achieved via a GSM modem. The GSM modem sets up a connection of a computer to the cellular network. Given that the remote monitoring stations are equipped with a corresponding modem, the control station administrator can, at any time, connect to the remote station (a process similar to calling a cellular telephone) in order to transfer the stored measurements to the central computer.

The remote monitoring station comprises an E/M radiation sensor (with isotropic tri-axial probes), which sweeps the frequency range from 100 kHz to 3 GHz (which includes the contribution of all sources, e.g. radio and television broadcasting antennas, cellular telephony antennas, etc) and an embedded device, which processes, stores and transmits the measurement data to the central control station. The data is sent to the respective central control station on a daily basis, via the cellular telephony network. The measuring devices that are under the responsibility of the A.U.Th. apart from the whole frequency range, can separately cover the two frequency bands used by the cellular telephony networks (GSM-900 and GSM-1800 & UMTS).

The quantity control used to assess exposure is the effective (rms) value of the electric field strength, expressed in Volts per meter (V/m). The next step is to compare the measured field strength with a reference value. The monitoring station has all the necessary technical characteristics and qualifies for an electromagnetic radiation monitoring system. The remote monitoring stations measure the effective value of the electric field strength by conducting

measurements every 3 seconds. Then, the mean effective value of the electric field strength is computed for a time interval of 6 minutes, which has been adopted in Europe and other countries as the minimum time interval of observation and comparison with the reference levels (EU Recommendation). Finally, the time mean value of the effective value of the electric field strength is computed, which is graphically represented versus time on the website.

Frequency Selective Measurements

The University of Thessalonica performs selective frequency outdoor measurements which can also be accessed through the Hermes project website (and also through their own website). Receiving antennas (bi-conical and dipole) with an isotropic radiation pattern in at least one plane and linear polarization were used to estimate the total power density from a radiation source. A spectrum analyzer connected to a computer was used to process and save the measurements.

All 15 measurements took place outdoors, near GSM base stations (50-250m distance), which can be freely accessed by the general population (e.g. roads, playgrounds, schools, squares, or the vicinity of public buildings). The measurement points were chosen in such a way that they are distributed along the whole urban area of Thessalonica, in order to make a first estimation of the exposure levels in this area. The frequency range measured in the present study (20 - 3000 MHz) was divided in a number of frequency bands. An appropriate antenna was used for each band. Bi-conical antennas (EMCO) were used in the range 20 – 300 MHz, and dipole (Hewlett-Packard) for the ranges 300 – 1000 MHz and 1000 – 3000 MHz.



Figure GR-2. Measurement locations in Thessalonica.

Each of the three frequency ranges measured with a specific antenna type, was divided into sub-bands. The power density and corresponding Exposure Quotient, on each frequency sub-band (e.g. FM, GSM), are estimated by processing spectra received with different intermediate filters. The identification and the detection of the peak values (of the emissions) are made in the spectrum recording taken with the narrowest intermediate filter. On the other hand, the estimation of the final value is made with the values taken with a wide intermediate filter, in order to overestimate the power corresponding to each discrete peak (emission frequency). By using software for automated measurement, there is the possibility to divide each frequency range into sub-bands, in order to achieve a detailed scan. Each frequency sub-range can be scanned up to 50 times. The data are transferred and saved in the computer's hard disk, for further processing.



Figure GR-3. GIS from the Hermes Project. The dark coloured areas of the map of Greece indicate the prefectures where the project is currently being developed.

9.3.4 Status of the project

The Hermes Monitoring is an ongoing project. The University of Thessalonica plans to continue and expand the frequency selective measurements.

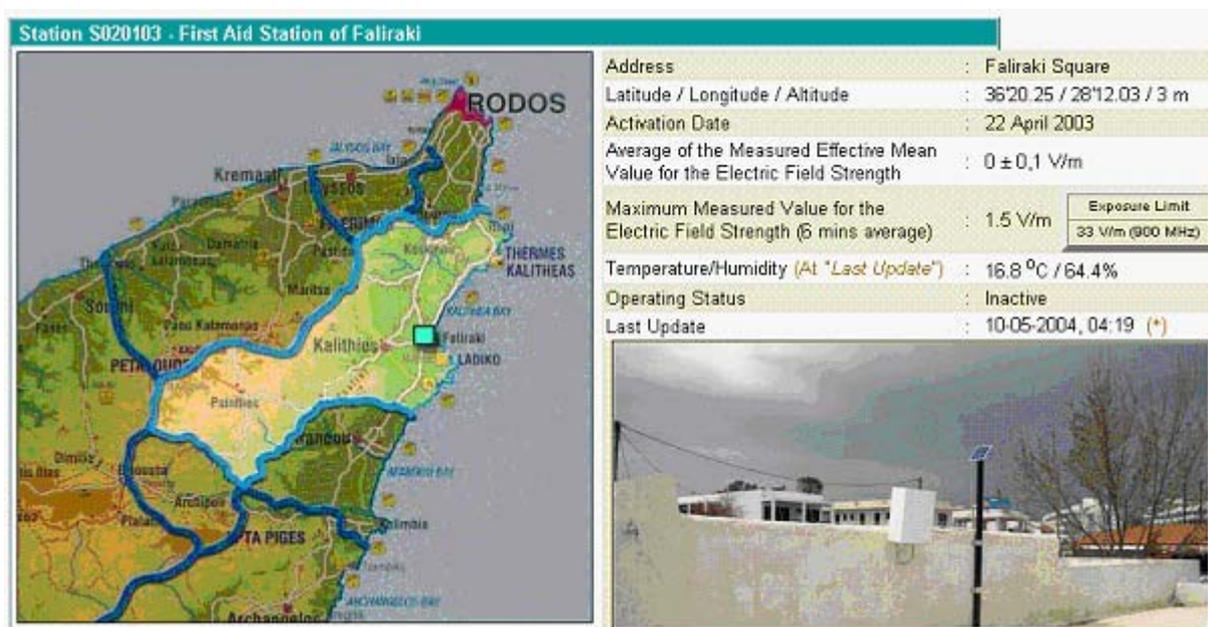


Figure GR-4. Visual display of the characteristics and the results of a spot measurement.

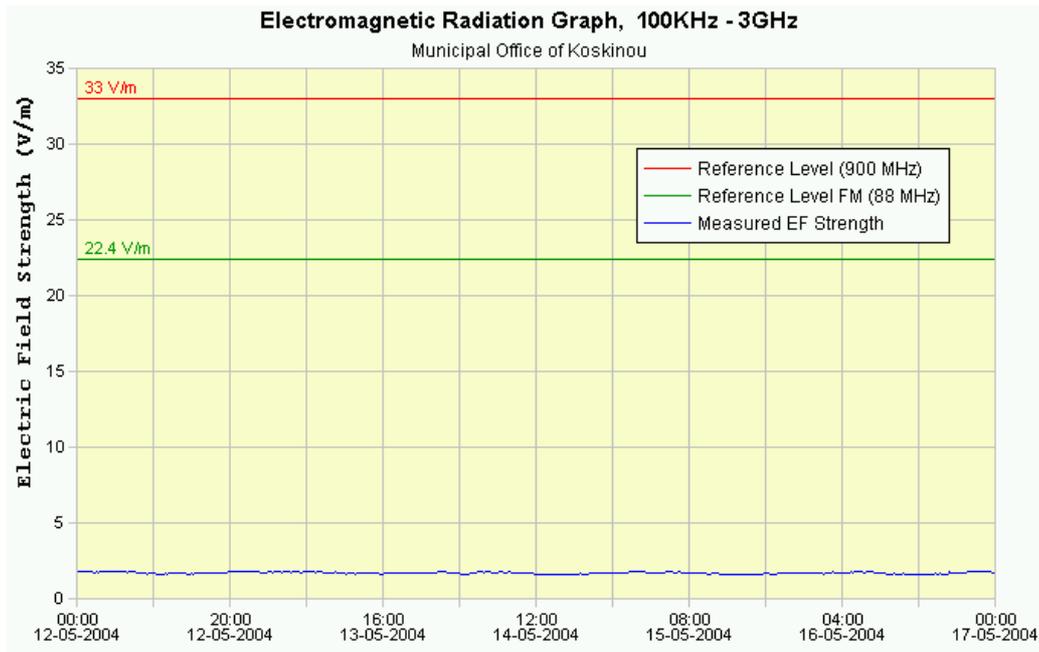


Figure GR-5. Electric field strength versus time at a monitored location of the project.

9.3.5 Display of the information

HERMES Project

The website of the monitoring project includes many information about the procedure, FAQ’s and results of the measurements. First a GIS permits to choose a place of the country were monitoring is being performed (see Figure GR-3). When a place is chosen, the characteristics of the location are shown, see Figure GR-4. Below these panels, a formulary avoids that the user selects the graphic of the monitoring during a day or days.

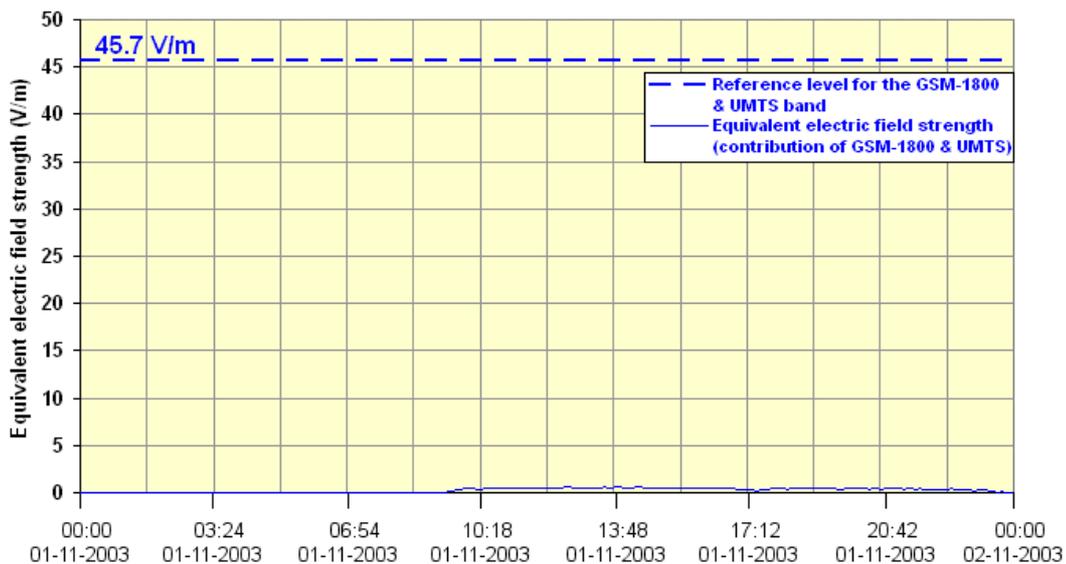


Figure GR-6. Variation of the electric field strength of the GSM 1800 and UMTS bands measured at a station during one day.

As seen in Figure GR-5, the graphic of results shows the measured levels in comparison with the GSM and FM guidelines, for the chosen location. The Hermes project also performs frequency

selective monitoring of the spectrum. The Figure GR-6 below shows the results for a location in the municipality of Thessalonica. The user can choose as well the time span of the graphic, and whether the total band, the GSM 900 or the GSM 1800 + UMTS contributions to be displayed.

Frequency Selective Measurements

The results of the measurements are available at <http://rcl.physics.auth.gr/Measurements>. The website also includes the information given here about description of the project: measurement methods, legal frame of the measurements (guidelines followed: Greek legislation based on EU recommendation), or definition of the basic concepts about exposure. The results are shown on a map of the city as in Figure GR-7, where the red spots indicate the location of the measurements.



Figure GR-7. Location of the frequency selective measurements of the exposure performed in the city of Thessalonica.

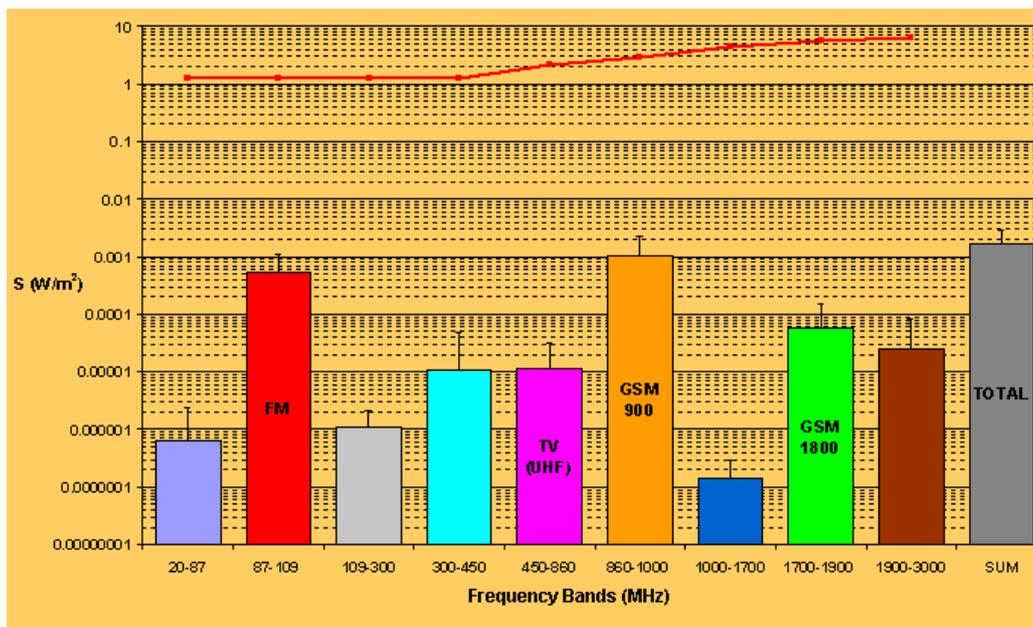


Figure GR-8. The bar graph depicts the estimated power density for each sub-band of the controlled spectrum (for the 15 measurements conducted). The red line denotes the reference level for the central frequency of each sub-band, according to the Greek law.

A summary of the total results (see Figure GR-8) and the single results in every location can be seen. The levels of exposure are shown separately for every frequency sub band, as power density or as total exposure quotient.

9.4 Legal requirements

The Greek authorities have adopted the European reference levels, applying an additional safety factor of 20%. The Greek reference levels are specified in the Common Ministerial Decree No 1105 of the 6th September 2000 (*Act 1105/Vol. II/6.9.2000 "Measures to protect the general public from the operation of ground antenna installations"*). For every new planned land based antenna installation, a proper technical study for its EM emissions must be prepared by the owner and submitted to EEAE in order to prove that there are no places accessible to the general public where the exposure levels exceed the 80% of the reference level values (as stated in the EU recommendation). After examination, EEAE gives its expert opinion to the EETT. For already existing installations, a declaration of conformity is also submitted to prove that safety limits are not exceeded.

10. Hungary

10.1 Introduction

The National Public Health Centre - National Research Institute for Radiobiology and Radiohygiene (OSSKI, www.osski.hu/) is active in the EMF in situ survey measurements area. The survey or expert report that have been performed by OSSKI are available on the Internet website of the institute. The institute has examined more than thousand measurement sites located mainly around mobile base stations. At more than 290 measurement sites frequency selective measurements have been made according to the COST244bis STM protocol. There are also other professional enterprises measuring the EMF in the environment and workplaces.

10.2 National Research Institute for Radiobiology and Radiohygiene

10.2.1 Purpose of the information

The main purpose of the information on the web is dedicated to the information of the public. The measurement survey for exposure assessment is also used for scientific information purposes about the environmental exposure situation. In some cases the operators have to obtain a certification on the RF exposure around the base stations.

10.2.2 Availability of data

The data are available for scientific evaluation and purpose mainly. Not all data are available for the public. The information of data is restricted to certain institution according to the accreditation certificate of the laboratories in the institute. In case of specific request by the local government or public the institution often provides specific exposure data.

10.2.3 Description of Methodology

For the exposure assessment OSSKI also applied numerical calculation using the Telstra model (Mobile Base Station Field Intensity Plotting Program, MBSFIP) software. For the measurement both frequency selective and broadband measurement were used for monitoring and/or spot measurements. A recent investigation of the institute was "*RF exposure from GSM mobile phone base station in Hungary: a study within the COST STM*" performed by G. Thuroczy.

For that purpose frequency selective measurements were performed in the bands of GSM 900 and GSM 1800 down links. The assumption was made that far field conditions can be assumed. Therefore the measured electric fields could be converted to power densities. Measurements were performed using wide band antennas (PBA 10200 (ARCS) 80 MHz-2200 MHz) connected to a spectrum analyser (Advantest U4941) and the antenna was always mounted on a tripod at slightly varied heights around 1.5 m. During the sample (scanning) time, the maximum field strength in each direction was obtained by using the “peak hold” function of the analyser.

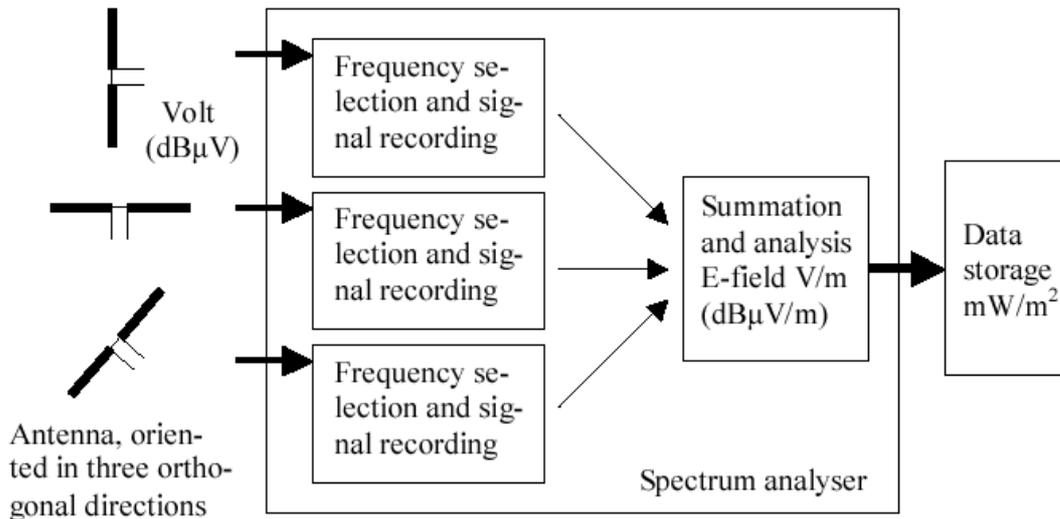


Figure HU-1 Scheme of the measurements performed for the COST 244 project

All data were obtained from spot measurements ($N = 292$), and in most cases no information concerning the variations of the field strengths versus time was available. The effective power density was obtained by the vectorial summation of the orthogonal electric field (V/m) components. Using the formulae $P = E^2/377$, the result is expressed as the effective power density in mW/m^2 .

The measured exposures were expressed in mW/m^2 . The data were expressed as:

- S_{sum} (mW/m^2): The sum of all power densities in the respective GSM band
- S_i (mW/m^2): The highest power density measured at a single frequency in the respective GSM band

10.2.4 Status of the project

The process of exposure assessment is ongoing. There was a finalization evaluation in the COST244bis STM, as explained in 10.2.3. Nowadays there have been collected enough data for a new evaluation since the final report of COST244bis.

10.2.5 Display of the information

The measurement data and the information about the places where any examination have been performed are available in Excel format.

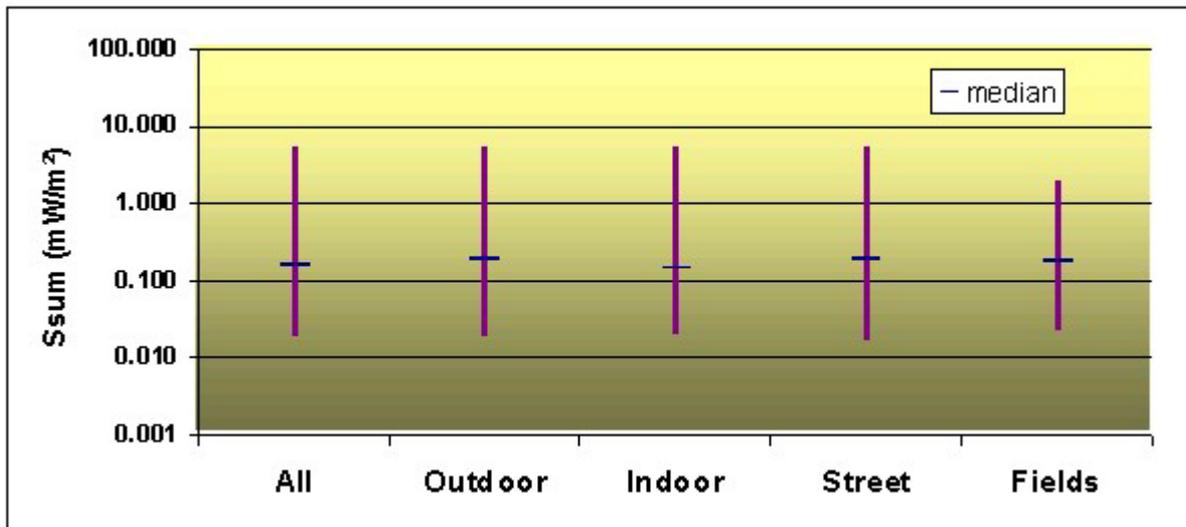


Figure HU-2. Power density in different type of environment
 (S_{sum} (mW/m^2): The sum of all power densities in the respective GSM band)

10.3 Legal Requirements

The Ordinance 32/2000, "Ordinance on reference RF levels emitted by radio communication masts" has been issued in 2000 by the Ministry of Health and covers the frequency range 30 MHz – 60 GHz. The National Communication Authority is responsible for giving the permission of radio transmission to the operators. They have all technical data of any radio transmitter installed. Otherwise, according to an ordinance by Ministry of Informatics and Communications any new radio station need an expert report of EMF exposure assessment when the radiated RF power emitted by the stations is higher than 400 W ERP in any direction and the stations will be planned in the residential living and/or resting area. The ordinance was published and put into power in 2003 April.1. (Revised in 2004 as the 6/2004 Ordinances of Ministry of Informatics and Communications).

In Hungary, the 1999/519/EC Recommendation was fully adopted by the government. The new ordinance "63/2004 (VII.26) EszCsM Ordinance" issued on 26th of July 2004 by the Ministry of Health, Social and Family Affairs is responsible for the regulation on the exposure limits of electromagnetic fields. The new ordinance has been in force since 4th of August 2004.

11. Ireland

11.1 Introduction

ComReg (www.odtr.ie/) is the statutory body responsible for the regulation of the electronic communications sector (telecommunications, radiocommunications and broadcasting transmissions) and the postal sector in Ireland. Among its tasks the ComReg is occupied with EMF exposure assessments, namely audit reports to verify that licensed operators are in compliance with their license conditions relating to emission limits for radiation, measurements of non-ionizing radiation (NIR) emissions at sites in the Republic of Ireland, and the 'Site Viewer' facility, a database of the national mobile phone base stations.

11.2 ComReg

11.2.1 Purpose of the information

The aim of the audit reports was obviously to verify that licensed operators were in compliance with their licence conditions relating to emission limits for non-ionising radiation. The Siteviewer tool is an informative search engine that shows all the RF stations in the country. The NIR measurements are being performed to assess public exposure assessment, especially in sensitive places.

11.2.2 Availability of data

In the website all the information about the audits and the measurements of NIR performed are available in pdf format, but also the results are available in html format. The Site Viewer (http://www.siteviewer.ie/siteviewer/site_search.asp) database allows everybody to get information about mobile sites in Ireland with additional information about the site name, operators (Meteor, O2 and Vodafone), transmission types and the height of the used antennas.

11.2.3 Description of Methodology

NIR Measurements

The full NIR program consists of the measurement of Non-Ionizing Radiation emissions at 400 sites throughout the country. The site measurements were planned and carried out by the Safety and Environmental Test Section of the National Electronic Technology Centre (NETC). NETC is the only Irish agency accredited by the National Accreditation Board (NAB) to measure the levels of non-ionising radiation from telecommunications masts. At each location electric field strengths measurements were conducted in the frequency bands of interest, and recorded and converted to power density levels for direct comparison with the ICNIRP guideline levels. These power density levels are tabulated alongside the relevant ICNIRP limits.

Measurements of the non-ionizing radiation emissions from each site were conducted in accordance with ECC Recommendation (02) 04. For the purposes of this program, measurements were carried out at GSM sites and Mixed Use sites (*Radio and TV transmission stations, and other non mobile stations*). An initial survey of the area was conducted to determine the location(s) of highest non-ionizing radiation emissions. At the “GSM only site” this was done by using a broadband probe and an engineering mobile phone, in conjunction with the appropriate software, to identify the position of maximum field strength. The engineering mobile phone provides an indication of the field strength levels from the GSM channels in use in the vicinity of the site.

Once the location of the highest field strength emissions were identified, a series of narrowband measurements were taken at these locations. These measurements were performed using Hewlett Packard spectrum analysers and associated EMCO antennas. At “GSM only sites”, measurements were performed over the frequency range from 300MHz – 2GHz. This range includes both the GSM 900 and GSM 1800 bands. For mix use sites, measurements were performed over the frequency range 30MHz – 40GHz. These measurements included all radio services that are present at these sites. These services include GSM, Broadcasting, fixed links, MMDS, FWA, Point to Point links, amongst others. At both “GSM only sites” and “Mixed Use sites”, electric field strength measurements conducted in the frequency bands of interest, are recorded and converted to power density levels for direct comparison with the ICNIRP guideline levels. These power density levels are tabulated alongside the relevant ICNIRP limits. The tables present the highest emission level readings recorded within a band.

Audit Reports

The Commission for Communication Regulation commissioned three audit reports (1998, 2000 and 2001) to verify that telecommunications licensed operators complied with their license conditions relating to emission limits for non-ionising radiation. These audits were performed nearby to transmitters to ensure compliance. On the basis of the results detailed in the publications available at the website (pdf format), ComReg confirmed that all operators audited met the necessary requirements. To ensure that licensed operators are in compliance with their license conditions relating to emission limits for non-ionising radiation, the Office of the Director of Telecommunications Regulation (ODTR) is the licensing authority.

The measurements were made using broadband equipment in the frequency range 100 kHz to 40 GHz and narrowband equipment over the frequency range of 30 MHz to 14 GHz. The broadband equipment calculated the total power density over a frequency bandwidth of 0.1 MHz to 40 GHz. This frequency bandwidth covers long-wave, medium wave and FM radio broadcasts, VHF & UHF television, the cellular mobile telephone services, MMDS (Microwave Multipoint Distribution System) and Rurtel transmissions and microwave point-to-point links up to 40 GHz. Narrowband emissions were measured in the frequency range from 30 MHz up to 14 GHz, depending on the particular transmitter frequencies in use at a particular site. This enables the power level from each transmitter to be determined. This frequency range includes FM radio broadcasts, VHF & UHF television, the cellular mobile telephone system, MMDS and Rurtel transmissions and microwave point-to-point links.

11.2.4 Status of the project

The project of measurements is still ongoing; actually, 300 locations are already available at the website. Regarding audits, reports with the results are published every year (available in pdf format to download).

Site	Frequency Range	Highest reading W/m ²	ICNIRP guideline Limit W/m ²
Kilkenny City	300MHz – 1GHz	0.000279678	4.781
	GSM 900	0.000234239	4.75735
	GSM 1800	0.000361958	9.225
	1GHz – 2GHz	0.000232091	9.25

Table IR-1. Emission levels recorded in the NIR measurements in Kilkenny City. The power density and the quotient contained in these graphs are given in exponential (E) format.

11.2.5 Display of the information

NIR Measurements

The Table IR-1 presents the highest emission levels recorded within a specific band. To the left of each of the results tables, a graphical snapshot of the radio spectrum being analysed is presented. Narrowband results were documented as can be seen in Figure IR-1. The results at each site are typically tabulated as four individual results. These are:

- The power density, over the frequency range of interest for the individual license holder (e.g. the MMDS band, from 2.5 to 2.686 GHz for Chorus).
- The times below the ICNIRP Guideline limit for this limited frequency range.

- The power density, over the entire frequency from 30 MHz to 18 GHz (covering VHF radio and television, UHF television, mobile telephony systems, microwave Point-to-Point links and MMDS).
- The times below the ICNIRP Guideline limit for this broad frequency range from 30 MHz to 18 GHz.

In addition, at sites where there were significant transmissions from more than one operator transmitting in the specific frequency range of interest (e.g. at Ennis, where Eircell, Esat Digifone, and Meteor were all transmitting in the GSM 900 band), two extra results are included.

These are:

- The power density, over the frequency range of interest for all license holders transmitting in that frequency range.
- The times below the ICNIRP Guideline limit for all operators transmitting in this limited frequency range.

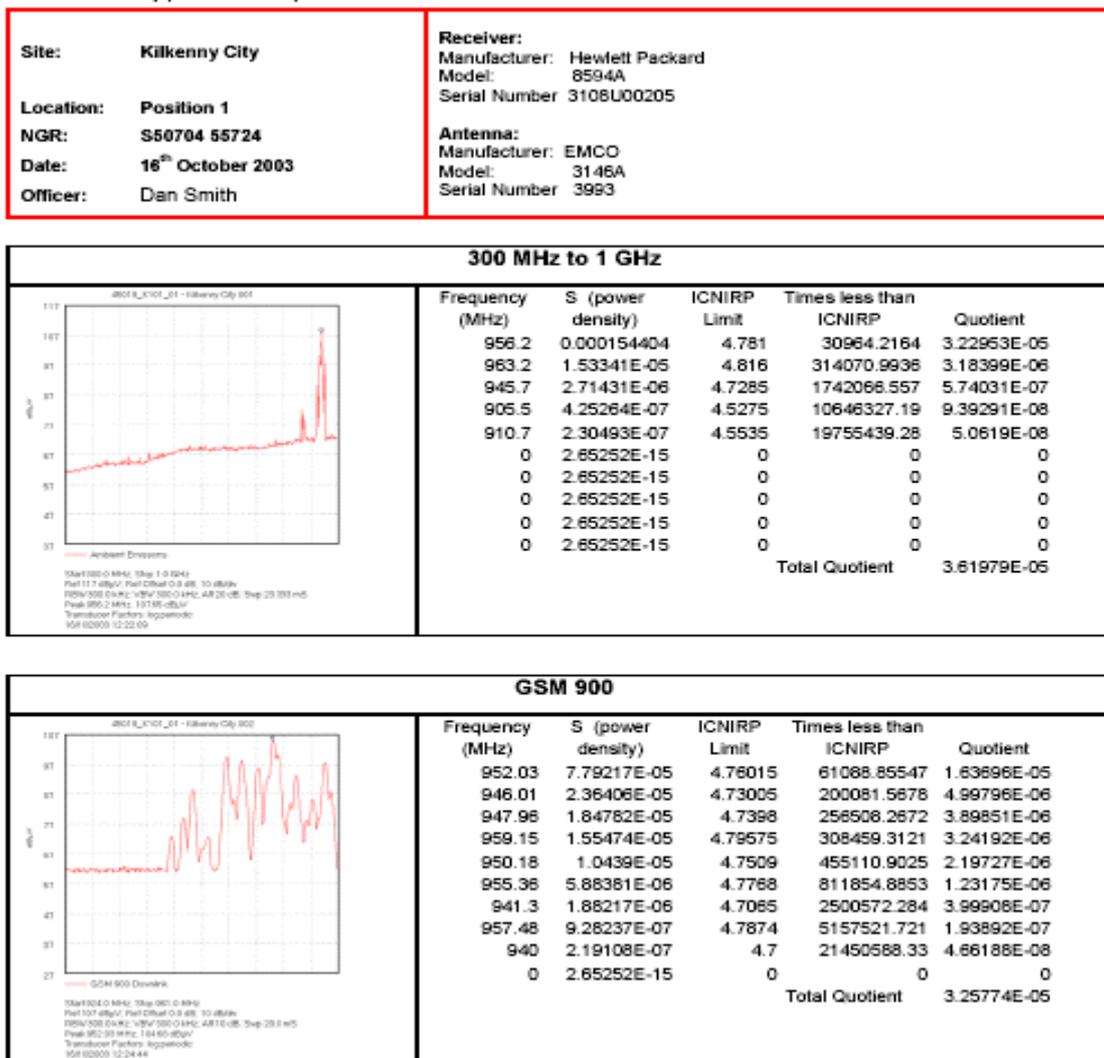


Figure IR-1. Information sheet of a set of measurements in Kilkenny City.

Site Viewer

The 'Site Viewer' facility uses a database of national mobile phone base stations. The Commission for Communications Regulation (ComReg) manages the database; the data itself is the property of the Operators. The system is similar to those already reviewed. A menu allows selection of location, although one can also select the place in the map itself. The results of every search are as in Figure IR-2 and when a mast symbol is double clicked, an 'info' like in Table IR-2 appears, showing the characteristics of the station.

