

Mobile Phone Base Stations

Siting and Safety

What is National Grid Wireless?

National Grid Wireless* is a wholly-owned subsidiary of National Grid. We are one of the UK's leading owners and operators of shared radio communications and broadcast infrastructure. We own and operate the BBC's transmitter service and through this we have over 80 years' experience of building, maintaining and operating radio systems in the UK.

We own and manage large numbers of radio installations of all types, including mobile phone base stations. In addition to the BBC transmitter sites our portfolio of radio sites includes BT telephone exchanges and National Grid's electricity pylons and public utility sites.

Mobile phone networks in the UK

There are now more mobile phones in the world than fixed-line phones. In the UK there are more mobile phone subscriptions than there are people (62 million by September 2005) as some people now have more than one phone or mobile device.

Numbers continue to grow and phone usage per customer is also growing, not only for voice calls and text messaging, but also for connecting computers and other mobile devices to the internet, email and mobile data services.

National Grid Wireless is working with all five of the UK's mobile operators to provide the necessary infrastructure and network capacity to keep pace with this demand.

How do mobile networks work?

Mobile phones are small radio transmitter-receivers; they communicate with radio base stations using radio waves. Because the phones are low-powered transmitters (typically one watt or less), there must be a base station relatively close-by if a good quality two-way connection is to be maintained.

Each base station consists of transmitting and receiving equipment connected to antennas which communicate with nearby phones. The base station is connected to the operator's network, so that calls can be passed on via a central 'switching centre' (a telephone exchange).

Siting of base stations

The UK's five mobile operators already have over 45,000 mobile phone base stations. Many of them share structures, so the actual number of sites is less than the number of base stations.

Each operator's base stations must be very precisely sited so as to provide adequate coverage and they must be close enough together for their areas of coverage (known as 'cells') to overlap.

Increasingly, mobile phone users rely on their phones as their principal or even their only phone, so it is important that residential areas, along with all other areas where people want to use their phones, are covered effectively.

In built-up areas each operator's base stations may be only a few hundred or even tens of metres apart.

Radio waves

Mobile phone base stations transmit and receive radio waves.

Radio waves are electromagnetic waves. There are many natural forms of electromagnetic waves in the electromagnetic spectrum, for example visible light which occurs at a much higher frequency and shorter wavelength, above radio waves.

Many common devices use radio waves, including TV and radio transmitters (many operated by National Grid Wireless), private mobile radio communications services, cordless phones, remote locking systems for cars, baby alarms, wireless computer networks and so on.

Radio waves, including mobile phone transmissions, are classed as 'non-ionising'. They should not be confused with 'ionising' radiations like x-rays and gamma rays, which occur at extremely high frequencies, above visible light, in the electromagnetic spectrum. Ionising radiations can irreversibly change molecular structure and are known to be harmful.

National Grid Wireless sites do not emit ionising radiation. The question remains whether the very low-level non-ionising radio transmissions from mobile phone base stations could be harmful. There are sometimes reports in the media, and it is possible to find information on the internet, suggesting that base stations might be responsible for a whole range of illnesses, including cancer.

Most people live near a base station, so it is very important to consider this question carefully.

*The National Grid Wireless group of companies, are: National Grid Wireless Ltd, National Grid Wireless No 2 Ltd National Grid Wireless No 3 Ltd & National Grid Wireless Aerial Sites plc, all with registered offices at 1-3 The Strand London WC2N 5EH

Are mobile phone base stations safe?

It is not possible to *prove* that anything is safe. To make an informed assessment about base stations we need to consider these factors:

- **What are the safety guidelines for mobile phone base stations?**
- **Do mobile phone base stations comply with the guidelines?**
- **Are the guidelines adequate and up to date?**
- **What does the scientific evidence say?**

What are the safety guidelines?

The Government's statutory adviser on the safety of radio transmissions is the Radiation Protection Division of the Health Protection Agency (HPA).

The HPA recommends that all mobile phones and base stations in the UK should comply with the guidelines of the International Commission on Non Ionizing Radiation Protection (ICNIRP). The ICNIRP guidelines are accepted as the appropriate safeguard to public health by the World Health Organization, the European Commission, the majority of countries in Europe and many others across the world.

Do mobile phone base stations comply with the guidelines?

Yes they do.

National Grid Wireless confirms that all mobile phone base stations under its control comply with the ICNIRP guidelines in all accessible areas.

Since 2001 the UK's Radiocommunications Agency, now part of the Office of Communications (Ofcom), has been conducting measurement surveys around mobile phone base stations near schools, hospitals and other places where local people have requested a survey. The results can be studied on the Ofcom web site.

