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Isle of Man
Government

Reiltys Ellan Vannin

REPORT OF THE COUNCIL OF MINISTERS

'A REVIEW INTO THE HEALTH IMPACTS OF MOBILE PHONE MASTS IN THE ISLE OF MAN'

June 2009

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Council of Ministers Report

'A Review into the Health Impacts of Mobile Phone Masts in the Isle of Man'

To the Hon. Noel Q Cringle, President of Tynwald, and the Hon. Council and Keys in Tynwald assembled.

In June 2007 in Tynwald Court the Chief Minister advised that an Officer Working Party had been established to consider the health implications of Mobile Phone Masts under the Chairmanship of the Director of Public Health.

The Officer Working Party submitted their technical Report (at Annex B) to the Council of Ministers.

After considering the Report the Council of Ministers determined to establish a Working Group chaired by the Hon WE Teare MHK (Minister for Health and Social Security) and comprising Mr A E Crowe MLC, Mr J R Houghton MHK, Mr T M Crookall MHK and Mr W M Malarkey MHK to consider the Officer Report with regards to the practical implications of the recommendations of the Officers Working Party Report.

The Working Group carefully considered the technical evidence contained in the Officer Report. The Group was particularly interested in the need to balance the requirements of the Island for good mobile communication against any proven health impact of Mobile Phone masts. The Council of Ministers Working Group Report contains an outline review of the Officer Report and an approach to the health impacts of Mobile Phone masts.

The Council of Ministers has considered and accepted the Working Group's Report (at Annex A) as the appropriate approach to the health impacts of Mobile Phone Masts in the Island.

The Council of Ministers requests that Tynwald notes the decision of the Council of Ministers as set out in their Report, and that the Report be received.

Hon J A Brown, MHK
Chief Minister

THE COUNCIL OF MINISTERS WORKING GROUP REPORT

'A REVIEW INTO THE HEALTH IMPACTS OF MOBILE PHONE MASTS IN THE ISLE OF MAN'

1 INTRODUCTION

1.1 On 19 June 2007 in Tynwald Court the Hon Member for Douglas North, Mr J R Houghton, asked the Chief Minister the following question in response to concerns expressed by residents of Onchan to the siting of a mobile phone mast on top of the G.P. Surgery in Onchan.

"Will you organise an officer-level working party to consider the levels of radiation emissions from mobile telephone base stations with a view to bringing formal regulations for approval by this Court?"

1.2 The Chief Minister advised Tynwald Court that an officer level Working Party had already been established under the chairmanship of the Director of Public Health with the remit to look at:

- the siting of mobile communication base stations from a public health perspective
- how Government, by using existing controls and current legislation, could ensure that base stations are located in compliance with the most up to date guidance from the UK's Health Protection Agency, in association with the National Radiological Protection Board
- how to ensure the UK's Health Protection Agency code of best practice is followed on the Island
- the need for further regulatory controls, if it is agreed that the current controls are not adequate

1.3 The Chief Minister further advised the Court that the Working Party would report to the Ministers for Local Government and the Environment and Health and Social Security in the first instance and would include in their deliberations the small transmitter masts which are less than a metre in height and used for short range distances.

1.4 The Officer Working Party submitted their technical report and a Working Group of the Council of Ministers chaired by the Hon WE Teare MHK and comprising Mr A E Crowe MLC, Mr J R Houghton MHK, Mr T M Crookall MHK and Mr W M Malarkey MHK considered the Officer Report which is at Annex B.

1.5 The Council of Ministers Working Group found that the Report contained useful information on mobile technology and its benefits, the health effects of mobile phone masts, the Planning system and mobile phones masts and the regulation of the mobile phone industry.

In particular the Group identified the following from the Officer Report which it considers to be important:

- a. The balance of evidence collected by the OWG indicates that there is no general risk to the health of people living near mobile phone mast base stations on the basis that exposures are expected to be small fractions of guidelines.
- b. Scientific evidence does not support a link between a series of vague symptoms, described by members of the public and exposure to electromagnetic fields. At least some of these symptoms may be related to anxiety about the presence of new technologies.
- c. In areas outside the projected beam, for example directly under a mast, the measured power density will always be very low (lower than the exposure that a person would receive from a mobile phone handset as it is held closer to the head).
- d. Whilst there is no scientific evidence to show that mobile phone masts have any adverse effects on children the use of precaution principle is justified in relation to the location of the beams of greatest intensity from Macro-Cell base stations.
- e. There is a need to regularly audit masts for the level of emissions, the direction of those emissions and their physical safety.
- f. There are substantial benefits to mobile phone masts in terms of ability to contact the Emergency Services, economic benefits, convenience and reassurance.
- g. There are a wide variety of telecommunications systems in operation on the Island. In respect of planning legislation there are three types of operations:
 - o Small scale additional antennas attached to existing masts and base stations which are minor and do not require planning permission.
 - o Permitted development for Telecommunications code system operators (only Manx Telecom) under provisions of the Town and Country Planning Order 2005
 - o All other structures require planning permission.

The public therefore find it difficult to appreciate the different planning consents and regimes.

2 RECOMMENDATIONS OF THE WORKING GROUP TO THE COUNCIL OF MINISTERS

- 2.1 The Council of Ministers Working Group found the Officers report helpful in focusing on the issues and drawing together the available scientific evidence. The Working Group carefully balanced the concerns expressed by members of the general public and the scientific evidence and recommend:-
 1. That consideration is given within the Department of Health & Social Security to implementing the following procedure:-

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- Director of Public Health to provide information to General Practitioners (G.P.) regarding the possible symptoms a patient may present with claiming to have been affected by exposure to electromagnetic waves.
 - The G.P. should exhaust all other possible causes of the symptoms by appropriate testing. If no other cause is identified they should refer the patient to an appropriate consultant.
2. That the Isle of Man follows the International Commission on Nonionising Radiation Protection (ICNIRP) levels.
 3. On a precautionary principle basis there should be a general presumption against granting planning permission for any future mobile phone mast *Base stations which do not meet the ICNIRP guidelines for public exposure.
 4. That the Department of Local Government and the Environment to accept the Director of Public Health as a notified party for any planning applications for the erection of a mobile phone mast.
 5. That a programme of random technical audits which give consideration to any masts where equipment has been added to base stations be established to ensure that emissions from mobile phone base stations do not exceed the ICNIRP guideline levels. The Communications Commission be requested to consider the requirements including funding and coordination to enable the adoption of this recommendation and how the public could be made aware of the information from the audits. The Communications Commission to report to Council thereon. **
 6. That permitted development rights for Telecommunications Code System Operators under the provisions of the Town and Country Planning Order 2005 in regard to the erection of Mobile Phone Masts* be rescinded.
 7. That a voluntary Code of Practice on Mobile Phone Mast Development be introduced based on the one operating within the United Kingdom.
 8. That Public Health Department develop easy to understand material setting out the facts about the likely health impacts of mobile phone masts for supply to anyone who is concerned.
 9. That any submission from a third party on a planning application for a mobile phone mast which raises health issues is referred to Public Health for comment.
 10. That the Director of Public Health be tasked with monitoring international research and studies on the health impacts of mobile phone masts within existing resources and to raise any concerns identified with the Minister for Health and Social Security.

*'Mast' means a radio mast or a radio tower

**The Working Group were concerned that the random technical audits of base stations referred to in Recommendation 5 may not detect any deflection of mobile

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phone masts as soon as it occurs. The Working Group therefore seek the co-operation of operators in being vigilant regarding deflections, especially in localities with high population density. This need to be vigilant should be regularly reinforced by the Communications Commission.

OFFICER REPORT

**A Review into the Health Impacts of Mobile
Phone Masts on the Isle of Man**

REVISED IN FEBRUARY 2009



Foreword

Scientific developments are an essential feature of civilisation; scientific advances have played a key role in almost all aspects of life. Unfortunately, a few of the technological advances have been shown to have done more harm than good to society at large – for example, asbestos. Partly coloured by such experiences and partly because there is a growing health awareness amongst the public, it is not uncommon for members of the public to raise health concerns about specific scientific developments.

Mobile telephone technology is one scientific development which has shown an exponential growth in the last decade; naturally, health concerns have been expressed from different parts of the world, both about mobile phones and masts which are essential for mobile phones to function.

Locally, concerns were raised about one specific mast located above a General Practice surgery in Onchan. Following these concerns, a petition was submitted. An officer-level Working Party chaired by the Director of Public Health was established to report to Tynwald.

The attached report is a report of the Working Party on Mobile Phone Masts; the Working Party has based its conclusions and recommendations on available scientific evidence and does accept that where there is insufficient evidence, we should adopt a precautionary approach.

Hon W E Teare ACIB MHK
Minister for DHSS

August 2008

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Executive Summary

1. Introduction and Background

Concerns about the health effects of mobile phones and masts have been raised in several countries across the world; many governments set up expert committees to advise them on this issue. In the UK, the Stewart Committee was set up in 2000 to advise the UK Government.

In the Isle of Man in the past, there had been some concerns about the health effects of phones and masts. Recently, there had been much public anxiety and concerns about a mast located above a GPs' surgery. In response to a question in Tynwald, the Chief Minister set up a committee to look into the health effects of mobile phone masts.

The present Working Party was set up following the Tynwald question cited above. The Committee was chaired by Dr P Kishore, Director of Public Health. It included in its membership, officers from other Departments which are closely connected with the issue, such as DoLGE, DHA and the Communications Commission.

The Working Party at the outset decided that its main purpose was to appraise the scientific evidence with regard to the health effects of mobile phone masts and make recommendations to the Government, based on scientific evidence. The Working Party approached the task in two different ways –

- (a) reviewing scientific publications, such as expert committee reports, papers in scientific journals and websites; and
- (b) holding meetings with experts in the field.

In general, two types of health effects have been attributed to phone masts –

- a) Immediate effect – often referred to as Electromagnetic Sensitivity Syndrome (EMS); and
- b) Long-term effect – the effect of being exposed to the waves from mobile phone masts for a long time.

The Working Party reviewed the literature on both issues; specific attention was devoted to identify if there were any sub-groups in the population who are particularly vulnerable to the health effects of mobile phone masts.

2. Basics of Mobile Phone Technology

One of the first radio signal (wireless) messages was transmitted in 1895, by the famous Italian Scientist, Guglielmo Marconi. Mobile phone communication likewise uses **radio waves** for signal transmission. Radio waves are just one of many forms of electromagnetic energy. Electromagnetic energy covers a broad spectrum and includes ultraviolet and visible light, infrared and microwaves, radar, and at longer wavelengths radio and television signals; all these are of comparatively low energy.