11.3 Legal Requirements

In Ireland there is a Planning and Development Act issued by the Department of Environment and Local Government in November 2001. The limits base on ICNIRP guidelines for the general public in the frequency range 0 Hz – 300 GHz. The compliance of these mandatory limits is verified through the Department of Health and Children (compliance with EC/519/99). A Telecommunications Law issued by the Office of the Director of Telecommunications Regulation (ODTR) based on ICNIRP guidelines covers the frequencies 900 MHz and 1800 MHz and is also mandatory for the public. The compliance of this limits is verified through monitoring by the ODTR.



Figure IR-2. Siteviewer search engine

Site Details						
Site Name	Site ID	County	Site Co-located?	Antenna Height Above Ground (Metres)	Transmission Type	Operator
Knockroe, Abbeyknockmoy	GY029	Galway	YES	30	GSM900	Vodafone

Table IR-2. Details of a RF installation.

For the siting of telecommunication masts in Ireland, guidelines have been issued by the Department of Environment and Local Government in July 1996 for the frequencies 900 MHz and 1800 MHz. These guidelines should protect the general public but are not mandatory.

12. Italy

12.1 Introduction

The Regional Agencies for the Environment Protection ARPA, and the National Agency for the Environment Protection, APAT, on behalf of the Ministry of Environment; and, moreover, the Ministry of Communications through the “Ugo Bordoni” Foundation are Italian institutions that deal with non-ionising radiation and health.

12.2 APAT and ARPA, SINANET

12.2.1 Purpose of the information

The APAT and ARPA constitute the National Network of Environmental Information (SINANET, www.sinanet.anpa.it) dedicated to inform the population about environmental risks. The regional agencies (ARPA) approve BTS installation, and perform controls by means of measurements and numerical simulations.

12.2.2 Availability of data

Data about exposure assessment are collected by the National Thematic Centre of Physical Agents, CTN-AGF, (www.sinanet.anpa.it/aree/AgentiFisici/homeosserv.asp), in coordination with the APAT. On behalf of the Ministry of Environment, APAT issues a synthetic report of National data. In some cases, regional data on BTS (but also on other RF and ELF sources) are available on the websites of those regional agencies (ARPA) that often have already set-up a monitoring activity (i.e. in Piemonte, Veneto, Emilia-Romagna, Toscana).

12.2.3 Description of Methodology

Broadband and narrow-band (if necessary) measurements are performed. Often, the places where measurements have to be performed are chosen from data of the sources archive, and by means of preliminary analysis performed with numerical simulations. There are both fixed and continuous networks of measure, or spot-measurement based campaigns. There is an integrated approach, depending on particular circumstances, and on the level of experience of different ARPAs technical groups.

12.2.3 Status of the project

In many regions the monitoring is regular, and the insertion of new sources requires specific authorization. Currently, data allow only a general evaluation of the levels found around BTS.

12.2.4 Display of the information

So far, data are collected and presented according to regionally defined criteria, which may differ, even if they are collected in a unique format by CTN-AGF; a future standardization is expected. In fact, APAT is going to realize, within SINAnet, the Italian Catalogue of Environmental Data Sources, organized in co-operation with Thematic National Centres (CTN) of SINAnet, each for its specific theme (currently, the website of SINAnet contains the “Observatory about Non-Ionizing Radiation”, but the site is still under construction and the accessible areas need login and password).

The Ministry of Environment includes in its website (www.minambiente.it/) a database with the RF stations that do not fulfill the Italian guidelines about levels of radiation (Decree DM 381/98) and the procedures to be accomplished to solve the problems (also pdf files have been issued with further explanations).

12.3 Fondazione UGO BORDONI

The Ugo Bordononi Foundation (<http://www.fub.it/>) is an Italian institution established in 2000 to promote and encourage the scientific research applied to the field of telecommunications and electronics.

12.3.1 Purpose of the information

In relation with EMF exposure, the Foundation accomplishes the *Monitoraggio CEM* project (<http://www.monitoraggio.fub.it/>) along with the Ministry of communications and supported by the local authorities and the operators of Telecommunications. The project has three objectives:

1. To inform the citizens on the exposure levels and their long and short-term variations.
2. To inform to the scientific community fully on the spatial and temporal characteristics of the distributions RF electromagnetic fields.
3. To create the conditions for a sustainable development of the communication networks with a guarantee of transparency and avoiding unjustified alarm and non-coordinated actions of the local corporation.

The project also gives to telecommunication companies a mean to obtain technical information to eliminate the possible controversy provoked by a non-univocal application of the legal guidelines and standards. It also makes some suggestions about the location of the base station according to the population density of the settlements.

12.3.2 Availability of data

The website of the consortium “Elettra 2000” (<http://www.elettra2000.it/>, whose partners are Fondazione Ugo Bordononi, Fondazione Guglielmo Marconi and The University of Bologna) includes also large amount of information about guidelines, technologies and concerns on the telecommunications systems. Information and documentation are widely available for citizens, experts and companies.

	Centralina EIT Mod. EE - 407	Centralina COMTEST Mod. Sentinel
	<p>Tipo di Sensore: Isotropico</p> <p>Banda di Frequenza: 100 KHz - 3 GHz</p> <p>Gamma di Misura: 0.5 + 150 V/m</p> <p>Risoluzione: 0.1 V/m</p> <p>Campionamento: 1 Misura/sec Program.</p> <p>Campo Misurato: X,Y,Z e Totale; Max e Medio</p> <p>Formato Dati Registrati: Salvabile in Formato ASCII</p> <p>Diagnostica: Attivabile</p> <p>Alimentazione: 6V</p> <p>Consumo: 16 + 300 mA (con GSM in Trasmissione)</p> <p>Temperatura di Funzionamento: -10 + +50 °C</p> <p>Ingombro: 310 x 170 x 427 mm</p> <p>Peso: 4.6 kg</p> <p>Modalità di Trasmissione: GSM, Seriale</p> <p>Download Misure: Automatico / Manuale</p>	<p>Tipo di Sensore: Isotropico</p> <p>Banda di Frequenza: 100 KHz - 3 GHz</p> <p>Gamma di Misura: 0.5 + 100 V/m</p> <p>Risoluzione: 0.1 V/m</p> <p>Campionamento: 5 msec</p> <p>Campo Misurato: Max e Medio</p> <p>Formato Dati Registrati: Salvabile in Formato ASCII</p> <p>Diagnostica: Attivabile</p> <p>Alimentazione: 12V</p> <p>Consumo: 200 mA Max</p> <p>Temperatura di Funzionamento: -5 + +55 °C</p> <p>Ingombro: 350 x 200 x 160 mm</p> <p>Peso: 4 kg</p> <p>Modalità di Trasmissione: GSM via SMS</p> <p>Download Misure: Automatico ogni 4 ore</p>

Figure IT-1. Devices used in the monitoring project Monitoraggio CEM.

12.3.3 Description of Methodology

The monitoring system consist of a measurement centre and a structure for the transmission of the data via the Centri di Controllo Locali (Local Control Centre) and the Centro di Racolta

Nazionale (National Research Centre), attached to the Italian Ministry of Communications. Spot measurements were made with broadband sensors (frequency range 100 kHz to 3 GHz, 0.1 V/m sensitivity), where the intensity due to all the possible operating signals, was measured in the frequency range between 3 MHz and 3 GHz. Pictures with the equipment employed are also available as those in Figure IT-1.

The principal characteristics of the project are summarized in the following table:

Number of hours of observation	334417
Total number of measurements	4025684
Number of monitored places	592
Schools	226
Public buildings or places	97
Private Rooms	265
Health Facilities	4

Table IT-1. Summarized results of the Monitoraggio CEM.

12.3.4 Status of the project

The project is still ongoing and as can be seen in the Figure IT-2, there are regions where the project is active (dark blue), places where it is being activated (light blue) and places where the monitoring must still be defined (yellow).



Figure IT-2. Map showing the Italian regions covered by the Monitoraggio project.

12.3.5 Display of the information

The data is accessible for the general public. The user must choose a region from the map of Italy (like Figure IT-2) and a list with the measurements performed so far will be displayed. When a place is chosen a picture shows the technical information about the methodology of the measurement and a table shows the values of the electric fields obtained (see table IT-2).

Hour of	Mean value in 6 min	Peak Value	X Axis	Y Axis	Z Axis
---------	---------------------	------------	--------	--------	--------

measuremer	(V/m)	(V/m)	(V/m)	(V/m)	(V/m)
1.30	1,00	1,10	1,00	0,10	LOW
1.36	1,00	1,10	1,00	0,10	LOW
1.42	1,00	1,10	1,00	0,20	LOW
1.48	1,00	1,10	1,00	0,20	LOW
1.54	1,00	1,10	1,00	0,10	LOW
2.00	1,00	1,10	1,00	0,10	LOW
2.06	1,10	1,10	1,00	0,30	LOW
2.12	1,00	1,10	1,00	0,30	LOW
2.18	1,00	1,10	1,00	0,10	LOW
2.24	1,00	1,10	1,00	0,10	LOW
2.30	1,00	1,10	1,00	0,10	LOW
2.36	1,00	1,10	1,00	0,20	LOW
2.42	1,00	1,10	1,00	0,10	LOW
2.48	1,00	1,10	1,00	0,10	LOW
2.54	1,10	1,10	1,00	0,10	LOW

Table IT-2. Monitoring data. The Table shows the mean value in 6 minutes, the peak value and the components of the field in the three directions. LOW indicates values under the sensitivity threshold of the devices used.

The data are also displayed in a graphical view as seen in Figure IT-3.

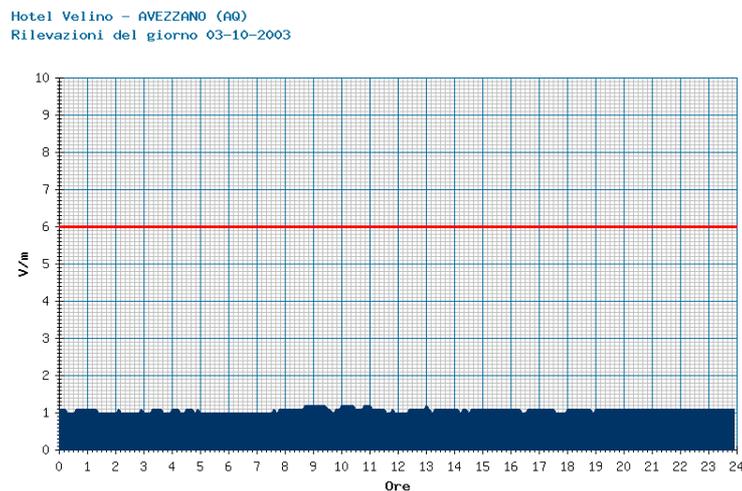


Figure IT-3. 24 hour monitoring graphic.

12.4 Legal Requirements

The Italian Parliament issued the law No. 36/2001 “Framework law on protection against exposures to electric, magnetic, and electromagnetic fields” in February 22, 2001. This law covers installations, systems and devices used for civil, military and public purposes that can imply the exposure of workers and members of the general public to electric, magnetic and electromagnetic fields in the frequency range 0 Hz - 300 GHz. In particular, this law applies to long-distance power lines and to radio electric installations, including installations for mobile telephones, radars and fixed plants for broadcasting signals. This Law is mandatory but it is not based on ICNIRP recommendations.

On August 28, 2003 the decree GU the President of the Council of Ministers issued n.199 “Establishment of exposure limits, attention values, and quality goals to protect the population against electric, magnetic, and electromagnetic fields generated at frequencies between 100 kHz and 300 GHz”. In this decree limits for radio frequency electromagnetic fields of base stations as well as television- and broadcast transmitting stations, operating in the frequency range from 100 kHz to 300 GHz, are specified. This limits lie clearly under those specified by ICNIRP. For

protection against exposure generated by sources other than fixed systems for telecommunication and radio-TV broadcasting in this frequency range, the restrictions set out in the EU Recommendation 12 July 1999 - published in the O.J.E.C. on July 30, 1999 - are applied. Local Authorities using standards CE 211-6 and 211-7 and Article 14 of Law No. 36 control the compliance of the limits. The Guideline CEI 211-7 (2001) describes the Italian procedure for measurements of EMF radiation, and was issued by ANPA/ARPA (The Regional Agencies for the Environment Protection) in 1999. Mobile telephone companies are obliged before the installation of BTS to provide the ARPAs with technical data, and to assure that limits are not overcome. ARPAs are responsible for controlling the process of putting into service; the information on this procedure is available for the public.

13. Latvia

13.1 Introduction

In Latvia the levels of exposure due to electromagnetic fields of mobile phone base stations are measured when commissioning the station to ensure confidence in respect of public health. Also measurements are performed to respond to complaints received from the population.

13.2 Legal Requirements

The national standards in Latvia are the recommendations:

- LVS ENV 50166-1: 1995 "Human exposure to electromagnetic fields. Low frequencies (0 Hz 10 kHz)".
- LVS ENV 50166-2: 1995 "Human exposure to electromagnetic fields. High frequencies (10 kHz 300 GHz)", registration no. 3309.

(LVS = Latvijas Valsts Standarts, Latvian Standards)

Both standards have been issued by the Latvian Standards Organization and are valid for public and occupational exposure but do not base on ICNIRP (However, limits are quite similar in the frequency of interest). Also they are not legally binding.

The 5th February 1997 the Latvian Government issued "The Protection Zones Act" which determines protection zones for the general public. Latvia is implementing the limits set down in the Council Recommendation 1999/519/EC for exposure to electromagnetic fields. The Latvian government does not have any safety criteria or levels in addition to the authorized levels of exposure to electromagnetic fields.

14. Liechtenstein

14.1 Introduction

The Office of Communications (at <http://www.llv.li/amtstellen/llv-ak/llv-ak-home.htm>) in Liechtenstein performed a series of measurements in the vicinities of telecommunications triggered by the public concerns of health risks of electromagnetic fields. Liechtenstein has similar limits as Switzerland enforced by law.

14.2 Amt für Kommunikation

14.2.1 Purpose of the information

The aims were both an audit of the installation of antennas and the evaluation of the exposure to electromagnetic fields.

14.2.2 Availability of data

The results of the measurements are available for the general public on the website in pdf format. The website includes other brochures about risk communication, expert advice and legal information.

14.2.3 Description of Methodology

The series of measurements were performed by the Ingenieurgemeinschaft für Geowissenschaften und Umwelttechnik from Regensburg in January 2001, at 107 sensitive sites located in public and open places in the surroundings from antenna installations. Broadband and frequency selective measurements of the electromagnetic field strength have been carried out in the frequency range from 30 MHz to 3 GHz. The equipment consisted of Advantest spectrum analysers, and Schwarzbeck antennas USLP9142 and UBA9116. Measurement points for which the calculation of immission were performed using location data sheets (to verify the measurements) as well as additional points of interest have been chosen. The electromagnetic field strength values of all measurements have been multiplied by a factor of 1,4 to compensate a possible measurement uncertainty.

Two different measurements have been performed:

- Outdoor measurement: The maximum horizontally and vertically electromagnetic field strength was determined swaying the antenna by 360 degrees in azimuth for both directions of polarization and then added vectorially.
- Indoor measurement: The maximum electromagnetic field strength was determined directly through a suitable adjustment of the antenna.

The applied outdoor and indoor measurement procedures followed the recommendations BAPT MV 20 und 22 from the Regulatory Authority for Telecommunications and Posts (<http://www.regtp.de/en/index.html>) and the “concept of a measurement recommendation for GSM base stations” from the Swiss Federal Office for Metrology and Accreditation – METAS (<http://www.metas.ch/en/index.html>). The measurement protocol with detailed description can be obtained at: http://www.llv.li/pdf-llv-ak-efm_messbericht_wuschek.pdf.

14.2.4 Status of the project

The project was finished with a public presentation in April 2001.

14.2.5 Display of the information

The results are in shown in several pdf files which, besides including the explanation of the methods used, show graphics and tables with the levels of electromagnetic field measured and its comparison with the normative (see 13.3 Legal Requirements), which is an adaptation of the ICNIRP and EU Recommendation guidelines. For the measurement data of a specific location (example: location F612A, community Triesen, Swarowski) there is a description of the place of the measurement, especially whether it is a location of sensitive use. For points close to the antenna

(no point of sensitive use) the sum of GSM and UKW/TV immissions in comparison to the NIS specification and to calculations is displayed in a table.

MP Nr.	Summe GSM*	Summe UKW/TV*	Gesamt*	NIS eingehalten?	Messung < Berechnung?
1	3,32 %	0,49 %	3,36 %	Ja	Ja

Table LIE-1. Comparison table for a spot measurement.

For points of sensitive utility a table shows the electric field strength (V/m) in comparison to guidelines, NIS specification and calculation.

MP Nr.	Summe GSM in Volt/m	Anlagegrenzwert in Volt/m	Prozent	NIS eingehalten?	Messung < Berechnung?
2	0,48 V/m	5 V/m	9,66 %	ja	Ja
3	0,27 V/m	5 V/m	5,39 %	ja	Ja

Table LIE-2. Comparison table for a 'spot measurement'.

14.3 Legal Requirements

The „Verordnung vom 21. November 2000 über den Schutz vor nichtionisierender Strahlung ortsfester Sendeanlagen von Telekommunikationssystemen“ (“Decree from 21. November 2000 for protection of non-ionising radiation of stationary transmitters for telecommunication systems” <http://www.llv.li/2000231.pdf>) is the regulation that regulates protection from non-ionising radiation for the installation of RF stations and is based in the Swiss regulation. The defined immission limits are based on the actual recommendations of the WHO, the ICNIRP and the European municipal, which are not binding for Liechtenstein because this topic is not content of the EWR-agreement. But for locations on which people stay regularly for a longer period of time (locations of sensitive use) there is a stricter rule compared to the EU recommendation.

15. Luxembourg

15.1 Introduction

In Luxembourg there is not many information available regarding exposure to EM fields. The Institut Luxembourgeois de Régulation deals with matters of the telecommunication market, such as frequency allocation or management of licenses, but also with norms and regulations to regulate the telecommunication's sector. The Luxembourg Government does not promote research on the effects of electromagnetic fields on human health because there is no budget for this and because the subject is not a health priority. Luxembourg has implemented measures to inform the public about the health impact of electromagnetic fields by setting up a telephone help line: + 352 478-5673. Concerning exposure from electromagnetic field technologies, the group Akut absl deals with elektrosmog matters and the possible risk for health due to exposure. The Internet website (www.akut.lu/) gives some information, reports (foreign investigations), and links to other similar sites.

15.2 Legal Requirements

In Luxembourg exists the "Standards regarding non-ionising radiation due to cellular mobile telephony" issued by the Environment Ministry and the Labour and Employment Ministry (www.aev.etat.lu/sec/Formulaires/F-302.doc). This document was made legally binding by the decree authorising the settlement mobile telephone networks. It applies to frequencies in the range from 10 kHz to 300 GHz, is valid for the public.

The Recommendation ITM-CL 179.2 (<http://www.itm.etat.lu/condtype/pdf/CI179-2.pdf>), which has been issued by the Government of Luxembourg, is not legally binding. This applies to frequencies in the range 10kHz to 300 GHz, valid for the public and also does not base on ICNIRP. Luxembourg has applied stricter limits than those laid down in the Council Recommendation 1999/519/EC. Limits in 1999/519/EC are valid for occupational exposure. No regional variations have been reported regarding protection of the public against Electromagnetic fields. However, the administration communales (local administrations) have the authority to ignore the national standards or apply stricter limits for public exposure to electromagnetic fields.

16. Malta

16.1 Introduction

The Malta Communications Authority (MCA, www.mca.org.mt/) is the National Agency responsible to regulate telecommunications. It was established on 1 January 2001.

Regarding public concern on health risks associated with EMF, the MCA took responsibility of EMF audits of GSM base station installations. The Malta National Laboratory was chosen as the Institution to perform such investigations, which started in January 2002 and has the purpose of auditing 50 new base station sites each year. There is also a private monitoring system, called the Progett Gardiola, being developed by Vodafone and the University of Malta. The authorities suggest the application of the limits of the ICNIRP guidelines and EC recommendations.

16.2 MCA

16.2.1 Purpose of the information

The country's high population density and restricted land area have necessitated locating practically all types of antenna stations within densely built and populated environments. Lack of public information and rapidity of deployment of these sites contributed to public concern that the increase in exposure to RF electromagnetic fields could be harmful to health. In response to this, the Malta Communications Authority commissioned a detailed survey on a national scale intended to ascertain that both the public and occupational ICNIRP reference levels for exposure are not exceeded. Basically it consisted of audits from RF installations but focused on public concerns about EMF radiation.

16.2.2 Availability of data

Data are presented as a GIS on the website with description of methods and purposes available in pdf format. Furthermore, in the rubric "EMF Emissions and Public Health" in the Telecommunication Library of the website <http://www.mca.org.mt/library/> a multitude of

information such as EMF Audit Results, survey papers, ICNIRP Guidelines, Standards for EMF from Broadcasting Transmitters may be viewed online or downloaded in pdf format.

16.2.3 Description of Methodology

Both field calculations and measurements were performed, and compiled in a detailed database of all base stations in operation.

1. Prior to surveying a site, fields were calculated and plotted using the Mobile Base Station Field Intensity Plotter (MSFIP®) by TELSTRA. This serves to identify the extent of the measurement survey and to identify potentially problematic regions or at least, locations where the power density is predicted to be relatively high. Antenna library files enable to determine gain, polarization, and directional properties. Input TRx characteristics enable 2-D fields to be plotted at any desired plane. Simple spreadsheet-based calculations provided a second estimate.
2. Broadband (using Narda 8718B field survey meters and isotropic probes 8760D in the range 300kHz – 3GHz, and D8722D in the range 300kHz – 50GHz,) and narrowband (using relatively narrowband calibrated antennas and spectrum analyzer to measure the E-field) measurements according to the IEEE recommendation C95.3-2002 were performed. The types of measurement performed were:
 - Instantaneous – preliminary exposure assessment.
 - Whole body average – assessment of average exposure of human body at a particular location.
 - Extended spatial average – assessment of average exposure within a defined volume.
 - Time average – either at a spot or along a line traversed at constant velocity.



The three antenna sectors at site Vo145.

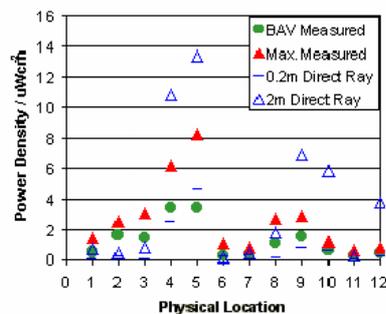


Figure 7: Measured and computed fields at site Vo145 – direct ray model.

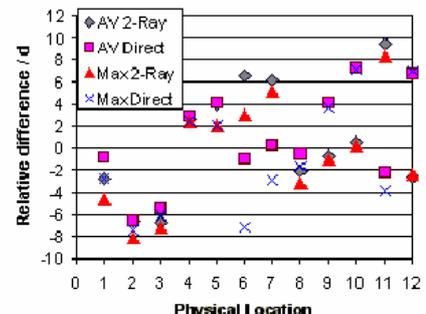


Figure 9: Relative difference between measured and computed power density at site Vo145.

Correlation coefficients - Vo145			
AV 2-ray	AV direct	Max 2-ray	Max direct
0.83	0.85	0.85	0.85

Figure MA-1. The measurements performed in Malta include comparison of calculated and measured power densities.

Figure MA-1 shows some results of both measurements and calculations in comparison. As can be seen, the correlation coefficient is 0.85, but it reached 0.96 in one scenario.

16.2.4 Status of the project

On-site measurements of 55 randomly selected sites were done during 2002. The survey was extended through 2003 and 2004; about 50 new sites are audited each year. There is also a possibility of new measurements on demand, a planned review of the situation with the introduction of 3G networks, and an extension of the audits to broadcasting transmitters, microwave links, radar, etc.

16.2.5 Display of the information

The results are shown as a GIS on the website (Figure MA-2). The information from every location where a measurement was performed is displayed as in Figure MA-3, where the radiation levels are levelled according to the ICNIRP guidelines (Figure MA-3, right).

16.3 Other Projects

16.3.1 Progett Gardjola

The Department of Communications and Computer Engineering at the University of Malta in association with Vodafone Malta Ltd, has embarked on a project to inform the general public about Radio Frequency Radiation the so-called Progett Gardjola.

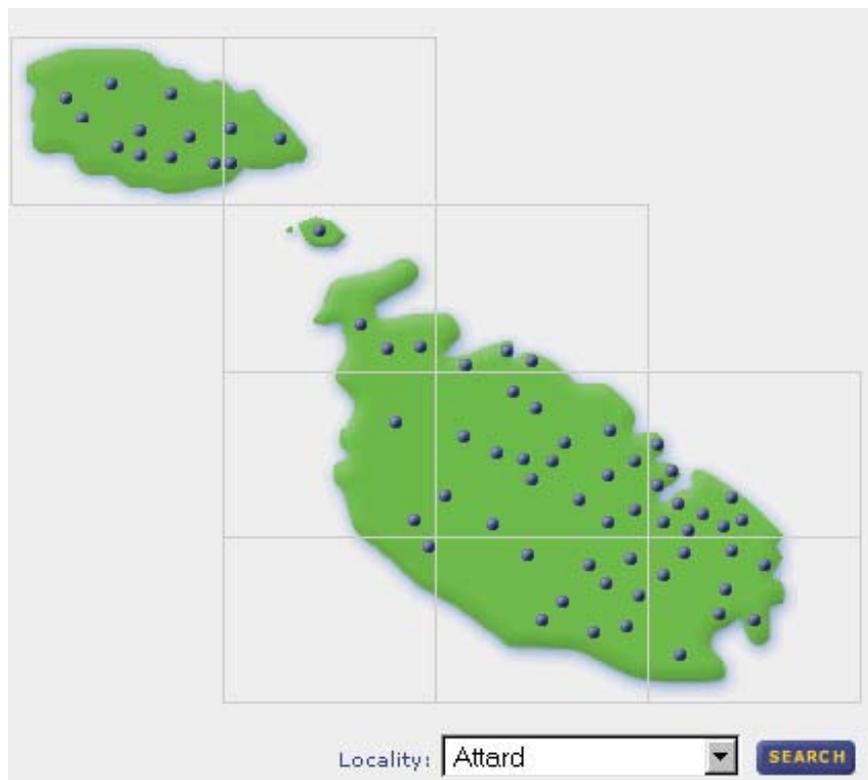


Figure MA-2. Web-based GIS from the Malta Communications Authority.

Through Progett Gardjola the public is able to monitor Radio Frequency radiation levels in Malta and Gozo in quasi-real time. Vodafone Malta Ltd has donated 10 electro-magnetic probes to the Engineering Department to be used in the frame of this project. Electro-magnetic radiation

probes measure radio frequency levels emitted within the 100 kHz – 3 GHz range including TV, radio and GSM transmissions. These probes have been installed in different locations across the Maltese islands.

MELLIEHA

Site No.	Street Address	Highest Reading	Average Reading	
V056	Triq il-Marfa	●○○○○	●○○○○	<ul style="list-style-type: none"> ● Very low - under 5% ● Low - 5% to 25% ● Medium - 26% to 50% ● High - 51% to 90% ● Limit - over 91%
G813	Triq il-Marfa	●○○○○	●○○○○	
Vc145	Triq E. Halley	●○○○○	●○○○○	
Vc9	Triq San Mikiel	●○○○○	●○○○○	
Go077	Triq San Mikiel	●○○○○	●○○○○	

Figure MA-3. The emissions from every provider's facility are given as a quotient of the limits.

The readings from each probe will be downloaded daily to a web server, which will be displaying readings as selected by the user. These readings are reproduced in graphs in the 'View Emission Levels' section on the website (<http://gardjola.eng.um.edu.mt/emr/>). In each graph (see Figure MA-5) the user can view the emission readings for the selected probe as well as the maximum emission levels set by ICNIRP, which have been adopted by the Maltese authorities.

Street: Triq l-Isbark tat-Torok
Locality: Birzebbugia
Island: Malta
Additional Info: Probe installed: Dec 03 Residential Roof
EMF Probe Specifications
Fields measured: Electric field
Measurement range: 0.5V/m – 130 V/m
Resolution: 0.1V/m
Reading values: Average of 6 minute periods

Table MA-1. Summary table of a monitored spot.

The website contains photographs of the measurement scenarios, tables with the summarized outcomes of every measure (see Table MA-1), and graphics (Figure MA-5) with the field strength (V/m) across time.

16.4 Legal Requirements

With August 25, 2000 the Ministries of Health, Transport and Communications and Social Policy issued the "Report on Recommendations for limiting human exposure to time-varying electric, magnetic and electromagnetic fields in the frequency range from 0 Hz to 300 GHz" with limits identical to ICNIRP but not legally binding, valid for public and occupational exposure. Due to the fact that the compliance of the limits is voluntary no specific authority for verifying is mentioned.

Nevertheless, the Malta Communications Authority (MCA) has general powers under the Malta Communications Authority Act (Chapter 418 of the Laws of Malta) and specific powers under other laws, such as the Telecommunications (Regulation) Act (Chapter 399 of the Laws of Malta). The Authority is the appointed competent authority for the supervision of signature

certification service providers established in Malta as defined in the Electronic Commerce Act (Chapter 426 of the Laws of Malta).

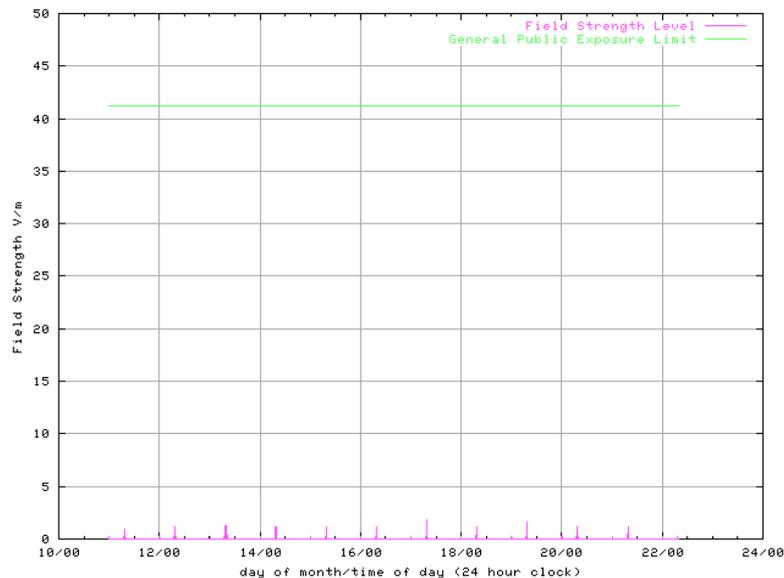


Figure MA-5. The graphic of the daily monitoring of a location in Malta shows the field strength level (in pink) compared with the guideline level (in green).

17. Poland

17.1 Introduction

In Poland only information from single measurement protocols performed at the Military Institute of Hygiene and Epidemiology, in Warsaw, is available. Limits applied in Poland are lower compared to those of the ICNIRP guidelines.

17.2 Military Institute of Hygiene and Epidemiology in Warsaw

17.2.1 Purpose of the information

The aims of the measurements performed are risk assessment, risk communication and scientific purposes.

17.2.2 Availability of data

Some data are available, but they have not been classified and processed till now.

17.2.3 Description of Methodology

The tests performed so far included spot measurements, by applying broadband meters, and also extended by use of frequency-selective equipment. Broadband measurements are made for routine assessment (power density for general public, electric and magnetic field strength for workers), and the device used is a 0,3-3 GHz electric field probe calibrated under far field conditions. For every broadcasting installation and electromagnetic field source the measurement protocol is specified in the order of minister of environment (J. of Law 107/1998) and the standards are PN-72/T-04900 and PN-T-06580. Detailed laboratory procedures for base stations are established with co-operation of operators.

17.2.4 Status of the project

The process of measurement is based on demands.

17.2.5 Display of the information

The data available include measurement protocols, but there is not a unified database.

17.3 Legal Requirements

The Government of Poland has issued separate ordinances for public and occupational EMF-exposure in the frequency range from 0 Hz to 300 GHz which both do not accord to the ICNIRP recommendation. The compliance to both Ordinances is mandatory. For workers the “Ordinance of the Ministry of Labour and Social Politics, Republic of Poland, Journal of Law, No.4/2001, pos.36” was issued by January 2nd 2001 where the limits in the frequency range from 0,15 to 3 GHz are: $E > 20$ V/m and $H > 0,05$ A/m only for exposure shorter than 8 hours and $E > 200$ V/m and $H > 0,5$ A/m only for exposure in protective clothes. For the general public the “Ordinance of the Ministry of Environment Safety, Republic of Poland, Journal of Law, No.192/2003, pos. 1883” has been issued by November 14th 2003.

18. Portugal

18.1 Introduction

In Portugal, the Institute of Telecommunications is a scientific institution doing research in the area of communications. After the big development of mobile phone communications and the arising concern about health risk due to the proliferation of telephony base stations, this association has the goal to inform the public about the known risks of the new information technologies. The Institute developed the project MonIT, a system that monitors the electromagnetic fields at different locations in Portugal, but it has also performed spot measurements at different places across the country. In Portugal exposure law enforces limits suggested by the EU.