By December 2005 over 400 surveys had been completed. The surveys have consistently demonstrated that actual radio field strengths around mobile phone base stations are very small fractions of the ICNIRP public guideline level. The highest level recorded up to that date was 1/279 - **nearly three hundred times below** the ICNIRP guideline level for the general public and average levels were even lower.

By way of comparison the exposure from a typical mobile phone (types vary) operating at full power may reach about one half of the guideline level. However, the phone will reduce its power substantially if it is near a base station because mobile phones have 'Adaptive Power Control' which reduces their output power to the lowest level needed to maintain a call.

Are the guidelines adequate and up to date?

The ICNIRP guidelines were first adopted in the UK for mobile phones and base stations in 2000 on the recommendation of the 'Stewart Report' - the report of the Independent Expert Group on Mobile Phones, known after its chairman, Sir William Stewart, who is now Chairman of the HPA.

To gain a full understanding of the Stewart Report and of the other reports referred to below it would be necessary to read them in full. We have provided website links at the end of this guide to help you find copies of the reports.

The Stewart Report made several recommendations in addition to the adoption of the ICNIRP guidelines. In particular it recommended a precautionary approach to mobile phone technologies, that there should be an independent programme of health research, and that there should be a further review of the health position after three years.

That review was undertaken in 2004 and reaffirmed the ICNIRP guidelines as the appropriate safeguard for public health.

The Mobile Telephone Health Research (MTHR) programme was established to carry out the recommended research. It is funded jointly by government and the mobile telecommunications industry, including National Grid Wireless.

What does the scientific evidence say?

There have been many reviews of the scientific evidence for effects of mobile phones and base stations on people's health. These are useful because they can weigh up all the evidence, taking account of the quality of individual studies and deal with contradictions between individual results.

In January 2005, the National Radiological Protection Board (NRPB), which has now become the Radiation Protection Division of the HPA, published two significant reports. These are available on the HPA website.

A Summary of Recent Reports on Mobile Phones and Health 2000–2004

In this document the NRPB summarises reviews from national and international bodies into the health effects of mobile phone technologies which have been produced since the Stewart report in 2000.

These reviews do not represent the views of individual scientists, nor are they reports on individual pieces of research. Each, like the Stewart Report, is a review of all the relevant evidence.

The summary considers 26 reviews in all. It includes reviews by:

The European Commission, ICNIRP, the World Health Organization, the UK's Advisory Group on Non Ionising Radiation, The British Medical Association, the UK Institute of Electrical Engineers, the Royal Society of Canada, the Health Council of the Netherlands, authorities in France, Sweden, Switzerland and the United States and a joint statement by authorities in the Nordic countries (Denmark, Finland, Iceland, Norway and Sweden).

The purpose of the NRPB's summary was to bring information from these various sources together and to highlight any commonality or differences in opinion. The reports generally give separate conclusions for mobile phone base stations and for the use of mobile phones, because mobile phones, although complying with the guidelines, do so by a much smaller margin.

About base stations, the NRPB states in its summary and conclusions that:

"... these reports stress that very low level exposures, typical of base stations, are extremely unlikely to cause any effects on biophysical grounds" (Page 3, *Summary of conclusions and recommendations*).

Mobile Phones and Health 2004: Report by the Board of NRPB

This report is the NRPB's own review of developments since the Stewart Report in 2000.

The report concludes, as did the Stewart report, that a precautionary approach to mobile phone technologies should continue to be adopted. It welcomed the adoption of the ICNIRP guidelines in the UK as recommended by the Stewart Report.

The report supports the ongoing programme of measurement surveys of radio field strengths around mobile phone base stations conducted by OFCOM as it sees this as providing reassurance to the public (Introduction paragraph 56).

In considering measurement surveys the report concluded:

"The measurements also demonstrate that there is no scientific basis for establishing minimum distances between base stations and areas of public occupancy, as has been suggested in some countries. There are many sources of RF [Radio Frequency] fields and it would in practice have little impact on people's overall exposure." (Introduction, paragraph 53).

Children

It is understandable that people are particularly concerned about protecting their children from harm. The Health Protection Agency and other authorities have recommended that, as a precautionary measure, children's use of mobile phones should be limited.

An expert workshop held by the World Health Organization in June 2004 to consider the sensitivity of children to electromagnetic fields, including radio waves, concluded that in developing policy for children and pregnant women, whilst some precautionary measures are appropriate for children's use of mobile phones,

"exposure levels from mobile phone base stations are extremely low, and therefore precautionary measures do not need to be recommended." (Report in *Pediatrics Vol. 116 No2, 2005*)

The role of the Town and Country Planning system

Concerning Town and Country Planning, *Mobile Phones and Health 2004* urged clearer and more readily understandable procedures to be followed by local authorities and mobile operators and it welcomed the adoption of the Code of Best Practice on Mobile Phone Network Development (in England and Wales). The Code of Best Practice was drawn up and agreed by representatives of central and local government and the industry, including the mobile operators and National Grid Wireless.