The radio waves themselves are composed of electric and magnetic fields. The two components (the electric and magnetic) are often referred to as an electromagnetic field (EMF); or more loosely termed a radiofrequency field (RF-field). Broadcast television signals have similar physical properties to radio signals, but differ in their transmission frequency. Mobile phones also operate using radio waves but these are of a shorter wavelength than those used for the signals broadcast by radio transmitters.

Mobile phones operate in the microwave band of the spectrum. Within the microwave band are the separate frequency channels used by different mobile phone technologies. The main mobile phone technology used by the public in the Isle of Man - and indeed worldwide - is the 'Global System for Mobile communication' – the GSM system.

Radio waves (radiation from phone masts) are not 'radioactivity'. Radio waves are of comparatively low energy and so cannot 'ionise' (ie, change at the atomic level) physical matter such as human tissue. Only high energy radiations such as cosmic and gamma rays, and (medical) X-Rays can 'ionise' matter and thereby change and damage its atomic structure. Radio waves are therefore labelled a form of **non-ionising radiation**.

At close distance microwaves can induce surface heating and this property is employed in microwave ovens, which use a powerful microwave source in close proximity to foodstuffs. In contrast mobile phone handsets are very low power devices, and based on extensive laboratory tests on handsets, the consensus of international scientific opinion is that very little heating can be induced in human tissue (such as the head). Mobile phone base stations likewise emit microwaves but at a similarly low power density and at a much further distance from an exposed individual than a mobile phone handset in normal operation.

In the Isle of Man, base stations / antennas comprise a mixture of masts, monopoles, rooftop and building installations and lamp-posts. Currently, **Manx Telecom** has 54 base stations, with operating powers ranging from 1.6 watts to 30 watts. In addition, **Sure Mobile** has transmitters at 32 sites (16 are co-located) with operating powers ranging from 7 watts to 37 watts. Lastly, **Cloud 9** has transmitters at 9 base stations with operating powers ranging from 0.2 watts to 20 watts. Base stations can be categorised in terms of the size of their area of signal transmission (from large to small) as macrocell, microcell, and picocell. **Macrocells** use a tower or high mast to achieve wide area coverage and they also need more power to cover that large area. **Microcells** are normally placed at street level on suitable roofs or walls, lamp-posts or shop-signs, and they may be camouflaged to blend in with their surroundings. The **picocells** are normally sited to improve signal strength in areas of high demand and also inside large buildings such as shopping centres to enhance signal transmission.

The measured power level (or density) of the radio wave beam drops significantly only a few metres from the antenna, and so at a greater distance has a very low power level. In areas outside the projected beam, for example directly under a mast, the measured power density will always be very low. Only a very low level of radio wave exposure can be measured in public areas; indeed, a lower level of exposure than a person would receive from the (lower-powered) mobile phone handset (because it is held close to the head).

The macrocell stations use towers and masts which easily establish a wide-area public exclusion zone of 10 to 15 metres around the transmitting antennas. Site access should only be required by telecommunications workers. Microcell base stations should be securely sited to ensure that the general public will always be at least a few metres away, and therefore (even within the projected radio wave beam) the radio wave power density in public places should be very low.

In recent years several other radio wave technologies have been introduced, particularly for data communication between computer equipment and other electronic devices (eg, **Bluetooth**). Wireless local area networks (WLAN's and **Wi-Fi**) are also now commonly used in homes and in many public buildings (commercial offices, hotels, airports, schools, etc). A Wi-Fi device has a much lower power requirement than a mobile phone handset. Because Wi-Fi devices operate at low power, they also have a very limited radio signal transmission range. Additionally, because signal transmission is intermittent, an individual's time-averaged radio wave exposure is lower than the exposure they would receive when using a mobile phone.

3. Benefits of Mobile Phone Technology

The number of mobile phones has shown an exponential growth in the last decade; the benefits of increased mobile phone use are difficult to quantify but include –

- a) Health benefits, as medical help can be quickly summoned in emergency situations;
- b) Better communications for businesses;
- c) Improved quality of life.

4. Telecommunications and the Planning System

The main focus of current planning policy in respect of telecommunications is on impacts on visual and general amenity. To date DLGE has followed English planning guidance relating to the health impacts of telecommunications. The current planning legislation on the Island is complicated and not well understood by the public and practitioners alike. Any changes need to be simple and understandable to the full cross section of the community.

5. Conclusions and Recommendations

Electromagnetic Sensitivity Syndrome (EMS)

The Working Party recommends:

- **The setting up of an awareness campaign for both public and professionals**
- **That subjects reporting of EMS symptoms be offered an explanation and information and if necessary interventions for anxiety and not be treated by removal from source of Radio Frequency waves, as recommended by the World Health Organisation (WHO).**

Precautionary Principle

The Working Party recommends:

Public Consultation and reducing public concern as a key part of the planning process when siting new or modifying existing base stations.

That, although there are no definite demonstrable effects on children, it would be prudent not to site base stations in locations where children are likely to be exposed to the beams for a long duration. While the Working Party would have liked to make more definite recommendations in terms of distance, etc, it is felt that there are so many variables to be taken into consideration that each planning application needs to be considered carefully and that a decision should be made based on a complete assessment of the negative and positive consequences, including impact on public anxiety.

The Stewart Report made the following recommendation, which the present Working Party endorses:

“We recommend, in relation to macro cell base stations sited within school grounds, that the beams of greatest intensity should not fall on any part of the school grounds or buildings without agreement from the school and parents. Similar considerations should apply to macro cell base stations sited near to school grounds”.

The Working Party endorses this recommendation of the Stewart Report.

Long-term Effects of Mobile Phone Masts

The Working Party recommends:

The use of the ‘Precautionary Principle’ in the siting of Mobile Phone Masts.

Health Effects on Vulnerable Groups

The Working Party recommends:

The use of the ‘Precautionary Principle’ in the siting of Mobile Phone Masts.

Road Traffic Accidents

The Working Party recommends:

That the public be made more aware of the increased risk of accidents while using hands-free sets while driving and that they should reduce the use of such devices to a minimum.

Develop a public awareness campaign to advise the public to limit the use of hands-free sets while driving.

Maximum Permissible Levels of RF Waves

The Working Party recommends:

The Isle of Man to follow the International Commission on Non-ionising Radiation Protection (ICNIRP) levels.

The establishment of a programme of random technical audits of base stations to ensure that emissions from mobile base stations do not exceed the ICNIRP guideline levels. The audit should be commissioned by the Mobile Phone operators under the supervision of the Communications Commission. The results of the audit should be made available to the public.

Planning of Mobile Masts

The key recommendations of the Stewart Report are:

“For all base stations, including those with masts under 15m, permitted development rights for their erection be revoked and that the siting of all new base stations should be subject to the normal planning process”.

“That particular attention be paid initially to auditing of base stations near to schools and other sensitive sites”.

“In relation to macro cell base stations sited within school grounds, that the beam of greatest intensity should not fall on any part of the school grounds or buildings without agreement from the school and parents. Similar considerations should apply to macro cell base stations sited near to school grounds.”

The Working Party endorses the recommendations of the Stewart Report.

Risk Perception and Risk Communication

The Working Party recommends:

That there is an urgent need to develop an approach for risk communication to the public.

That if health concerns about new developments are raised during public consultation, these should be referred to the Director of Public Health for an independent scientific assessment.

Health Impact Assessment

The Working Party recommends:

That a comprehensive Health Impact Assessment Programme be set up on the Isle of Man, and that the Government should support the DHSS and the Public Health Directorate in the development of such a programme.

1. Background

1.1 General

Mobile Phones are popular and an important means of modern communication. This technology has changed the way people lead their lives and companies do business.

Most technological advances attract health concerns at some stage. Partly because, in the past, health effects of certain agents became apparent only very late (eg, asbestos, Thalidomide) and partly because the population has in general become more health-conscious, most technological developments face the challenge of proving that they do not adversely impact on health; this is all the more so with developments which show an exponential growth such as mobile phones.

Health concerns about mobile phones and masts have been raised across the world from many countries. Many countries set up expert committees to study the health impact of mobile phones and/or masts. Many of such committees submitted more than one report.

Two types of health effects seem to be raised in connection with mobile phones and masts:

Immediate Effect: referred to as Electromagnetic Sensitivity Syndrome (EMS); certain subjects report various symptoms (often neurological) when they are exposed to electromagnetic waves, most often from a phone mast.

Long-term Effect: Concerns about the effect of using mobile phones or being close to a mast over the long-term have been raised. This is an issue where direct evidence is impossible to obtain and one has to extrapolate from other areas.

In the UK, the Stewart Report (Sir William Stewart: Mobile Phones and Health: A report from the Independent Expert Group on Mobile Phones, Chiltern, May 2000), was the first expert committee report. In his foreword to the Report, Sir William Stewart states "the balance of evidence does not suggest that mobile phone technologies put the health of the general population of the UK at risk". Stewart proposed that a precautionary approach be adopted until more robust scientific evidence becomes available. The report made 30 recommendations to the UK Government. The report recommended the setting up of a substantial research programme financed jointly by the mobile phone companies and the public sector under the aegis of a demonstrably independent panel. The report also recommends a further review of the possible health impact of mobile phone technology in three years' time.

The Mobile Telecommunications and Health Research (MTHR) Programme was set up following the recommendation of the Stewart Report. A report on the health effects of mobile phone technology was published in 2007 by the MTHR Programme.

1.2 Local Background

On the Isle of Man, apart from isolated concerns regarding the immediate effects of phone masts, there was no general concern until recently. In 2007, when the monopoly of Manx Telecom came to an end and other operators started to set up business in the Isle of Man, concerns were expressed about the effect of multiple antennas and/or masts.

Major concerns were raised about one particular mast located near a General Practitioner's Surgery in Onchan – the concern was:

How would it affect the health of vulnerable groups who attend the surgery and children in the school nearby?

A public meeting was organised to discuss the concerns. On 19 June 2007, the Member for Douglas North (Mr John Houghton, MHK) tabled the following question for oral answer by the Chief Minister in Tynwald:

“Will you organise an officer-level working party to consider the levels of radiation emissions from mobile telephone base stations with a view to bringing formal regulations for approval by the Court?”

The Chief Minister in reply to this question answered;

“that an officer level-working party under the Chairmanship of the Director of Public Health has been set up.”

A Petition signed by 1,157 residents objecting to the mast located above the Village Walk Health Centre in Onchan was received by the DHSS Minister. The Petition called for removal of the masts.