18.2 MonIT

18.2.1 Purpose of the information

The project MonIT (<http://www.lx.it.pt/monit/>) presents information about EM radiation arising from mobile communications, exposure limits, related literature to support the results of the measurements performed at locations close to base stations in some selected places around the country. The content of the website is said to have two aims: to inform the citizens with facts explained simply and to provide more advanced information for the technical community.

18.2.2 Availability of data

Besides the results of the measurements of the monitoring system (“*Monitorização Contínua*”) and the spot measurements (“*Monitorização Localizada no Tempo*”), the website also includes general (basic information for non professionals) and technical information (legal requirements, reports about EMF and health, links to other institutions...) about electromagnetic fields.

18.2.3 Description of Methodology

The methodology of the measurements (spot measurements) is quite similar to that from the European Recommendation (*Revised ECC Recommendation (02) 04* from the CEPT). First a broadband measurement is carried out in the frequency range from 100 kHz to 3 GHz. If the

results are below the limit the conclusion is that there is no need of further action in that location, but if the levels are exceeded, a more detailed investigation using frequency selective equipment has to be performed to account for all the single contributions to the overall exposure.

Because the recommendation does not include a procedure to select the measuring points, the project monIT has developed their own method. This protocol includes two factors to be considered before selection: the number of base station in the vicinity location and the topology of the installation. The different classifications of topologies are: rural, urban and interior, in addition the different places where the antenna is mounted (tower, mast, front of a building, pole, wall, rooftop...) are taken into account. If there is only one base station in the surrounding, the protocol (“MonoEB”) describes an identification process of the spots with elevated EM fields according to a geometric net (see Figure POR-1). The fields are then measured in these locations but without neglecting other possible hot spots.

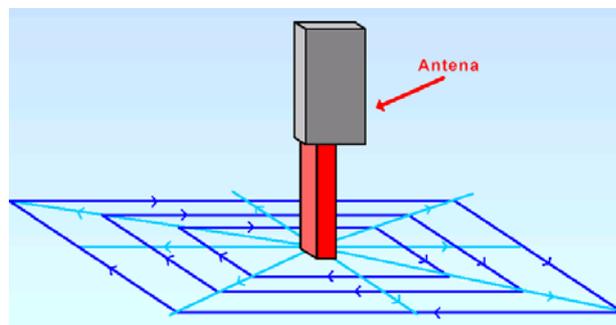


Figure POR-1. Maximum-radiation grid for an isolated antenna.

If more than one base station is present in the environment, the procedure is called “MultiEB”. Firstly, they apply the protocol “MonoEB” to obtain the high level spots for every antenna separately, then, by combining the procedure, measurements are done at those points with line of sight from more than one station and in the hot-spots obtained in the phase “MonoEB”, which are superimposed in more than one station.



Figure POR-2 Portable and remote monitoring sets.

The devices used are a portable monitoring set consisting of a PMM 8053 and 8053A survey meters with an EP-330 E-field probe that can be used in the frequency range from 100 kHz to 3 GHz. Monitoring is usually performed with broadband meters. The remote monitoring set consists of a NARDA BN 2600 survey meter with a probe EP-330 working in the range 500 kHz - 3 GHz, and an Anritsu MS2711B spectrum analyser. The results of the measurements are sent via GSM to the central monitoring station that also controls the monitoring set.

18.2.4 Status of the project

The project is ongoing, new locations are regularly included and there are also places which are permanently monitored.



Figure POR-3. Information on a monitoring site.

18.2.5 Display of the information

The project shows separately the locations where monitoring is performed and locations where spot measurements have been made. There are locations where the measurements are still ongoing, as well. The Figure POR-3 shows a place where monitoring was carried out. The table displays geographical information, scope of the tests, objectives and limitations.

Figure POR-4 shows the graphic of the results from the measurement during one month (daily, weekly and longer period plots are also available) in comparison with the more restrictive limit (1999/519/CE).

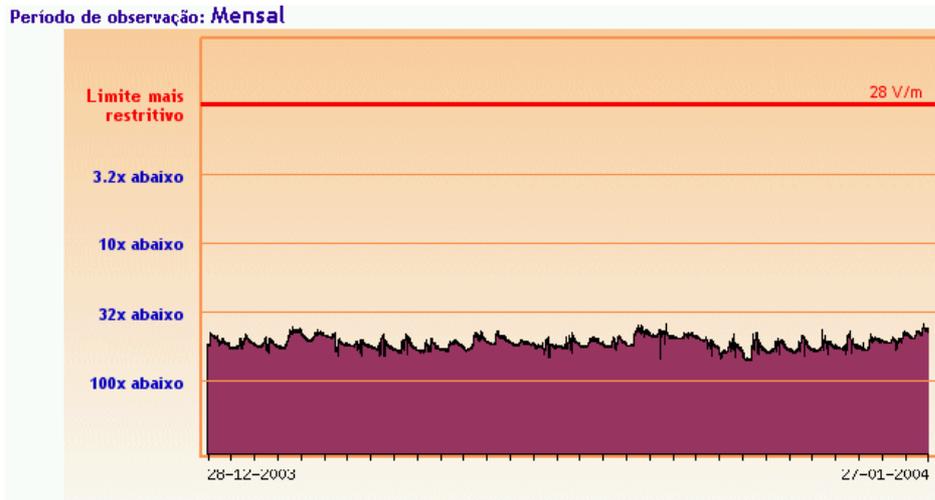


Figure POR-4. Monthly results of the monitoring, the red line represents the threshold level and the electric field is expressed as a quotient of the level.

Finally, in the Figures POR-5 and POR-6 a spot measurement environment is shown. For every spot measurement a detailed description of the environment, characteristics of the location and results with conclusions about compliance with limits are given.



Figure POR-5. Test environment for a spot measurement.

18.3 Legal Requirements

By 18th January 2003 the Government of Portugal issued the Decree-Law no. 11/2003 (<http://www.anacom.pt/template20.jsp?categoryId=5321&contentId=88327>) which is based on the European Council Recommendation (EC 1999/519). The decree covers the frequency range from 0 Hz to 300 GHz and is mandatory for the general public. To verify the compliance, entities qualified to install and use radio-communications stations must present every year to the national radio-communications regulator (ANACOM, Autoridade Nacional de Comunicações, www.icp.pt) a monitoring and measurement plan of the levels of electromagnetic fields arising from radiocommunication stations, requesting the approval afterwards. The results of these monitoring activities must be presented every three months to ANACOM, to the Ministry for Health, and to the municipal councils of the places where the radio-communications stations are installed. Draft regulations regarding the procedures for monitoring and measurement of electromagnetic field strength coming from radio-communication stations are under public consultation from ANACOM and available only in Portuguese version. With the Decree the ANACOM also undertook the task of adapting the Recommendation ECC (02)04 about the procedures of monitoring and measurement of the levels of radiation of the EM fields.

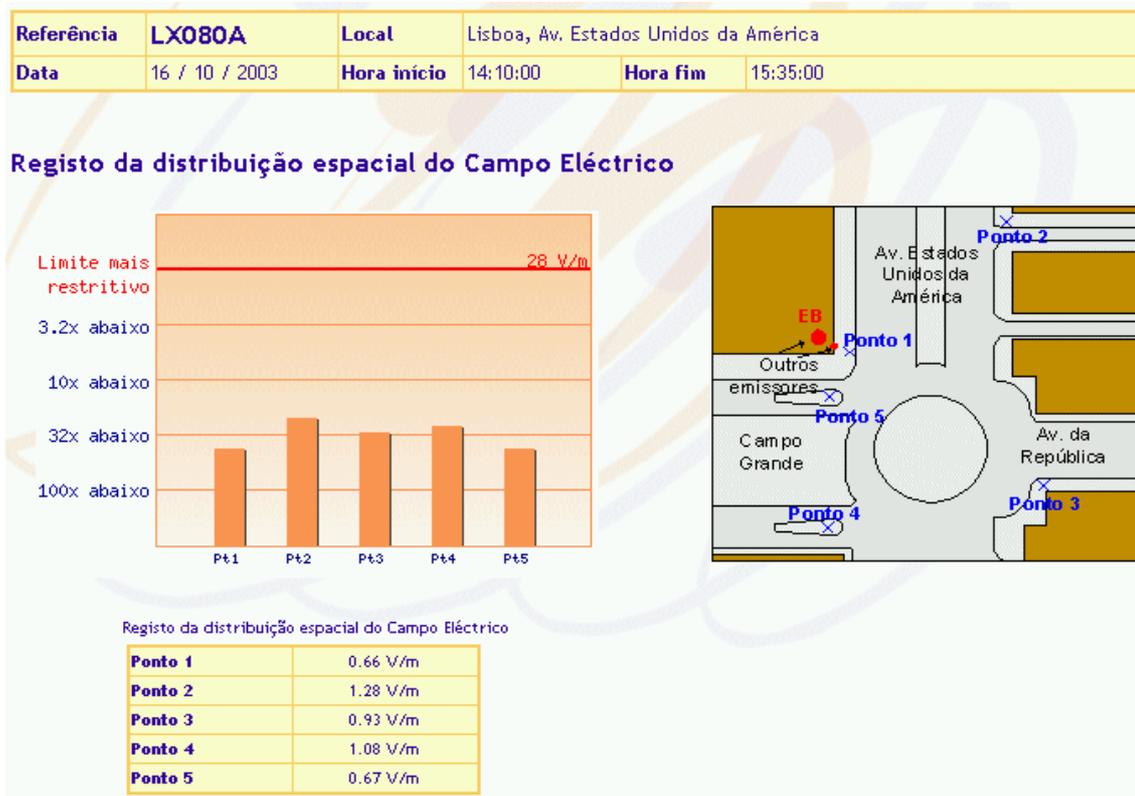


Figure POR-6. Results of a spot measurement. Several spots around the base station are chosen for a frequency selective measurement

19. Slovak Republic

19.1 Introduction

There are no regional variations in the Slovak Republic regarding the protection of the public against electromagnetic fields and there are no known initiatives to introduce them. However, the government provides information to the general public via the press, radio and television.

19.2 Legal Requirements

Legally bindings in The Slovak Republic are:

1. The Act No 272/1994 (Coll.) on the protection of public health issued by the National Council of the Slovak Republic in 1994. This Act covers the frequency range from 60 kHz to 300 MHz and is mandatory for the general public.
2. The Decree No 123/1993 (Coll.) on the protection of health from the harmful effects of electromagnetic fields issued by the Ministry of Health in 1993 and based on ICNIRP (0 to 300 GHz and mandatory for occupational and public exposure). An amendment to the aforementioned decree is being drawn up.

20. Slovenia

20.1 Introduction

The Ministry of Environment, Spatial Planning and Energy, together with its agencies Inspectorate for the Environment and Spatial Planning, and Environmental Agency, is the institution that provides information on exposure of the general public due to mobile phone station and competent legislation. Other institution that provides information is the Institute for Telecommunications (ITK, <http://www.i-tk.org/html-ang/elektromag-sevanja.htm>).

20.2 Ministry of Environment, Spatial Planning and Energy

20.2.1 Purpose of the information

Information is collected due to legal requirements about mobile phone base station installations.

20.2.2 Availability of data

Data are public and everybody has the right to access to environment data in accordance with the Environment Protection Act (OJ RS, No. 41/2004) and Access Information Public Character Act (OJ RS, No. 24/2003).

20.2.3 Description of Methodology

Every location for base station must be planed carefully and must suit criteria stated in a Decree concerning radiation levels in the natural and living environment. For the acquisition of necessary permission to build a base station, expert assessment by an authorised person is necessary to assess that the emissions from the RF EMF base stations are below threshold values on all the area concerned. Before the edition of user permission, the provider must perform initial measurements from authorised institutions or persons for every base station. With these measurements the exposure of the natural and living environment is assessed. The Inspectorate for the Environment and Spatial Planning is responsible for supervising of the implementation of this decree.

Measurements of electromagnetic radiation are executed in accordance with the regulations on Initial Measurements and Operational Monitoring for Sources of Electromagnetic Radiation and on Conditions for Their Execution (OJ RS, No. 70/96) and the decree on Electromagnetic Radiation in the Natural and Living Environment (OJ RS, No. 70/96). Measurements are

executed based on a procedure defined in the standards SIST ENV 50166-2 and IEEE Std C95.3-1991.

20.2.4 Status of the project

Data are acquired on basis of the expert assessment and measurements. The national program of the Environment Protection is in preparation; the approach for EMF is to prepare maps of exposure areas.

20.2.5 Display of the information

Data are available in form of reports in accordance to Regulations on Initial Measurements and Operational Monitoring and in form of inquiry table in Excel and Access format.

20.3 ITK

Inside the ITK the EMR Department was established to help regulate the exposure to EMF in Slovenia. The key activities of the EMR Department are as follows: consultancy work regarding EMF, EMF measurements, prediction and calculation of EMF, preparation of final reports on human exposure to EMF, publications and lecturing. The main activity is making initial measurements of every new RF source. Measurements are required pursuant to a Slovenian decree. They are also able to calculate worst-case scenarios for end-users. They can also prepare an official report for every calculation and measurement of a given RF source. The Institute uses calibrated instruments for narrowband and broadband measurements and all kinds of antenna for such measurements.

At the Institute there is software available able to calculate the radiation patterns stemming from different RF sources at one location. Therefore they can predict the worst-case scenario (hazard zone) regarding human exposure to EMR for every RF source and clusters of sources. A draft report on initial measurements (<http://www.i-tk.org/slike/Osnutek-porocila-meritve.pdf>) with measurements of GSM 900 and GSM 1800 antennas is available.

20.4 Legal Requirements

To verify the compliance of the limits the Minister of the Environment and Physical Planning issued the „Regulations on Initial Measurements and Operational Monitoring for Sources of Electromagnetic Radiation and on Conditions for Their Execution“. This regulation defines, that the initial measurements shall be conducted after the initial start-up of a new or reconstructed radiation source, periodic measurements every third calendar year for radio frequency radiation sources and fifth calendar year for low frequency radiation sources. The executor of measurements must issue a report on their execution. The person in charge must submit the report on initial measurements to the Environmental Agency 30 days after the measurements have been conducted, report on operational monitoring by 31 March of the current year for measurement conducted in the previous year.

In Slovenia, the permissible limit values of electromagnetic radiation in natural and living environment and in the workplaces are set by the “Decree on electromagnetic radiation in natural and living environment (OG 70/96)” as cited before, in natural and living environment, and in the workplaces by the regulations “SIST ENV 50166-1 - Human exposure to electromagnetic fields Low-frequency (0 Hz to 10 kHz)” and “SIST ENV 50166-2 - Human exposure to electromagnetic fields High-frequency (10 Hz to 300 GHz)”. The limits are below those of the Recommendation 1999/519/EC (and, because the decree is valid only for the public, also below ICNIRP) but an exception is the frequency range >0,01-1 MHz for which the limit for the

effective strength of the electrical field corresponds to that given by ICNIRP. More recently there is work toward preparing an act addressing radiation protection following the recommendations of ICNIRP is expected in 2004.

21. Spain

21.1 Introduction

In Spain there are both governmental and university projects regarding exposure to RF transmitting stations. On the one side, the website of the Ministry of Industry, Tourism and Commerce includes an information system about the location and radiation levels of telecommunication antennas, and on the other side the University of Valencia performs a permanent monitoring of electromagnetic fields. Exposure to electromagnetic fields is regulated by a degree containing the same limits as the EU recommendation.

21.2 MICT

21.2.1 Purpose of the information

The Spanish Ministry of Industry, Tourism and Commerce has an Information Service about Radio-electric Installations and Exposure Levels (http://www.setsi.mcyt.es/movil/top_mov.htm) where the general public can look up the location of mobile phone base stations with output power above 10 W throughout the entire country.

The certifications have been done by experts and were presented on June, 2002, fulfilling the Real Decreto 1066/2001 about guidelines for Public Health against Radio-electric radiation (which are basically these from the ICNIRP) in a project called “Plan de Inspección de Emisiones Radioeléctricas 2002”, (*Plan of Investigation of Radio-electric Emissions 2002*). The purpose is to inform the population, regional and local governments and to answer any questions via email. Regarding risk assessment there is only limited information.

21.2.2 Availability of data

All measured data from annual campaigns is accessible for the public under the above mentioned website, although not up to date. Also many other information reports and reviews (even epidemiological) about health and electromagnetic fields, European and Spanish guidelines and legal requirements about safety levels, is included as well as easy understandable tutorials for the general public to inform about the matter. Reports and annexes with information about the procedure of the measurements are available on the website, as well.

21.2.3 Description of Methodology

The study *Plan of Investigation of Radio-electric Emissions 2002* consists of three parts:

- *Proceedings in sensitive places.* Measurements were performed in 3,818 locations at a maximum distance of 100 meters from a base station and included sites like 2,152 schools or similar buildings, 667 hospitals and 999 green zones (parks and residential areas). Power density measured lay between a minimum value of $0.0081\mu\text{W}/\text{cm}^2$ and a maximum of $1.18\text{mW}/\text{cm}^2$, which is quite small compared to the limits ($450\mu\text{W}/\text{cm}^2$).
- *Audit of certifications of the settlement of Radio-electric installations.* From a total number of 19,219 certifications received until June 28th 2002, 847 installations were audited to provide an error less than 3% and a confidence interval at least 97.5%. The aim

was to examine “in-situ” if the installations were made according to the legal requirements.

- *Requests of information from public and private institutions, and citizens.* Writings (complaints or questions) received about legal aspects and radiation levels of base stations, were answered.

The procedure of measurement of Radio-electric emissions in the frequency range 9kHz-300GHz was performed according to the European Recommendation (02)04 (CEPT) about measurements of non-ionizing radiation. The protocol consists of three phases:

- Broadband measurements in far-field when the total radiation level is investigated. Isotropic portable probes are used for these measurements. The probe is moved in a distance from 1.10 to 1.70 m from the floor for some time until a measure of the peak value of the E-field is obtained. As probes are used the method is not quite accurate, and if the level of radiation obtained exceeds the normative level more precise measurements will be done in phase two.
- Selective frequency measurement in far field is accomplished when the levels obtained in phase one are over the limit or when the level of exposure in every frequency band needs to be investigated. The procedure is performed with antennas attached to spectral analyses or receivers. If any of the values obtained is above the reference level, the conclusion is that the station does not fulfill the legal requirements. In a second case, if the levels are below the limit but above a decision level, defined as the reference level minus 40dB, a third phase of measurements should be done to get a better approach. Finally, if all the measurements are below the levels the installation complies with the legal requirements.

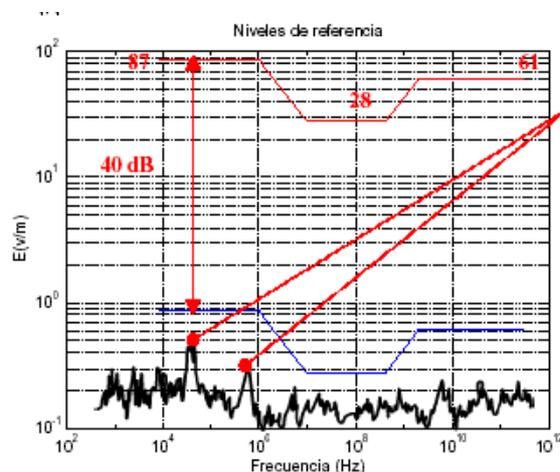


Figure SP-1. Reference levels of electric field (in V/m)

- The third phase is performed as indicated in the phase of selective frequency measurement or to measure pulsing signals (such as radars) or in near-field conditions.
 - The measurements in the near field are carried out with the same devices as in phase two, by measuring electric and magnetic fields separately and comparing the values obtained with the reference levels
 - Radar pulses are measured with a bandwidth $B_w=4/\tau$ (with τ the duration of the impulse that makes it possible to obtain 99% of the power of the signal), so that

21.3 Other Projects

21.3.1 SMP, Valencia, Spain

The Technical University of Valencia (<http://www.smp.upv.es/>) in collaboration with the Service of Radioelectric and Environmental Control (Servicio de Control Radioeléctrico Medioambiental, SCRM, <http://www.itaca.upv.es/scrm/index.html>) has developed a Permanent Monitoring System accessible for all internet users on its website. This system was created to answer the public concerns about the fast proliferation of communications systems and the associated radiation levels, and is dedicated to perform a continuous monitoring of the level of electromagnetic field intensity to control the stations if exceed the Spanish guidelines.

CARACTERÍSTICAS TÉCNICAS			
Operador:	TELEFONICA MOVILES TELEFONICA MOVILES		
Sistema:	DCS	GSM	
Banda de Frecuencia:	1800 MHz	900 MHz	
Nº Sectores:	3	3	
Fecha Autorización:	1/21/1999	6/17/1998	
NIVELES MEDIDOS EN EL ENTORNO			
Fecha Medición: 2/16/2002			
Valores medidos en los puntos de máxima señal			
Distancia (m)	Acimut (°)	Valor Medido ($\mu\text{W}/\text{cm}^2$)	Valor Permitido ($\mu\text{W}/\text{cm}^2$)
5	220	1.17	451
8	60	1.126	451
10	315	0.491	451
45	320	0.066	451
50	70	0.072	451
CARACTERÍSTICAS DEL EQUIPO DE MEDIDA UTILIZADO			
Marca:	HOLADAY		
Modelo de equipo:	HI-6005		

Figure SP-3. The GIS shows info about every installed station, along with the values of power density ($\mu\text{W}/\text{cm}^2$) obtained in measurements made in the surroundings of the antenna (Distance (m)).

The system performs measurements of radiation coming from GSM base stations and broadcast towers present in the facilities of the University in 9 locations equipped with monitoring stations (8 measuring electric fields and 1 measuring ELF magnetic fields from a transformer). The location of the monitoring stations is changed every two weeks. The results of the measurements are published via the Internet available for the public.



Figure SP-4. Monitoring site.

The graphics displayed show the intensity of the field in logarithmic scale (Figure SP-5) and the exposure quotient in relation to the guidelines over an entire measured day.

21.3.2 Estaciones de Telefonía Móvil, Generalitat Valenciana, Spain

The website <http://juno.disemina.gva.es/moviles/index.htm> from the Government of the Comunidad Valenciana (*Generalitat Valenciana*) in Spain puts at people's disposal the levels of exposure from mobile telephony base stations (GSM 900 and 1800) and the relation of these levels (spectral power density) with the reference levels established in the European and national standards. Engineers independent from Mobile Telephony Companies performed the measurements. The information is updated regularly with the data from new installed base stations.

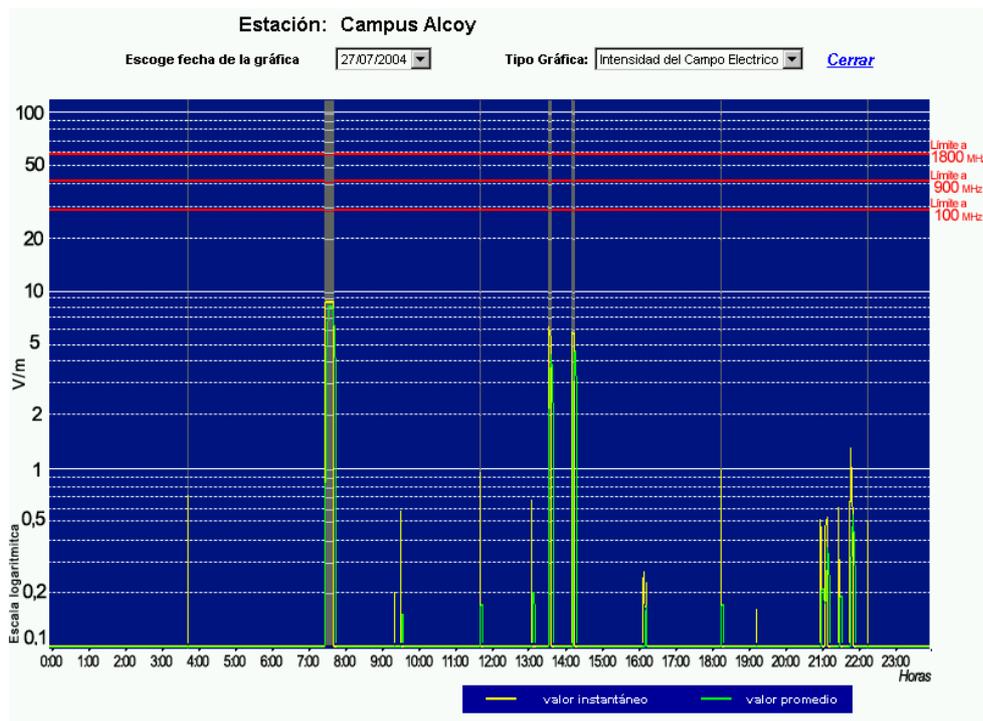


Figure SP-5. Plot of a daily monitoring showing the electric field strength compared with the limits of the guidelines (in red).

The website does not show concrete explanations about the methods used. It includes a summary of the number of stations measured, the mean values and the relation of the values measured with the mandatory reference level (see Table SP-1 and Figure SP-7), and a detailed description of the values obtained at every measurement location.

	Number of base station	Mean value measured ($\mu\text{W}/\text{cm}^2$)	Times under referenc level
Comunidad Valenciana (tot)	2212	1.26	164.68
Alicante	760	1.57	132.29
Castellón	326	1.03	202.31
Valencia	1126	1.41	132.29

Table SP-1. Table of the measurements for the total community (Comunidad Valenciana) and particular regions (For the regions Alicante, Castellon and Valencia).

Below are the results of the measurements around an exemplary base station. A map (a GIS allows selection of the location) shows the surroundings of the station, which includes the

location of the antenna and the points where measurements were performed (see Figure SP-3). A table shows the distance to the antenna, the reference levels and the power densities measured (in some cases 0.0 because they were below the sensitivity response of the devices, Table SP-2 and Figure SP-7).

The website includes links normative references and to other national and international projects from universities, governments and institutions.

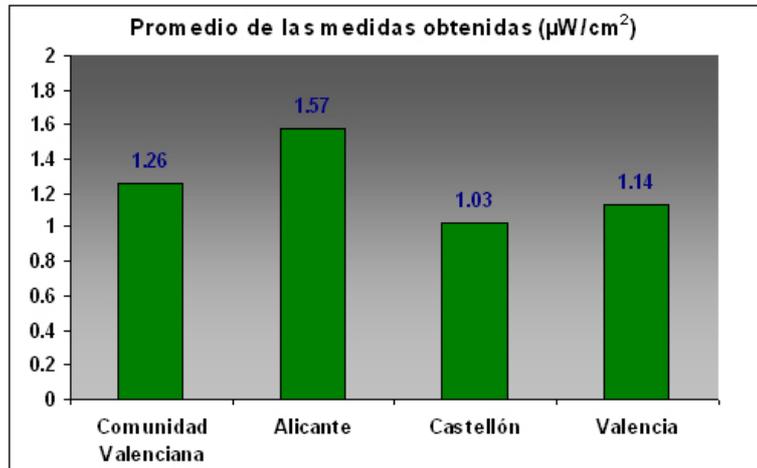


Figure SP-6. Mean value of the power density obtained and in the above-mentioned three regions.

Datos de la Estación	
Operador	AMENA
Tipo de Estación	GSM1800
Población	VALENCIA
Situación	GARAJE PLAZA DE LA REINA

Distancia	Acimut	Nivel de Referencia ($\mu\text{W}/\text{cm}^2$)	Valor Medido ($\mu\text{W}/\text{cm}^2$)	Zona Sensible
3.7	30.0	902.51	3.91	NO
4.0	230.0	902.51	1.67	NO
10.3	115.0	902.51	0.6	NO
12.0	160.0	902.51	0.43	NO
17.5	340.0	902.51	0.26	NO
20.0	230.0	902.51	0.21	NO

Table SP-2. Characteristics of the measurement around a base station in Valencia.

The tag “Zona Sensible” refers to sensitive places like hospitals, schools that, in this case, are not in the whereabouts from the base station.

21.4 Legal Requirements

Two Royal Decrees regulate the Public Health Protection in respect of electromagnetic emissions. Both decrees base on the ICNIRP recommendations in the frequency range 0 Hz-300 GHz. The Royal Decree “Radioelectric Public Domain Protection“ issued from the Ministry of Science and Technology by 28 September, 2001 is valid for the public, whereas the Royal Decree 1451/2000 issued by 28July, 2000 is valid for public and occupational exposure. Both Decrees are legally binding.

Additional there are the General Law of Telecommunication, the General Law of Public Health, the Royal Decree 1066/2001, and the CTE/23/2002 Order. This set of laws establishes the legal requirements to be fulfilled by the providers of RF installations (in respect of exposure limits, installation procedures) and also the procedures available for authorities to fulfill these requirements (e.g. audits, measurements).



Figure SP-7. Graphical representation of the power density (Potencia recibida) of 6 spot measurements according to the distances (Distancia) shown in Table SP-2, i.e., the location 1 in this figure corresponds to the distance 3.7 m in Table SP-2.

22. Sweden

22.1 Introduction

In Sweden the Swedish Radiation Protection Authority, (SSI, www.ssi.se) is the organization that deals with matters about EMF radiation and publishes the norms concerning exposure limits. Information also included consists of reports with measurements of base station radiation (in Swedish) and fact sheets about exposure topics. Additionally, the Swedish National Post and Telecom Agency (PTS, www.pts.se) is the governmental authority that monitors the electronic communications and postal sectors.

22.2 Legal Requirements

In Sweden the ordinance „Announcement of the Swedish Work Environment Authority with regulations on radio frequency electromagnetic fields" was issued in 1987 by the Swedish Work Environment Authority, which does not base on ICNIRP but on EHC 16 (1981) and NCRP No.86 guidelines and is mandatory only for occupational exposure in the frequency range 3 MHz - 300 GHz.

In 1995 the Swedish Radiation Protection Authority (SSI Statens Strylskyddsinstitut, www.ssi.se) issued the ordinance "The Swedish Radiation Protection Institute's Regulations on Drying with Microwaves" according to the ICNIRP recommendations mandatory only for public exposure in the frequency range 10 MHz - 150 GHz. In the year 2002 the SSI issued the recommendation "General Advice on the Limitation of Exposure of the General Public to Electromagnetic Fields" according to ICNIRP (0 - 300 GHz). This recommendation is only valid

for public exposure and not legally binding, so the compliance with the respective limits is voluntary. In Sweden there are therefore no legal binding limits for radio frequency electromagnetic fields in the public area. Only for occupational exposure there are legally established limits. The SSI has decided in 1999 to adopt the recommended WHO respectively ICNIRP limit values for EMF (0-300 GHz) as general guideline in Sweden. For the public the institute recommends exposure values that are 5 times lower as those for occupational exposure. This corresponds to the ICNIRP-values.

23. Switzerland

23.1 Introduction

OFCOM or BAKOM (Federal Office of Communications, www.bakom.ch) is the Swiss Confederation's technical center dealing with technical aspects of the area of mobile communication (calculations, measurements and measurement techniques). For questions regarding possible effects on health, the Federal Office for the Environment, Forests and Countryside (BUWAL, http://www.umwelt-schweiz.ch/buwal/de/fachgebiete/fg_nis/index.html) or the Federal Office of Public Health are the relevant technical centers of the Confederation.

23.2 BAKOM

23.2.1 Purpose of the information

The AntennenKataster from BAKOM is a GIS that provides information on location of radio transmitters in the country (http://www.bakom.ch/en/funk/freq_nutzung/standorte/index.html), including broadcast services (includes transmitting stations for FM radio (VHF), short-wave radio (HF), medium-wave radio (MF), digital radio ("Digital Audio Broadcasting" DAB) and television) and telecommunication services (UMTS and GSM). BAKOM presents also facts about general knowledge of telecommunications, EMC, frequency plans and other information.

23.2.2 Availability of data

The website from OFCOM includes mainly information about electromagnetic compatibility and the presence of electromagnetic radiation in the environment, health issues. Regarding measurements of the radiation coming from cellular mobile telecommunication networks, BAKOM performed, together with ARCS (Austrian Research Center in Seibersdorf), a set of measurements and calculations to verify the "Salzburg Model", or whether an exposure of $1\text{mW}/\text{m}^2$ (imposed in 1998 in Salzburg) can be complied with, and if so, what network structures are required.

23.2.3 Description of Methodology

Exposure in Salzburg

In the project (summary downloadable in pdf format in BAKOM's website), BAKOM proposed that the exposure values should be determined for each network operator in the vicinity of 3 different antenna types in each case. At the proposal of the regional sanitary administration of Salzburg, the choice of the individual sites was determined on 27 July 2001 by the casting of lots, under notarial supervision, by a representative of the environmental protection office of the Salzburg municipal authorities. An investigation of the already known antenna sites that are critical in regard to exposure was deliberately not undertaken.

BAKOM subsequently derived the exposure situations using computer simulations (the *Quickplan* tool). The environmental data necessary for this (land registry maps) as well as the data on the transmitting installations were made available by the Salzburg authorities, the office for environmental protection and the network operators. The three-dimensional visualisation of the electromagnetic fields generated by the antennas allowed a reliable analysis not only of the NIR-exposure but also of the coverage situations. ARC Seibersdorf Research GmbH, was entrusted with the practical execution of the measurements. The practical measurements were made between 12 November and 19 December 2001.