Government Planning Policy Guidance in England states that "it is the Government's firm view that the planning system is not the place for determining health safeguards" (PPG8, para. 30). Similar guidance and advice applies in Scotland, Wales and Northern Ireland.

Mobile Phones and Health 2004 states:

"The board supports the government view that whilst planning is necessarily a local issue, the assessment of evidence related to possible health concerns associated with exposure to RF fields from base stations is best dealt with nationally" (*Executive summary Paragraph 41*).

Addressing public concern

Even though most people use mobile phones, we appreciate that some people still have concerns about mobile phone base stations affecting their health.

The question remains how best to address these concerns when they are not supported by the evidence.

Certain authorities in Europe, while accepting the scientific evidence, have nevertheless introduced restrictive measures on the siting of base stations as a response to public concern. Examples are the imposition of arbitrary minimum distances between base stations and areas of public occupancy, or refusing to site base station on publicly owned property.

Experience now shows that such steps which are not based on science can reinforce some people's concerns, and do not reduce public exposure to radio waves.

National Grid Wireless feels the best means of addressing concern is by communication, and by providing sources of demonstrably independent expert information which will allow people to draw their own conclusion from the evidence.

Please contact our community relations team if you would like to discuss any issues connected with our sites.

Information

Here are some addresses, phone numbers and web sites from which you can obtain further information and access to the reports we have referred to. An electronic version of this document is available, in which you can follow the links.

If you do not have access to the internet, please contact us and we may be able to post you some of this information.

Health Protection Agency

Radiation Protection Division, Chilton, Didcot, Oxon, OX11 0RQ.

Telephone: 01235 831600.

Email: information@hpa-rp.org.uk

Web site: <http://www.hpa.org.uk>

Advice on Limiting Exposure to Electromagnetic Fields (adoption of the ICNIRP guidelines) (NRPB Volume 15 No 2)

Direct link: http://www.hpa.org.uk/radiation/publications/documents_of_nrpb/pdfs/doc_15_2.pdf

A Summary of Recent Reports on Mobile Phones and Health 2000–2004 (NRPB, Report W-65)

Direct link: http://www.hpa.org.uk/radiation/publications/w_series_reports/2005/nrpb_w65.htm

Mobile Phones and Health 2004: Report by the Board of NRPB (Documents of the NRPB Volume 15 No 5)

Direct link: http://www.hpa.org.uk/radiation/publications/documents_of_nrpb/abstracts/absd15-5.htm

Mobile Telecommunications and Health Research Programme (MTHR)

Web site: <http://www.mthr.org.uk>

The Stewart Report (2000)

Web site: <http://www.iegmp.org.uk>

Direct link to the report: <http://www.iegmp.org.uk/report/text.htm>

Direct link to: Clarification of Issues discussed in the Stewart Report (including explanation of advice on schools):
<http://www.iegmp.org.uk/report/clarification.htm>

Office of Communications (OFCOM)

Web site: <http://www.ofcom.org.uk>

Includes the Sitefinder database of mobile phone base stations in the UK and details of the base station measurement audit programme and results.

World Health Organization (WHO)

Information on electromagnetic fields and details of the WHO EMF project

Web site: <http://www.who.int/peh-emf/en/>

Report on the WHO Expert Workshop on sensitivity of children to EMFs (Official Journal of the American Academy of Pediatrics).

Direct link: <http://pediatrics.aappublications.org/cgi/content/full/116/2/e303>

International Commission for Non-Ionizing Radiation Protection (ICNIRP)

Web site: <http://www.icnirp.org>

Direct link to the ICNIRP guidelines: <http://www.icnirp.org/pubEMF.htm>

Mobile Operators Association (MOA)

Russell Square House, 10-12 Russell Square, London WC1B 5EE.

Telephone: 020 7331 2015

Email: info@ukmoa.org

Web Site: <http://www.mobilemastinfo.com>

Includes links to useful sources of information, interest groups, alternative opinions and contact details for all the UK's mobile operators (see 'Links')

Code of Best Practice on Mobile Phone Network Development

Available from the Department for Communities and Local Government (formerly the Office of the Deputy Prime Minister)

Web site: <http://www.communities.gov.uk>

Direct link: <http://www.communities.gov.uk/index.asp?id=1144926>

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