2. The Working Party: Composition and Terms of Reference

2.1 Membership:

Dr P Kishore - Chairman
Director of Public Health, Public Health Directorate
Department of Health & Social Security

Dr P Emerson
Consultant in Public Health Medicine, Public Health Directorate
Department of Health & Social Security

Mr M Hall
Director of Environment Safety and Health
Environment Safety and Health Directorate
Department of Local Government and the Environment

Mr A Hewitt (retired November 2007)
Director, Communications Commission

Mr I McCauley
Director of Planning and Building Control
Directorate of Planning and Building Control
Department of Local Government and the Environment

Dr P McKenna
Senior Scientist, Government Laboratory
Department of Local Government and the Environment

Mr R Williamson
Technical Director, Communications Division
Department of Home Affairs

2.2 Purpose

To advise the Council of Ministers and the Government of the Isle of Man on the health impact of mobile phone masts.

Terms of Reference:

- a) To undertake a critical review of the scientific literature on the health impact of mobile phone masts and to hold discussions and consultations with experts, as appropriate.
- b) To produce a summary of evidence on:
 - the general health effects of mobile phone masts and radiofrequency (RF) waves;
 - specific sub-groups in the population who may be more vulnerable to the health effects of RF waves;
 - measures which have been recommended to ameliorate any possible health effects of RF waves in the short- and long-term.
- c) To identify the indirect health benefits of improved mobile phone networks.
- d) To produce a statement on the overall health impact of mobile phone masts giving due consideration to both the likely dis-benefits and the likely benefits of such technology.
- e) To consider if the present regulatory framework needs to be strengthened.

Accountability:

To the Council of Ministers via the Ministers for Department of Health and Social Security (DHSS) and the Department of Local Government and the Environment (DLGE).

2.3 How the Working Party approached the task

The Working Party approached the task in two ways:

- Review of existing literature
- Meeting with experts in the field to hold discussions.

Review of existing literature

The following literature was critically analysed by the members of the group.

- Expert Committee Reports

(a list of expert committee reports from across the world was compiled by the Librarian in Keyll Darree)

- Primary Research Papers published in scientific journals
- Websites of *Mast Sanity* and papers cited by *Mast Sanity*
- The BioInitiative report.

The approach adopted was for all reports to be scrutinised by one of the members of the group who then produced a summary of the key points and these were further discussed at the meeting of the Working Party.

Meeting with experts in the field to hold discussions.

Two visits were made by Dr Kishore and Dr McKenna:

a) University of Essex

The University of Essex has a massive research programme on mobile phone technology. Discussions were held with Professor Elaine Fox and Professor Ricardo Russo. The laboratory where the study on Electromagnetic Sensitivity was being undertaken was visited; several papers published in scientific journals were also obtained for scrutiny.

b) Health Protection Agency Radiation Protection Division

Discussions were held with Dr Jill Meara, Deputy Director of the Division, as well as other staff involved. HPA also supplied copies of several publications, which were reviewed.

3. Basics of Mobile Phone Technology

3.1 Communication using Radio Waves

One of the first radio signal (wireless) messages was transmitted in 1895, by the famous Italian scientist, Guglielmo Marconi. He used primitive equipment comprising wire coils, metal fragments, batteries and an aerial (antenna). Mobile phone communication likewise uses **radio waves** for signal transmission.

Radio waves are just one of many forms of electromagnetic energy. Electromagnetic energy covers a broad spectrum and includes ultraviolet and visible light, infrared and microwaves, radar, and - at longer wavelengths - radio and television signals; all are of comparatively low energy. The lower the frequency of a radio wave the longer is its wavelength.

The radio waves themselves are composed of electric and magnetic fields. The two components (the electric and magnetic) are often referred to as an electromagnetic field (EMF); or more loosely termed a radiofrequency field (RF-field). Unfortunately, the use of the different descriptive terms does not aid public understanding of the nature of radio waves. Nevertheless, the strength of either the electric or magnetic field component of a radio wave can be measured using suitable instrumentation (*radio wave measurement quantities and units are given in Table 1 below*).

A radio signal generator can convert sound (from a microphone) into radio waves, which can be transmitted by an antenna and then detected by receiving equipment (such as AM or FM radio) and converted back into sound. Mobile phones also operate using radio waves but these are of a shorter wavelength than those used for the signals broadcast by radio transmitters. Broadcast television signals have similar physical properties to radio signals, but differ in their transmission frequency.

Table 1

Quantity	Unit
Frequency	Hertz (Hz)
Wavelength	metre (m)
Electric field strength	volt per metre ($V\ m^{-1}$)
Magnetic field strength	ampere per metre ($A\ m^{-1}$)
Power density	watt per square metre ($W\ m^{-2}$)

3.2 Mobile Telephone Communications

The part of the electromagnetic spectrum used in telecommunications can be subdivided into frequency (or wavelength) bands. Mobile phones operate in the microwave band of the spectrum. Within the microwave band are the separate frequency channels used by different mobile phone technologies. The main mobile phone technology used by the public in the Isle of Man and indeed worldwide is the 'Global System for Mobile communication' – the GSM system; however, there are other related radio communications systems such as GPRS, 3G and TETRA (*The different mobile phone systems are described in the Glossary*).

3.3 Non-Ionising Radiation

Radio waves are of comparatively low energy and so cannot 'ionise' (ie, change at the atomic level) physical matter such as human tissue. Only high energy radiations such as cosmic and gamma rays, alpha and beta particles and (medical) X-Rays can 'ionise' matter and thereby change and damage its atomic structure. Radio waves are therefore labelled a form of **non-ionising radiation** and are completely distinct and different in nature from ionising radiation (radioactivity).

It was stated above that mobile phones use radio waves, so why do we hear so much about 'radiation' from them and from base stations? The use of the word 'radiation' in normal everyday use is referring to 'radioactivity' (which is ionising radiation and which can damage human tissue). **Radio waves (radiation from phone masts) are not 'radioactivity'** because they are non-ionising and cannot damage human tissue. Mobile phone masts do not emit radioactivity (ie, radiation of the kind associated with a nuclear reactor leak such as occurred at Chernobyl in 1986).

Unfortunately, the general public use the word 'radiation' as a catch-all description for many forms of energy emission; for example: heat from an electric radiator, nuclear power station radiation and also mobile phone radiation – but all three forms of energy are completely different in their natures.

3.4 Thermal (heating) Properties of Microwaves

The radio waves used in mobile phone communication are **microwaves**, described as such for having a wavelength which is greater than 1 millimetre and less than 1 metre. The corresponding frequency band is 300,000 MHz to 300 MHz.

At close distance, microwaves can induce surface heating and this property is employed in microwave ovens, which use a powerful microwave source in close proximity to foodstuffs.

In contrast, mobile phone handsets are very low power devices, and based on extensive laboratory tests on handsets, the consensus of international scientific opinion is that very little heating can be induced in human tissue (such as the head).

Mobile phone base stations likewise emit microwaves but at a similarly low power density and at a much further distance from an exposed individual than a mobile phone handset in normal operation.

3.5 Mobile Phone Handsets and Base Stations

A **mobile phone handset** can convert between sound and radio waves, enabling two-way communication, just like a conventional wire-connected telephone. The mobile phone transmits and receives radio waves (signals) by communicating with a radio antenna (mounted on a mast) located at a **base station**. Base stations transmit and receive radio waves and link to other nearby base stations thereby allowing communication over a large area network. The transmission and reception area for an individual base station is known as a **cell** (hence the term **cell phone**). At each base station the equipment necessary to generate the radio signals may be housed in a cabin or cabinet, or within the building on which the mast (antenna) is mounted. The linking of terrestrial networks, together with communication satellites, forms the global telecommunications network.

A base station may have transmitting equipment and antennas belonging to different telecommunications companies. In the case of a shared base station the antennas are therefore described as being **co-located**.

In the Isle of Man, base stations comprise a mixture of masts, monopoles, rooftop and building installations and lamp-posts. Currently, **Manx Telecom** has 54 base stations, with operating powers ranging from 1.6 watts to 30 watts. In addition, **Sure Mobile** has transmitters at 32 sites (16 are co-located) with operating powers ranging from 7 watts to 37 watts. Lastly, **Cloud 9** has transmitters at 9 base stations with operating powers ranging from 0.2 watts to 20 watts.

3.6 Power Output of Mobile Phone Handsets

Mobile phone handsets are battery-powered. The energy is used to generate the radio wave signal and to power the microphone/speaker and electronic parts. The physical nature of radio waves means that the power density of the generated radio wave signal drops off rapidly with distance from the antenna (in the handset or at the base station).

Most mobile phones in use today use the GSM transmission technology. The maximum power output from a GSM mobile phone handset is about 2 watts; however, in areas with good to moderate signal reception, the actual output power will be much less. Conversely, in locations where signal reception is poor, the power level of the handset rises automatically towards its maximum level, to enhance signal reception and transmission.

3.7 Base Station Location and Power Output

Base stations are normally sited 200 to 500 metres apart in urban areas, and 2 to 5 kilometres apart in rural areas. There are different types of base station. A typical base station mast could use three panel-shaped **sector antennas** to achieve full area (360 degree) signal transmission. On another base station site, a **pole-shaped antenna** might be used to receive and transmit the radio wave signal. Some base stations also have **dish antennas** fixed to the mast structure for point-to-point (line-of-sight) microwave communication between base stations.

Base stations can be categorised in terms of the size of their area of signal transmission (from large to small) as macrocell, microcell, and picocell. **Macrocells** use a tower or high mast to achieve wide area coverage and they also need more power to cover that large area. **Microcells** are normally placed at street level on suitable roofs or walls, lamp-posts or shop-signs, and they may be camouflaged to blend in with their surroundings. The **picocells** are normally sited to improve signal strength in areas of high demand and also inside large buildings such as shopping centres, train stations and airport terminals, to enhance signal transmission.

The total power output of the macrocell sites will rise and fall according to phone user demand. Typically, the power output of an individual antenna is 10 watts. The maximum possible output power of an individual base station will be the sum total of the powers of all antennas fixed on the transmission mast. The power outputs of existing macrocell base stations currently operating on the Isle of Man are between 20 and 40 watts.

The typical maximum output power of a microcell base station is about 1 or 2 watts and they normally have fewer transmitting antennas than the larger macrocell base stations.

The radio waves emitted by a base station antenna travel as a directed beam which fans out from the antenna. The antenna will normally be mounted on a mast or a building, in such a way as to project the emitted beam towards the horizon, but with a slight downward tilt. The projection of the beam in this configuration means that it will normally reach the ground between 50 and 300 metres from the antenna. The general public's maximum potential exposure to the radio waves occurs where the projected beam reaches ground level. The measured power level (or density) of the beam drops significantly only a few metres from the antenna, and so at a greater distance has a very low power level. In areas outside the projected beam, for example, directly under a mast, the measured power density will always be very low.