For the frequency selective measurements, a combination of the sweeping (defined measuring volume (cylinder of 1 m diameter and 1 m height, 0.75 m above ground) is scanned with an antenna for maximum) and the raster (on each of three horizontal planes, 20 raster points are measured at three orthogonal orientations) method was applied,

- The positions of the maximum were identified by the sweeping method. The sweeping range was extended to an entire room (always with 0.5 m distance to walls and objects, and up to a height of 2 m).
- The field strengths of the maximum found this way were determined like a measurement for a single raster point according the raster method.

The values of the maximum were determined by means of the method ADD3D of the ARC of the field; three measurements with orthogonal orientation were taken and added up to the total field strength. At each point with the predominant BCCH frequencies, the field strengths of GSM900 and GSM1800 were measured, but only the BCCH-frequencies of the antenna sites of interest were accounted for.

The conclusions were:

- At 8 of the total of 13 antenna sites selected at random the Salzburg assessment value of 1 mW/m^2 was exceeded by up to a factor of 40.
- Furthermore the analyses of the exposure situations show that for modern GSM networks in urban areas the exposure levels for those living near transmitting equipment are on average between 10 and 200 mW/m^2 .
- The measurements, as well as the exposure situations simulated using computers, thus indicate clearly that an exposure value of 1 mW/m^2 cannot be complied with, for people living near antenna installations in an urban area, for technical and operational reasons. It would probably be very difficult to achieve exposure values lower than 100 mW/m^2 without substantial economic consequences.

The report "*Nichtionisierende Strahlung Vergleichsmessungen an Mobilfunk-Basisstationen*" which compares different methods for assessing radiation from electromagnetic fields is also available in the website of BAKOM.

23.2.4 Status of the project

Reports about those matters are continuously written and updated.

23.2.5 Display of the information

AntennenKataster

When a station is elected additional information on the installation will appear: description of the radio service, radiated power of the installation, and, in the case of broadcasting stations, extra information on the broadcast channels and frequencies (see Figure CH-1).

For broadcasting the radiated power is given in W (Watt) and for Mobile communications the radiated power is divided into the following categories:

- "Very low": total power is less than 10 W,
- "Low": total power is included between 10 and 100 W,
- "Medium": total power is included between 100 and 1000 W,
- "High": total power is more than 1kW.

To determine the total radiated power of a broadcasting station, in each case the maximum radiated powers of the individual antennas (i.e. all broadcasting antennas at the site concerned) are added together, without taking into account the different transmission directions of the antennas.

In order to determine the total radiated power of a base station for mobile communications, the maximum radiated power of the sector with the highest power (range around main direction of radiation) is first determined for each network operator and for the GSM900/GSM1800 and UMTS frequency bands. These maximum sector power values for each individual network operator and for the corresponding frequency band are then added up (without taking into account the different transmission directions). The result is the specified total radiated power. The indicated transmitting powers therefore indicate maximum values.

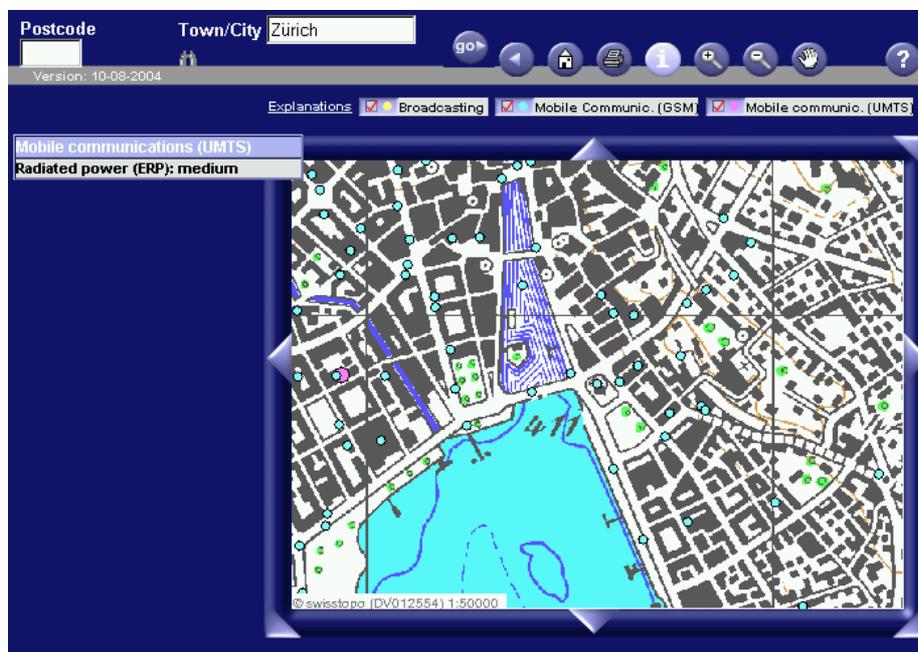


Figure CH-1. GIS Antennenkataster.

23.3 BUWAL

BUWAL provides many reports about electromagnetic fields and health aspects, with the aim to give reliable information about the risks of the electromagnetic fields. Detailed information on an individual installation can be obtained from the authorities in charge of protection of the

environment and about the effects of electromagnetic radiation in the BUWAL website (BUWAL Report and tutorials). There are legal texts, standards and some technical topics about telecommunications, as well as recommendations to measure radiation from GSM and UMTS antennas.

23.4 Legal Requirements

The legal texts applicable for correct base antenna installations are:

- Telecommunications Law (LTC), *Fernmeldegesetz (FMG) vom 30. April 1997 784.10.*
- Decree concerning telecommunication installations (OIT), *Verordnung vom 14. Juni 2002 über Fernmeldeanlagen (FAV).*
- Decree of OFCOM concerning telecommunication installations, *Verordnung des Bundesamtes für Kommunikation vom 14. Juni 2002 über Fernmeldeanlagen.*
- Decree concerning telecommunication services (OST), *Verordnung vom 31. Oktober 2001 über Fernmeldedienste (FDV).*
- Decree concerning Frequency Management and Radiocommunications Licenses (OGC), *Verordnung vom 6. Oktober 1997 über Frequenzmanagement und Funkkonzessionen (FKV).*
- Decree of OFCOM concerning Frequency Management and Radiocommunications Licences, *Verordnung des Bundesamtes für Kommunikation vom 9. Dezember 1997 über Frequenzmanagement und Funkkonzessionen.*

The „Ordinance relating to Protection from Non-Ionising Radiation (ONIR, Nr. 814.710)“ which has been issued by the Swiss Federal Government on 23 December 1999 regulates the limit values in the frequency range from 0 Hz to 300 GHz and is valid for fixed base stations if their emissions refer to the public. The ONIR is based on the Environmental Protection Law (LPE, Federal Law relating to the Protection of the Environment; of 7 October 1983). For places where people may stay for a short time, the recommended ICNIRP-values with this decree are generally applied.

In addition precautionary emission limitations, so called installation limit values (ILV), must be respected at places of sensitive use, e.g. apartments, schools, hospitals, permanent workplaces, children playgrounds (this is where people stay for a longer time). They refer to the radiation of a single installation at a defined reference state of operation and are about a factor 10 lower than the limit values. Under certain circumstances exemptions from respecting the ILV can be granted.

24. The Netherlands

24.1 Introduction

The ‘Nationaal Antennebureau’ is charged with the task of giving information to the public on behalf of the national authority. Through the website www.antennebureau.nl everybody can get general information about antennas and regulations. More specific information can also be obtained by telephone (not via internet).

24.2 Nationaal Antenneregister

24.2.1 Purpose of the information

Information about mobile phone base stations is gathered in the Nationaal Antenneregister. Measurements of the electric fields have been performed at selected ‘public’ locations (50 sites). No measurement program has been started (yet) on a systematic way.

The main purpose of the provided information is risk communication. Besides, measurements are performed in order to check the agreements made with the operators.

24.2.2 Availability of data

Part of the information is available to everybody and in part has restricted access. Through the website of the Nationaal Antennebureau (www.antennebureau.nl) everybody can see for each mobile phone base station, the distance (contour) at which the ICNIRP reference levels is exceeded. The calculation of the contour is done on the basis of the information (ERP, gain, coordinates, etc.) that according to the law, the operators submit to the authority. Unfortunately it has not been possible up till now to include on the website the exact location of the base station (only the ZIP code area). Discussions are still going on whether public knowledge of the exact location (within few meters) should be considered crucial for the security of the installation.

24.2.3 Description of Methodology

The Nationaal Antennebureau collects information on mobile phone base stations submitted by the operators to the authority. On basis of these information (ERP, gain, location, etc.) calculations on the expected field strengths are done. The result is available through Internet.

Furthermore measurements are performed in order to check the agreements made with the operators. A measurement protocol is used which has been developed by TNO and the Radio-communication Agency. The protocol is based upon international standards (e.g. EN 50383) and allows the use of both broadband and frequency selective equipment. Discussion is still ongoing about the calculation methods to be used. The data are the based on spot measurements in the frequency bands of GSM 900 and 1800. Further measurements will include UMTS band.

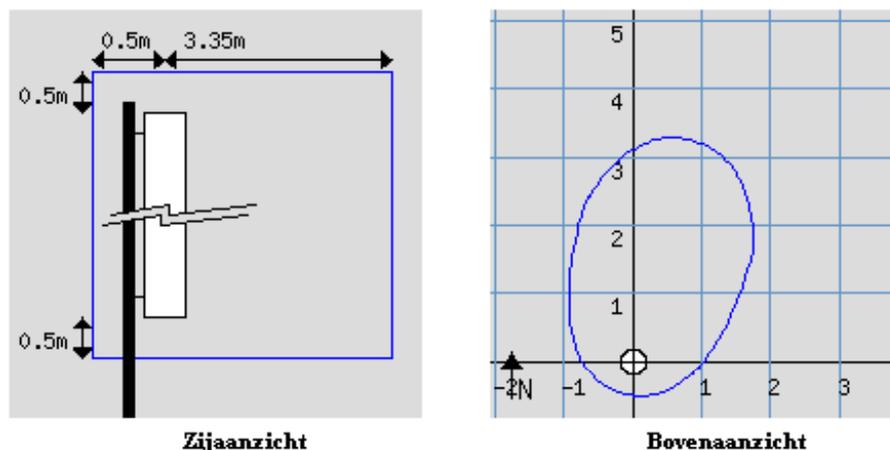


Figure NL-1. Calculation of the radiated fields by a base station's antenna.

24.2.4 Status of the project

Audits on the installations are regularly done, but, as said before, no measurement program has been started (yet) on a systematic way.

24.2.5 Display of the information

The data are included in a database that is maintained by the National Antennabureau and can be looked up using postal codes.

24.3 Legal Requirements

In the Netherlands presently there are no legal determined limit values for the limitation of exposition of the general public. The Council of Health from the Ministry of Health has worked out recommendations for limitation of exposure that are followed in praxis. Initial point in the recommendation for radio frequency electromagnetic fields (300 Hz – 300 GHz) is the limitation of thermal effects. Research results of non-thermal effects are categorized as too unsure to take into account for establishing limit values. The derived limit values for electric and magnetic field strength easily lie over the ICNIRP-values. The broadcasting company should give to the licensing authority information about technical data. This information is gathered in the national register. Until now this information is not available to the public.

25. United Kingdom

25.1 Introduction

In the UK information about exposure of general public is available from two sources: The National Radiological Protection Board (NRPB, www.nrpb.org), and the Office of Communications (OFCOM, www.ofcom.org.uk).

25.2 OFCOM

25.2.1 Purpose of the information

Ofcom is the regulator for the UK communications industries, with responsibilities across television, radio, telecommunications and wireless communications services. Regarding public concerns, OFCOM provides Risk Communication.

25.2.2 Availability of data

OFCOM includes two projects about mobile base stations and a FAQ's page with valuable information about health risks of mobile communications.

- The 'Sitefinder' Mobile Phone Base Station Database is a national database of *mobile phone base stations and their emissions* (<http://www.sitefinder.radio.gov.uk/>) but it is not responsible for planning or health issues relating to mobile phone base stations and masts.
- Audit of Mobile Phone Stations. The Radiocommunications Agency, currently OFCOM, undertook in 2001 an audit programme of with a focus on base stations sited on schools. The aim of the programme was to ensure that emissions from mobile phone base stations were below the International Commission on Non-Ionising Radiation Protection (ICNIRP) guidelines. The results from the surveys are published on the OFCOM website: <http://www.ofcom.org.uk/static/archive/ra/topics/mpsafety/school-audit/audit.htm>

Additionally OFCOM offers background information on mobile radio technology and health, i.e. the Stewart Report, whose conclusions gave a cause for the two research programs to be created.

25.2.3 Description of Methodology

Sitefinder

“Sitefinder” shows information, provided voluntarily by the operators, on all operational, cellular radio transmitters (GSM, UMTS and TETRA) in England, Scotland, Wales and Northern Ireland. Indoor sites in public places such as airports and railway stations, etc. are also included.

The information provided on each site is described in Table UK-1 below.

Parameter	Comments
Type of Transmission	This is specified in terms of the technology used. Two types of cellular technology operate in the UK, GSM and UMTS.
Height of antenna	In terms of metres above ground level.
Frequency range	Cellular radio networks operate in one of three bands in the UK; 900 MHz, 1800 MHz & 2.2 GHz.
Transmitter power	Specified in terms of Effective Isotropic Radiated Power (EiRP dBW) per channel.
Maximum licensed power	In EiRP dBW per channel. The maximum licensed power is the highest power that would ever be permitted from a particular transmitter. In practice, most transmitters would operate substantially below this limit.

Table UK-1. Characteristics of an antenna installation in UK.

Audit of Mobile Phone Base Station

The Audit only included schools in its first year, but in the following years it has included successively hospitals (2002, 2003) and private houses and other multi-user sites (2003), aimed to give a more complete picture of emission levels across a wider range of radio frequencies. Hospitals and schools located near to a mast are again invited to register. Also old peoples homes are particularly invited to register, and other sensitive sites will be considered on a case-by-case basis.

Methods

In every site audited several spot measurements were performed. In every location the power density (W/m^2) was measured in the frequency range regarding the communication systems present in the area (GSM, ETACS, TETRA and 3G). The measurements were taken at regular frequency intervals (*frequency selective*) within the band of frequencies using receivers and selective antennas appropriately calibrated and spectrum analysers (commonly Rohde & Schwarz EB200). The maximum electric field strength values in decibel microvolts per meter (dB (mV/m)) were then converted to power density in watts per square meter (W/m^2).

25.2.4 Status of the project

The Sitefinder GIS is updated every three months. It is noted that only operational transmitters, i.e. those that are actually transmitting, are included on the database.

The School Audit began in 2001 and goes on in 2004. PDF files with the results are already available for the four years.

25.2.5 Display of the information

Sitefinder

To access the data from Sitefinder the user only has to write the postcode, street name or city, and once this is entered the database will display a series of maps showing cellular radio

transmitters in that area (Figure 1). When you click on the icon for a particular site the parameters identified in Table UK-2 (and explained in table UK-1) will be displayed.

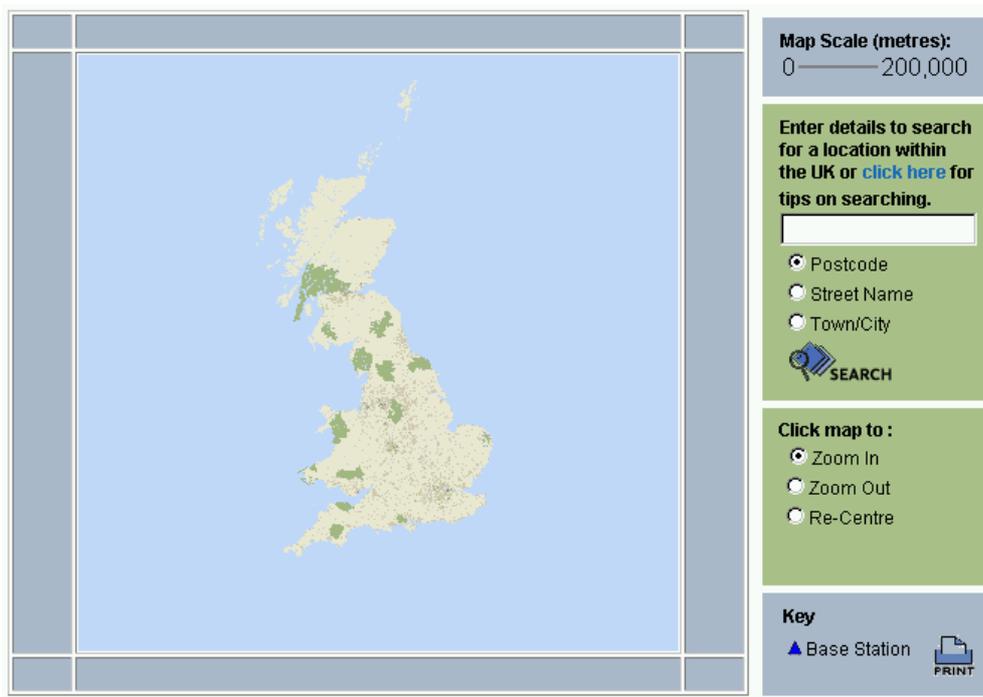


Figure UK-1 Interface of the Sitefinder GIS.

Name of Operator	MMO2
Operator Site Ref.	4644
Height of Antenna	22.3 Metres
Frequency Range	900 MHz
Transmitter Power	20.3 dBW
Maximum licensed power	32 dBW
Type of Transmission	GSM

Table UK-2. Characteristics of a base station.

Audit of Mobile Phone Base Station

The website gives complete information about how the measurements were done and the results obtained in their relation with the ICNIRP guidelines. PDF files with the results of test are available to download. A FAQ page gives additional information about aims, conditions and methods of the Audit Program as long as information for the citizen about how to use the database, technical information about RF stations and possible health risks.

The results are represented, as seen in Figure UK-2, along with the ICNIRP limit, the Frequency Exposure Quotient (the ratio of the measured maximum electromagnetic power density to the

ICNIRP limit at a given frequency), the Band Exposure Quotient (the sum of all the frequency exposure quotients in a band at a single location), and the Total Band Exposure Quotient (the sum of all the frequency exposure quotients in all bands at a single location).

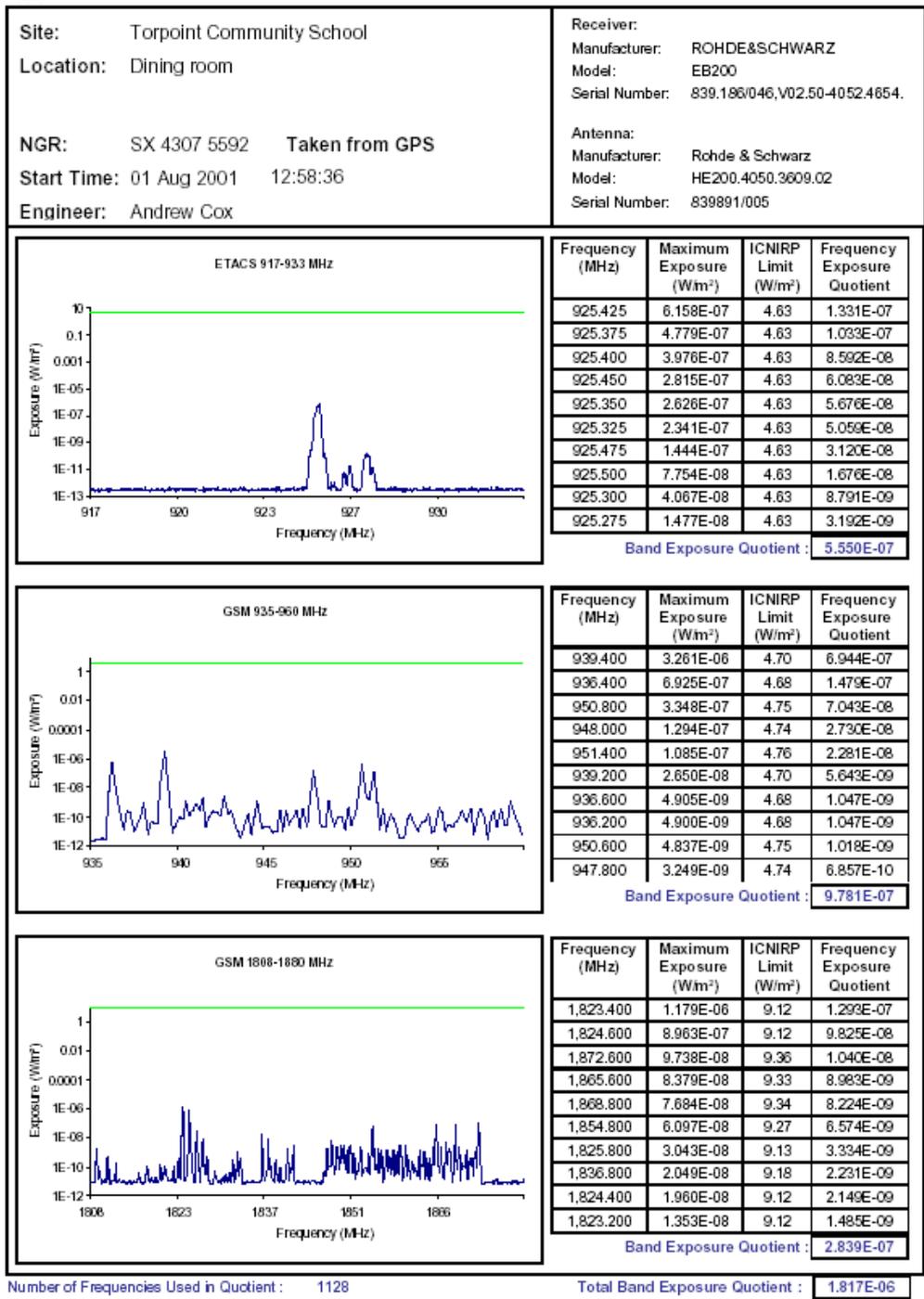


Figure UK-2. Display of the information obtained in every measurement in the Audit of Mobile Station.

In this database there is other kind of measurements like the “Mendip Public Broadcast/Mobile Phone Audit”, where broadcast and mobile phone contributions were measured showing that the public broadcast band contributes about 95% of the total while the mobile phone band contributes with the other 5%. Other studies like this were also performed showing quite similar results.

Manufacturer	Model	Type	Frequency Range
Schaffner-Chase	VBA6196	Biconical	30 – 300 MHz
Schaffner-Chase	UPA6108	Log-periodic	300 – 1000 MHz
EMCO	3115	Ridgeguide	1 – 18 GHz

Table UK-3 Antennas used for radiofrequency measurements.

25.3 NRPB

25.3.1 Purpose of the information

The National Radiological Protection Board (NRPB, www.nrpb.org) works together with the UK Health Protection Agency on topics related with Radiation. The board performs tasks that cover topics from investigations of the influences of radiation on health to guidelines to reduce those radiation hazards and campaigns to inform the citizens.

Regarding non-ionizing radiation NRPB carries out surveys of exposure levels in the environment around mobile phone base stations. The programme, called NRPB Radio Wave Surveys (<http://www.nrpbdev.org.uk/basestations/index.cfm>), includes measurements carried out on a commercial basis in different environments such as schools, homes, public places, or work places.

25.3.2 Availability of data

The NRPB website contains a Flash interface which displays the most important results of the measurements carried on. There is also other complementary information for users about mobile telephony and health, scientific reports and procedures. All the information is open to the public.

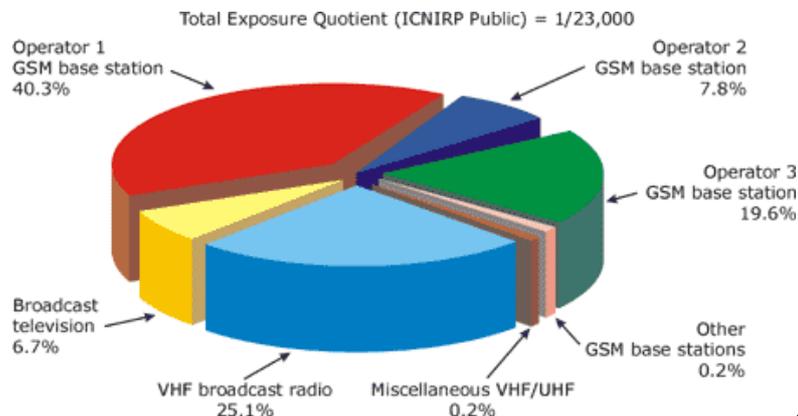


Figure UK-3. Contribution of every source to the total exposure quotient as obtained in UK by the NRPB.

25.3.3 Description of Methodology

The website includes a pdf with the description of one of these measurements. The measurements were done with a Hewlett Packard E4407B spectral analyzer connected to one of a choice of broadband antennas, as shown in Table UK-3 via a coaxial cable. This set-up allowed measurements to be made over a range of frequencies (30 MHz to 3000 MHz) using a narrow bandwidth, which made possible the detection of power densities as low as $0.001 \mu\text{W}/\text{m}^2$.

The maximum field strength from every signal was then recorded in order to calculate the worst-case exposure quotient at each measurement location and compare it with the ICNIRP guidelines.

The survey measured the contribution from base stations, VHF/UHF, TETRA, Broadcast Radio and TV towers and even Radar. The percentage of every signal to the total radiation was calculated as well and shown in pie charts as in Figure UK-4.

25.3.4 Status of the project

The procedure of measurement is ongoing.

25.3.5 Display of the information

In the website there is summarized graphic of all the surveys carried out showing the exposure quotient for every location and the contribution of every source to this quotient (see Figure UK-5). A summary of the main results is also available with an indication if they are in compliance with the ICNIRP guidelines.

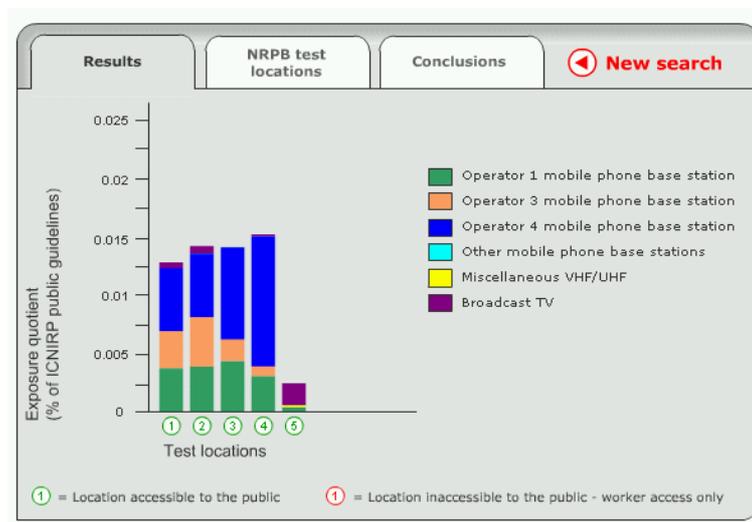


Figure UK-4. Screenshot of the Flash animation that presents the outcomes of the NRPB measurements.

25.4 Other Projects

O₂ Webmap

O2 WebMap (website <http://www.webmap.o2.co.uk/>) is a Geographical Information System developed by O2, a telecommunication services provider in the United Kingdom. This search engine provides information of the actual and future O2 GSM and GPRS coverage. The purpose of the project is therefore marketing, because it only provides information about this network.

After an area or location is selected (as seen for Edinburgh in figure UK-5) the program lets you select an area around which all the base stations available will be displayed. The table shows info on the location of the tower, the distance from the center of the area chosen, the type of the base station (transmitting frequency and size) and if an outage is planned. Any information about output power or electromagnetic fields is displayed.

registry (geographical information systems with description and location of antenna facilities), measurements and monitoring systems.

	Registry	Measurements	Monitoring
Austria	Senderkataster (FMK)		
		Umwelt Steiermark	
Belgium		NCS (BIPT)	
		ISSeP	
Czech Republic		NRLNIR	
Denmark		Aalborg University	
	Mastedatabasen (INTA)		
France	Cartoradio (ANFR)	Campagne de Mesures (ANFR)	
Germany	EMF Datenbank (RegTP)		
		EMF MessReihe (RegTP)	
		IZM	
		Mobilfunk Messungen, Nürnberg	
		Funkwellen Messprojekt, Baden	
		Schleswig-Holstein (Umwelt BundesAmt)	
Greece		EEAE	
			Hermes Project
		Technical University of Thessalonica	
Hungary		OSSKI	
Ireland	Site Viewer (ComReg)		
		NIR Measurements (ComReg)	
Italy		APAT, ARPA	
	Monitoraggio CEM (FUB)		Monitoraggio CEM (FUB)
Liechtenstein		Amt für Kommunikation	
Malta	MCA	MCA	
			Progett Gardiola (University)
Poland		MIHEW	
Portugal		MonIt (IT)	MonIt (IT)
Slovenia		ITK	
Spain	MICT	MICT	
			SMP (TUV, SCRM)
	ETM (GV)	ETM (GV)	
Switzerland	Antennenkataster (BAKOM)		
The Netherlands	National Antenne Register		
United Kingdom	Sitefinder (OFCOM)		
		Audit of MPBS (OFCOM)	
		Radio Wave Surveys (NRPB)	
	O2 WebMap		

Webindex

Austria

www.fmk.at

www.senderkataster.at

www.umwelt.steiermark.at/

Forum Mobilkommunikation Austria

Senderkataster Austria

Umwelt Steiermark

Belgium

www.bipt.be/bipt_E.htm

www.issep.be/public.asp?id=239

www.health.fgov.be/CSH_HGR/

BIPT, the Belgian regulatory body for postal services and TC

Institut Scientifique de Service Public

Health Council

Czech Republic

www.hyggpraha.cz/odbory/hyg_prace.htm National Reference Laboratory on Non-Ionizing Radiation

Denmark

www.itst.dk/
www.mastedatabase.dk National IT and Telecommunication Agency (INTA)
Mastedatabasen (INTA)

Estonia**Finland**

www.stuk.fi Radiation and Nuclear Safety Authority Finland
www.ttl.fi Finnish Institute of occupational Health

France

www.anfr.fr Agence Nationale des Frequences
www.cartoradio.fr/netenmap.php?cmd=zoomfull Cartoradio France
www.sante.gouv.fr/ Ministere de la Sante et de la Protection Sociale

Germany

www.regtp.de/ RegTP
<http://emf.regtp.de/GisInternet/> EMF Datenbank (Messreihe, RegTP)
www.izmf.de Informationszentrum Mobilfunk
www.lfu.baden-wuerttemberg.de/lfu/abt3/funkwellen Landesanstalt Umweltschutz
www.umwelt.schleswig-holstein.de Umwelt Schleswig-Holstein

Greece

www.eeae.gr/el/topics/index.html Greek Atomic Energy Commission
www.eett.gr/eng_pages/index2.htm National Telecommunications and Post Commission
www.hermes-program.gr Hermes Project Internet
http://rcl.physics.auth.gr/Measurements/Main_Entry.htm Technical University of Thessalonica

Hungary

www.osski.hu/ National Research Institute for Radiobiology and Radiohygiene

Ireland

www.odtr.ie/ Commission for Communication Regulation

Italy

www.sinanet.anpa.it Rete del Sistema Informativo Nazionale Ambientale
www.minambiente.it Ministero dell'Ambiente e della Tutela del Territorio
www.fub.it Fondazione Ugo Bordoni
www.monitoraggio.fub.it Monitoraggio CEM (Fondazione Ugo Bordoni)
www.elettra2000.it Monitoraggio CEM (Fondazione Ugo Bordoni)

Latvia**Liechtenstein**

www.llv.li/amtstellen/llv-ak/llv-ak-home.htm Amt für Kommunikation

Luxemburg

www.akut.lu/
www.ilr.etat.lu/

Akut absl
 Institut Luxembourgeois de Régulation

Malta

www.mca.org.mt
<http://gardjola.eng.um.edu.mt/emr>

Malta Communications Authority
 Monitoring Gardjola Progett

Poland

www.wihe.waw.pl/index_an.htm

MIHEW

Portugal

www.lx.it.pt/monit/
www.icp.pt

Monit – Electromagnetic Radiation Monitoring
 Anacom – National Communications Authority

Slovak Republic**Slovenia**

<http://www.i-tk.org/>

ITK, Institute for Telecommunications

Spain

www.setsi.mcyt.es/movil/top_mov.htm
www.smp.upv.es
www.itaca.upv.es/scrm/index.html
<http://juno.disemina.gva.es/moviles/index.htm>

Ministerio de Industria, Turismo y Comercio
 Sistema de Monitorizacion Permanente, UPV.
 Sistema de Monitorizacion Permanente, UPV.
 Estaciones de Telefonía móviles Comunidad Valenciana

Sweden

www.ssi.se
www.pts.se

The Swedish Radiation Protection Authority
 National Post and Telecom Agency

Switzerland

www.bakom.ch
www.bakom.ch/en/funk/freq_nutzung/standorte/index.html
www.umwelt-schweiz.ch/buwal/de/fachgebiete/fg_nis/index.html

BAKOM
 BAKOM Antennenkataster
 BUWAL, Elektrosmog Infoseite

The Netherlands

www.antennebureau.nl

Nationaal Antennebureau

United Kingdom

www.nrpb.org
www.nrpbdev.org.uk/basestations/index.cfm
www.ofcom.org.uk
www.sitefinder.radio.gov.uk
www.webmap.o2.co.uk

National Radiological Protection Board
 NRPB Radio Wave Surveys
 Office of Communications
 OFCOM GIS
 O2 GIS

WHO

www.who.int/docstore/peh-emf/EMFStandards/who-0102/Europe/EUROPE5.HTM

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- der Ingenieurgesellschaft für Geowissenschaften und Umwelttechnik, Regensburg, March, 2001.
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**ANNEX 4. Minutes 2nd Advisory Board Meeting (28th
October 2004)**

JRC/EIS-EMF

2nd Advisory Board Meeting

28th October 2004

Meeting Minutes

The 2nd Advisory Board Meeting took place at the European Commission's Joint Research Centre in Ispra, Italy. The minutes are not a word-by-word summary of the discussions during last Advisory Board meeting. The aim is to provide an overview of the topics addressed and an accurate account of the points of agreement and conclusions.