In open space, the measured power of a radio wave is inversely proportional to the square of the distance from the transmitting antenna; therefore, a doubling of the measurement distance from the antenna sees the power drop to one quarter strength. Due to the very significant fall in power intensity only a few metres from the base station antenna, only a very low level of radio waves exposure can be measured in public areas - indeed, a lower level of exposure than a person would receive from the (lower-powered) mobile phone handset (because it is held close to the head).

3.8 Site Safety at Base Stations

In theory the general public's exposure to radio waves emitted from a base station can be considered to be a whole body exposure. Radio signal antennas should be located on masts and buildings in such a way as to prevent persons from standing immediately in front of the operating antennas, where the power level (density) of the emitted beam can be significant. The macrocell stations use towers and masts which easily establish a wide-area public exclusion zone of 10 to 15 metres around the transmitting antennas. Site access should only be required by telecommunications workers, who will adhere to working practises which will protect them from potentially harmful thermal (heating) effects close to the antennas.

Microcell base stations should be securely sited to ensure that the general public will always be at least a few metres away, and therefore (even within the projected radio wave beam) the radio waves power density in public places should be very low.

3.9 Types of Mobile Phone Network

The Isle of Man, like the UK, has a GSM network which is used by the general population and by commercial businesses. To a lesser extent there is also an operational GPRS network, and a 3G network.

3.10 Isle of Man-licensed Mobile Phone Network Operators

Currently, there are three telecommunications companies licensed for mobile phone operations in the Isle of Man under the IOM Telecommunications Act 1984. The longest-established operator is Manx Telecom (a subsidiary company of Telefonica O₂). The other operators are Sure Mobile (a subsidiary company of Cable & Wireless) and Cloud 9 (a subsidiary company of Wire 9 Telecom).

3.11 Other Types of Radio Wave Communication Devices

In recent years several other radio wave technologies have been introduced particularly for data communication between computer equipment and other electronic devices (eg, **Bluetooth**), and to replace cabling to computer peripherals (printers, etc).

In the case of computers, wireless local area networks (WLAN's and **Wi-Fi**) are now commonly used in homes and in many public buildings (commercial offices, hotels, airports, schools, hospitals etc).

Radio wave technologies are also being used in cordless phones (**DECT**); likewise, radio wave signals are also used in telecom equipment in vehicles, in building security systems, in pagers and tagging devices (**RFID**) and many other remote control applications (*Details of the different systems are given in the Glossary*).

The radio wave signals from Wi-Fi enabled computers and routers are very low power (typically 0.1 watt). A Wi-Fi device therefore has a much lower power requirement than a mobile phone handset. Because Wi-Fi devices operate at low power they also have a very limited radio signal transmission range. Additionally, because signal

transmission is intermittent, an individual's time- averaged radio wave exposure is lower than the exposure they would receive when using a mobile phone.

In a situation where several Wi-Fi computers are being used in the same room (eg, a school classroom) it is unlikely that radio wave signals (data) are being transmitted from all machines simultaneously (for any significant period of time) and therefore it seems very unlikely that there could be an additive exposure effect.

4. Health Effects of Mobile Phone Masts

4.1 Electromagnetic Fields from Base Stations and Health Effects

Exposure to electromagnetic fields (EMF) is not a new phenomenon; however, during the latter part of the twentieth century environmental exposure to man-made EMF has increased steadily as more and more artificial sources such as electrical appliances and telecommunication gadgets become embedded within our society. Everyone is exposed to a complex mix of electrical and magnetic fields both at home and work. Over the course of the past decade some EMF sources have become the focus of health concerns, including power lines, microwave ovens, computer and TV screens, radars and, in the context of the report, mobile phone base stations.

The strength of a radiofrequency (RF) field is greatest at its source, and diminishes quickly with distance. There are RF exposure limits for both occupational exposure and the general public that are recommended by the International Commission on Non-Ionising Radiation Protection (ICNIRP). The ICNIRP Guidelines have been adopted by the UK's Health Protection Agency (HPA) in setting recommended UK exposure limits. The RF exposure limits apply to an individual's total RF exposure from all sources (including mobile phone handsets and base stations).

The operator is required to ensure that public access is restricted near base station antennas where RF signals may exceed ICNIRP exposure limits. Due to their lower frequency, at similar RF exposure levels, the body absorbs more of the signals from FM radio and television than of signals from base stations. Radio and television broadcast stations have been in operation for more than 50 years without any adverse health consequences being established.

Heating is the main biological effect of EMF exposure from radiofrequency signals. In microwave ovens this fact is employed to warm up food. The levels of radiofrequency fields to which people are normally exposed are very much lower than those needed to produce significant heating. Heating in itself is not necessarily a hazard to health as it depends on the capacity of the body to deal with the heat. It is not disputed that EMF above certain levels can trigger biological effects which are merely responses to a stimulus or change in the environment. Experiments with healthy volunteers indicate that short-term exposure at the levels present in the environment or in the home do not cause any apparent detrimental effects.

The Working Group also reviewed the MTHR 2007 Report (see Executive Summary at Appendix 1) which looked at the possible health risks associated with the widespread use of mobile phone technology. We conclude that none of the research supported by the Programme and published to date demonstrates that biological or adverse health effects are produced by RF exposure from mobile phones. Reassuringly, no epidemiological association was found between short-term mobile phone use (less than 10 years) and cancers of the brain and nervous system.

The current Island debate is centred on whether long-term low level exposure can evoke biological responses and influence well-being. In the area of biological effects and medical applications of non-ionising radiation, over 25,000 scientific articles and numerous international reports have been published in the last 3 decades. Scientific knowledge in this area is now more extensive than for most chemicals. Based on

recent in-depth reviews from a number of sources (see References section), the following conclusions and recommendations are applicable:

4.2 Effects on General Health (Electromagnetic Sensitivity Syndrome)

To date, scientific evidence does not support a link between a series of vague symptoms, described by some members of the public, and exposure to electromagnetic fields, known as Electromagnetic Sensitivity Syndrome (EMS). At least some of these symptoms may be related to anxiety about the presence of new technologies.

Based on the review of the literature and discussion with experts in the University of Essex, the Working Party could not find any scientific evidence to support the view that radiofrequency waves emitted by phone masts cause immediate symptoms.

The work of Professor Elaine Fox at the University of Essex shows that subjects do experience symptoms but these do not seem to be related to radiofrequency (RF) waves. This seems to be corroborated by work undertaken in other parts of the world.

The World Health Organisation's (WHO) position on this is that symptoms experienced by subjects, the symptoms being real, are a result of the psychological reaction to perceived ill-effects of RF waves rather than the RF waves themselves.

4.3 Effects on Pregnancy Outcome

Many different EMF sources in the living and working environment have been evaluated and the overall weight of evidence shows that exposure to fields at typical environmental levels does not increase the risk of any adverse outcome, such as spontaneous abortion, malformations, low birth weight and congenital diseases.

4.4 Health Effects on Vulnerable Groups

The Working Party specifically examined whether there was any evidence to suggest that any sub-sections in the population - eg, children - are more susceptible to the adverse effects of RF waves. It is known that children – because of their smaller size - absorb more RF energy of higher-frequency than adults do.

The Stewart Report concluded:

“The balance of evidence indicated that this is no general risk to health of people living near base stations on the basis that exposures are expected to be small fractions of guidelines.”

The World Health Organisation (WHO) Workshop on Exposure to Electromagnetic Radiation (WHO, 2004) also concluded that from the low exposures and the scientific evidence collated to date, it appeared unlikely that the weak signals to which people are exposed from base stations could cause cancer or any other adverse health effects.

4.5 Cataracts

There is no evidence that this effect occurs at levels of RF exposure experienced by the general public. There have been reports of eye irritation and cataracts among workers exposed to high levels of radiofrequency and microwave radiation in the course of their employment.

4.6 Cancer

A large volume of research was reviewed by the present Working Party and there is no evidence to substantiate any health concerns. Specific attention was devoted by the Working Party to reviewing the evidence of any association between cancers and living near base stations.

While there has been a study reporting an increased incidence of a type of brain tumour (acoustic neuroma) with use of mobile phones, no such association has been reported with living near base stations. There have been media reports of “cancer clusters” near mobile phone masts and an expert committee set up in Ireland examined this in detail, observing that:

- a) often the reported cluster does not exist
- b) the “reported cluster” is due to a number of factors including multiple reporting of the same cases and not a true cluster
- c) some of the cancers have occurred many years before the existence of the base station.
- d) other factors such as smoking are involved in many cases.

The report also points out that for statistical reasons it is often possible to identify ‘clusters’ which may not be real, and since mobile phone masts are widely distributed, such spurious clusters are often attributed to the presence of the mast.

Research is continuing internationally (eg, INTERPHONE and MTHRP) to investigate the biological effects (thermal and non-thermal), including RF exposure, with Governments' advisory Agencies examining the results of these studies as they appear. For example, the UK Government has instructed the HPA to carry out a programme of research into the use of wireless networks including WiFi computer technology. Therefore, the impact of RF exposure is being closely scrutinised to ensure that the general public can be confident that all of these RF technologies are safe.

4.7 Summary:

"The balance of evidence indicates that there is no general risk to the health of people living near to base stations on the basis that exposures are expected to be small fractions of guidelines" (Stewart Report).

4.8 Key Points

- A wide variety of environmental influences cause biological effects. "Biological effect" does not equal "health hazard".
- The main effect of radiofrequency electromagnetic fields is heating of body tissues.
- There is no doubt that short-term exposure to very high levels of electromagnetic fields can be harmful to health. The general public cannot be subject to this level of exposure under normal circumstances. Public concern focuses on possible long-term health effects.
- Despite extensive research, to date there is no evidence to conclude that exposure to low-level electromagnetic fields (eg, RF emissions from base stations) is harmful to human health.
- There is an extensive ongoing research programme across the world into possible effects on human health.

5. Benefits of Mobile Telecommunications Technology

5.1 Emergency Situations

The introduction of mobile technology has brought many benefits in the ability to contact the Emergency Services in emergency situations such as road traffic accidents and the reporting of crime. This is particularly relevant in rural areas where there may be no access to fixed-line telephone services.

5.2 Health Benefits

With widespread use of mobile phones, we are no longer dependent on landlines and help can be secured via mobile phones. There is a large volume of evidence in the medical literature that the eventual outcome of many serious medical conditions is dependent on the rapidity with which expert care is secured; eg, heart attack (the survival and the extent of the damage is related to the delay between the onset of symptoms, and administration of clot-busting drugs – the shorter the delay, the better the outcome). Similarly, there is a “one hour rule” for major accidents – best outcome is obtained if the victim receives expert care within the first hour of a major accident.

The list of conditions for which rapid treatment determines the outcome is expanding: eg, stroke - a condition which has been added to the list. Since many of the emergencies arise in unpredictable situations mobile phones have literally saved lives.

5.3 Economic Benefits

Mobile phone technology has facilitated communication; it is no longer necessary to wait for a worker to return to their office to contact that person. This shortens time delays and decision making. It would be difficult to quantify the indirect economic benefits but the fact that modern day business is highly reliant on mobile phone technology provides ample testimony to the economic benefits.

5.4 Convenience and Reassurance

An issue which is self-evident is that mobile phones have improved the quality of life, removing barriers to communication. Mobile phone calls and ‘texts’ (SMS messages) are extensively used in social situations and many teenagers of today cannot imagine a life without mobile phones.

Mobile phones also provide reassurance for parents and carers by helping them to maintain contact as required with their children. Again, it is difficult to quantify the benefits of this but it is likely to enhance the quality of life of all those involved.

In summary, the benefits from mobile phone technology are:

- Direct: In Emergency situations

- Indirect: Economic benefits
Improving quality of life.

6. Telecommunications and the Planning System

From the outset it is important to recognise that telecommunications systems have a wide range of requirements and apparatus. The terms of reference of the Working Party refer to mobile phone masts. But, as noted elsewhere in the report, there is a variety of other telecommunications systems in operation on the Island.

In respect of current planning legislation there are 4 types of telecommunications operations:

- a) Small-scale additional antennas attached to existing masts and base stations which are so minor that they do not constitute development and thus do not require planning permission.
- b) Permitted Development – ie, although defined as development, permission is granted under the provisions of the Town and Country Planning (Permitted Development) Order 2005 – Class 12 of Schedule 1 for development outside Conservation Areas and Class 9 of Schedule 2 for development in Conservation Areas.
- c) Permitted Development that requires prior approval under the provisions of Condition (3) Class 12 Schedule 1 of the Town and Country Planning (Permitted Development) Order 2005.
- d) All other structures require planning permission.

It should be noted that the Permitted Development Order 2005 only applies to companies or organisations classified as a “telecommunications code system operator”; ie, someone granted a licence under Section 5 of the Telecommunication Act 1984. Currently, Manx Telecom is the only telecommunications code system operator on the Island. Cable and Wireless (operating as Sure Mobile) and Cloud 9 do not have code system operator status.

The current secondary legislation in respect of telecommunications is based on the English Permitted Development Order and is complex and not easily understood. Extracts from the Permitted Development Order 2005 are attached in Appendix 2.

Having assessed whether any particular telecommunications operations require planning permission, there is a number of factors which are material to the consideration of any related planning applications. The first of these is general Government policy towards telecommunications. In January 2001 the Council of Ministers considered a report on the spread of communications masts and aerials across the Island.

It resolved that a Committee be set up comprising representatives of the:

- Communications Commission Technical Staff (subsequently transferred to the Department of Home Affairs Communications Division)
- Manx Telecom
- Broadcasting Authorities and associated service providers
- Civil Aviation Authority (now National Air Traffic Control)
- Department of Local Government and the Environment
- Manx National Heritage

The remit of the Committee would be to advise the Council of Ministers on the co-ordination of the provision of communications sites.

The Committee was duly constituted under the Chairmanship of the Communications Division. The Co-ordination of Transmission Aerials (COTA) Committee currently comprises representatives from:

Department of Local Government and the Environment – Planning Directorate
Manx National Heritage
Manx Telecom
Cable and Wireless

The focus of the Committee was on the environmental, heritage and visual impact of telecommunications development. The Committee is in the process of establishing a database of communication transmission sites for all operators on the Island. As a consequence of the work of the Committee, the Government Plan 2004/7, under the Telecommunications Objective states:

To support the development of high-quality telecommunication and digital communications technology for the use of the Island businesses and residents.

One of the key actions is to:

Encourage increased mast-sharing by broadcasters.

The policy aspects of the Committee's work were incorporated into the developing all- Island Strategic Plan which was subsequently approved by Tynwald in July 2007 and came into operation in August 2007. In the approved Strategic Plan, Infrastructure Policy 3 states:

A balance must be struck between the need for new, evolving communications systems to satisfy residential and business demand and the impact that the necessary infrastructure will have upon the environment. Measures which may help to achieve a satisfactory balance will include a presumption against visually intrusive masts in sensitive landscapes, the encouragement of mast-sharing by different operators, and the removal of redundant infrastructure. Exceptions to this policy would need to demonstrate a strategic national need, which cannot be otherwise secured by mast-sharing or alternative locations.

As can be seen from the above the main thrust of planning policy relates to impacts on visual and general amenity. This is because to date, the Department has followed English planning guidance relating to the health impacts of telecommunications. In addition to similar Permitted Development Order requirements, the Office of the Deputy Prime Minister (ODPM) has published a "Code of Best Practice on Mobile Phone Development" which was prepared in consultation with relevant Government Departments, Local Authorities and the mobile phone industry.

Part of the Code includes the operators' Ten Commitments, which are as follows:

- Develop, with other stakeholders, clear standards and procedures to deliver significantly improved consultation with local communities.
- Participate in obligatory pre-rollout and pre-application consultation with local planning authorities.
- Publish clear, transparent and accountable criteria and cross-industry agreement on site-sharing, against which progress will be published regularly.
- Establish professional development workshops on technological developments within telecommunications for local authority officers and elected members.
- Deliver, with the Government, a database of information available to the public on radio base stations.
- Assess all radio base stations for international (ICNIRP) compliance for public exposure, and produce a programme of ICNIRP compliance for all radio base stations as recommended by the Independent Expert Group on Mobile Phones.
- Provide, as part of planning applications for radio base stations, a certification of compliance with ICNIRP public exposure guidelines.
- Provide specific staff resource to respond to complaints and enquires about base stations, within ten working days.
- Begin financially supporting the Government's independent scientific research programme on mobile communications health issues.
- Develop standard supporting documentation for all planning submissions whether full planning or prior approval.

Cable and Wireless (Sure Mobile) undertook the following process in respect of developing their network:

- Cable & Wireless (C&W) identified all existing telecommunications structures on the Island.
- C&W then held initial discussions with the Planning Directorate about the planning system and the policies in place for the Island.

- C&W then started to identify locations, mainly Department of Home Affairs masts and National Grid Wireless masts, in order to attach equipment to existing masts (mast-sharing).
- Following the identification of mast-sharing options, C&W then identified site-sharing options, ie, new masts adjacent to existing masts, and finally new locations for masts. The various sites were discussed with the Planning Directorate prior to any application to identify any issues and whether the sites were generally acceptable.
- C&W sought advice on the format of the applications and what information should be included in the applications. It was advised that the applications should be submitted to a UK standard, ie, in accordance with the UK's Code of Best Practice on Mobile Phone Network Development. The application should include:
 - a) details of the proposed structure
 - b) statement explaining the reasons for the choice of design
 - c) technical justification – details about the purpose of the site and why the development is required
 - d) details of alternative sites rejected, with a justification for rejecting them. This should include existing masts, structures and other buildings within the search area
 - e) an explanation if no alternatives considered
 - f) predicted coverage plots
 - g) a declaration of conformity with ICNIRP Public Exposure Guidelines.
- Applications submitted in accordance with the advice given by a planning officer.
- Public consultation was carried out by the Planning Directorate in accordance with the Town and Country Planning (Development Procedures) Order 2005 – ie, display of site notice and press notice in the press.
- Applications were determined either by the Planning Committee or in some cases by the Director of Planning and Building Control under delegated powers.

In respect of the Village Walk, Onchan applications, while a limited number of comments were received, the subsequent objections stated people had not seen the site notice and/or press notice or been aware of the implications.

The Working Party considers that the experience of the Cable and Wireless application at Village Walk, Onchan indicates:

- The public are not generally aware of existing telecommunications installations with the exception of certain sites where the initial installation was contentious

- The public often do not object until the matter (and concerns over the health implications) are raised by individuals and a general concern develops.
- The public find it difficult to appreciate the different planning consents and regimes. Why does one type need consent and another does not? Why does one operator require planning permission but another has the benefit of permitted development?

7. Regulation of the Mobile Phone Industry on the Isle of Man

7.1 Isle of Man Communications Commission

The Commission, a Statutory Board, regulates the telecommunications and broadcasting sectors on the Island, both of which have gone through substantial change in the recent past.

Telecommunications including mobile phone infrastructure and services are key facilities in an Island that prides itself on, amongst other things, its strength in e-business. They are essential to support our finance and other industries and to connect all members of our population with each other and to the wider world. The Commission is striving for a regulatory environment which encourages all our mobile phone operating companies, whether the established incumbent or one of the newer service providers, to develop facilities for tomorrow as well as today.

The Communications Commission licenses and regulates telecommunications and broadcasting in the Isle of Man under the Telecommunications Act 1984, the Radio Masts Regulation Act 1988 and the Broadcasting Acts 1993 to 2007.

7.2 Telecommunications

The Communications Commission exercises its functions in the manner which it considers is best calculated to promote the interests of consumers, purchasers and other users of telecommunications services in the Island. It ensures that all those who run mobile phone networks comply with the terms and conditions of their licences.

7.3 Radio Communications

The Commission works closely with the UK Office of Communications on radio spectrum issues. Ofcom is responsible for the licensing of radio spectrum under the Wireless Telegraphy Act 2006, which it does in consultation with the Commission to take into account differences between UK and Isle of Man Government policies.

- The Commission licenses the commercial site-sharing of transmitter mast facilities on the Island for both the public and the private sectors. Refer to the Communications Commission Service Delivery Plan 2008.

7.4 UK Ofcom

The UK Office of Communications 'Ofcom' works in partnership with the mobile phone industry, to implement the industry **Code of Best Practice on Mobile Phone Network Development**. The Code seeks to follow the safety guidelines for limiting human exposure to RF emissions. The Code deals with the siting, design and operational safety of radio masts and antennas mounted on buildings. In May 2000 the IEGMP (Stewart Group) recommended, as a precautionary approach, the establishment of a programme of random technical audits of base stations. In response, the UK Government asked the Radio Communications Agency, now Ofcom, to implement a national measurement programme, to ensure that emissions from mobile phone base stations do not exceed the ICNIRP guideline levels. Measurements made at a wide variety of typical locations throughout the UK show that exposure at publicly accessible locations near to base stations is very much below the safe exposure limits. www.ofcom.co.uk

7.5 Sitefinder database

The UK Health Protection Agency (HPA) supports the UK authorities' decision to have an ongoing check on emissions from base stations and "sees this as providing reassurance to the public that exposure guidelines are not being exceeded". The HPA has a statutory responsibility to give advice to Government on Electromagnetic fields and health; this includes publishing guidelines for the safe exposure to EMF.