Introduction

The meeting started with the welcome given by D. Papameletiou of the JRC and followed by the introductory remarks from A. Doronzo of DG SANCO.

The basic purpose of the meeting was to address – and reach conclusions on - various important matters that were not fully reviewed during our first meeting on the 12th July. These included the mission and final composition of the Advisory Board, the EIS-EMF objectives, working plan and the immediate actions to be taken.

A. Doronzo reiterated the continuing strong support of DG SANCO in the EIS-EMF Project. He stressed the great importance that the European Commission attaches to the EMF and Health issue, and to the follow-up and further development of earlier EU initiatives in this area. In particular, in the recently adopted “European Environment & Health Action Plan 2004-2010”, “Action 13: Follow developments regarding electromagnetic fields” is directly relevant to the EIS-EMF project, as is “Action 9: Develop public health activities and networking on environmental health determinants” to public concerns, risk perception, communication and management on EMF & health issues. Further, “Action 4: Enhance coordination and joint activities on environment and health” aims at promoting continued exchanges between health and environment authorities and stakeholders at EU level.

Following the self-introduction by all participants, Tom Mc Manus (Ireland) was nominated as rapporteur to be assisted by G. Delfini (The Netherlands) and A. Boettger (Germany). The meeting structure was agreed to be a round-the-table discussion chaired by the JRC. The rapporteur's report is included in Annex A4.2.

After a brief presentation of the EIS-EMF Project current status by the JRC (by D. Papameletiou and C. del Pozo) and the proposed “Discussion document”, a detailed, point-by-point discussion of the document followed.

We had fruitful round-the-table discussions and reached general agreement in the structure and main objectives of the EIS-EMF project, the mission and role of the Advisory Board, as well as on most of the points of the proposed work programme. In particular, we fully agree

in a number of practical actions and milestones to be accomplished in the next few months and the coming year (2005).

Participants: The number of participants was 21, with the participation of DG-SANCO and of 16 representatives from thirteen EU Member States, the co-coordinator of the EMF-NET FP6 Action, and three members of the JRC/EIS-EMF Project. The “List of participants” is included in Annex A4.1.

1. Objectives of EIS-EMF

The schematic structure of the EIS-EMF project discussed and agreed during the meeting is displayed in fig. 1 (from main text).

The basic objectives of the project agreed at the meeting are as follows:

- To promote cooperation among policy makers on public health and EMF issues in the EU.
- To network relevant national authorities, and exchange information and experiences on the implementation of policies.
- To develop common approaches and coordinated actions in EMF risk communication across the EU, and to improve risk communication based on scientific evidence and best practices.
- To establish a dialogue with key stakeholders, NGOs, social partners, academia, and international organizations.
- To develop, maintain, and operate a web-based gateway to all relevant information on EMF exposure and health related issues across the EU.
- To establish and implement on annual basis a work-programme of thematic activities on EMF risk communication.

JRC and DG SANCO will clarify with DG Employment whether Occupational Health matters are included in the EIS-EMF project.

2. Advisory Board: Mission and role

Broad agreement was obtained about the mission and role of the Advisory Board, which constitutes a high level network of European competent Authorities on EMF and Health related issues, to exchange information and assess strategies on how information on EMF exposure can be used in national policy making and in risk communication.

The Terms of Reference for the Advisory Board were agreed. The document entitled “Mission Statement” was discussed in full detail and is attached to these minutes ([Annex 1](#), from main text). In particular, each Advisory Board member should identify the national

network of relevant authorities on EMF and Health issues, and guarantee that the regional level is covered. Full members represent their respective national administrations and will act as focal points for the national network of competent authorities on EMF and Health issues – this is a crucial requirement that needs to be fulfilled. DG SANCO and the JRC will contact the competent national authorities to complete the list of representatives from all 25 Member States.

3. International Collaboration

JRC reported about a coordination meeting among WHO-EMF, ICNIRP, EMF-NET, COST281, and EIS-EMF which was held at the WHO headquarters in Geneva the 11th October 2004, with the objective to establish an effective coordination of future activities, and to develop combined actions and workshops, particularly to present and discuss the scientific evidence on potential health effects of human exposure to EMF. Also agreed in this meeting was the need for close collaboration on risk perception and risk communication activities, particularly with the WHO. A follow up meeting to establish a tangible work programme may be convened by DG SANCO in early 2005.

4. Work Programme

Agreement was reached during the Advisory Board meeting that the following topics constitute the work programme for 2005:

- EIS-EMF Gateway and Country reports on EMF & Health
- EU-wide database on EMF exposure measurements
- Scientific evidence on potential health effects from EMF
- Risk perception and risk communication activities
- Other topics of interest. Thematic studies

4.1 Web-based Gateway

An essential part of the EIS-EMF project is the development and implementation of a Web-based information platform on public health issues related to EMF exposure, which is being carried out in parallel to the EU “Country reports” activity (see Chapter 4.2).

The JRC presented the preliminary architecture of the EIS-EMF gateway. The basic approach is to constitute a single Web-tool linking all major European and worldwide information sources on risk communication in the area of Human Exposure to EMF. It will provide links and retrieval facilities by subject and date.

The gateway structure consists of multiple interconnections between menus listing key actors, institutions, organizations, and pointing to various information categories and actions (legislation, technical information, studies, research, etc). It will provide links to all relevant sites, to documents and reports on health impact studies, to regulations, risk communication studies and tools, EMF measurements and exposure, technical standards, etc. In addition, it will give access to deliverables from the EIS-EMF work programme, including “country reports”, conference reports and workshop reports from meetings organised or supported by the EIS-EMF. In general, every piece of information generated by the project will contribute to the web-system and information platform.

It will include concise explanatory notes on specific responsibilities and functions, and specialised pages collecting the most relevant elements of various institutional websites. It will identify key documents and publications and increasingly provide electronic versions of them. It may also provide automatic or full translations for a number of selected documents.

The milestones are as follows:

- AB members provide information on a) national networks and b) country reports (end of January 2005)
- JRC implements this information into the “Gateway” and provides access to AB members before the AB meeting in May 2005
- Discussion & evaluation of Gateway in AB Meeting in May 2005
- Gateway “fine-tuning”, further development and updating (from June 2005 onwards)

4.2 Country Reports

National representatives agreed in fully supporting the JRC in the production and periodic update of these “Country reports” following a common layout presented and discussed at the meeting, and included with these minutes (actually in [Annex 2](#) from main text). Full contributions to the Country reports should be ready by January-February 2005. Additions, improvements and any other inputs are encouraged and may be submitted at any time. All this information will be summarised and made available at the EIS-EMF web-based gateway. EIS-EMF Website at <http://www.jrc.cec.int/eis-emf>

The aim of the country reports is to present in a single document and a common layout, a concise and thorough:

- Inventory of the relevant players, actions, sources of information, key documents, regulation(s), parliamentary questions/answers, R&D actions, press articles, and databases in the area of EMF and health across Europe, from national authorities, industry, academia, NGOs, etc.
- Explanatory information on the institutional roles of the various national authorities involved on EMF and Public Health issues.
- Case Studies

- Appraisal of risk communication and policy implementation experiences collected at national, regional, local levels.

Milestones:

- Preliminary Country reports submitted in July 2004 and edited into a single document (28th October)
- Discussion and development of common layout (October-November 2004)
- Final contributions from Advisory Board (End January 2005)
- Review by JRC and issue of the first draft (end of February 2005)
- Submission and discussion of a final draft version in the next AB meeting (beginning of May 2005)
- Publication of annual “integrated” reports with standard common layout (June-July 2005)

4.3 EU-wide database on EMF exposure measurements

The JRC gave a summary presentation on the “Feasibility study on European database of EMF exposure due to mobile phone base stations”. This study, carried out in collaboration with Seibersdorf Research (of the Austrian Research Centres), is close to completion. The final report will be submitted to the Advisory Board for comments and suggestions in December 2004.

This report, depending on the recommendation of the Advisory Board, may form the basis for a proposal for funding by the EC (from the IDA Programme, of the Enterprise Directorate) on the development and implementation of a Database on EMF Exposure data across EU, and promote common exposure measurement and assessment standards. This database could also complement the EIS-EMF gateway by holding a greater range of publications and documents on EMF & health issues from national and regional administrations, government agencies, industry, international organisations, professional associations, etc. The suitability of such a proposal will be discussed at the next Advisory Board meeting in May 2005.

4.4 Scientific evidence on potential health effects from EMF

In this area EIS-EMF has already started close collaboration with EMF-NET, COST 281, WHO EMF-Project, and ICNIRP (see Chapter 3).

JRC participates in the EMF-NET and will assist in the evaluation and review of “issue reports” to be produced by the EMF-NET on the scientific evidence of possible health effects

of human exposure to EMF. The coordinator of this FP6 Action (P. Ravazzani) was invited to participate at the Advisory Board meeting.

Following proposals by the JRC and EMF-NET, there was general agreement on the necessity and opportunity of the co-organisation, on a yearly basis of a high-level Workshop on the current status of “scientific evidence” on health impacts of EMF with EMF-NET, in collaboration with WHO, and other relevant international bodies if necessary. The overall objective is to present to the Authorities of the EU Member States the “Issue Reports”, which will cover all relevant EMF and Health issues and will be updated on annual basis. The first versions are expected to become available in 2005. In this light, the first workshop would be dedicated to the reviewing of these issue reports

Milestones:

- Organisation of a Workshop on “Scientific Evidence” in cooperation with EMF-NET (2 days, by November 2005).
- As a follow up activity, A. Doronzo of DG SANCO suggested holding a major EU “Presidency Conference” on EMF and Health, organized by JRC/EIS-EMF in collaboration with EMF-NET and WHO, in early 2006.

EMF-NET Fast response team

In answer to a request from various members of the Advisory Board, the coordinator of EMF-NET (P. Ravazzani) mentioned that the summaries produced by the EMF-NET “fast response team” in answer to specific questions on EMF and health from the European Commission could possibly be made available to the EIS-EMF Advisory Board. This point needs to be clarified with DG Research, the EC service with direct responsibility on the matter. A. Doronzo from DG SANCO accepted to look at this possibility. The other request for the Advisory Board to interrogate directly the fast response team was also discussed but it was considered unpractical – at least for the foreseeable future – because of time and manpower limitations as well as the EMF-NET operational and financial constraints.

4.5 Risk perception and risk communication activities

The advisory board agreed that risk perception and risk communication activities should be developed by EIS-EMF in cooperation with the Advisory Board and other leading international organizations and projects. The basic elements of a work programme on risk perception and risk communication may evolve from a Workshop in this area. Several members of the AB suggested that the focus should be on presenting and analysing case studies from several EU Member States.

Milestones:

- Organisation of a Workshop on EMF Risk Communication in the EU – Case Studies (possibly 2 days, by July 2005).
- The JRC will make a call for contributions on risk communication case studies from the Advisory Board members or their proposed national experts (December 2004).

- The JRC will publish an annual report on the status of EMF risk communication in the EU on the basis of the workshop results and the country reports (December 2005).

4.6 Other topics of interest

An action plan on suitable studies and other EIS-EMF activities will be drawn in collaboration with key experts, and in consultation with advisory board members. It will be focused on key priority needs agreed by the Advisory Board, depending on the availability of resources at national and at EU levels. The JRC will coordinate thematic activities agreed by the members of the advisory board (January-December 2005).

5. Next Advisory Board meeting

The tentative date for the next Advisory Board meeting is in the first week of May 2005. All participants are requested to give their inputs to fix the definitive date.

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EIS-EMF Project

Final report

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A4.2: Rapporteur's Report

EIS-EMF Project: 2nd Advisory Board Meeting Ispra, 28th October 2004

Overview

There is continuing strong support for the EIS-EMF Project from the Commission through DG SANCO.

The EMF - health issue continues to be a very important one. Action 13 of the EU's Environment and Health Action Plan is devoted to the follow-up of earlier EU actions and policies in this area. Action 9 deals with Risk Communication and Risk Management and therefore complements the EIS-EMF Project being undertaken at the Joint Research Centre at Ispra.

The continuing and increasing public concern over EMF related issues highlights the need to take a fresh look at approaches to risk communication with a view to identifying effective new initiatives. This is one of the key aims of the EIS-EMF Project. It underscores the importance of the Advisory Board's involvement in a project of truly vital importance to the safe and acceptable development of wireless communication and electrical power applications in Europe in the twenty-first century.

The Advisory Board

The Terms of Reference for the Advisory Board were agreed. Each Member State can nominate an EMF expert who will have his or her expenses refunded by the Commission. Member States may send larger delegations to Board Meetings but at their own expense and with the prior agreement of the JRC Project Manager. It was also agreed that, from time to time and when appropriate, the Board might invite other important groups, committees or agencies to Board Meetings to exchange views and advice on matters that concern them and the Board.

It is a fundamental requirement of a Board Member that he or she becomes the focus for establishing their respective National EMF Networks and the conduit whereby these networks become involved in the work of the EIS-EMF Project.

Project Work Plan 2004 – 2005

The first element of the Project Work Plan should be in place by June 2005. This is the "EIS-EMF Gateway" information database. Essentially every piece of information generated by the project and every input to the project from the National Networks will be available to Board Members and a substantial proportion of all of this will be available to the public. This EMF information 'supermarket' will include the Country Reports from Member States, all risk communication studies and risk communication tools provided by the National

Networks, a database of EMF exposure measurements and measurement methodology from across Europe, conference reports and workshop reports from meetings organised or supported by the EIS-EMF Project, plus material from outside the EU which is considered relevant to the project. It is hoped to have the Country Reports completed by the respective Board Members by the end of January 2005. These will be incorporated into Gateway, together with other information by May 2005.

The other main element of the initial Work Plan deals with EMF measurements. A feasibility study by George Neubauer of the Siebersdorf Institute is due to be completed and submitted to the JRC by December 2004. This study is expected to provide a methodology for determining public exposure to electromagnetic fields in the vicinity of mobile phone masts and provide guidance on a harmonised approach to future measurement surveys. It is understood that DG Enterprise may be interested in developing a EU database on EMF exposure. There are therefore good prospects of an early follow-up to the Siebersdorf study.

International Collaboration

At the first Advisory Board Meeting in July 2004 there was some concern expressed over possible overlap and conflicting opinions being expressed by a number of major international organisations that are involved in EMF- health issues. Since that time constructive discussions have been held with these organisations. The favourable outcome is an agreement to hold a major workshop dealing with an examination of the nature and quality of the scientific evidence for exposure to electromagnetic fields affecting health. Co-sponsors with the JRC EIS-EMF Project are WHO, ICNIRP, COST 281 and EMF-NET. The dates for this workshop have still to be fixed but it is expected to take place in November 2005 in Italy.

Other Meetings and Workshops

There was wide support and interest in holding a workshop that dealt specifically with Risk Communication, as opposed to one that would also include risk perception issues. A decision on whether to hold a second workshop in 2005 will depend, in part, on the response of Board Members to a request (that the Project Manager will circulate soon) asking for information on any relevant Case Studies that Member States have completed and other appropriate material. Mr Doronzo of DG SANCO suggested holding a major EU "Presidency Conference" dealing with EMF issues raised by the EIS-EMF Project. This suggestion was well received. A suitable time for such a conference would be early 2006.

The next meeting of the Advisory Board will be held in May 2005.

AOB

The final item discussed was how the EIS-EMF Project might obtain copies of the EMF-NET "Quick Responses" that are provided to the Commission following EMF scares that receive extensive media coverage. The outcome depends on DG RESEARCH who is the 'proprietor' of the information. The Project Manager will have further discussions with DG SANCO.

The meeting adjourned at 5.30pm.

Tom McManus 9 November 2004

**ANNEX 5. Coordination Meeting at DG SANCO,
31st January 2005**

European Information System on Electromagnetic Fields (EIS-EMF)

On behalf of DG SANCO

EMF Co-ordination Meeting

Jean Monnet Building, meeting room C5 126
Luxembourg, 31st January 2005

Purpose of the meeting

To discuss co-ordination and collaboration issues concerning our various activities dealing with EMF exposure and health issues, and risk communication initiatives. We will also explore some possible ways of developing future common initiatives at the EU level.

In particular, this meeting will address the organisation by the JRC during this year 2005 of two high-level workshops, and the participation and support from EMF-NET, COST281, WHO, and ICNIRP. Workshop (1), see outline in attachment, will present an overview and appraisal of EMF risk communication initiatives by member states and stakeholders in the EU, and the other (Workshop (2), outline also in attachment) will discuss the results of the analysis and interpretation by EMF-NET, of the scientific evidence on potential health effects from human exposure to EMF across the frequency spectrum.

The shared goal of the workshops is to inform the decision-making process on public health and EMF issues in the Member States and the European Commission, to promote cooperation among policy makers on public health and EMF in the EU, and to contribute to an effective risk communication based on scientific evidence and best practices.

Attachments:

- Agenda & List of participants
- Workshop Outline (1): “EMF Risk Communication in the EU – Case Studies”
- Workshop Outline (2): “Analysis and interpretation of ‘scientific evidence’ on EMF exposure and health effects for EU policy-making”
- Minutes of the 2nd Advisory Board meeting of JRC/EIS-EMF

Agenda

11:00	13:00	<i>Introduction by JRC</i> - Short report on 2 nd Advisory Board meeting of JRC/EIS-EMF - Co-ordination & Collaboration (JRC, EMF-NET, COST281, WHO-EMF, ICNIRP)
13:00	14:30	<i>Lunch</i>
14:30	15:00	<i>Introduction by the European Commission (Videoconference with Brussels)</i>
15:00	15:30	<i>Co-ordination & collaboration issues</i>
15:30	16:00	<i>Collaboration on risk communication activities and Workshop “EMF risk perception in the EU – National initiatives and case studies”, by July 2005</i>
16:00	16:15	Coffee Break
16:15	16:45	<i>Workshop: Analysis & interpretation of ‘scientific evidence’ on health impacts from EMF exposure for EU policy-making, by November 2005</i>
16:45	17:15	<i>Any other Bussiness</i>
17.15	17.30	Conclusion

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A5.1: Workshop Outline: “EMF Risk communication in the EU – Case studies”

(2-2 ½ days, July 2005, Brussels or Ispra)

Organisation:

EC Joint Research Centre, Institute of Health and Consumer Protection
&
Representatives of Authorities on Health and EMF from EU Member States

In collaboration with:

WHO/International EMF Project
EMF-NET FP6 Co-ordination Action
COST281 Action
ICNIRP

Background

The Network of European competent Authorities on EMF and health related issues, requested EIS-EMF to organize a high level workshop, in collaboration with key international organizations and actions (WHO, ICNIRP, EMF-NET, COST 281) to present and discuss the state of the art about the EMF Risk communication practices carried out by EU Member States and key stakeholders, including industry and NGOs. The focus of the presentations will be on lessons learned from real life case studies and national initiatives.

EIS-EMF is a policy driven activity carried out by the JRC with the objective to promote cooperation among policy makers on public health and EMF risk communication issues in the EU. Its advisory board constitutes the Network of European competent Authorities on EMF and health related issues.

Rationale & Objectives

Risk communication in the EU has been significantly hampered by the absence of a clear strategy to promote cooperation among policy makers to exchange experiences, and to develop common approaches and coordinated communication actions on public health and EMF issues. Many risk communication initiatives have been implemented at national level across the EU and there is indeed a great interest in learning about their objectives and outcome, on how similar issues were tackled in different countries, in different administrative, legislative and socio-economic contexts.

The main objective of the workshop is to identify and discuss key risk communication experiences and initiatives that were milestones in EMF policy making across the EU, and eventually worldwide. These may include:

- Establishment of official (government) or independent committees,
- Parliamentary hearings, questions and responses,
- Public hearings and consultations (Stewart report, Zmirou report etc),
- Round table discussions at local and regional levels with participation of citizens, NGOs, industry, academia, etc

- Information campaigns (TV, radio, press, leaflets, fact sheets, web sites, etc.)
- Measurement campaigns and communication of the results
- Surveys/studies, risk perception research, pro-active R&D, etc

On this basis the workshop will provide an overview of all relevant national initiatives, promote the exchange of information and experiences, and assist stakeholders in the conception of future communication actions.

Meeting Audience & Agenda

Participants at the workshop include the network of European competent authorities in health and EMF, supporting national experts, and a selected audience of other experts and stakeholders (from academia, NGOs, and industry).

The workshop will present as many case studies as possible, and will allow extensive question time and discussion. In addition, the representatives from the network of European competent authorities, experts from academia, NGOs and stakeholders from industry are invited to present plenary appraisals about the “lessons learned” at national or stakeholder levels.

Preliminary agenda

First day

- Introductions by the EC, WHO, ICNIRP (30 minutes)
- Key note lecture 1 (30 minutes)
- Keynote lecture 2 (30 minutes)

Plenary Session “ Case Studies”

Plenary presentations of case studies at national or “stakeholder” levels

- Case Studies I: EU case studies (1 ½ hour, including question time)

Lunch

- Case Studies II: EU (1 ½ hour)
- Case Studies III: International cases studies (1 ½ hour)
- Poster session (parallel to the oral sessions)

Second Day

- Case Studies IV: EU case studies (1 ½ hour)

Plenary Session “ Synthesis, Appraisal and Lessons Learned”

Plenary presentations synthesis of all relevant case studies, "lessons learned" and future plans at national or “stakeholder” levels

- The point of view of Authorities

Lunch

- The point of view of Industry
- The point of view of NGOs
- The point of view of Academia

Conclusions

The deadlines for delivering contributions to the workshop are:

- | | |
|--|--------------|
| - Case studies: title and abstract | end of March |
| - Case studies: Full text | end of May |
| - Plenary presentations “ Lessons Learned” | end of June |

A5.2: Workshop Outline: “Analysis and interpretation of ‘scientific evidence’ on EMF exposure and health effects for EU policy-making”

(2 ½ -3 days, November 2005, Brussels or Ispra)

Organisation:

EC Joint Research Centre, Institute of Health and Consumer Protection
&
EMF-NET FP6 Co-ordination Action

On behalf of the European Commission

In collaboration with:

COST281 Action
WHO/International EMF Project
ICNIRP

Background

The Network of European competent Authorities on EMF and health related issues, requested EIS-EMF and EMF-NET to organize a high level workshop, in collaboration with key international organizations and actions (WHO, ICNIRP, COST 281) to present and discuss the state of the art about the “scientific evidence” on health effects caused by EMF.

EMF-NET and JRC/EIS-EMF are two major EC funded projects aiming at supporting the European Commission and Member States in developing common approaches and strategies in decision making on public health and EMF issues, and to improve risk communication based on scientific evidence and best practices.

- EMF-NET is a large Coordination Action funded by FP6. EMF-NET main task is to analyse and interpret the scientific evidence on the possible health impacts of exposure to electromagnetic fields, for the European Commission, and, through it, for policy makers and health authorities at the EU level.
- EIS-EMF is a policy driven activity carried out by the JRC with the objective to promote cooperation among policy makers on public health and EMF risk communication issues in the EU.

Rationale and Objectives

Currently there is a significant amount of novel R&D results emerging from EU funded research and a number of other international initiatives that are offered for consideration to policy makers. These research results are being analysed systematically by EMF-NET. The first interpretation reports are expected by the end of 2005 and this workshop may represent the first venue to communicate and discuss the analysis and interpretation to the Network of

European competent Authorities on EMF and health, and to a selected audience of experts and stakeholders.

This workshop is intended to form the basis for the organization by the European Commission of a high-level EU “Presidency Conference” on the ‘scientific evidence’ of EMF exposure and health effects in mid 2006.

Meeting structure

The workshop will be centred on the presentation of the “Key Interpretation Reports” produced by EMF-NET. These reports are state of knowledge reports providing authoritative evaluation and interpretation on possible health effects from EMF exposure. The workshop will include extensive question time and round table discussions with the objective of examining the reports and up-to-date evidence presented, to respond to specific public concerns and to identify possible policy making needs.

The topics treated should follow closely the structure of the EMF-NET tasks and work-packages. Discussion of the results and conclusions from recent EU (FP5) funded research projects, and other relevant international studies and scientific reviews will also be included.

Presentations may take the form of “interpretation” reviews that summarise and integrate various more specific, scientific “issues” associated with any topics focusing the public interest and requiring informed policy-making and answers. As an example of interpretation issues, and by not means an exhaustive list, we have: EMF hypersensitivity, possible children higher sensitivity and vulnerability to EMF, EMF and childhood cancer, EMF genotoxicity, ELF and health (power lines and residential exposure), RF and mobile telephony, base stations and handsets; potential long-term effects and whole-body exposure, etc.

Tentative agenda:

1) The workshop may extend over 2.5 or 3 days in July and be hold in Brussels, or at the JRC in Ispra.

2) It may consist of four different sessions of half-day each plus a last half-day of round table discussions.

- Laboratory studies
- Epidemiological studies
- Occupational
- Emerging technologies and health, and R&D (both in the EU and globally)

3) Roughly, the first day may cover the scientific evaluation of the results of the studies on EMF health effects across the frequency spectrum (ELF, low and intermediate frequencies, RF, to THz), including laboratory and epidemiological human studies, and research needs and recommendations.

4) During the second day topics treated may be the EMF exposure related risk in the working environment, aspects of dosimetry (on exposure measurement and assessment), new emerging technologies and health, R&D activities in the EU and worldwide, medical applications and electromagnetic compatibility of medical devices, etc.

- 5) The last day to conclude the workshop presentations, and for a round table discussion involving all participants (and a panel of all speakers).
- 6) JRC and EMF-NET plan to publish the proceedings of the Workshop by early 2006.

ANNEX 6. Meeting Agendas, Participants and Documents (12-14th July 2004)

European Information System on Electromagnetic Fields Exposure and Health Impacts

On behalf of DG SANCO

**EIS-EMF Kick-off Meeting, EMF Risk Perception
Workshop, and Stakeholder Dialogue**

Ispra, 12-14th July 2004

**Project Outline & Status
Working Plan & Milestones**



EUROPEAN COMMISSION
DIRECTORATE GENERAL JRC
JOINT RESEARCH CENTRE
Institute for Health and Consumer Protection
Physical and Chemical Exposure Unit

Project Outline & Status

Rationale & Objectives

There is a growing public concern on the potential adverse health effects of human exposure to EM radiation, particularly from GSM base stations whose number will rise even more to implement the latest 3-G developments (UMTS). Scientific uncertainties over the possible health impacts of EMF and the inability of the scientific community to clearly identify and characterize potential risks are inducing public debate.

To address this problem there has been a targeted R&D planning and funding by FP5 at EU level and by Member States at National level. As a result, various ongoing R&D activities are expected to provide data to clarify this state of things. In order to integrate the emerging scientific results into policy-making priorities, two major projects, the EIS-EMF and EMF-Net, funded by the European Commission, are currently at the launching stage.

EIS-EMF is carried out by the JRC and will run in close collaboration with ICNIRP, WHO EMF-Project, COST 281, and EMF-NET (a FP6 Co-ordination Action). JRC is a partner of the EMF-NET consortium. In this role JRC is in charge of developing and operating a Web-based information exchange tool among EMF-NET partners and a knowledge-based database that includes all project results. On this basis, EIS-EMF benefits from the timely and robust infrastructure of EMF-NET; which provides the essential scientific review and input for developing risk communication contents and tools.

The synergy and interface between the two projects is a strategic asset:

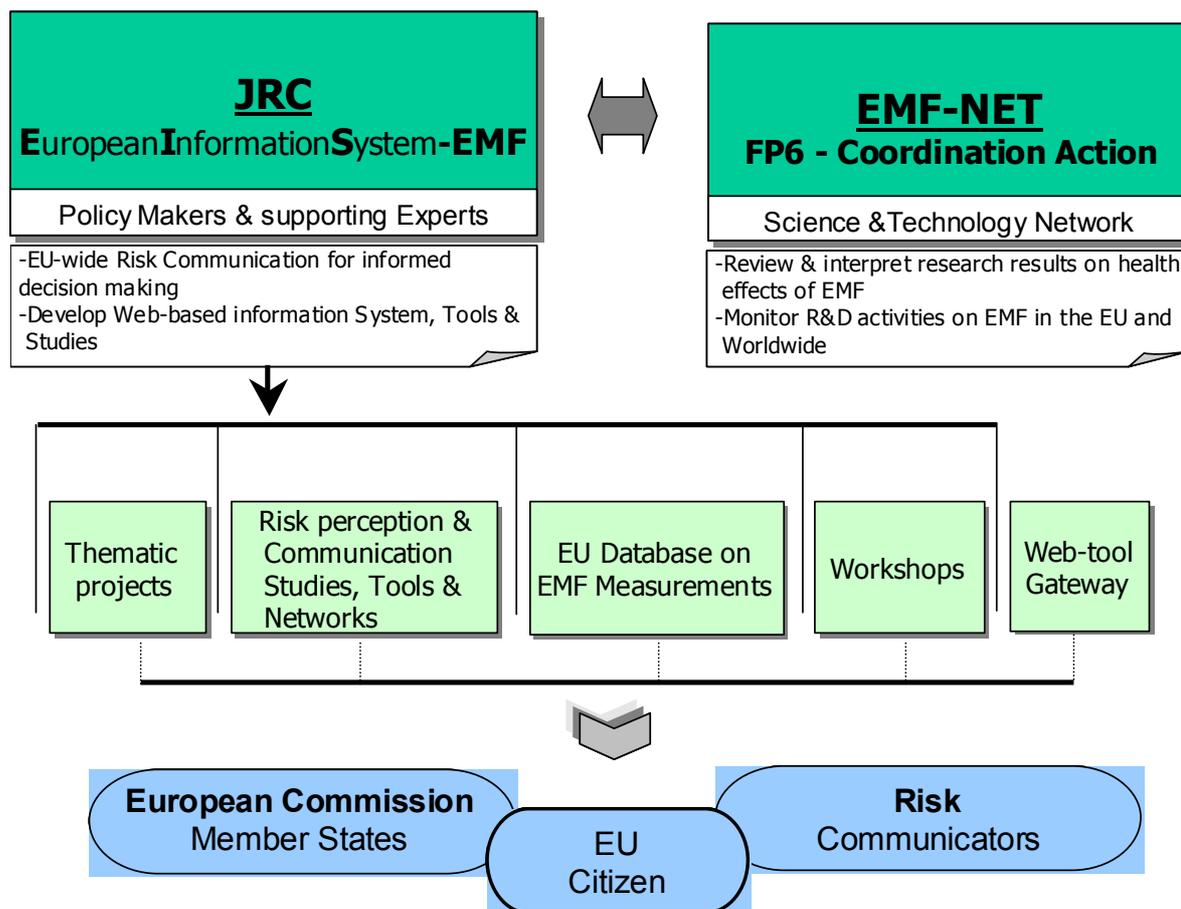
- EMF NET: a large S&T EU network that distils the emerging scientific evidence on health effects,
- EIS-EMF: a policy-driven/support project, that processes the EMF-NET results into risk communication contents ready to use by policy makers.

Management, deliverables and timetable of EIS-EMF

JRC/IHCP/PCE is responsible for the day-to-day management of the project. EIS-EMF includes a steering committee, an advisory board and several committees of thematic experts ([see Advisory Board mission statement](#)). The steering committee and the advisory board ensure that the project planning and execution respond to the needs of the European Commission and of Member States. [The project “kick-off” meeting - and first workshop – is expected for 12-14 July 2004.](#)

Overall the milestones of EIS-EMF are:

- (2004) Prototype development of the Information System & Demonstration
- (2005) Pilot operation of the first year



The main task is to develop and implement a EU-wide programme on EMF risk communication. For this purpose, the JRC: (1) is establishing an EU-wide network of policy-makers (Advisory Board) and experts to exchange and assess strategies on how information on EMF exposure is to be used in a harmonised way in policy making and in risk communication, (2) is developing and will operate a Web-based information platform on public health protection, risk perception and risk communication activities, and (3) is elaborating tools (newsletters, fact-sheets, reports) and carrying out activities for risk communication on EMF, and for the dissemination of information to stakeholders and EU citizens.