Sitefinder was set up as a result of recommendations of the Stewart Report to the UK Government in 2000. It is a voluntary scheme under which mobile network operators make information available on the location and operating characteristics of individual base stations, so that people who wish to inform themselves about this can do so. Ofcom hosts the Sitefinder database on behalf of the Government. The UK Government is responsible for planning and health issues relating to mobile base stations and masts, and for policy on the scope of the Sitefinder scheme.

Information on several base stations in the Isle of Man has been posted at www.sitefinder.radio.gov.uk

8. Conclusions and Recommendations

8.1 Electromagnetic Sensitivity Syndrome (EMS)

Based on published scientific literature and discussion with experts, the Working Party came to the conclusion that symptoms experienced by subjects, the symptoms being real, are the result of the psychological reaction to perceived ill-effects of RF waves rather than the RF waves themselves.

The Working Party recommends:

- **The setting up of an awareness campaign for both public and professionals**
- **That subjects reporting such symptoms be offered an explanation and information and if necessary interventions for anxiety and not be treated by removal from source of RF waves, as recommended by the World Health Organisation (WHO).**

8.2 Precautionary Principle

The 'precautionary principle' was first used in German environmental law in the 1970s; it has since been used by many countries for aspects of environmental health. The World Commission on the Ethics of Scientific Knowledge and Technology (COMEST, 2005) defined the application of the Precautionary Principle to scientific advances as:

“when human activities may lead to morally unacceptable harm that is scientifically plausible but uncertain, actions shall be taken to avoid or diminish that harm”.

It is also emphasised that actions should be chosen that are proportional to the seriousness of the harm and with an assessment of the moral implications of both action and inaction. The choice of action should be the result of a participatory process. It is also worth highlighting that care must be taken to have a due process when putting the precautionary principle into practice. Not all health concerns are real; there may be spurious associations - associations do not imply a causation. Indiscriminate use of the precautionary principle would only stifle scientific innovation and may adversely impact on health by denying the population the possible health benefits of the innovations. It could also create undue public anxiety if there are widespread variations between countries in the approaches adopted.

In the context of mobile phone technology, there are two issues.

- i) the majority of the measures are directed at the use of mobile phones themselves.

- ii) It is difficult to completely separate the siting of masts from use of mobile phones: if the masts are sited at inappropriate locations, it would only lead to increased exposure to RF waves among mobile phone users.

The Working Party recommends:

Public Consultation and reducing public concern as a key part of the planning process when siting new or modifying existing base stations.

That, although there are no definite demonstrable effects on children, it would be prudent not to site base stations in locations where children are likely to be exposed to the beams for a long duration. While the Working Party would have liked to make more definite recommendations in terms of distance, etc, it is felt that there are so many variables to be taken into consideration that each planning application needs to be considered carefully and that a decision should be made based on a complete assessment of the negative and positive consequences, including impact on public anxiety.

The Stewart Report examined the issue of locating mobile phone masts in or near schools and concluded that while there is no scientific evidence to show that mobile phones or masts have any definite adverse effects on children, the use of precautionary principle is justified since:

- a) children absorb a higher proportion of the RF waves compared with adults
and
b) because they are young, the lifetime exposure would be greater.

The Stewart Report made the following recommendation, which the present Working Party endorses:

"We recommend, in relation to macro cell base stations sited within school grounds, that the beams of greatest intensity should not fall on any part of the school grounds or buildings without agreement from the school and parents. Similar considerations should apply to macro cell base stations sited near to school grounds".

8.3 Long-term Effects of Mobile Phone Masts

Various research bodies and expert committees have examined the evidence surrounding potential health effects of long-term exposure to RF waves and concluded that there is no credible evidence so far to suggest that long-term exposure to RF waves is associated with any health effects. It is impossible at present to obtain direct evidence about such health effects, since extensive use of mobile phones is a rather recent phenomenon.

However, indirect evidence cited below provides some reassurance:

- Mobile phone masts are not the only sources of RF waves; there are several other sources such as mobile phones, radio, television, computer monitors and VDUs, store and airport security systems, remote control access systems, paging systems, microwave ovens, etc.
- Some of these have been in extensive use for a long time – radio stations have been transmitting for over 80 years and TV for over 50 years. There have been no health concerns raised about these services. One can extrapolate from this that mobile phones and base stations, which also emit RF waves, concluding that they are unlikely to cause any health effects.

The Working Party recommends:

The use of the 'Precautionary Principle' in the siting of Mobile Phone Masts.

8.4 Health Effects on Vulnerable Groups

The Working Party could not identify any evidence of adverse health impact on children or any other vulnerable groups. None of the expert committees whose reports the Working Party scrutinised could find any evidence in this area.

The Working Party recommends:

The use of the 'Precautionary Principle' in the siting of Mobile Phone Masts.

8.5 Road Traffic Accidents

Based on the existing scientific literature and discussions with experts, the only direct health hazard from mobile phones is increased incidence of road traffic accidents if mobile phones are used while driving. Evidence indicates that the incidence of road traffic accidents is increased even when hands-free sets are used. There is a general lack of awareness of this among members of the public.

The Working Party recommends:

That the public be made more aware of the increased risk of accidents while using hands-free sets while driving and that they should reduce the use of such devices to a minimum.

Develop a public awareness campaign to advise the public to limit the use of hands-free sets while driving.

8.6 Maximum Permissible Levels of RF Waves

The Working Party for the Isle of Man Government considered whether it should recommend a level below that recommended by the International Commission on Non-ionising Radiation Protection (ICNIRP). The ICNIRP guidelines are based on a comprehensive review of the scientific literature carried out by experts. The ICNIRP guidelines recommend that the maximum levels of exposure of the public be five times less than those recommended for workers. The rationale for this five-fold reduction was to cover members of the public who might be particularly sensitive to RF waves, although there is no scientific evidence for this. The ICNIRP guidelines have been incorporated in a European Council Recommendation (1999), which has been agreed by all countries in the EU.

The present Working Party concluded that there is no justification in the Isle of Man Government departing from the ICNIRP guidelines. However, it is important that a regular audit of all the masts is undertaken to ensure compliance with the ICNIRP levels.

The Working Party, therefore, recommends:

The Isle of Man to follow the International Commission on Non-ionising Radiation Protection (ICNIRP) levels.

The establishment of a programme of random technical audits of base stations to ensure that emissions from mobile base stations do not exceed the ICNIRP guideline levels. The audit should be commissioned by the Mobile Phone operators under the supervision of the Communications Commission. The results of the audit should be made available to the public.

8.7 Planning of Mobile Masts

The Stewart Report, on pages 5 and 6, details several recommendations for planning of mobile phone masts.

The key recommendations of the Stewart Report are:

“For all base stations, including those with masts under 15m, permitted development rights for their erection be revoked and that the siting of all new base stations should be subject to the normal planning process”.

“That particular attention be paid initially to auditing of base stations near to schools and other sensitive sites”.

“In relation to macro cell base stations sited within school grounds, that the beam of greatest intensity should not fall on any part of the school grounds or buildings without agreement from the school and parents. Similar considerations should apply to macro cell base stations sited near to school grounds.”

The Working Party endorses the recommendations of the Stewart Report.

8.8 Risk Perception and Risk Communication

Clearly there seems to be a paradox with regard to RF waves where the main source of RF waves is radio and TV, yet the population at large has not raised any concerns. This may be related to the fact that radio and TV transmitters are often located in remote areas with the result that the distance offers a safety measure.

While public perception of risk is not always related to the actual size of the risk and the factors for this disparity are multi-factorial, the Working Party recommends that a public information campaign to address this be initiated. This is extremely important for a country like the Isle of Man which has and continues to be at the forefront of business and commercial developments. It is likely that the Island will see many new technical developments. It is important that the public are fully involved in the decision-making process for such developments and to enable this to happen the public need to have a realistic perception of likely risks and benefits. The onus is on the Government to ensure that unrealistic perceptions of risk do not stifle the Island's economic development.

Additional health concerns raised during public consultation: At present if the Planning Division of DoLGE receives concerns regarding possible health effects from members of the public, there is no process for obtaining independent advice. The Working Party felt that this needs to be rectified.

The Working Party recommends:

That there is an urgent need to develop an approach for risk communication to the public.

That if health concerns about new developments are raised during public consultation, these should be referred to the Director of Public Health for an independent scientific assessment.

8.9 Health Impact Assessment

The population is becoming increasingly health conscious and is becoming more concerned about how various developments impact on their health. In addition, the patterns of illness in Western societies has shifted to chronic health conditions (eg, cancer, coronary heart disease, respiratory disease) for which a single cause is not identifiable. This leads to the situation in which since no one cause is identifiable, associations are attributed between diseases and various environmental factors.

It is important to proactively assess the health impact of emerging technologies and other developments (eg, major capital developments) so as to:

- a) identify if the technology or development will have an adverse impact on health;
- b) consider the measures that can be put in place to minimise such impact bearing in mind the precautionary principle cited previously.

In addition, such an exercise will also provide an opportunity for health improvement which can be undertaken as a part of the development at no or minimal extra cost.

This exercise is referred to as health impact assessment and in some countries it is a statutory requirement for major capital developments (similar to Environmental Impact Assessment).

The Working Party recommends:

That a comprehensive Health Impact Assessment Programme be set up on the Isle of Man, and that the Government should support the DHSS and the Public Health Directorate in the development of such a programme.

Appendices

Appendix 1

Executive Summary of MTHR Report 2007

The Report describes the progress of the UK Mobile Telecommunications and Health Research (MTHR) Programme. It was established in 2001 on the recommendation of the Independent Expert Group on Mobile Phones (Stewart Committee) with initial funding of £7.36 million provided by government and industry on a 50:50 basis. Further contributions later raised this to £8.8 million. In order to ensure that none of the funding bodies can influence the outcome of the MTHR Programme, it is run by an independent programme management committee. This includes some members of the Stewart Committee and additional specialists to provide a broad range of expertise. It has four overseas members, including a representative of the World Health Organisation, and was initially chaired by Sir William Stewart. He was succeeded by Professor Lawrie Challis in November 2002.

The first of the 28 research projects supported by the Programme started at the end of 2001. To date, 23 studies have been completed and the results of many have been published in peer-reviewed scientific journals (23 papers so far). The Report describes this latter research and places it in context with work going on in other parts of the world. Information on the progress of the unpublished MTHR projects is also given and further details can be found on the MTHR website: www.mthr.org.uk. Having assessed the outcome of the research funded by the Programme, the Committee has identified priorities for future research to be supported by a second phase of the Programme - MTHR2.