Specific activities that constitute the work programme of EIS-EMF are:

- [Advisory Board](#)
- [Country-specific reports on EMF sources and GSM/UMTS base stations](#)
- [EIS-EMF Web-based information system & gateway](#)
- [“Issue reports”](#) and [Stakeholder dialogue](#) on EMF and health issues: Interface with EMF-NET
- [Risk perception and communication issues related to EMF exposure, particularly from base stations and potential adverse health effects.](#)

- [EU database on EMF measurements and standardisation issues for EMF exposure measurements and assessment procedures](#)
- [Other topics of interest – thematic projects – and workshops, to be decided](#)

The advisory board supervises the planning and progress of the above work programme. After validation and endorsement by the Scientific Committee on Health and Environmental Risks (SCHER), final results will be disseminated to the public.

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Working Plan and Milestones

1. JRC/EIS-EMF Advisory Board

1.1 Mission Statement

The basic mission of the Advisory Board is to establish a high level European network of competent Authorities on EMF & Health issues. They will discuss and implement through the EIS-EMF project a harmonisation of risk communication practices on EMF across the EU. This includes ensuring that the information provided to the public and to decision makers through the EIS-EMF Project is reliable, relevant, balanced, user-friendly, up-to-date and timely. Further, it includes the establishment of an active information exchange among the Advisory Board members and the European Commission to create a common knowledge base on the potential health effects that may be associated to the EMFs.

1.2 Structure

The JRC will provide a technical secretariat for the development of EIS-EMF.

The Advisory Board should be constituted by a maximum of 25 full members, mostly national representatives from competent authorities in the Member States. DG SANCO will chair it.

Full Members of the Advisory Board: The Advisory Board is basically composed by national representatives from the various EU Member States who are actively involved in policy-making in the area of EMF and health related matters. The mission statement and the roles/expectations listed above apply to full members.

Associate Members and observers of the Advisory Board: A selected number of experts have been invited to participate on the Advisory Board:

- Based on their involvement in International organisations (COST, ICNIRP, WHO) interested in EMF health-related issues,
- As supporting national experts,
- As observers from National Research Institutions, Academia and Industry interested in EMF health-related issues.

1.3 Modus Operandi

The Advisory Board members and supporting experts will advise the JRC in the planning of the work programme, and in the execution of the work. They will act as national focal points to ensure that:

- Policy makers, key scientists and risk communicators will focus the overall design, planning and work programme of EIS-EMF on the key priority needs as perceived across the EU.
- The production of risk communication contents within EIS-EMF is carried out appropriately and effectively.
- The risk communications contents developed by the EIS-EMF will be used in a harmonised way by the key communication channels in every EU Member State.
- Participate in, and lead, technical working groups for the definition and evaluation of thematic studies and pilot projects initiated by EIS-EMF in collaboration with recognised experts. Contribute to the identification of resources to support such initiatives.

At present the establishment of the following TWGs is proposed

- Stakeholder dialogue
- Risk Perception
- Risk Communication
- Uncertainty factors in risk assessment

JRC welcomes proposals for the establishment of other TWGs, and their operation including the preparation of corresponding working papers and the development of relevant activities.

The Advisory Board will support EIS-EMF to develop and implement a EU-wide programme on EMF risk communication. For this purpose it will act as EU-wide network of policy-makers and experts to exchange and assess strategies on how information on EMF exposure is to be used in a harmonised way in policy making and in risk communication.

The Advisory Board should meet once a year to review and evaluate all deliverables elaborated by the JRC, and to provide advice on the current and future work-programme and priorities of the EIS-EMF.

The Advisory Board will be requested to participate in the identification of meaningful issues of public interest and concern on EMF & Health related matters, and in the evaluation of “key issue” reports ([see work-package 4.2](#)). In particular they will be requested to comment on the policy relevance of the “scientific evidence” and to draw conclusions and recommendations for action.

The representatives of the Advisory Board will be requested to collect the views and comments from all the AB members and to present them at the EMF stakeholders’ dialogue.

1.4 Milestones

- ◆ 12th July 2004, at first Advisory Board meeting ([see Agenda](#)):

- Review of EIS-EMF Working plan & milestones
- Review the EMF-NET proposal on the list of “key issues” on “EMF & Health”
- Setting of TWGs concerning specific actions and work-packages.

- ◆ Initial contributions and presentation of EU Country specific reports on EMF and health. August-October 2004: Drafting of the full, comprehensive, reports with the participation as all country representatives and experts ([see work-package 2](#)).

- ◆ 13th July 2004: Participation of AB members to EMF risk perception and risk communication workshop and ensuing round-table.

- ◆ 14th July 2004: Participation of AB members at the preparatory meeting for the TWG “Stakeholders Dialogue” on EMF and health issues, review first list of “key issues” presented by EMF-NET, and definition of the work-programme.

- ◆ December 2004: Review of EIS-EMF annual report

- ◆ April 2005 (to be decided): Second AB meeting.

- ◆ Foreseen long-term involvement with EMF-NET and representative Stakeholders (see [work-packages 4](#) and [5](#)):

 - Participation in reviewing of “key issue” reports once a year for the next four years (2005-2008). The first set of reports is expected by April 2005.
 - Participation at the “Stakeholder dialogue” meetings, possibly twice a year, over the next four years (2005-2008). The next meeting should take place before April 2005.

2. Country-specific reports on EMF and Health: Sources, Regulations, and Risk Communication approaches. Web-gateway to national EMF activities

2.1 Objectives

The basic objective of these reports is to present a concise and thorough review of national approaches, regulatory measures, and actions in the area of EMF, the associated environmental and health impacts, and potential risks. This is, we believe, an unique and much needed undertaking, aiming at summarising and presenting in a single document, and a common lay-out, a concise and thorough inventory of the relevant players, actions, norms and regulations, sources of information and databases in the area of EMF across Europe, from national authorities, industry, academia, NGOs, etc.

As an initial contribution we are asking "policy-making" members of the advisory board, to prepare (in collaboration with national supporting experts) brief country-specific reports giving an overview of their country legislative initiatives, regulations, and relevant actions in the field of EMF & Health, and risk communication approach and channels. These first contributions will form the basis for the production and periodic updating (once a year) of comprehensive country-specific reports on EMF at the European level. Written reports should include the list of relevant regulatory bodies and other institutions, and organisations having a role in the EMF & Environment and Public Health debate. For each case and when it applies, the list must mention:

1. Specific responsibilities and functions,
2. Regulatory tools and/or relevant initiatives, and
3. Key documents and publications.

Only summary information, links to sources, and contact addresses are required. This information will help to update the JRC country-specific reports on EMF sources and GSM/UMTS base stations. Reports, lists of contributors, and contact points, will be made available both as hardcopies and at the JRC/EIS-EMF Website. They will also form the basis for the setting of a detailed Web-gateway to national EMF activities across Europe. The description and tentative structure for the Country reports on EMF & Health are presented in [Annex 1](#).

2.2 Milestones

- ◆ 2 July 2004: Initial contributions from AB members (and supporting experts).
- ◆ First Advisory Board meeting 12 July 2004: Brief oral presentations of "Country-specific reports" by AB members. Propose and discuss a model "template" for the drafting and periodic updating of reports.

- ◆ August-October 2004: Drafting of the full, comprehensive, reports with the participation as all country representatives and experts.
- ◆ November-December 2004: Final document and Web-gateway integrating all national reports.
- ◆ 2005: second update of the national reports to be decided in the second AB meeting possibly in April 2005.
- ◆ 2005: To develop a monthly/bimonthly or quarterly “EMF & Health Issues” newsletter on key developments across the EU and beyond

3. EIS-EMF Web-based Information Platform & Gateway

3.1 Objectives

The task of developing and operating EIS-EMF is a complex and demanding one, as heterogeneous users, and a multitude of sources are being targeted. The strategic approach is to constitute a single Web-tool linking all major European and worldwide information and risk communication sources in the field of Human Exposure to EMF.

The Web-system will serve as a tool during the development of the contents for managing the information exchange among experts, stakeholders and JRC/EIS-EMF and EMF-NET partners. EIS-EMF develops risk communication contents and tools through dedicated projects and thematic studies. Deliverables in this work programme contribute to the web-system and information platform, such as:

- Country-specific reports on EMF and Health: Web-Gateway to national EMF activities, legislation, key websites, key documents, etc
- “Key issues” reports: Providing interpretation of EMF research results and the EMF risk communication to decision makers and to EU citizens will be focused,
- EU-wide databases:
 - o Database on EMF exposure measurements, in particular from GSM-UTMS Base Stations
 - o Knowledge-based interface with existing EMF Databases and European References Database
- Risk perception and risk communication activities and programme of studies.

3.2 Web System developments

EIS-EMF Website: *Work in progress* (<http://www.jrc.cec.eu.int/eis-emf/>), also implementation of CIRCA discussion forums for both EIS-EMF and EMF-NET projects and of a common CIRCA interest group for the “stakeholder dialogue”.

CIRCA (Communication & Information Resource Centre Administrator): This is a powerful Web-based information management tool developed at the European Commission. The production of the Issue Reports and reviewing process will be managed through the CIRCA platform. This process will involve the EMF-NET various TWG and Steering Committee, scientific “issue-specific” virtual networks, the JRC EIS-EMF stakeholder forum, and members of the EC Scientific Committees. A common virtual “interest group” platform, shared by both projects, will be implemented at CIRCA for the stakeholders’ dialogue. Access rights and user profiles will be allocated to all members of the stakeholders’ forum after registration.

3.3 Development of contents

Implementation into the Website of information sources, tools, and databases across the EU: *Work in progress in conjunction with country reports project:* It will provide links to other relevant sites and organisations and to national documents and reports on EMF measurements and exposure, on technical standards, on EMF related legislation and regulations and health impact studies, and information on mobile phone base-stations and other radio-frequency sources. Networks of thematic experts will be implemented, to identify and put forward relevant topics in EMF & health related matters and to develop pilot studies. In the same way we will implement a network of experts on EMF risk perception and communication issues.

Key issues” reports: Providing interpretation of EMF research results and the EMF risk communication to decision makers and to EU citizens will be focused ([see work -package 4](#)).

Database on EMF exposure measurements, in particular from GSM-UTMS Base Stations ([see work-package 7](#)).

Pilot study: “Monitoring multilingual EU media reporting on EMF & health issues”: We are applying the European Media Monitor (*) in the evaluation of public opinion on exposure to EMF & Health and Environmental issues at the EU level. We are looking for media reporting on EMF exposure and possible health effects, hazards, etc, as well as public reactions and perception of risk. The idea is to monitor public concerns with EMF, to identify citizens-concern groups and risk communication channels, as well as to implement risk perception & risk communication studies. The searches combine keywords from two distinct groups: (1) a technical EMF word, together with a (2) health or public reaction related one. (*) EMM, developed by Web Technologies at the JRC, is a software system that provides “real time” news monitoring across all major European on-line media sites.

Knowledge-based interface with existing EMF Databases and European References Database: (project proposal) The JRC, together with EMF-NET and FEMU at Aachen University, is studying cost-efficient options to develop such a knowledge-based interface to facilitate the retrieval of reference literature pertaining to a given “issue” from a number of existing EMF-databases. This knowledge-based interface will develop around allocations between the issue definitions in the EMF-NET project and the information categories, indexes, and tagging systems of the existing key data bases on EMF. This will in practice correspond to a European database holding wide range of documents in EMF and health, and technical and scientific references and projects. Such database will be fundamental tool for informed decision making, for carrying out research and the periodical evaluation of research results, and for the setting of exposure limits and recommendations. It may also play a key role in any information dissemination campaign and risk communication exercise. To guarantee the database continuity, including the data coverage, quality and updating frequency, the necessary actions and synergies with the key existing databases are being explored. Draft working-paper “Knowledge-Based Interface & European References Database on Health Effects from Exposure to EMF” will be discussed with interested parties.

3.4 Milestones

- ◆ Final report on information system Prototype Development (2004):
 - EIS-EMF Website (published June 2004)
 - Inventory and selection of information sources, tools, and databases (ongoing)
 - CIRCA Information management tool (March 2004)
 - European Media Monitoring application (April 2004)
- ◆ November-December 2004: Final document and Web-gateway integrating all national reports (drafted with the participation of the Advisory Board members)
- ◆ October 2004: Working paper "EMF exposure data in the EU, risk perception and risk communication issues". It will include the Workshop Proceedings (EMF risk perception and risk communication, 13th July 2004) with full versions of the presentations together with a concise review of key studies and tools on risk perception that may be relevant for risk communication and decision-making on EMF & health.
- ◆ December 2005: Final Report on the Pilot study: "Monitoring multilingual EU media reporting on EMF & health issues"
- ◆ Final report on the EIS-EMF Web system prototype development (December 2005)
- ◆ In conjunction with EMF-NET: Production and updating of 'key issue' reports, once a year for the next four years (2005-2008). The first set of reports is expected by April 2005.
- ◆ November 2004: final report on the feasibility study on a "European Database on EMF Measurements from Mobile Communication Base Stations". Foreseen development and implementation of a "European Database on EMF Measurements from GSM-UTMS Base Stations" (2005-2006)
- ◆ Knowledge-based interface & European References Database: Draft working-paper (May 2004). Discussion on suitability and feasibility at Advisory Board meeting 12th July 2004. Decision on future actions (December 2004). Possible implementation & development (2005-2006).
- ◆ April 2005 (to be decided): Second AB meeting. Review the "Integrated National reports on EMF at EU level", and proposal for report yearly updating (2005, 2006, etc).

4. Production of “Issue reports”

4.1 Objectives

JRC/EIS-EMF is playing a major role in the process of identification, production and evaluation of “key issues” reports on EMF and health. Moreover, JRC/EIS-EMF co-chairs with the EMF-NET the so-called “Stakeholder dialogue” on electromagnetic field exposure and health. These combined actions have for basic objectives to ([see working paper on “Issue Reports, Stakeholder Dialogue & References Database” in Annex 2](#)):

:

- Provide at EU level a reference system on validated data on the “evidence on potential health impacts of EMFs”,
- Draw conclusions on the policy relevance of the “scientific evidence”, and to carry out a transparent and systematic stakeholder dialogue on these conclusions ([see work-package 5](#)),
- Provide European Commission, as well as policy makers and health authorities at the EU level, interpretation of the scientific results and clear and concise advice in support of appropriate policy options, and
- Inform the EU citizens.

Key issue reports are state of knowledge reports providing authoritative evaluations on possible health effects from EMF exposure. Their basic purpose is: a) to organize reviewing & interpretation of scientific results and the evaluation of evidence on potential health impacts, and b) to inform the decision-making process and give transparent, reliable advice on the setting of recommendations at the EU level, and provide high-quality information to address citizen’s concerns. Key Issue Reports and interpretation reports will be organised in three levels, from level 3 to level 1, in descending order of detail and complexity:

- “Scientific Evidence Report” (Level 3): Detailed scientific report.
- “Policy Relevance Report” (Level 2): Detailed analysis of the policy relevance of the “scientific evidence” including, conclusions and recommendations for action.
- “Public Communication Report” (Level 1): clear and broadly accessible summary of previous levels 3 and 2.

Production and validation of Issue Reports is a four-stage process: 1) EMF-NET FP6 consortium review and interpret evidence on possible health impacts from EMF and produce draft key Issue Reports, 2) JRC/EIS-EMF organises the information-flow, and a broad-based peer-review process with virtual expert networks, 3) EIS-EMF and EMF-NET co-chair and organise a “stakeholder dialogue” to produce level 2 and 1 reports. Validation of all levels by the “Scientific Committees” of the European Commission.

The conclusions from the Level 3 and the Level 2 reports prepared jointly with EMF-NET will be submitted for review to the Advisory Board of JRC/EIS-EMF. After this review

process, JRC/EIS-EMF and EMF-NET will draft the level 2 reports that will be submitted as the main input to the TWG “stakeholder dialogue”. On the basis of finalised level 3 and 2 reports, JRC/EIS-EMF and EMF-NET will involve risk perception and risk communication experts in the production of the final level 1 document to optimise the understanding of the texts by the general public. The results will be tested, by applying risk perception metrics on special focus groups.

4.2 Milestones

- ◆ 20th March 2004: First draft working paper on “Interface JRC/EIS-EMF and FP6 EMF-NET” which start discussion about the “Key issues” at the first Steering Committee meeting of EMF-NET in Thessaloniki, 20th March 2004.
- ◆ 15th May 2004: EMF-NET Website was made public, as well of the setting of the information platform for document management and online forum among the EMF-NET TWGs (based on EC CIRCA resource).
- ◆ June 2004: Revised version “Issue Reports and Stakeholder dialogue” accepted by EMF-NET steering committee to form the basis of the collaboration between JRC/EIS-EMF and FP6 EMF-NET, and the production, reviewing and validation of “key issue” reports, and “stakeholder dialogue”.
- ◆ April 2005: First draft issue reports.

5. Stakeholders dialogue on issue reports

5.1 Objectives

The JRC and the EMF-NET are, together, establishing a forum for a systematic stakeholders' dialogue between scientists, industry, NGOs, and policy-makers at EU level on EMF & Health related matters, particularly on the policy relevance of the "key Issues reports" that are produced in [work-package 4](#).

The overall objective is to establish a fully representative forum with a balanced participation of stakeholders to:

- Provide transparent and effective ways for the stakeholders to be involved in the process of identification and evaluation of emerging issues related to human exposure to EMF.
- Take into account stakeholder views during the issue identification and the production of levels 2 and 1 reports on the policy relevance of the "scientific evidence" and its interpretation for policy making.

To implement this forum, EMF-NET and EIS-EMF are currently establishing a TWG "Stakeholder dialogue on EMF issues". The TWG is open to all stakeholders concerned, and its first meeting is scheduled for the 14th July 2004. In this meeting, the initial list of "key issues" will be presented by EMF-NET as well as the composition of the various technical working groups of experts and scientists, responsible for the drafting of the "scientific evidence" reports (level 3). At later stages, new issues may need to be considered, as well as the production of "interpretation reports", as required by the circumstances, and in answer to public and policy-making concerns.

The members of the TWG will:

- Act as focal points representing their networks of individual stakeholders
- Define together with EMF-NET and EIS-EMF the terms of reference and work programme of the TWG,
- Be responsible for providing feedback to the documents produced by the JRC and EMF-NET, mainly "policy relevant" draft reports (level 2) draft reports.

"Stakeholder dialogue" meetings may be convened twice a year, over the next four years (2005-2008). The next meeting should take place before June 2005.

5.2 Milestones

- ◆ 14th July 2004. Preparatory meeting for the establishment of TWG Stakeholder dialogue on EMF exposure and health.
- ◆ April/May 2005: Review of first draft Issue Reports.
- ◆ June 2005: second TWG meeting.

6. Risk perception and risk communication: facts, approaches and best practices. Programme of studies

6.1 Objectives

A basic objective of this work-package is to make stakeholders, experts and decision-makers, in the area of health & exposure to EMF, fully aware of the need and benefits of risk perception studies in order to optimise risk communication at EU level. On this basis a work-programme on risk perception studies may be defined, discussed and eventually funded.

Risk perception research shows that psychological and cultural factors may either amplify or attenuate public beliefs about hazards. *It has also taught us that effective communication strategies are not easy, and must minimally be grounded in a thorough understanding of the knowledge and frames of reference of target audiences.* The public is not irrational, however. *Their judgements about risk are influenced by emotion and affect in a way that is both simple and sophisticated. The same holds true for scientists. Public views are also influence by worldviews, ideologies, and values; so are scientists' views, particularly when they are working at the limits of their expertise.* Monitoring risk perception improves risk communication. It helps to identify public concerns and fears; it can anticipate public responses to experiences and events, and it helps the definition of well-directed information campaigns.

Risk communication in the EU has been significantly hampered due to the lack of a clear strategy, of appropriate common tools and contents, and not least by the absence of systematic monitoring and understanding of public risk perception. As a consequence:

- a) Risk perception by the European **citizens** is being influenced randomly by several information sources which makes reactions of the public unpredictable;
- b) **Decision-makers** feel induced to pass legal provisions or guidelines that may in fact produce opposite results to those intended and perpetuate the insecurity felt by many Community citizens.

6.2 EIS-EMF workshop on “EMF Risk perception and risk communication: tools, experiences and strategies”

The main objective of the workshop is to make stakeholders, experts and decision-makers in the area of health & exposure to EMF fully aware of the need and benefits of risk perception studies in order to optimise risk communication at EU level. As an initial output of the Workshop a concise review of key studies and tools on risk perception that may be relevant for risk communication and decision-making on EMF & health will be drawn (see below). Workshop's [agenda](#) and [list of abstracts](#).

Risk perception & communication: Initial review paper. We have asked the active collaboration of the speakers to publish the Workshop Proceedings including the full versions of their presentations. This will also include a concise review of key studies and tools on risk

perception that may be relevant for risk communication and decision-making on EMF & health. The idea is to present a list of relevant studies of both academic and practical interest - carried out on behalf of either private or public institutions - that are considered important for further consideration by stakeholders and decision makers. Brief comments on the quality of these studies, their methodological aspects, usability, and cost/benefit, from the contributors will be adequately integrated into the JRC paper.

6.3 Programme of studies on risk perception and risk communication across the EU

Follow-up from Risk perception and Communication Workshop: Setting up a network of experts, initially involving the Workshop lecturers, and then including other experts in the area of risk perception and risk communication. There will participate together with EIS-EMF Advisory Board and associated members and experts, in the definition and prioritisation of studies and actions to be considered by the JRC. On this basis, follow up projects may arise on behalf of the EC and stakeholders, in the short-to-mid term.

JRC plans to draw a “technical annex” and call for tenders for a pilot, comparative study on risk perception and risk communication practices in a few selected EU countries. The basic aim is to give a brief but informed review of the public perception of risk from EMF - particularly mobile phone base stations - in some key EU countries, on the communication and information efforts to deal with these concerns, and to identify some best practices.

Development of tools for risk communication (newsletters, FAQs, fact-sheets, audio-visual material, etc): The advisory board will be requested to assess the expected benefits from the use of these central risk communication tools and materials. Depending on their advice and the eventual availability of the necessary funding, EIS-EMF will proceed to the production and dissemination of these tools.

6.4 Milestones

- ◆ 13th July 2004: Workshop “EMF risk perception and risk communication: Tools, experiences and strategies”.
- ◆ Workshop proceedings including first draft of review paper: expected by August 2004 and then final version by September 2004.
- ◆ December 2004: “Technical annex” and call for tenders for a pilot, comparative study on risk perception and risk communication practices in a few selected EU countries.
- ◆ Programme of studies on risk perception and risk communication across the EU: *2005-2006, studies to be defined and prioritized.*
- ◆ Development of risk-communication tools of the EIS-EMF, setting information campaigns and surveys in collaboration with national representatives of member states: 2005-2006.

7. EU Database on EMF exposure measurements and standardisation issues

7.1 Objectives

The key objective of EIS-EMF is to develop a EU-wide risk communication channel, and for this purpose it is a priority to develop strategies and tools on the basis of actual data describing the current situation on human exposure to EMF in Europe. Only under these conditions it may be possible to establish, across Europe, the existence of any causal links between radiation sources, levels of exposure, and health effects.

In the framework of the implementation of the EC (99/519) recommendations, and in order to reduce public exposure to EMF, EC continues working towards of EU common standards, and the harmonisation of norms covering all devices emitting EMF:

- To assess compliance and set legislation on design and testing of equipment
- To define requirements to protect humans from hazardous effects that may be caused by EMF emitted by electrical apparatus, covering any possible and well-established thermal or non-thermal effects
- Priority standards: Mobile Phones and Base Stations (900 MHz, 2 GHz)

The adoption and complete application of common reference levels and standards by all Member States, in accordance with the EC recommendations, is still an ongoing process. In the advent of the adoption of a common measurement standard, the present work-package aims at unfolding the specifications for a EU Database on EMF exposure measurements, and to assess its feasibility in terms of cost-benefit criteria. The focus of the database would be to provide: (1) an “observatory” function of EMFs in the EU, (2) a reference for comparability across EU, and for EMF source apportionment; and (3) the basic contents for risk assessment and communication.

Moreover, it would:

- Facilitate the definition of common tools and practices in risk perception monitoring and of risk communication at the EU level
- Facilitate risk assessment by expert scientist panels
- Facilitate information exchange among stakeholders and the public in general

7.2 Inventory, analysis and harmonisation of key data sources and communication channels on EMF exposure measurements

The focus of the database would be to provide: (1) an “observatory” function, (2) a reference for compatibility across EU, (3) a tool to facilitate risk assessment by expert scientist panels, and (4) the basic contents for risk communication. A EU-wide database on EMF measurements will allow the estimation of global exposure levels – as well as to assess inter-comparability and portability – and thus it would facilitate information exchange and communication among stakeholders and the public in general, and facilitate the definition of

common tools and practices in risk perception monitoring and of risk communication at the EU level.

The first step is to focus on mobile phone base stations (both GSM and UTMS). A feasibility study is in course to identify and assess existing data, their comparability and the expected new CENELEC standards, member states initiatives, and to specify the database main requirements, uses and key users. The Technical Annex for the [“Feasibility study on a European Database on EMF Measurements from GSM-UTMS Base Stations”](#) is presented in [Annex 3](#). This study is carried out in collaboration with Seibersdorf Research (of the Austrian Research Centres).

7.3 Standardisation issues for EMF exposure measurements and assessment procedures

This project is composed of two main actions: (1) An European inventory and harmonisation of key EMF risk communication channels and of national data sources in the EU on human exposure to EMF (partially addressed in the feasibility study above), and (2) Observatory of European (and worldwide) legislative and R&D activities on human exposure to EMF.

As a first step a systematic inventory of these activities is a key priority for EIS-EMF. The second step is to draw an action plan for the assessment and harmonisation of national infrastructures and key activities for monitoring human exposure to EMF at EU level. This action plan will be carried out in collaboration with EMF-NET, CENELEC relevant TWGs, and COST 281. A workshop on “EMF exposure assessment and monitoring” is foreseen. It should review the measurement standards and protocols, and the use of exposure data in risk communication across the EU.

Establishment of the observatory: information collection and dissemination through the EIS-EMF gateway. Observatory activity will be carried out in close collaboration with EMF-NET, and also seeking the participation of COST, CENELEC, and the WHO-EMF.

7.4 Milestones

1. Feasibility Study on a “European Database on EMF Measurements from Mobile Communication Base Stations”

- ◆ May 2004: Start of the project.
- ◆ Mid of July 2004: First draft report, questionnaire and mailing list, including requirements on the database and available information on existing exposure data, draft report will be discussed with the JRC and submitted to key experts.
- ◆ Mid of August 2004: Evaluation of comments of key experts.
- ◆ September 2004: Finalisation of chapter of existing exposure data, preparation of 2nd draft report and submission to stakeholders and JRC/EIS-EMF Advisory Board.
- ◆ October 2004: Meeting between JRC and Seibersdorf Research to discuss comments from advisory board and identify further developments. November 2004: Final report.

- ◆ 2005-2006: Possible development and implementation of a “European Database on EMF Measurements from GSM-UTMS Base Stations”.

2. Standardisation issues for EMF exposure measurements and assessment procedures

- ◆ European inventory and harmonisation of key EMF risk communication channels and of national data sources in the EU on human exposure to EMF (November 2004-October 2005).
- ◆ Observatory of European legislative initiatives and R&D projects on human exposure to EMFs: 2005-2006.
- ◆ Workshop on “EMF exposure assessment and monitoring”: 2005 - date to be decided.

8. Projected studies and workshops

Action plan on suitable studies, workshops, and other JRC/EIS-EMF activities will be drawn in collaboration with key experts, and their implementation will be prioritised in consultation with advisory board members.

8.1 Other topics of interest

- Standardisation issues for EMF exposure measurement and risk assessment procedures.
- Strategies for the use of uncertainty factors in risk assessment.
- Appraisal of National and stakeholder risk communication channels on EMF, strategies and practices.
- On the necessity of EU common standards and regulation for EMF non-ionising medical applications and instrumentation.
- Review and evaluation of current practices and standards on epidemiological studies and recommendations: particularly on risk perception issues at EU level.

8.2 Thematic workshops

The workshops will be aimed to develop consensus among the key stakeholders from public administration, academia and industry on the identification of emerging issues and the specification priority action plans.

Themes considered are the following:

- EMF exposure assessment and monitoring. Measurement standards and protocols; Use of exposure data in risk communication across the EU.
- Risk perception monitoring and risk characterisation on potential adverse health effects in the vicinity of base stations.
- New developments in wireless communication, EMF exposure and health implications.

Working Documents

European Information System on Electromagnetic Fields Exposure and Health Impacts

A6.1: National Reports on EMF and Health (proposed structure)

Sources, regulations and risk communication approaches

**Advisory Board Meeting
Ispra, 12th July 2004**



EUROPEAN COMMISSION
DIRECTORATE GENERAL JRC
JOINT RESEARCH CENTRE
Institute for Health and Consumer Protection
Physical and Chemical Exposure Unit

Country Reports on EMF & Health (& Web-Gateway to National EMF Activities)

The purpose of this short document is to start the discussion – and request your suggestions – on the structure, scope, and content of the “National Reports on EMF and Health: Sources, Regulations, and Risk Communication approaches” and to propose a model “template” for their drafting.

1. Rationale & Objectives

Exposure from EMF fields is an unavoidable fact of life, and understanding the potential health effects and the environmental impacts and risks, is a priority. Up-to-date, high quality information is needed to support policy-making as well as for the setting of comprehensive and well-funded regulations, of EMF exposure conditions and limits. Transparency in the decision making process requires active citizen involvement and unrestricted public access to information; information has to be thorough, clearly summarized and well presented. The key word is information and it must be accessible, well structured, comprehensive, and trustworthy.

For this purpose JRC – in close coordination with DG SANCO – is developing a Web-based information platform on public health issues related to EMF to (1) provide quality information and sound advice for the EC and Member States actions and communication needs, and (2) to elaborate tools and contents for the dissemination of information to EU citizens and stakeholders, and promote common practices and standards for risk perception monitoring and risk communication at the EU level.

This is a complex task involving multiple and heterogeneous actors, and a multitude of sources of information, different viewpoints, and at times competing and conflicting findings and arguments. One essential initiative, in providing such information, is the systematic production – and periodic updating – of EU wide country-specific reports on EMF and health.

The basic objective of these reports is to present a concise and thorough review of national approaches, regulatory measures, and actions in the area of EMF, the associated environmental and health impacts, and potential risks. This is, we believe, an unique and much needed undertaking, aiming at summarising and presenting in a single document using a common lay-out, a concise and thorough inventory of the relevant players, actions, norms and regulations, sources of information and databases in the area of EMF across Europe, from national authorities, industry, academia, NGOs, etc.

2. Reports structure and content

The reports will include a comprehensive inventory of national key initiatives, relevant actors, institutions and organizations at governmental, industry and NGO levels. They will also provide a brief account of the various roles and responsibilities, and an exhaustive list of contact points, links, etc. Reports must also present a systematic overview of all pertaining information sources, of public domain reports, documents and other accessible and relevant publications.

This task requires the close partnership between the JRC, the EIS-EMF Advisory Board members and supporting experts, and the active collaboration from the competent authorities, industry, and other concerned actors in each Member State.

Production and periodic updating of National Reports on EMF (0-300 GHz frequency range)

As an initial contribution we are asking "policy-making" members of the advisory board, to prepare (in collaboration with national supporting experts) brief country-specific reports giving an overview of their country legislative initiatives, regulations, and relevant actions in the field of EMF & Health, and risk communication approach and channels. These first contributions will form the basis for the production and periodic updating (once a year) of comprehensive country-specific reports on EMF at the European level.

Written reports should include the list of relevant regulatory bodies and other institutions, and organisations having a role in the EMF & Environment and Public Health debate. For each case and when it applies, the list must mention:

- (5) Specific responsibilities and functions,
- (6) Regulatory tools and/or relevant initiatives, and
- (3) Key documents and publications.

Only summary information, links to information sources and databases, and contact addresses are required. This information will help to update the JRC country-specific reports on EMF sources and GSM/UMTS base stations.

Country-specific reports: points to consider

Below we propose a list of topics and information categories that should be covered by the National reports on EMF. This is a working draft; suggestions on the topics, contents and structuring of the reports are welcome.

“National Reports on EMF and Health: Sources, Regulations, and Risk Communication approaches”. All frequency ranges: Static and Extremely Low-frequency fields, Intermediate frequency fields and Radio frequency fields and sources.

- Inventory of national key initiatives on EMF from:
 - (a) Authorities (regulatory bodies, Health authorities, Radio & Telecommunications, governmental advisory institutions, etc)

- (b) Industry (Telecommunications, Mobile telephony, Power Grid operators, etc), and
- (c) NGOs and Academia (consumer associations, citizen advisory and special interest groups, research institutions, etc).