Cancers of the brain and nervous system

The MTHR Programme has contributed to the UK component of a large multinational epidemiological study on the use of mobile phones and the risk of cancers of the brain and nervous system. The result of the UK component and pooled analyses with other North European countries showed no epidemiological association for short-term exposures (less than ten years). However, the situation for longer exposure times is less clear and the Committee has identified a need for further work in this area. This is discussed in greater detail below.

Brain function

The set of volunteer studies of brain function is one of the largest that has been carried out anywhere and covers possible reactions to exposure to radiofrequency (RF) fields from changes in response times and memory to blood pressure. However, none of these studies shows that brain function is affected by RF exposure and the Committee has concluded that there is no need for further studies on adults at the present time.

Electrical hypersensitivity

The Programme has supported the largest and most robust studies of electrical hypersensitivity yet undertaken anywhere and these have offered no convincing support for the hypothesis that the unpleasant symptoms experienced by sufferers result from exposure to mobile phone or base station signals. Whilst the Committee does not believe that there is any need for further studies in relation to mobile phones and electrical hypersensitivity, it recognises that the signal from the TETRA radios and base stations used by the emergency services have raised specific concerns and it will be supporting additional work in this area as part of the second phase of the Programme.

Biological mechanisms

The Programme supports studies to investigate two of the possible cellular effects identified in the Stewart Report: stress protein production and calcium signalling. A very careful study of stress protein production demonstrated that the previously-observed effect was probably due to heating. In the light of this and other recently published studies, the Committee considers that there is no need for further investigation of these phenomena. In the absence of convincing new evidence of robust cellular effects, the Committee does not propose to support further work in this area.

Base stations

The Programme has supported further investigation of exposures from microcell and picocell base stations. These have provided additional reassurance that exposures are low, but have revealed that exposures in the immediate vicinity of the installation may be higher than those at the same horizontal ground-level distance from macrocell installations. The Programme has also supported important work on the evaluation of a personal exposure data logger. This appears to offer a promising new approach to exposure assessment that may eventually make possible epidemiological studies of risk from base station exposure. The Committee is aware that work on the further development and application of personal exposure data loggers is currently in progress elsewhere in the world. It does not, therefore, propose to fund additional work in this area at the present time, but will keep developments under review.

Risk communication

Work supported by the Programme in the area of risk communication has revealed that the reaction of people to the precautionary advice issued by the Government varies enormously and is influenced by complex networks of prior attitudes and beliefs. This may help to explain the finding that the penetration of precautionary advice to the public is limited and suggests that policy makers may need to adopt alternative strategies for risk communication. The Committee believes that this is an area that is poorly understood and that there is a need for significant additional research effort to be applied in a systematic study.

Mobile phones and driving

It is well-established that using a mobile phone while driving impairs performance and increases the risk of an accident. A new volunteer study supported by the Programme offered no evidence that this impairment was more pronounced than that due to other in-car distractions such as conversations with passengers or adjustment of interior controls. There

were, however, suggestions that use of a mobile phone may draw on greater cognitive resources than other distractions.

Research recommendations

The Programme has highlighted some gaps in our knowledge that need to be filled. The absence of an association between exposure to mobile phone signals and cancers of the brain and nervous system for exposures of less than ten years is encouraging. However, cancer symptoms are rarely detectable until ten to fifteen years after the cancer-producing event and, since few people have used their phones for that long, it is too early to say for certain whether mobile phones could lead to cancer or indeed to other diseases, such as Alzheimer's and Parkinson's diseases, which have not been studied at all. Another gap concerns the effect of RF exposure on children. The reactions of children to environmental agents, such as lead, tobacco smoke, ultraviolet radiation, and ionising radiation, may be different and/or stronger than those of adults. It is therefore possible that the same could be true of exposure to mobile communications signals and very little has been done so far to investigate whether this is the case.

The two issues – a cohort study on adults and research on children – are the main priorities for the recently announced extension to the Programme, MTHR2, for which funds of around £6 million have already been committed. Funding has again been provided by government and industry on an equal basis. The report describes the other areas where further work is planned.

Overall conclusions

The MTHR Programme was set up to resolve uncertainties identified by previous evaluations of the possible health risks associated with the widespread use of mobile phone technology. None of the research supported by the Programme and published so far has demonstrated any biological or health effects from mobile phones or masts. Studies on volunteers provided no evidence that brain function is affected by exposure to the signals emitted by mobile phones of the TETRA radios used by the emergency services. Similarly, studies on electrical hypersensitivity have offered no convincing support for the hypothesis that the unpleasant symptoms experienced by sufferers result from exposure to signals from mobile phones or base stations. An extremely careful study suggested that a previously reported cellular effect was probably due to heating.

The Programme has also supported work on the measurement of base station emissions and these have confirmed that exposures are low, although it appears that exposures in the immediate vicinity of microcell installations may be somewhat higher than those at the same horizontal ground-level distance from the larger macrocell installations. A study on risk communication found that the penetration of precautionary advice to the public is limited and suggested that policy makers may need to adopt alternative strategies for the delivery of messages in this area. Finally, a study supported by the Programme confirmed previous observations that the use of a mobile phone while driving, whether hand-held or hands-free, impairs performance and increases the risk of an accident. However, in this particular study, the impairment appeared to be similar to that from other in-car distractions.

The Committee has recognised that, while many of the concerns raised by the Stewart Committee have been reduced by the Programme and work done elsewhere, some still remain. It has therefore proposed a further programme of work to address these. Priorities will include work to assess whether long-term exposure (greater than ten years) increases

the risk of developing cancers of the brain and nervous system. In addition, work to assess whether exposure to mobile phone signals in children is associated with a different, or enhanced, symptomatology is also considered a priority.

Appendix 2

Extracts from the Town and Country Planning (Permitted Development) Order 2005

Schedule 1 – Development outside Conservation Areas

Class 12 – Telecommunications

Operations by or on behalf of a telecommunications code system operator for the purpose of the operator's telecommunications system in, on, over or under land controlled by that operator or in accordance with his licence, consisting of -

- a) the installation, alteration or replacement of any telecommunication apparatus; or
- b) operations ancillary to radio equipment housing.

Exceptions

Operations within paragraph (a) above are not permitted if on completion of the operations –

- a) in the case of the installation of apparatus (other than on a building or other structure) the apparatus would exceed a height of 15m above ground level;
- b) in the case of the alteration or replacement of apparatus already installed (other than on a building or other structure) the apparatus would when altered or replaced exceed the height of the existing apparatus or a height of 15m above ground level, whichever is the greater;
- c) in the case of the installation, alteration or replacement of apparatus on a building or other structure, the height of the apparatus (taken by itself) would exceed 15m, where it is installed or to be installed on a building or other structure which is 30m or more in height, or 10m in any other case;
- d) in the case of the installation, alteration or replacement of apparatus on a building or other structure, the highest part of the apparatus when installed, altered or replaced would exceed the height of the highest part of the building or structure by more than —
 - i) 10m, in the case of a building or structure which is 30m or more in height,
 - ii) 8m, in the case of a building or structure which is more than 15m but less than 30m in height;
 - iii) 6m, in any other case;

- e) in the case of the installation, alteration or replacement of any apparatus other than a mast, an antenna, a public call box, or any apparatus which does not project above the level of the surface of the ground, or radio equipment housing, the ground or base area of the structure would exceed 1.5 square metres;
- f) in the case of the installation, alteration or replacement of apparatus on a building or structure (other than a dwelling house or a mast) of an antenna on a building or structure which is less than 15m in height; on a mast located on such a building or structure or, where the antenna is to be located below a height of 15m above ground level, on a building or structure (other than a dwelling, house or mast) which is 15m or more in height —
 - i) the antenna is to be located on a wall or roof slope facing a highway which is within 20m of the building or structure on which the antenna is to be located;
 - ii) in the case of dish antennas, the size of one dish would exceed 0.9m or the cumulative size of every such dish would exceed 1.5m, when measured in any dimension;
 - iii) in the case of antennas other than dish antennas, the operations would result in the presence on the building or structure of more than 2 antenna systems; or
 - iv) the building or structure is a registered building or ancient monument;
- g) in the case of the installation, alteration or replacement of apparatus on a building or structure (other than a dwelling house or a mast) of an antenna on a building or structure which is 15m or more in height or on a mast located on such a building or structure, where the antenna is located at a height of 15m or above, measured from ground level –
 - i) in the case of dish antennas, the size of one dish would exceed 1.3m or the cumulative size of every such dish would exceed 3.5m, when measured in any dimension;
 - ii) in the case of antennas other than dish antennas, the operations would result in the presence on the building or structure of more than 3 antenna systems; or
 - iii) the building or structure is a registered building or ancient monument;
- h) in the case of the installation of a mast, on a building or structure which is less than 15m in height, such a mast would be within 20m of a highway;
 - i) in the case of the installation, alteration or replacement of radio equipment housing
 - ii) the housing is not ancillary to the use of any other telecommunication apparatus;
 - iii) it would exceed 29 cubic metres or, if located on the roof of a building, 10 square metres in area

Conditions

- Any antenna or supporting apparatus, radio equipment housing or structure ancillary to radio equipment housing constructed, installed, altered or replaced on a building shall, so far as practicable, be sited so as to minimise its effect on the external appearance of the building.
- Any apparatus or structure shall be removed from the land, building or structure on which it is situated, as soon as reasonably practicable after it is no longer required for telecommunication purposes, and such land, building or structure shall be restored to its condition before the operations took place.
- In the case of operations on land consisting of -
 - i) the construction, installation, alteration or replacement of a mast or a public call box, or of radio equipment housing with a volume exceeding 2 cubic metres, or
 - ii) operations ancillary to radio equipment housing -
 - a) before an application to the Department in accordance with the following paragraphs, where the proposed operations consist of the installation of a mast within 3 kilometres of the Isle of Man Airport at Ronaldsway, or of a public call box, the operator shall notify the Department of Transport of the proposal;
 - b) the operator shall, before beginning the operations, apply to the Department for a determination as to whether the prior approval of the Department will be required to the siting and appearance of the structure in question;
 - c) the application shall be accompanied by a written description of the proposed structure and its proposed location;
 - d) the operations shall not be begun before one of the following occurs:
 - the operator receives from the Department a notice of its determination that no such prior approval is required;
 - where the Department gives the operator notice that such prior approval is required, the giving of such approval within 28 days following the date on which it received the operator's application;

- the expiry of 28 days following the date on which the Department received the application, without the Department making any determination as to whether such approval is required, notifying the operator of its determination, or giving or refusing approval to the siting or appearance of the structure in question.
- e) the operations shall, except to the extent that the Department otherwise agrees in writing, be carried out -
- where prior approval is required, in accordance with the details approved;
 - where prior approval is not required, in accordance with the details submitted with the application or otherwise agreed by the Department;
- f) the operations must be begun –
- where approval has been given by the Department, not later than the expiration of 5 years beginning with the date on which approval was given;
 - in any other case, not later than the expiration of 5 years beginning with the date on which the Department was given the description referred to in sub-paragraph (c).