Including:

- Relevant actors, role and responsibilities
 - Institutions and organizations at governmental, industry and NGO levels (names, addresses and key www sites)
 - Information and data sources. Relevant publications and documents – contact points
 - Legislation & Regulations. Existing as well as planned initiatives
- Risk Communication strategies and channels (Authorities, Industry, NGOs)
 - 1. Risk communication tools and initiatives: information campaigns, workshops, surveys, leaflets, newsletters, etc. Other events, and key publications
 - 2. Public perception of EMF risk, surveys and monitoring. Risk perception and risk communication studies/research.
 - Summary overview of research support to EMF & Health. Main areas and topics
 - 1. Government supported research
 - 2. National Research Institutions
 - 3. Industry supported research
 - Data and databases
 - 1. EMF sources and exposure data across full frequency range.
 - 2. Base station technical information, geographic distribution.
 - 3. Exposure monitoring and compliance measurements.

Proposed list for the production of Reports:

- 1) Austrian representative and supporting expert (J. Hohenberg and G. Neubauer)
- 2) Belgium representatives and supporting expert (Gilbert Decat, Willy Pirard and Luc Martens)
- 3) Czech representative (Ludek Pekarek)
- 4) Danish representative and supporting expert (Lis Keiding and J.B. Andersen)
- 5) Dutch representatives (Genevra Delfini and Eric Van Rongen)
- 6) Finish representative (Maila Hietanen)
- 7) French representatives and supporting experts (Rene de Seze, Gilles Dixsaut, Bernard Veyret and Joe Wiart)

- 8) German representatives and supporting expert (Axel Bottger, Evi Vogel, and Gert Friedrich)
- 9) Greek representatives and supporting expert (T. Karabetsos, Evelyn Vafeidou, and T. Samaras)
- 10) Hungarian representative (G. Thuroczy)
- 11) Irish representative and supporting expert (Bob Hanna and Tom McManus)
- 12) Italian representative and supporting expert (Angelo Marino and G. D’Inzeo)
- 13) Polish representative (Stanislaw Szmigielski)
- 14) Slovenian representative and supporting experts (P. Otorepec, R. Pajntar, and P. Gajsek)
- 15) Spanish representative and supporting expert (Pablo Fernández-Cid, David Sanchez Hernandez, and Alejandro Ubeda Maeso)
- 16) Swedish representative and supporting expert (Lars Mjones and Kjell Hansson Mild)
- 17) Swiss representative (Mirjana Moser)
- 18) UK representative and supporting expert (G. Worsley and A. McKinlay)

Contacts will be developed with representatives from all other EU member states not included in the list.

3. Milestones

- 2 July 2004: Initial contributions from AB members (and supporting experts). During AB meeting, a single document including all initial reports, lists of contributors, and contact points, will be made available both as hardcopies, and at the JRC/EIS-EMF Website.
- First Advisory Board meeting 12 July 2004: Brief oral presentations of “Country-specific reports” by AB members. Discussion on the structure, scope, and content of the “National Reports on EMF and Health: Sources, Regulations, and Risk Communication approaches”. Propose and discuss a model “ template” for the drafting and periodic updating of reports.
- August-October 2004: Drafting of the full, comprehensive, reports with the participation as all country representatives and experts listed below. Further information will be collected by the JRC to complete the reports’ “template” as agree during AB meeting on the 12th July. Institutions, contact points and links provided in the initial country-specific reports will be addressed to request further information as needed. (An essential role of the AB members and experts is the establishing

appropriate links and feedback with relevant national infrastructures, international bodies, and JRC/EIS-EMF.)

- November-December 2004: Final document and Web-gateway integrating all National reports on “EMF and Health: Sources, Regulations, and Risk Communication approaches” across Europe. (Because of our aim to cover all EU countries, information and contacts from Member States not originally included in the document will be looked for.)
- April 2005: Second AB meeting. Among others, it will review the “Integrated National reports on EMF at EU level”, and new JRC proposal for reports’ yearly updating.

**A6.2: Issue Reports, Stakeholder Dialogue &
References Database (Interface JRC EIS-EMF & FP6
EMF-NET)**

Working Paper

C. F. del Pozo and D. Papameletiou

July 2004



EUROPEAN COMMISSION
DIRECTORATE GENERAL JRC
JOINT RESEARCH CENTRE
Institute for Health and Consumer Protection
Physical and Chemical Exposure Unit

List of topics discussed

Executive Summary

1. Introduction
2. Identification of “key issues”
3. Production of Issue Reports
4. Stakeholder Dialogue
5. The CIRCA tool
6. Developing a knowledge based interface between EMF-NET and existing EMF Databases

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This paper is a revised version of working paper “Developing the Interface between JRC EIS-EMF and FP6 EMF-Net” presented to the 1st Steering Committee meeting of EMF-Net, Thessaloniki 20th March 2004.

Executive Summary

EMF-NET and JRC EIS-EMF are currently two major EC funded projects aiming at supporting the European Commission and Member States in harmonising decision making and risk communication on health effects from EMF exposure.

The overall objectives are to:

- Provide at EU level a reference system on validated data on the “evidence on potential health impacts of EMFs”,
- Draw conclusions on the policy relevance of the “scientific evidence”,
- Provide European Commission, as well as policy makers and health authorities at the EU level, interpretation of the scientific results and clear and concise advice in support of appropriate policy options,
- Inform the EU citizens.

The present working paper analyses options for EMF-NET and JRC/EIS-EMF to harmonise objectives, and allocate roles and tasks for the:

- Identification and definition of “key issues” around which the interpretation of EMF research results and the EMF risk communication to decision makers and to EU citizens will be focused.
- Production, peer review, periodic update, and validation of Key Issue Reports and Interpretation Reports.
- The establishment of a forum for a systematic stakeholders’ dialogue between NGOs, policy-makers, industry and other concerned stakeholders at EU level on EMF exposure & Health related matters.

This paper proposes the methodology and work allocations between EIS-EMF and EMF-Net to carry out the production and the updating of the Key Issue Reports for the period 2004-2008. This includes the establishment of the infrastructure and procedures, the so-called “stakeholder dialogue”, for the efficient exchange of information among stakeholders, and the development of a knowledge-based interface to facilitate the retrieval of reference literature pertaining to a given “issue” from a number of existing EMF-databases.

1. Introduction

EMF-Net and JRC/EIS-EMF are currently two major EC funded projects aiming at supporting the European Commission and Member States in harmonising decision making and risk communication on health effects from EMF exposure.

The EMF-NET FP6 Coordination Action is constituted by experts from almost all scientific and technical activities and aspects in the area of bio-electromagnetics in Europe, with the main task of reviewing and interpreting the evidence on the possible health impacts of exposure to electromagnetic fields, mainly for European Commission, and policy makers and health authorities at the EU level.

The EIS-EMF is an activity of the JRC carried out on behalf of DG-SANCO. The main objective of EIS-EMF, is to develop and implement a EU-wide programme on EMF risk communication, and contribute to the development of a EU Official risk communication channel on EMF. The aim is to (1) provide quality information and sound advice for the EC and Member States actions and communication needs, and (2) promote common practices and standards for risk perception monitoring and risk communication at EU level, and elaborate tools (newsletters, fact-sheets, reports) for the dissemination of information to stakeholders and EU citizens.

JRC is also partner of the EMF-NET consortium and in this role JRC is in charge of developing and operating a web-based information exchange tool among EMF-NET partners, and a knowledge-based database to include all relevant scientific data and EC funded project results.

At present, as both projects EMF-NET and EIS-EMF are at the launching stage, the basic purpose of this working paper is to analyse options for both projects to harmonise objectives, maximize synergies, and allocate roles and tasks for the:

- Identification and definition of “key issues” around which the interpretation of EMF research results and the EMF risk communication to decision makers and to EU citizens will be focused,
- Production, peer review, systematic update, and validation of Key Issues Reports and Interpretation Reports.
- The establishment of a forum for a systematic stakeholders’ dialogue between NGOs, policy-makers, industry and other concerned stakeholders at EU level on EMF exposure & Health related matters.

Each issue report includes the following three levels:

- “Scientific Evidence Report” (Level 3): Detailed scientific report.

- “Policy Relevance Report” (Level 2): Detailed analysis of the policy relevance of the “scientific evidence” including, conclusions and recommendations for action.
- “Public Communication Report” (Level 1): clear and broadly accessible summary of previous levels 3 and 2.

The production, peer-review and validation of these three-level “Key Issue Reports” is proposed as a four-stage process:

- 1) EMF-NET produces the draft level 3 “Issue Reports”
- 2) EIS-EMF carries out the scientific peer review of level 3 reports.
- 3) EIS-EMF/EMF-NET co-chair and organise a “stakeholder dialogue” to produce level 2 and 1 reports.
- 4) Validation of all levels by the “Scientific Committees” of the European Commission.

2. Identification of “key issues”

The tentative list of topics to be considered in the selection and production of key summary “Issue Reports” is presented below. The discussion about the Key Issues started at the first Steering Committee meeting of EMF-Net in Thessaloniki, 20th March 2004, and currently the Main Task Managers of EMF-NET have been asked to finalise the list by June 15, 2004. Table I provides a preliminary example of such EMF Key Issues list.

New issues may need to be considered, as well as the production of “interpretation reports” as required by the circumstances, and in answer to public and policy-making concerns. These reports will summarise and integrated all “key issues” associated with any specific request and need for information.

As an example of interpretation issues, and by not means an exhaustive list, we have: EMF hypersensitivity, possible children higher sensitivity and vulnerability to EMF, EMF and childhood cancer, new emerging technologies and health, EMF occupational exposure (also including exposure assessment), EMF and biomedical application, quality assurance in EMF research, EMF risk perception and communication, EMF research inside and outside Europe, etc.

A transparent and workable procedure must be established to validate the issues choice, and to ensure their harmonised use in risk communication across the EU. This includes the following steps:

- EMF-NET produces the level 3 “Key Issue” and “Interpretation” Reports by means of Technical Working Groups TWGs of experts
- EIS-EMF carries out the scientific peer review of level 3 reports by means of its Advisory Board and by establishing “virtual networks” of experts for any given issue. Suggestions and comments will be compiled and presented to EMF-Net TWGs for consideration and final drafting of reports.
- At the end of the previous two stages, EIS-EMF/EMF-NET will co-chair and organise a “stakeholder dialogue” to finalize the level 2 and 1 reports.
- Validation of all levels by the Scientific Committees of the European Commission

Table I – Preliminary example of the EMF Key Issues

<i>Biological effects of EMF – Laboratory studies</i>
1) Effects on molecules
2) Effects on cell membrane
3) Effects on cells
4) Effects on Tissues
5) Effects on biological system (sensory, cardiac, neurological) or target organs <ul style="list-style-type: none"> a. Heating effects b. Genotoxic effects
6) Carcinogenic effects
7) Behavioural disorders and effects on other physiological systems or organs
8) Medical applications of EMF <ul style="list-style-type: none"> a. Therapeutical applications b. Application for diagnosis c. Prosthesis d. EMC of EMF medical and not medical devices <ul style="list-style-type: none"> i. Prosthesis ii. Clinical devices iii. Clinical environment
9) Effects on the Thermo-regulatory System
10) Hyperthermia
11) Occupational effects <ul style="list-style-type: none"> a. High level exposure b. Specific dosimetric assessment for high EMF exposure
12) Combined exposure
13) Studies on interaction mechanisms
<i>Biological effects of EMF – Epidemiological and human studies</i>
14) Effects on the results of selection bias, transients and/or other mechanisms;
15) Prospective cohort studies of mobile phone users
16) Potential long-term effects of whole-body exposure
17) Personal dosimeters capable of monitoring all EMF components
18) Studies on high level EMF exposed workers
19) EMF Hypersensitivity
20) Combined exposure
<i>Studies related with the Interaction between EMF and Biological Systems</i>
21) Studies on interaction Mechanisms
22) Molecular Simulations
23) Frequency Spectrum
24) Mobile Communications Systems
25) Antennas <ul style="list-style-type: none"> a. Cellular Phones b. Base Stations
26) EMF Measurements

3. Production of “issue reports”

Issue reports are expected to be sound, authoritative “state of knowledge” reports in a number of topics that will be identified. Identification and definition of “key issues” is the responsibility of EMF-NET, in collaboration with JRC/EIS-EMF. Contributions from stakeholders and the European Commission will be requested and their views taken into consideration.

The reports will be produced and up-dated in a yearly basis. In the next four years, therefore, four full sets of Key Issue Reports are expected to come to light: the first, in the first quarter of 2005, the second one a year later in 2006, and then in the same manner the third and the fourth in 2007 and 2008.

As stated before, Key Issue Reports and interpretation reports will be organised in three levels, from level 3 to level 1, in descending order of detail and complexity.

They are as follows:

- **Level 3**, provide the initial, full text of the experts’ report, it should be a thorough review and evaluation of all the scientific evidence on the issue treated. The level 3 draft reports will be submitted to large thematic virtual-expert networks for review. This should guarantee that nothing important is missing. The procedure will be open and transparent to ensure that access is given to all available and pertinent knowledge. The conclusions and recommendations would provide the basis for the level 2 reports.
- **Level 2**, underpins the policy relevance, R&D needs and recommendations for action that result from the scientific evidence reported in level 3. The production of the report will be based on a structured “stakeholder dialogue” procedure (see chapter 4).
- **Level 1**, gives a thorough and clear summary intended for communications to the general public. The production will be based on finalized level 3 and 2 peer review and stakeholder dialogue procedures.

The production, review, and validation of Issue Reports are summarized in Figure 1.

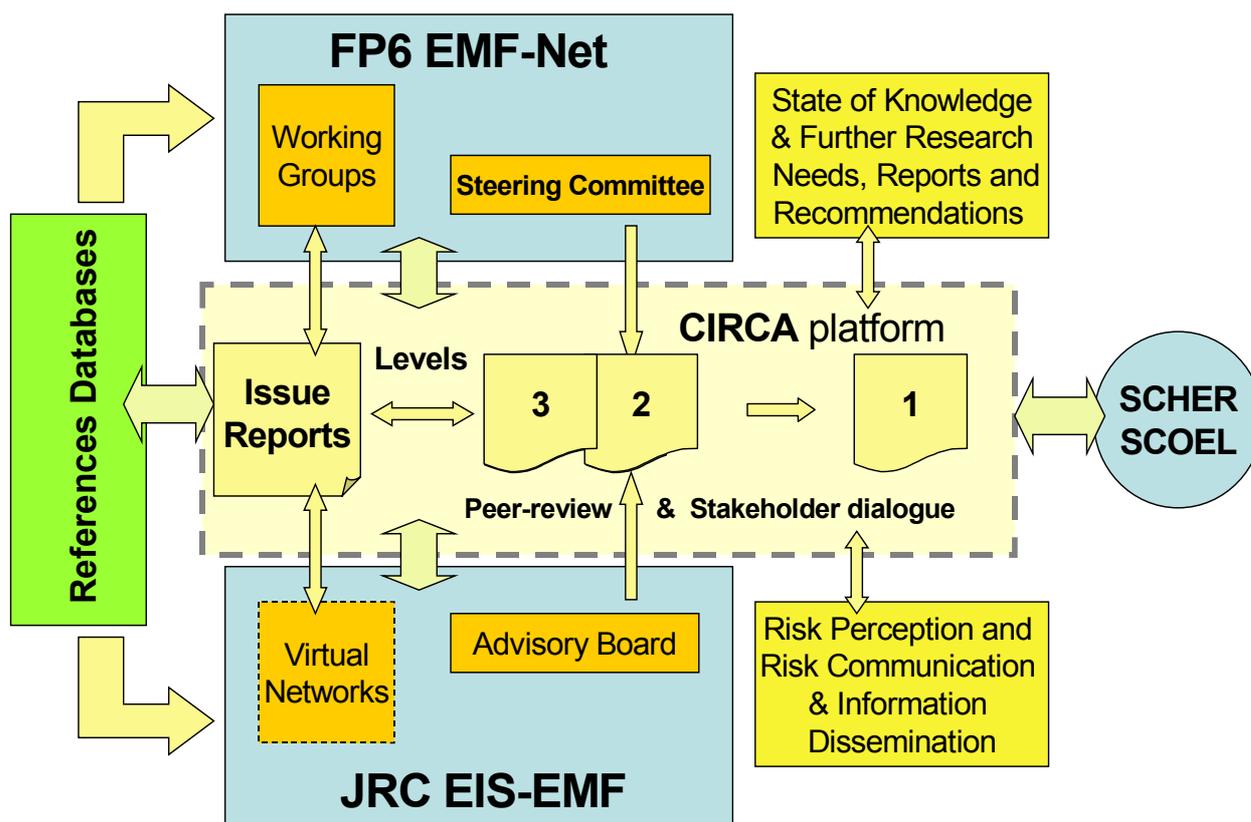


Fig. 1 Issue Reports production, Scientific Peer-review, Stakeholder Dialogue and EC Committee Validation using the CIRCA tool

EMF-NET tasks

To produce draft reports EMF-NET will establish issue-specific Technical Working Groups (TWGs) to be in charge of the production of the various Issue Reports. From practical considerations, the TWG should not include more than five or six members, counting the committee chairman.

Drafting the level 3 reports

The TWG members will be proposed by the Main Task managers and appointed by the EMF-NET Steering Committee. Their tasks include mainly:

- The production of the first draft Key Issue Reports
- The inclusion of the comments and propositions resulting from the reviewing process

The reviewing processes (see below) is carried-out with the support of JRC/EIS-EMF and the CIRCA tools (see on Chapter 5)

Editorial Board

An *Editorial Board* will be in charge of supervising the production of issue reports to ensure that peer review results, advice and recommendations for policy-makers, and EC and Member States actions will be considered. This *Board* may be the same for all issues and be formed of selected Steering Committee members from EMF-NET, including the JRC/EIS-EMF and other invited experts on an ad-hoc basis.

Drafting the level 2 and 1 reports

These activities will be carried out by EMF-NET jointly with JRC/EIS-EMF. The Editorial Board will be also in charge for the production of these Reports, which take into account the results of scientific peer review, stakeholder dialogue, and validation procedures carried out jointly with by the JRC/EIS-EMF. In particular, both projects will co-chair the TWG “stakeholder dialogue” (see below and Chapter 4)

JRC/EIS-EMF Tasks:

The JRC will set the information platform for document management and online forum among the EMF-NET TWGs (based on EC CIRCA resource, see below Chapter 5). It will also organise and co-ordinate the scientific peer-review process, and co-chair the so-called stakeholder dialogue and initiate the Committee validation, within the same platform.

Scientific peer-review of level 3 reports

The scientific peer review will be carried out by “virtual networks” of experts, which will be set up mainly through systematic searches in various databases and libraries. These virtual networks will further be screened with the collaboration of the EMF-NET TWGs and the participants of the stakeholders dialogue. The “virtual networks” will be offered access to the draft TWG issue reports through the CIRCA document management system in order to provide critical inputs. The feedback from the virtual networks will be processed into the Issue Reports by the TWGs.

Level 2 reports

The conclusions from the Level 3 and the Level 2 reports prepared jointly with EMF-NET (see also above) will be submitted for review to the Advisory Board of JRC/EIS-EMF, which constitutes a EU network of competent Authorities on EMF. After this review process, JRC/EIS-EMF and EMF-NET will draft the level 2 reports that will be submitted as the main input to the “stakeholder dialogue” (see Chapter 4).

Level 1 reports

On the basis of finalised level 3 and 2 reports, JRC/EIS-EMF and EMF-NET will involve risk perception and risk communication experts in the production of the final level 1 document to optimise the understanding of the texts by the general public. The results will be tested, by applying risk perception metrics on special focus groups.

Final Joint Task:

Validation

The final reports will be submitted to DG SANCO's Scientific Committees on Health and Environmental Risks (SCHER), and to DG EMPL's Scientific Committee on Occupational Exposure Limits (SCOEL).

4. Stakeholder Dialogue

The JRC/EIS-EMF and the EMF-NET are, together, establishing a forum for a systematic and transparent stakeholders dialogue between NGOs, authorities, industry, worker and consumer associations and other concerned - and representative - stakeholders. The aim is to take into account stakeholder views during the issue identification and the production of levels 2 and 1 reports on the policy relevance of the "scientific evidence" and its interpretation for policy making.

The outcome of the scientific peer review (final level 3 reports) will be offered to stakeholders, for consultation using the CIRCA system (see below in Chapter 5).

The following structured procedure is proposed:

- The JRC/EIS-EMF and EMF-NET will establish jointly a TWG "Stakeholder dialogue on EMF issues". The TWG is open to all stakeholders concerned.
- The participants of the TWG will act as focal points representing their networks of individual stakeholders. They will be responsible for providing feedback to the documents produced by the JRC and EMF-NET (mainly level 2 draft reports integrating comments from the EIS-EMF Advisory Board).

Participants at the first meeting of the TWG on 14th July include representatives from Industry and Consumers Associations, Workers on EMF related Industries: ETNO, MMF, GSM, EURELECTRIC, FIEEC, ITU, ETUC, BEUC, ICES; as well as experts from the EMF-NET, authorities represented at the EIS-EMF Advisory Board, and invited officials from the European Commission.

JRC/EIS-EMF together with EMF-NET will be responsible for co-chairing the "stakeholder dialogue", which includes:

- Opening the TWG activities to all stakeholders concerned
- Proposing agendas and work programmes
- Providing timely discussion documents

- Providing transparent information exchange procedures
- Integrating the outcome of the stakeholder dialogue into the final documents (mainly level 2 and 1 reports).

Stakeholder Meetings

At least 2 meetings on yearly basis will be organised to agree on the terms of reference of the stakeholder dialogue, the list of participants, the work programme and to review the progress.

Information exchange procedures

Information exchange procedures on working documents will be carried out using the web-based CIRCA tool (see Chapter 5).

5. The CIRCA tool

CIRCA (Communication & Information Resource Centre Administrator) is a powerful web-based information management tool developed at the European Commission. The specific CIRCA architecture and information-flow will follow the structure of both JRC EIS-EMF and the EMF-NET projects – main tasks, work and sub-work packages. A common virtual “interest group” platform, shared by both projects, will be open at CIRCA for the stakeholders’ dialogue. Access rights and user profiles will be allocated to all members of the stakeholders’ forum after registration.

The production of the Key Issue Reports and reviewing process will be managed through the CIRCA platform. This process will involve the EMF-NET various TWG and Steering Committee, scientific “issue-specific” virtual networks, the JRC EIS-EMF stakeholder forum, and members of the EC Scientific Committees. Working within CIRCA will allow an easier handling and faster revision of documents, and exchanges between the various experts’ groups and reviewing committees. Automatic “coaching” of the whole process may be implemented by setting specific tasks and timetables.

6. Developing a knowledge-based interface between EMF-NET and existing EMF Databases

In conjunction with the development of CIRCA information platform the JRC/EIS-EMF is studying cost-efficient options to develop a knowledge-based interface to facilitate the retrieval of reference literature pertaining to a given “issue” from a number of existing EMF-databases. This knowledge-based interface will develop around allocations between the issue definitions in the EMF-Net project and the indexes, ontologies, tagging systems of the existing key data bases on EMF.

This knowledge-based interface will also address R&D activities in EMF & health related matters funded by FP5 and other EC programmes, as well as other initiatives by Member States at National level. These and a number of EU financed research activities and projects in recent years, makes highly desirable and necessary the setting of a central repository of

output information, documents and publications evaluating the results as well as ‘state of knowledge’ reviews and reports.

This knowledge-based interface will practically correspond to a European Database or Information System. A European references database would be a very valuable and specific contribution complementing other national and international efforts, and will provide full control and multi-level data accessibility. Such a system is a fundamental tool for informed decision making, for carrying out research and the periodical evaluation of research results, and for the setting of exposure limits and recommendations. It will also play a key role in any information dissemination campaign and risk communication exercise.

To guarantee the database continuity, including the data coverage, quality and updating frequency, the necessary actions and synergies with the key existing databases are being explored. In this light, a meeting between EMF-NET, JRC/EIS-EMF and the operators of key databases is proposed. The JRC/EIS-EMF is developing a working paper highlighting the technical options available.

European Information System on Electromagnetic Fields Exposure and Health Impacts

A6.3: Feasibility Study: “European Database on RF EMF Measurements” (Technical Annex)

C. del Pozo and D. Papameletiou



EUROPEAN COMMISSION
DIRECTORATE GENERAL JRC
JOINT RESEARCH CENTRE
Institute for Health and Consumer Protection
Physical and Chemical Exposure Unit

1. Rationale & Objectives

The JRC has the mandate by DG SANCO of the European Commission to develop and operate a European Information System on Electromagnetic Fields (EIS-EMF). The key objective of EIS-EMF is to develop a EU-wide risk communication channel, and to achieve this goal it is a priority to develop strategies and tools on the basis of actual data describing the current situation on human exposure to EMF in Europe. Only on these conditions would we be able to establish, across Europe, the possible causal links between radiation sources, levels of exposure, and any health effects that might result.

Risk communication on EMF in the EU has been hampered by the lack of comparable data and a central repository. In the advent of the adoption of a common measurement standard, the present study aims at unfolding the specifications for a EU Database on EMF measurements, and to assess its feasibility in terms of cost-benefit criteria. The focus of the database would be to provide: (1) an “observatory” function of EMFs in the EU, (2) a reference for comparability across EU, and for EMF source apportionment; and (3) the basic contents for risk assessment and communication. In this manner, therefore, it would

- Facilitate the definition of common tools and practices in risk perception monitoring and of risk communication at the EU level
- Facilitate risk assessment by expert scientist panels
- Facilitate information exchange among stakeholders and the public in general

This database will provide an essential input for large-scale health impact and epidemiological studies, and it may set the scientific background and infrastructure for a long-term institutional EU-wide monitoring activity. It may also allow the quantification of exposure from GSM fixed installations and enable the evaluation of exposure from emerging 3-G technologies.

The need for such a database has been identified by a number of specialised committees and actors, e.g. COST 244. There are in the EU different national measurement protocols, standards and regulations on EMF exposure. This state of things is partially the result of some countries adopting national limits not in line with the European recommendations 1999/519/EC. The setting of indispensable common measurement standards across Europe is still an ongoing process that is in charge of CENELEC WG1. This is the necessary condition for the implementation of a harmonized database on EMF measurements in the EU.

Before the database can be developed, the feasibility must be examined in a very first step. Main tasks are (1) to identify existing data on exposure and to evaluate their quality and comparability, (2) to examine the main requirements on such a database by identifying its uses and key users, in particular for risk assessment and communication purposes, (3) to analyse approaches of EU wide exposure assessment protocols to enable reliable and comparable statements on exposure in different parts of Europe (expected new common standards), and (4) to evaluate data availability and the feasibility of central storage at the JRC.

This work program is to be implemented in close co-operation between the JRC and the contractee.

2. Study Specifications - Deliverables

a. Information sources. Availability of EMF measurement data and Characterisation of their Potential for Risk Assessment and Communication Purposes.

In the first step, available information on exposure data of the general population with respect to fixed installations of mobile communication networks within EU countries and Switzerland will be analysed. Key aspects are the identification of the purpose and the assessment protocols of these data sets. They will be qualified and evaluated in relationship to the expected new CENELEC standards. A survey on the readiness to compliance as well as the projected measurement campaigns within the expected new standards (“future data”) will be performed. The information will be obtained by Internet searches as well as by interviews of specialists in target countries.

The goals of this work-package are to

- Identify **sources** of information, **purpose** and **availability** of data (for both existing and future data)
- Analyse type of data and assessment **protocols**
- Analyse potential use of the data for **risk assessment** and **risk communication** purposes

A questionnaire will be developed to enable standardised identification of information. The questionnaire must also be a survey on the necessity, possible uses and benefits of the database and, in particular, of its potential to be applied for both purposes: as a tool for direct risk communication, and as a mean for risk assessment and qualified risk communication.

The first draft report will be attached to the questionnaire. The questionnaire should be addressed not only to databases holders but also to other stakeholders (mailing list to be drawn in collaboration with the JRC) who will be requested to peer-review the first-draft report. The information obtained will be summarised and given in a final report. In addition, all contact addresses will be included in the report.

Several additional aspects as the availability of the information on the exposure due to other Radio Frequency sources will be taken into account. The study is not dedicated to analyse exposure data of specialised workers exposed in very close vicinity of the base stations not accessible for the general public. In the frame of this study no statistical analyses of the data sets collected are included, unless they are readily available from the data provider.

b. Drafting design specifications for the database

The goals of this work-package are:

- Analyse the architecture of the database, on both existing and future data (information, risk communication, scientific purposes, compliance criteria...)
- Define requirements on the database (file structure, format of presented data, access, additional information...)

- Definition of parameters, terms and quantities listed in the database. State their basic uses in exposure assessment (at the local, regional, national and EU levels) and in risk assessment and communication
- Discuss data updating procedures and quality assurance matters

This work-package will be performed in close and interactive co-operation with JRC.

c. Final Report

The outcome of work-packages 1 and 2 will be given in a draft report. Within this report the feasibility of the development of a reliable database on mobile communication base station exposure data of the general population will be analysed, requirements will be discussed. In addition, the usability of available information will be analysed with respect to future harmonized measurements – putting particular emphasis to its application for risk assessment and communication purposes.

Basic questions that should be answered are: (1) What are the conditions for direct risk communication from the database through EIS-EMF? (2) How and in what manner can we communicate the data? (3) What are the benefits of such communication? The potential of the database for further risk qualification and risk assessment applications must be clearly stated.

The draft report will be sent by JRC to key experts selected by JRC to be reviewed. Comments from the reviewers will be incorporated in the draft report by the contractee. In a second step the JRC will send the draft report to a large number of stakeholders from industry, policy makers, advisory bodies, etc. In the frame of a meeting the comments of stakeholders will be analysed by the JRC and the contractee, future actions will be decided on in the frame of this meeting. Necessary changes will be incorporated in the report before finalising it.

3. Time Schedule

- ◆ **May 2004:** Start of the project
- ◆ **Mid of July 2004:** First draft report, questionnaire and mailing list, including requirements on the database and the available information on existing exposure data, draft report will be discussed with the JRC and submitted to key experts
- ◆ **Mid of August 2004:** Evaluation of comments of key experts
- ◆ **September 2004:** Finalisation of chapter of existing exposure data, preparation of 2nd draft report and submission to stakeholders (EIS-EMF Advisory Board)
- ◆ **October 2004:** Meeting between the JRC and the contractee, discussion of comments from advisory board and further activities
- ◆ **November 2004:** Final report

European Information System on Electromagnetic Fields Exposure and Health Impacts

EIS-EMF Kick-off Meeting, Risk Perception & Communication Workshop and TWG "Stakeholder Dialogue"

A6.4: Meetings' overview & Agendas 12-14 July 2004

OVERVIEW OF EVENTS & WORKSHOP ABSTRACTS



EUROPEAN COMMISSION
DIRECTORATE GENERAL JRC
JOINT RESEARCH CENTRE
Institute for Health and Consumer Protection
Physical and Chemical Exposure Unit

JRC EIS-EMF Kick-off Meeting, Risk perception Workshop and TWG for Stakeholder dialogue

Ispra, 12-14 July 2004

Overview of Events

- *1st Day, 12 July (09:00-18:00): EIS-EMF Advisory Board Meeting*

The first day is about the establishment of the Advisory Board, which is a "policy makers network". Participants are representatives from Member States authorities responsible for EMF & Health, from other national and international organizations and experts from Academia.

- *2nd Day, 13 July (09:00-18:30): Workshop: "EMF Risk Perception and Risk Communication: Tools, Experiences and Strategies" and roundtable discussion*

Participants to the AB meeting and stakeholders from the 3rd day meeting are invited to attend the Workshop. The basic objective of the workshop is to make stakeholders, experts, and decision-makers, fully aware of the need and benefits of risk perception studies for optimising risk communication at EU level.

- *3rd Day, 14 July (09:00-16:30): "Stakeholder Dialogue"*

Preparatory Meeting of the Stakeholder Dialogue on EMF & Health Effects (in conjunction with the EMF-Net FP6 Coordination Action). The JRC and the EMF-Net are, together, establishing a forum for a systematic and transparent stakeholders' dialogue between NGOs, Authorities, Industry Associations and other concerned – and representative – stakeholders. The aim is to take into account stakeholder views during the identification and the production of "key issue" reports on EMF and health topics of general public concern and policy relevance.