For the purposes of this Class –

"the 1984 Act" means the Telecommunications Act 1984;

"ancient monument" means a monument under the guardianship of the Manx Museum and National Trust under section 10 of the Manx Museum and National Trust Act 1959, or in respect of which a preservation order under section 11 of that Act is in force, or included in a list of monuments published under section 13 of that Act;

"antenna system" means a set of antennas installed on a building or structure and operated by a single telecommunications code system operator in accordance with his licence;

"land controlled by an operator" means land occupied by the operator in right of a freehold interest or a leasehold interest under a lease granted for a term of not less than 10 years;

"mast" means a radio mast or a radio tower;

"operations ancillary to radio equipment housing" means the construction, installation, alteration or replacement of structures, equipment or means of access which are ancillary to and reasonably required for the purposes of radio equipment housing;

"operations in accordance with a licence" means operations carried out by an operator in pursuance of a right conferred on that operation under the telecommunications code, and in accordance with any conditions relating to the application of that code imposed by the terms of his licence;

"telecommunications apparatus" has the meaning given by paragraph of Schedule 1 to the 1984 Act;

"the telecommunications code" means the code contained in Schedule 1 to the 1984 Act;

"telecommunications code system operator" means a person who has been granted a licence under section 5 of the 1984 Act which applies the telecommunications code to him in pursuance of section 8 of that Act;

"telecommunication system" has the meaning given by section 2 of the 1984 Act.

Schedule 2 – Development in Conservation Areas

Class 9 – Telecommunications

Operations by or on behalf of a telecommunications code system operator for the purpose of the operator's telecommunications system in, on, over or under land controlled by that operator or in accordance with his licence, consisting of the installation, alteration or replacement of any telecommunication apparatus (other than a building or other structure).

Exceptions

Operations within this Class are not permitted if they consist of the installation of apparatus above ground (otherwise than inside an existing building or other structure), unless they are carried out in an emergency.

Conditions

- 1) The land must be reinstated to its condition before the operations took place.
- 2) Where traditional materials such as stone setts, cobbles, flags or kerbstones are disturbed, they must be carefully set aside, stored and replaced on completion of the operations.
- 3) In the case of operations in an emergency, the operator shall give written notice to the Department of such operations as soon as possible after the emergency begins.
- 4) Any apparatus installed in an emergency shall be removed from the land, building or structure on which it is situated at the expiry of the relevant period, and such land, building or structure shall be restored to its condition before the operations took place.

In this Class "the relevant period" means a period which expires -

- i) 12 months from the commencement of the operations in question, or
- ii) when the need for the apparatus ceases,

whichever occurs first. Other expressions used in this Class have the same meanings as in Class 11 of Schedule 1.

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References

Mobile phones are part of our way of life. Today in the UK, there are around 70 million mobile phone subscriptions, compared with 9 million in 1997/8. However, this rapid growth has been accompanied by a perception that exposure to radio waves – from mobile phones and base stations – may pose a health risk.

The balance of evidence from research to date suggests this is not the case. However, gaps in scientific knowledge have prompted calls for further study to be conducted. This is happening in the UK and around the world.

Below is a brief outline of some of the recent health reviews that have examined mobile phone technology and health, and their findings relevant to mobile phones and base stations; these documents have been studied by all members of the Working Party.

Health Reports

1996	World Health Organisation	The International EMF Project (Ongoing)
1999 March	Canadian Report	Royal Society of Canada's Expert Panel's review of the potential health risks of radiofrequency fields from wireless telecommunication devices
2000 January	Zmirou Report	French Health General Directorate
2000 May	Stewart Report	UK Independent Expert Group
2001 May	British Medical Association	Mobile Phones and Health, an interim report
2002 January	MTHR	UK Mobile Telecommunications and Health Research Programme
2002 January	Dutch Report	Health Council of the Netherlands, advisory report
2003 December	Swedish Report	Swedish Radiation Protection Authority (SSI), First annual report from SSI's Independent Expert Group on Electromagnetic Fields
2003 December	AGNIR Report	NRPB's Independent Advisory Group on Non-Ionising Radiation Report 'Health Effects from Radiofrequency Electromagnetic Fields'
2004 January	Dutch Report	Health Council of the Netherlands, Electromagnetic Fields Annual Update 2003

2004 May	Swiss Report	Swiss Research Foundation on Mobile Communications Annual Report 2003
2004 September	View of the Nordic Countries	A common view on Mobile Telephony and Health developed by the competent authorities in Denmark, Finland, Iceland, Norway and Sweden
2004 December	Review by ICNIRP Standing Committee on Epidemiology	A comprehensive review of the epidemiology of health effects of radiofrequency exposure
2004 December	Swedish Report	Swedish Radiation Protection Authority (SSI), Second annual report from SSI's Independent Expert Group on Electromagnetic Fields
2005 January	NRPB Report W65	A Summary of Recent reports on Mobile Phones and Health (2000-2004)
2005 January	NRPB Report	Documents of the NRPB - Mobile Phones and Health Volume 15 No.5 2004
2005 January	US Food & Drugs Administration (FDA)	FDA agrees with the NRPB on its conclusions that there is "no hard evidence of adverse health effects on the general public" from exposure to radiofrequency energy while using wireless communication devices. With regards to the safety and use of cell phones by children, the scientific evidence does not show a danger to users of wireless communication devices including children.
2005 January	British Medical Association	Mobile Phones and Health - An update
2005 May	French Agency for Environmental Health Safety	Opinion on Mobile Telephony
2005 November	Dutch Report	Health Council of the Netherlands Electromagnetic Fields Annual Update 2005
2005 December	WHO leaflet	Electromagnetic Fields and Public Health - Electromagnetic Hypersensitivity
2005 December	Swedish Report	Swedish Radiation Protection Authority (SSI), Third annual report from SSI's Independent Expert Group on Electromagnetic Fields
2006 May	WHO base station fact sheet	Electromagnetic fields and public health.

		Base stations and wireless technologies
2006 May	Institute of Engineering and Technology	Position Statement on the Possible Health Effects of Mobile Phones & Electricity Distribution
2007 February	Dutch Report	Health Council of Netherlands, Electromagnetic Fields Annual Update 2006
2007 March	Swedish Report	Swedish Radiation Protection Authority (SSI), Fourth annual report from SSI's Independent Expert Group on Electromagnetic Fields
2007 March	Irish Report	Irish Government's Expert Group on Health Effects of Electromagnetic Fields
2007 June	Swiss Report	Swiss Research Foundation on Mobile Communications Annual Report 2006
2007 June	Canadian Report	Update report by the Royal Society of Canada's Expert Panel on Potential Health Risks of Radiofrequency Fields from Wireless Telecommunication Devices
2007 September	UK MTHR Report	The report describes the progress of the UK Mobile Telecommunications and Health Research Programme

Other:

Bio Initiative Report http://www.bioinitiative.org/report/index.htm	A Rationale for a Biologically-based Public Exposure Standard for Electromagnetic Fields (EMF and RF)
Mast Sanity Website www.mastsanity.org	National organisation opposing the insensitive siting of mobile phone and Tetra masts in the UK

Glossary

3G (Third Generation) – a mobile phone technology 'Universal Mobile Telecommunication System (UMTS)' - allowing broadband communication. The antennas of 3G base stations operate at different frequencies (around 2100 MHz) and at lower power levels than the GSM system (due to improved technology).

Bluetooth – a short-range radio signal technology operating at about 2450 MHz. The power levels used by Bluetooth devices are in the range 0.001 to 0.1 watts.

COMEST – World Commission on the Ethics of Scientific Knowledge and Technology

DECT (Digitally Enhanced Cordless Telephone) – a radio signal technology used by some types of cordless telephone, using frequencies around 1900 MHz.

DOLGE – Department of Local Government and the Environment

DHSS – Department of Health and Social Security

EMF – Electromagnetic Field

EMS – Electromagnetic Sensitivity Syndrome (sometimes referred to as electromagnetic hypersensitivity syndrome (**EHS**)).

Frequency – wave oscillations (cycles) per second, 30 kilohertz (kHz) is thirty thousand; 1 Megahertz (MHz) is a million and 1 Gigahertz (GHz) is a thousand million.

GPRS – General Packet Radio Service – an enhanced GSM technology allowing multimedia services; sometimes called 2.5G.

GSM – Global System for Mobile communication - the digital mobile phone system most-used worldwide, it has improved technology compared with the first generation of mobile telephones and is sometimes called 2G. Two frequency bands are used, around 900 MHz and around 1800 MHz.

HPA – Health Protection Agency, UK

ICNIRP – International Commission on Non-Ionising Radiation Protection

INTERPHONE – a series of multi-national research studies into possible links between RF signals and different types of cancer, co-ordinated by the International Agency for Research on Cancer (IARC) - a part of the World Health Organisation.

MTHRP (Mobile Telecommunications Health Research Programme) – UK research programme jointly funded by UK Government and the communications industry.

NRPB – National Radiological Protection Board

OFCOM (Office of Communications) – UK Communications Regulator, is responsible for the licensing of radio spectrum under Wireless Telegraphy Act 2006, which it does in consultation with the Isle of Man Communications Commission.

RF – Radiofrequency

RFID (Radiofrequency Identification Device) – a small electronic memory device or tag that can communicate using radio waves.

SMS – Short Message Service.

TETRA (Terrestrial Trunked Radio) – a digital mobile telephone system used by the emergency services, using frequencies up to 400MHz. The TETRA base stations have similar output powers to GSM base stations and can transmit signals to either vehicle-mounted receivers or handsets. Two-way communication between handsets is also possible when there is no base station within range.

WAP (Wireless Access Protocol) – an-add on technology to GSM enabling multimedia services.

Wavelength – distance in metres between repeating points (one cycle) on a radio wave.

WHO – World Health Organisation

Wi-Fi (Wireless Fidelity) - a short-range low-power radio signal technology using four different frequency bands, the most commonly-used being at around 2400MHz.

WLAN (Wireless Local Area Network) – a radio signal technology used to link two or more computers, thereby replacing connecting cables with radio wave communication.