JRC EIS-EMF
1st Advisory Board Meeting
Agenda
Ispra, 12th July 2004

Morning Session

- 09:00-09:05** Welcome (JRC)
- 09:05-09:20** The EU policy Framework (DG SANCO)
- 09:20-09:45** Self-Introduction (All participants)

Introductory Presentations

- 09:45-10:00** WHO-EMF (M. Repacholi)
- 10:00-10:15** COST281 (N. Leitgeb)
- 10:15-10:30** ICNIRP (P. Vecchia)
- 10:30-10:40** EMF-Net (P. Ravazzani)
- 10:40-10:55** Coffee Break

JRC EIS-EMF Objectives & Advisory Board Role

- 10:55-11:10** JRC EIS-EMF: Project presentation (D. Papameletiou/C. del Pozo)
- 11:10-12:30** Advisory Board: Organisation, role & duties
- 12:30-14.00** Lunch

Afternoon Session

**Presentation & Discussion of the EIS-EMF Draft
Working Plan**

(Rapporteurs C. del Pozo/D. Papameletiou/G. Neubauer/J. Wiart/P.
Wiedeman/P. Ravazzani/J. Silny)

- 14:00-15:45** Presentation of country reports on EMF and risk communication by invited members of the Advisory Board, 10 min talks)
- 15:45-16:00** Coffee Break
- 16:00-16:20** EIS-EMF & EMF-Net, Interface and Synergies: “Key Issue” Reports, Stakeholder Dialogue & References Database (JRC, P. Ravazzani, J. Silny)
- 16:20-16:35** EMF Risk Perception and Risk Communication Channels & Networks. Pilot studies & concept papers. First action: Workshop on EMF and Risk Perception & Communication (JRC & P. Wiedemann)
- 16:35-16:55** Standardisation issues for EMF exposure measurements and assessment procedures. Feasibility Study: EU-Measurements Database and EMF Exposure from Mobile phone Base Stations (JRC, G. Neubauer, J. Wiart)
- 16:55-17:10** Website/Studies/Workshops/Other proposed actions (JRC)
- 17:10-17:40** Establishment of TWGs
- 17:40-18:00** **Summary, Recommendations and Conclusions** (T. McManus/G. Gallo)
- 18:15-19:00** JRC/COST/EMF-NET Consulting – Close Meeting
- 20:00 Invited Dinner

Workshop: EMF Risk Perception and Risk Communication

Agenda

Ispra, 13th July 2004

Morning Session

09:00-09:05 Welcome (JRC/SANCO)

09:05-09:20 Introduction (D. Papameletiou/ C. del Pozo)

Risk Perception: Methods, Tools & Concepts

09:20-09:40 “Risk perception, communication and EMFs: From public understanding of risk to public engagement with science” (N. Pidgeon & P. Cox, UK)

09:40-10:00 “The role of cognition and emotion in EMF risk perception” (P. Wiedemann, Germany)

10:00-10:20 “The Impact of the wider social and institutional environment on risk perception” (Adam Burgess, UK)

10:20-10:40 WHO activities on EMF risk perception and communication (M. Repacholi, WHO International EMF Project)

10:40-11:00 Coffee Break

Risk Perception: Field studies on ELF, Mobile Phones and Base Stations

11:00-11:20 “EMF: Risk perception, trust and confidence” (M. Siegrist, Switzerland)

11:20-11:40 “The Mobile dilemma: Empirical study of public risk perception on EMF and mobile phones in Denmark” (Hanne Svenningsen, Denmark)

11:40-12:00 “EMF and Health: Information and risk perception among general population in Spain” (Ana Fernandez Marcos, Spain)

12:00-12:20 “Risk Perception, somatization, and self report of complaints related to EMF” (Ulrich Frick, Germany)

12:30-14:00 Lunch Break

Afternoon Session

- 14:00-14:20** “Public perceptions of ELF-EMF risks: Comparing expert representations and lay mental models” (Patrick Cox, UK)
- 14:20-14:40** “The impact of EMF precautionary measures on risk perception” (Holger Schuetz, Germany)
- 14:40-15:00** “Understandings of the precautionary principle: No smoke without fire or better safe than sorry?” (Julie Barnett, UK)

Stakeholder Studies

- 15:00-15:15** “Mobile Telephony and Health - Public Perceptions in Great Britain & Internationally” (Jack Rowley, GSM Association)
- 15:15-15:30** “The Role of Risk Communication in EMF Issue Management” (Vasco de Janeiro, EURELECTRIC)
- 15:30-15:45** “MOA Initiatives on Stakeholder dialogue on EMF exposure and Health” (Mike Dolan, MOA)
- 15:45-16:00** “Global Industry Initiatives on Risk Perception and risk Communication” (Michael Milligan, MMF)

16:00 –16:15 Coffee Break

Round-Table Discussion:

Do EMF policy makers need risk perception research for optimising decision-making and risk communication?

- 16:15- 18:15** Panel presentations by WHO, EC SANCO, ICNIRP, COST, EMF-Net, Academia & Stakeholders and Rapporteur Reports (Chairman P. Ravazzani/D. Papameletiou)
- ◆ Do policy makers need risk perception research? Risk perception monitoring for effective risk communication (Rapporteurs G. Worsley, UK, and P. Vecchia, ICNIRP)
 - ◆ Public fears and facts: Base stations versus handsets? Are children at higher risk? Other EMF & health topics? (Rapporteurs A. McKinlay, Ireland, and B. Veyret, France)
 - ◆ Scientific uncertainty: risk perception by decision makers and experts - assessing and managing risk (Rapporteurs N. Leitgeb, COST281, and Evi Vogel, Germany)
- 18:15-18:30** Conclusions (DG SANCO/JRC)

TWG on “stakeholder dialogue on electromagnetic field exposure and health”

Preparatory Meeting

**Organised by the
JRC EIS-EMF and EMF-NET Projects**

Ispra, 14th July 2004



EUROPEAN COMMISSION
DIRECTORATE GENERAL JRC
JOINT RESEARCH CENTRE
Institute for Health and Consumer Protection
Physical and Chemical Exposure Unit

"Stakeholder dialogue" Meeting

Agenda

09.00	09.15	Welcome address D. Papameletiou (JRC)/ P. Ravazzani (EMF-NET)
09.15	09.30	Introductions European Commission (DG SANCO, DG RES)
09.30	09.45	Self-introduction (All participants)
09.45	10.30	Presentation of Working Paper: "Key Issues & Stakeholder dialogue" (JRC/EMF-NET)
10.30	10.45	<i>Coffee Break</i>
10.45	11.45	<i>Discussion with interventions by ETNO, MMF Manufacturers Assoc, GSM Assoc, EURELECTRIC, BEUC, EIS-EMF Advisory Board</i>
11.45	12.30	Proposal of "Key Issues" by EMF-NET
12.30	14.00	Lunch
14.00	15.00	<i>Discussion on the "issues proposal" and Work-program of the TWG</i>
15.00	15.15	Coffee Break
15.15	16.15	Discussion on the "issues proposal" and Work-program of the TWG
16.15	16.30	Conclusion (European Commission)

Workshop – List of abstracts

1. Risk perception, communication and EMFs: From public understanding of risk to public engagement with science

Nick Pidgeon
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University of East Anglia
Norwich - UK

This paper commences with a brief review of developments in risk perception and communication research. This research has shown us the range of factors – both psychological and cultural – which can amplify and attenuate lay beliefs about hazards. It has also taught us that effective communication strategies are not easy, and must minimally be grounded in a thorough understanding of the knowledge and frames of reference of target audiences.

The paper also presents new data from our own recent mental models research on public perceptions of EMFs from overhead power-lines in the UK. The paper goes on to outline some of the reasons why research and practice has recently moved beyond a one way-communication model, which stresses public understanding of risk issues, to a multi-way model of public engagement with science and risk policy. Within this new model dialogue and deliberation are viewed as important ways of incorporating public values into decisions, of reducing conflict between stakeholders, and means of building trust in risk managing institutions. The implications of this for EMF risk communication are briefly discuss

2. The role of cognition and emotion in EMF risk perception

Peter Wiedemann
Research Centre Jülich
Programme Group Humans,
Environment and Technology
Germany

Recently, the power of emotions in shaping risk perceptions has been re-discovered. This paper seeks to provide in its first part an overview on models used to describe the interactions of emotions and risk perception. Especially cognitive appraisal theories (such as Scherer, 2001) will be discussed that indicate how emotions are elicited by a series of cognitive appraisal steps. In the second part of the paper these models will be applied to RF EMF perception.

This paper focuses on testing a theoretical framework - the story model - that synthesises emotional and cognitive factors in a psychological theory of risk perception. As such, the model specifies psychological processes that link (a) cognitive representations of the meaning of certain aspects of risk issues, (b) risk perception; and (c) outrage versus empathy/leniency. Results from a series of experiments supporting the story model will be discussed.

3. The impact of the wider social and institutional environment on risk perception

Adam Burgess

Centre for Research into Innovation, Culture and Technology

Brunel University

Uxbridge - UK

It is important to recognise that the dimensions of the problem of EMF risk perception are relatively modest, and certainly vary considerably between different countries and time periods. Mobile EMF remains a 'phantom risk' and scientific uncertainty is actually quite limited. It is not a general public concern in any meaningful sense, although there are disgruntled individuals and even small, albeit typically short-lived campaigns. Arguably it is our own insecurities about dealing with this relatively limited problem that leads us to often overstate its actual dimensions.

Some insights have been gained from classical risk perception studies in this area, most notably those looking at the impact of precautionary warnings upon individuals. But there is a limit to how much more can be learned from the classical psychological paradigm of 'outrage' etc. From a more social and politically orientated perspective of risk perception, the main thing to recognize is that perceptions are highly contingent and subject to change. Recent research in media studies of science related risk confirms that perceptions are largely shaped by a (changing) media agenda, for example. Perceptions shouldn't be defensively responded to as if they were fixed; a *fait accompli*. This may have the effect of cementing what otherwise would have been only passing reactions.

The real character of hostile reactions to mobile EMF needs to be carefully examined. Initial reactions to the appearance of mobile masts often relate to the impact upon property prices, aesthetics (the view) and, most importantly, a lack of consultation. The wider environment – the impact of the media, shapes the extent to which more health based concerns emerge, and then endure for example. Other factors, which more specifically shape reactions, are:

- The volume of unexplained 'information' which is put into the public domain - as in 'new study suggests there may be a problem'. It is worth noting that the long media campaign against mobile EMF in the UK began with EC warnings about 'worrying' research in the early 1990s.
- The extent to which authority – both national and international - 'speaks with one voice'. It is principally where there are conflicting messages from different experts or institutions that concern is most sharply generated (as has been the case in Italy, for example, whilst a stark contrast would appear to be the Netherlands)
- A related factor is the independent establishment of precautionary warnings or safety levels. The universal refrain of all those expressing concern about EMF is that 'there are precautionary standards in Switzerland etc... why can't we have them too?'

Clearly, these factors are not subject to easy influence. Nor would there appear to be a 'magic bullet' that will instantly dissipate hostile reaction. But strategies to manage EMF risk perception need to be informed by an understanding of these wider factors.

4. EMF: Risk perception, trust, and confidence

Michael Siegrist
University of Zurich
Social Psychology Institute
Zurich - Switzerland

The perceived risks associated with electromagnetic fields (EMF) have received very little attention from risk researchers. We examined factors that influence acceptance of a mobile phone antenna in one's neighbourhood. Most people do not possess detailed knowledge about EMF. One-way people cope with this lack of knowledge is to rely on trust and confidence to simplify the problems they face. Although there is broad consensus on the importance of trust for risk management, there is no theory of trust and how it operates that social scientists agree upon. We propose a dual-mode model of cooperation based social trust and confidence. Trust and confidence are separate, but, under some circumstances, interacting sources of cooperation. Trust is based on value similarity, and confidence is based on performance. According to our model, judged similarity between the observers currently salient values and the values attributed to others determine social trust. Thus, the basis for trust is the belief that the person to be trusted would act as the trusting person would. The interpretation of the other's performance influences confidence. Confidence can be based on formal record keeping, contracts, control systems or other indicators of past performance. We hypothesize that trust information tends to dominate performance information. By "dominate" we mean that, to an observer, morality-relevant information (i.e., value similarity) is more important, and that it conditions the interpretation of performance-relevant information. Our model was tested in the applied context of EMF risks. Data from a random sample of 1313 Swiss citizens were collected. Structural equation modelling procedures were used to test the plausibility of the postulated dual-model of cooperation based social trust and confidence. Results indicate that the proposed model fits the data very well. The practical implications of the results will be discussed.

We devised a second study to assess the perception of risks associated with different EMF-related hazards. Data stem from a telephone survey conducted in the German and French speaking parts of Switzerland (N=1015). Participants assessed both risks and benefits associated with nine different sources of EMF. In addition, participants answered a set of questions related to attitudes towards EMF. According to respondents' assessments, power lines are the most risky source of EMF. Mobile phones and mobile phone base stations received lower risk ratings. People who used their mobile phones frequently perceived fewer risks and more benefits than people who used their mobile phones infrequently. People who believed they lived close to a base station did not significantly differ in their level of risks associated with mobile phone base stations from people who did not believe they lived close to a base station.

5. The Mobile dilemma: Empirical study of public risk perception on EMF and mobile phones in Denmark

Hanne Svenningsen
Information Centre for Environment and Health
Copenhagen - Denmark

In Denmark, the implementation of the third generation of mobile phone technology (3G) network has been met with considerable public resistance. Thus, a significant part of the public seem concerned that exposure to radiation from mobile telephones and base stations could lead to adverse health consequences, especially for children.

This report presents the main findings of an empirical study of public risk perception of radiation from mobile phones and base stations in Denmark. In order to get a better understanding of public concerns about this risk issue, three focus-group interviews were conducted in Copenhagen in the beginning of January 2004.

One group consisted of parents to schoolchildren. Four schools in Greater Copenhagen were selected, where concern have been expressed about possible negative health effects of radiation from base stations placed on top of the school building. Another group consisted of representatives from professional lobby organisations in the EMF area, like consumer organisations and organisations for people sensitive to electromagnetic fields. The last group included mainly young, high frequency users of mobile phones and IT-business people highly dependent on mobile phones in their jobs.

An overall finding is that along with factual arguments and personal experience also ethical and social considerations are underlying the public assessment of risk from mobile technology. For instance, possible risks from radiation in general are perceived as less acceptable, when children are involved.

In general, people experience a dilemma between perceived benefits and potential risk from mobile phone technology. Several individual strategies are obtained in order to try to balance risks and benefits. Strategies range from changing ones own use of the mobile phone and encouraging ones children to do the same, to playing down the risk because of lack of scientific evidence for harm. Yet, also collective strategies are put forward like "the government has to take responsibility", e.g. by prohibiting the use of mobile phones in certain public places, such as schools.

Another source of concern seems to be that mobile phone technology and its potential for generating health effects is incomprehensible to the general public. This mechanism is enhanced by disagreement among experts as well as incomplete scientific knowledge about the potential health effects.

The survey found that public concern is also fuelled by distrust towards national government and scientists working for industry. Apparently, public understanding of the risk is not solely driven by perception of the risk itself, it is also about perception of and preference for institutional handling of the issues. Thus, participants were suspicious about the government's statement, saying that radiation from base stations is not harmful to human health.

A widely held view was that there might be unknown long-term consequences. The possibility of cancer and brain damage, especially in children received significant attention. Most participants

wondered why a precautionary approach has not been adopted. Also, some are convinced that industrial interests influence government authorities as well as researchers.

Apparently, what causes concern is not solely the potential risk, but also the denial of it. Participants think that the government's statements are too clear-cut and one-sided. They think that it is better to be honest about the gaps in scientific knowledge. Moreover, it is argued, decision makers should accept that science is only one form of knowledge, and that other perspectives should also be taken seriously. Participants also believe that research challenging the risk assessments of the authorities is being ignored, and they express the need for independent researchers and organisations to assess and manage the risk.

Participants think they have the right to know what is planned with respect to the construction of the 3G-telecommunication network, and they want the opportunity to be involved. However, they also feel that the government and industry have neither informed them timely, nor involved parents in decision making about sitting of base stations on schools. It was also noted that the government is not responsive to public concerns and that information about the issue in general has been inadequate. The feeling of not knowing enough caused frustration and concern among some participants.

In Denmark, the current public debate focuses primarily on radiation from base stations. However, practically every expert agree that radiation from mobile phones exceeds the one from base stations up to several hundred times. As part of the survey, we focused on risk perception from mobile phones and base stations respectively.

As to base stations, it became clear that possible risks from the transmission system are seen as non-voluntary and imposed risks. Participants felt that they have no control over risk from base stations. Also, it was argued that radiation from transmission masts is unfair, because they expose the given community to radiation, while a great number of mobile telephone users benefits from it. Such aspects could explain why risks from transmission system apparently are perceived as relatively high.

Compared to this, mobile phones are linked with great benefit. Moreover, use of handsets is perceived voluntary and controllable (e.g. by restricting conversation length, using headsets or turning off the phone). In this sense, participants feel that they have a degree of control over possible risks from mobile phones. This could explain why possible risks from mobile phones are perceived relatively mild.

In conclusion, the results points to a set of core challenges. These include; taking public risk perception seriously; informing and involving the general public at an early stage, especially in where to site base stations; setting up systems of participation in order to allow possibility for informed dialogue; being open and transparent in all decision-making and research activities.

In general, this survey points to the importance of participatory processes and dialogue with the public in decision making under scientific uncertainty. World Health Organization (WHO) has prepared a set of guidelines for effective risk communication about EMF. In relation to these guidelines, we find that that stakeholder consultation as well as public information and dialogue involving scientists, public authorities, industry and the general public could be reasonable ways of meeting public concern about risk from mobile technology in Denmark.

6. Electromagnetic fields and health: information and risk perception among general population in Spain

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Asociación Española Contra el Cáncer
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Purpose:

The aims of the survey were to assess the level of information on electromagnetic fields (EMF) and their effect on health among the Spanish population; to know what the population think about having cell-towers near their homes; and to explore the perception of health risk associated with commonly used electromagnetic sources.

Subjects and Method:

The sample included 801 participants (18-65 years of age) randomly selected from the telephone directory, representative of all regions. Telephone interviews were performed based on a structured questionnaire. The survey was conducted during January 2004.

Results:

The results showed that 69% of the sample reported having no knowledge about EMF. Up to 90% mentioned to have a little or no information at all on the effect of EMF on health.

Nine in ten of the people interviewed had a mobile telephone. When comparing the risk perception regarding several commonly used devices (computer, microwave, TV and mobile telephone), mobile telephone and microwave were associated with a higher risk of health problems (48% each) than TV and computers. Of those (64%) who believed that those devices were linked with health problems, 40.7% associated them with cancer.

Regarding cell-towers, 52.1% of the sample believed that living near them means a health hazard, and of those who believed so, 51.8% clearly correlated the proximity of those base stations with cancer. 66% of the samples were against having base stations near their homes.

When several illnesses/symptoms were suggested to the participants in order to assess whether they associated them with EMF exposure, 68.9% reported headaches as the most prevalent health risk linked with such fields, 59% mentioned cancer, 48% named sleep disturbances/insomnia, 41.3% behavioural problems, and 35.6% congenital malformations.

Conclusion:

Despite the efforts of public institutions and consumer organisations to inform on EMF exposure (related to mobile telephones and cell-towers) and health the population report having scarce if any information on the subject. It seems that the mass media have been far more effective in reaching the population as the main datum population mention regarding this issue is linked with health risks, mainly cancer. More research is needed to explore information needs and concerns of the population in order to design an effective multi-sectorial policy to handle health risk perception among citizens.

7. Cognitive factors influencing symptom report on complaints allegedly related to electromagnetic fields: an experimental survey study

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A representative sample (n=1997 individuals drawn from the population registry) of the population aged 18 to 64 years in the German city of Regensburg was addressed by mail to participate in a one-hour face-to-face interview on personal health and environmental conditions.

Study I: Impact of introductory contact on participation and symptom report.

Mailings were all performed using the same university letterhead and introducing the research group on environmental health as the author of the study. Three consecutive waves of mailings addressed 496, 997, and 501 randomly assigned individuals. Introductory letters describing aims and purpose of the study were changed between waves. Whereas the first wave was describing the study as focussed on general environmental conditions potentially influencing health status and well being and not mentioning electromagnetic fields as topic of the study, the second wave was announced as a study on different living conditions in Regensburg's various neighbourhoods as potential sources of health symptoms. Simultaneously to the second mailing an article in the local newspaper also reported about the study and its purpose in the same sense. A photocopy of this article was added to the introductory letter in the second and third wave. The introductory letter of the third wave announced the study explicitly as dedicated to the potential health impact of electromagnetic fields mentioning mobile phones and their base stations as emitters of electromagnetic radiation. Potential health impact of mobile phone networks was described as an important research problem and people were quite intensively urged to participate in the study in order to help to clarify this topic.

We expected the third wave to yield the highest participation rates due to the high level of public interest in this research topic in Germany at the time of the study. But participation rates (not adjusted for neutral losses) varied only little between 30.5 % and 35.5 % over the waves and could not be shown to differ significantly. The global response rate was adjusted for neutral losses and calculated at 39.1 %. Due to this low participation rate a fourth wave of sampling was performed using random walk procedures and unannounced doorbell ringing of the interviewers as the initial contact. This procedure yielded a very similar participation rate of 37.4 % (496 households contacted with approximately 218 eligible individuals). A total of 758 individuals participated in the study. Interviewers were not informed about differences in the introductory letters.

Standardized interviews were performed by trained interviewers and ended with probands' symptom reports on a list of 36 allegedly EMF-related health symptoms that had all been reported in the literature. The total score of this complaint list reached excellent psychometric properties and Rasch-conformity of the scale could be shown.

A comparison of the 4 different initial contacts revealed that the first wave introducing the study under a very global paradigm of general environmental conditions as potential sources of health impact resulted in a significantly higher symptom report among this group. Specifying more specific potential health risks (concrete living conditions in neighbourhoods or mobile phone base stations) as

topics of the study lead to a smaller number of symptoms reported in the interview. The observed effect size was comparable to the well-known gender difference between men and women in complaining about unspecific health symptoms.

Study II: Impact of cognitive context on symptom report

During the interviews, the last part before asking the complaint questions consisted of a complete pair-wise comparison (“What do you think means a greater risk for you personally?”) of perceived health risks resulting from three standardized conditions by the interviewees. Perceived personal health risk from electromagnetic radiation was evaluated against the risk of suffering from a severe influenza (fever of 40° C during 3 weeks) and against the risk from a randomly varied anchoring condition: In a 2 by 2 experimental design the subjective probability of this anchoring condition and the threat resulting from the condition were manipulated as high or low and randomly assigned to the subjects:

High probability and high threat scenario: Getting involved in a traffic accident and being severely injured. Necessity of spreading the smashed car to save you.

High probability and low threat scenario: Getting involved in a traffic accident and suffering from cervical whiplash injury with necessity to wear a toby collar for three weeks.

Low probability and high threat: Being severely radiated due to an accident in a neighbouring nuclear power plant and suffering from radiation sickness.

Low probability and low threat: Getting into a thunder storm with a close-by lightening causing three weeks of modest headache.

Whereas the subjective probability of the anchoring condition did not result in different symptom report, people comparing potential EMF-risks against a high threat anchoring condition reported a smaller number of symptoms for the preceding 30 days. This effect was especially pronounced for those people with a greater tendency to somatise their health condition (median split of the sample on a standardized somatisation instrument administered in an earlier part of the interview).

Interpretation:

Both results can be explained as contrast effects in judging one’s health status. After comparing EMF-related risks to nuclear meltdowns or dreadful car accidents one’s own complaints during the preceding 30 days seem less worth reporting. Thus, EMF risks are not perceived to represent the same class of dreadful events like the ones chosen in the threat scenarios (experiment 2). The same mechanism in experiment 1 could have precluded symptoms from being reported to the interviewer, because if living conditions in the neighbourhoods are the declared focus of the study, symptoms attributed to a person’s workplace (for instance) seem not relevant to be reported. Or, if mobile networks and their health impact are the aim of the study, symptoms that can be attributed to known physical illnesses by the person might also be underreported.

8. Public perceptions of ELF-EMF risks: Comparing expert representations and lay mental models

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The paper presents some of the key findings of an on-going study of public perceptions of radiation hazards, funded by the UK Department of Health. The research uses 400 kV Overhead Electricity Transmission Lines as a case study for eliciting lay mental models of and mitigation preferences for ELF-EMF risks.

In Phase 1 of the study, lay mental models of ELF-EMF risks were seen to be multi-dimensional, with particular focus on the policy and 'affect' dimensions to the risk, compared to expert representations that primarily focus on an exposure-effect dimension. While clear distinctions were apparent in the 'knowledge' base of the lay and expert models of the risks, beliefs and indeed value orientations supporting risk management policy and mitigation preferences were less differentiated.

The lay mental models were subsequently used to inform the design of the Phase 2 risk ranking exercises, the findings of which are also outlined in the paper. In the ranking exercises, the case study risk(s) is located within (1) a radiation risk set or (2) a broader set of health risks, while the risks sets are themselves framed from (3) a personal or (4) a community perspective. This 2x2 study design sought to explore further the contextual nature of risk perceptions and mitigation preferences and to validate the applicability of the findings in the mental model phase.

The contextualisation of lay understanding of radiation risks, the heuristics adopted by a lay public in responding to the risks of ELF-EMF's and the public acceptability of perceived risks are likely to have significant implications for communications about and management of radiation risks.

9. The impact of EMF precautionary measures on risk perception

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Application of the precautionary principle has become a major topic in discussions about the management of potential health risk from EMF sources such as base stations and mobile phones. Here discussions focus on why, when and how to invoke precautionary measures and which measures are appropriate.

An aspect that has been neglected so far in these discussions is whether taking precautionary measures might itself influence the perception of EMF risks. This question is currently investigated in a series of experimental studies. First results from two of these studies will be presented, which indeed suggest that such influences might exist and that they might be detrimental to the objectives underlying the application of the precautionary principle.

10. Understandings of the precautionary principle: 'No smoke without fire' or 'better safe than sorry?'

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It has been suggested that the operation of the precautionary principle in relation to mobile telecommunications technology may cause or exacerbate public concerns. Exploring this is part of the current focus of a project funded by the Mobile Telecommunications Health Research Programme. This project, 'Communicating Uncertainty: Mobile Telecommunication Health Risks' is using focus groups, a survey and a series of experimental studies to explore the communication of uncertainty. This presentation will look at some of the evidence from the focus groups about how the UK government's current stance about mobile telecommunications is understood. Six focus groups have been conducted with members of the public that (a) varied in their phone use and (b) in their awareness and concern about mast sitting.

Preliminary analyses strongly suggest that a precautionary position in this area did not induce or exacerbate concern about the safety of mobile telecommunications or the validity of the science in this area. For those involved in protesting against mast sitting this was simply seen to be in line with a position that they had already taken. There was evidence that the validity of government uncertainty and its attendant precautionary actions were undermined both by beliefs about other government actions and by the nature of risk communication in other areas. These findings will be further explored in the survey and experimental phases of this research programme.

Stakeholder Studies & Presentations

11. Mobile Telephony and Health - Public Perceptions in Great Britain & Internationally

Jack Rowley
Director Environmental Affairs
GSM Association

This report presents the findings of research conducted on behalf of the GSM Association (GSMA), the Mobile Manufacturers Forum (MMF) and the Mobile Operators Association (MOA), regarding the British general public's attitudes to the alleged health risks associated with mobile phone handsets and masts. The main objectives of the GSMA/MMF/MOA/MORI research were to:

- Understand the British public's awareness and perceptions of the alleged health risks associated with the use of mobile phones
- To track changes in this awareness and perceptions
- To monitor the effect of media coverage
- To test reaction to proposed government and industrial initiatives
- To understand attitudes towards use of mobile phones by children

The general public quantitative tracking research has been taking place on a regular basis over the last 6 years. In 1998, Cellnet originally commissioned the study, and then the Mobile Operators Association (formerly the Federation of Electronics Industry). Since 2000 two waves a year have been conducted, with occasional extra measures as required. The quantitative research is conducted via MORI's Face-to-Face Omnibus. Each wave of research interviews a nationally representative quota sample of British adults aged 15+ throughout Great Britain (England, Scotland and Wales, but excluding Northern Ireland). Interviews are carried out using CAPI (Computer Assisted Personal Interviewing), face-to-face in respondents' homes. Data have been weighted to reflect the known national population profile. Several additional sources and studies will be referenced to illustrate wider perspectives.

12. The Role of Risk Communication in EMF Issue Management

Vasco de Janeiro
Environment and Sustainable Development
Union of the Electricity Industry
EURELECTRIC

General Framework

- The electricity industry is facing enormous challenges
- The relationship with citizens customers is increasing
- Trust and confidence are essential competition elements
- Customers: aware, suspicious, reactive, sensitive, demanding
- Technically complex
- Involves important values (home, health)
- The exposure level is not a free choice
- Alleged potential health effects are discussed in terms of risk (if any)
- Risk is difficult to understand, explain and accept

Risk management process

Main aspects:

- Risk assessment
- Risk perception
- Risk communication

EURELECTRIC Report on Risk Communication

Share common experiences: To improve capability of constructing new power lines.

- Case studies collected in 1998-1999
- 23 cases from 10 European countries ((DE, DK, FIN, F, GR, IE, IT, NL, PT, SWE).
- Structured questionnaire: 1) Story (what, when, where), 2) Actions (by company and stakeholders), 3) Lessons learned (positive or negative).

Case studies

- Public meetings: Usually in the context of a new power line; impromptu questions answered
- Face-to-face contacts: Request from customer (PC disturbances, health risk, property value, etc), personal contact (i.e., measurement device lent to customer).
- Issue management: Company strategies planned, cooperation with stakeholders (i.e., researchers, local authorities, politicians, media), lengthy process.

13. MOA Initiatives on Stakeholder dialogue on EMF exposure and Health

Mike Dolan
Executive Director
UK Mobile Operators Association
MOA

There are now 50 million mobile phone subscribers in the UK and they need networks of radio base stations in the right places in order to use their phones. Because of the fast uptake of the technology in recent years the operators have had to expand their networks to keep pace with customer demand. Network expansion has caused concern in some sections of the community with much of the concern being focused on radio frequency health and safety issues.

This presentation will outline the UK network operators' response to public concern since 1999 and their commitment to best sitting practice for mobile phone radio base stations including initiatives for community and local authority consultation. In particular, the presentation will report on a proactive programme of stakeholder engagement undertaken for the UK network operators by the Mobile Operators Association. The programme has been in place since 2000 and is ongoing.

14. Global Industry Initiatives on Risk Perception and risk Communication

Michael Milligan
Secretary General
Mobile Manufacturers Forum
MMF

Overview of perceptions and attitudes

- Perceptions shaped by media Perceptions and Attitudes: Need to keep issue in perspective:
 - 1) Not a major front of mind issue for most people, 2) Prompting raises awareness and concerns.
 - For handsets: Personal benefit generally outweighs concerns
 - For networks: Personal benefit argument not seen, link to devices often not understood, NIMBY attitude

Examples of specific Industry communication initiatives: in Austria, France, Ireland, Switzerland, Canada, Israel, Japan, China, Singapore, Australia.

Deriving the common elements

- Most national programs have implemented the following elements:
 - Websites
 - Brochures
 - Fact Sheets
 - Newsletters
 - Information Seminars
- Depending on the circumstances, additional elements may have also been incorporated:
 - Commitments relating to siting and deployment
 - Base station monitoring programs
 - SAR specific campaigns
 - TV and Newspaper Advertising
 - Stakeholder engagement/cooperation
 - Support for research

Assessing effectiveness

To assess the communications activities we need to incorporate measurable outcomes and evaluation processes.

- Purpose (Why do we want to communicate?)
- Desired result (What are the outcomes (measurable) that we want to see from the project?)
- Communications Objectives (What are the communications outcomes sought from the project?)
- Audience (Who do we want to reach?)
- Key messages (What do we want to say?)
- Actions (What sort of communication activities do we have in mind?)

- Evaluation (How will we know we have achieved our objectives?)

Conclusions Despite the perceptions and the challenges the industry strives to be open and responsive to consumers:

- Extensive array of communications activity taking place in most countries.
- Actual communication activity depends greatly on local circumstances
- However common elements emerge from all of the campaigns
- The continuing challenge is how to assess their overall effectiveness

**JRC EIS-EMF KICK-OFF MEETING, EMF RISK
PERCEPTION & COMMUNICATION WORKSHOP AND
TWG FOR STAKEHOLDER DIALOGUE**

**JRC - Ispra (Bldg. 36 – Room 1 and 2)
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ANNEX 7. Work programme for 2005

Main objectives and proposed deadlines

Objective 1:

EMF Risk Perception & Communication

- 1.1 Publish a EUR Report on Proceedings from July 2004 EMF Risk Perception Workshop at the JRC (Deadline April 2005)
- 1.2 Organise Workshop “Risk Communication across EU: Case Studies” (Deadline July 2005)
- 1.3 Publish Proceedings from July 2005 Workshop (Deadline December 2005)

Objective 2:

Country Reports & Gateway

- 2.1 Produce a second draft on the "Country Reports" (March 2005)
- 2.2 Produce a pilot gateway on UK (April 2005)
- 2.3 Upload Country Reports into Gateway (May-June 2005)
- 2.4 Publish Country Reports (July 2005)
- 2.5 Provide Public access to the Gateway (August-September 2005)

Objective 3:

Organise a Workshop on the “Scientific Evidence” of the potential Health Effects of exposure to EMF in coordination with DG-SANCO, DG RES, and DG ENTR, and in cooperation with EMF-NET, COST281, WHO-EMF, and ICNIRP (November 2005)

- 3.1 Publish proceedings (early 2006)

Objective 4:

EU EMF Measurements Data Base

- 4.1 Review final report by Seibersdorf (March 2005)
- 4.2 Publish report together with Seiberdorf (September 2005)
- 4.3 Develop in cooperation with JRC EMF collaborative Action an IDA (DG ENTR) proposal for the construction of the database (March-September/Meeting of the JRC CA in September 2005)

Objective 5:

Co-ordination of Advisory Board

- 5.1 Organise a meeting in May 2005
- 5.2 Organise a meeting in November 2005

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