Guidance For Working Near Base Stations and Antenna Sites

Prepared by LEIA Safety and Environment Committee

SAFETY INFORMATION SHEET

GUIDANCE FOR WORKING NEAR BASE STATIONS AND ANTENNA SITES

PREAMBLE

This Information Sheet is one of a series produced by the LEIA Safety and Environment Committee on topics relevant to the Lift and Escalator Industry. Whilst every effort has been taken in the production of these sheets, it must be acknowledged that they should be read in conjunction with the relevant legislation, codes of practice etc. They should not be taken as an authoritative interpretation of the law but guidance to it.

INTRODUCTION

This document gives general safety advice which should ensure, when followed that the worker's general exposure to cellular radio frequency (RF) fields will be within applicable safety limits. There may also be other sources of RF exposure such as radio and TV broadcasters, police, military or private radio systems and possibly radar that need to be taken into account. There may be local guidelines already available which should be followed. Before working near a base station or antenna site the lift company should satisfy itself that they have the latest safety information provided by the mast operator or/and the landlord/client/management company of the building they are working in.

The client, under section 3 of the Health and Safety at Work etc Act is responsible for ensuring the safety of others (as far as is reasonably practicable) and should be contacted if lift companies have concern about RF exposure. If necessary the mast operator should be able to supply data relating to exposure levels on each site. If necessary the client could commission a site survey measuring radio frequency levels using a monitor. Attention is drawn to the Non-ionising Radiation – The Electro Magnetic Fields [EMF] Directive which requires legislation on workers' exposure to electromagnetic fields. This places a number of duties on employers, including: -

- To conduct a risk assessment and calculate EMF strengths
- To eliminate or reduce as low as possible the risk of exposure and where risk cannot be eliminated that measures are devised by the employer to reduce the risk of exposure below the Exposure Limit Value.

The Control of Electromagnetic Fields at Work Regulations 2016 came into force on 1st July 2016. HSE guidance to the Regulations can be downloaded here:
http://www.hse.gov.uk/pubns/priced/hsg281.pdf

BASIC INFORMATION

The International Commission on Non Ionizing Radiation Protection (ICNIRP) http://www.icnirp.de/PubEMF.htm provides guidelines for limiting exposure to time varying electromagnetic fields for both the general public and workers. The guidelines have been widely adopted around the world.

The operator of the base station or antenna should provide sufficient information or warning signs to ensure that workers who have not received specific EMF training can take action to avoid exposure above the relevant limit.

In principle, RF levels decrease rapidly when a person moves away from the source, e.g. a transmitting antenna. As a rough rule of thumb exposure is reduced by a factor of four every

time the separation distance between the person and the antenna is doubled. For each antenna, the RF level can be calculated or measured.

Figure 2 shows an example of a sign used to inform about the compliance distance for RF workers. For each cellular RF source present the operator will determine an exclusion zone outside of which the RF levels are below the relevant levels stated in the ICNIRP guidelines. Access to this area should be restricted through physical location of the antenna, physical barriers/signage and/or information given to the site provider. In the majority of cases antennas are made safe by design i.e. positioned such that people cannot access the areas where RF could exceed the reference levels stated in the ICNIRP guidelines.

MEDICAL IMPLANTS

A worker with an active medical implant (for example, a cardiac pacemaker) or a personal active medical device, should consult with their employer to determine what sort of specific arrangements can be made in order to comply with any safety requirements. Without further analysis, personnel with active medical devices should not enter RF areas.

TYPICAL ANTENNA SITES (Figure 1)

Mast in a secured compound:

- Accessible to trained RF workers only

Rooftop and similar sites:

- Sites where it would be reasonable to expect that only RF and other workers would have access to areas where antennas are located
- Some rooftops may also be publicly accessible

Publicly Accessible sites:

- Sites where it is known or reasonable to expect that the general public may gain access

Examples of Cellular Antenna and Rooftop Installations

Figure 1

Sites usually controlled by a premises owner/controller:

- Rooftops
- External building walls
- Lamp posts

Sites visited by non-operator third parties:

- Lift maintenance company
- Cleaning
- Roofing company

Note: There may be other non-cellular RF sources present on the rooftop such as radio broadcasting, emergency services radio system etc.

RADIO FREQUENCY SIGNS

Defined by major mobile phone network operators following the recommendations of the Stewart Report which called for:

- The implementation of clearly defined exclusion zones which delineate areas within which exposure guidelines may be exceeded
- A nationally agreed set of RF safety signs

The agreed signs are based on:

- Standard symbols and phrases for radio-frequency radiation hazards
- British Standards BS5378 'Safety Signs and Colours'
- The Health and Safety (Safety Signs and Signals) Regulations 1996

The safety sign design policy is followed by the main cellular operators, there are three main groups of signs that should be considered when working near antennas. There may be slight variation how the information is laid out on the warning notice but they should all contain the same information.

The three main signs are as follows:

Site entry signs (Figure 2):

- Fixed to access point to roof top
- Identifies the existence of RF hazard(s)
- Indicates there is further safety signage on site
- Gives all relevant operator name(s), telephone number(s), site identification number(s)
- Installed by first operator on site
- Subsequent operators add logo and contact details

Figure 2

Warning Signs (Figure 3)

- Placed at the boundary of the relevant non-compliance zone
- Used with barriers where necessary
- Warns of the hazard
- Mandates actions to follow, or prohibits unauthorised access
- Provides operator name, telephone number and site number

The signs may have some variation in layout because of the different network provider, the top diagram shows the O_2 but this may be Vodafone, Orange etc.

Figure 3

Antenna Signs (Figure 4)

- Sign fixed to the antenna and/or its mounting
    - On all faces which the antenna could be approached
- Warns of the hazard
- Identifies owner of the antenna, telephone number and site number

Figure 4

The signs may have some variation in layout between the different network providers but they will all convey similar information.

Where a lift engineer is required to walk through an area where the occupational guideline exposure limits may be exceeded then a shutdown of the radio transmitters is required This is requested in conjunction with the client/site controller by contacting the operator(s) in advance and by supplying the following information:

- Site ID and/or Location
- Reason for outage and full details of works to be undertaken
- Proposed start/finish date and time
- Contact details and any other relevant information

In return the operator, provides

- A unique reference number
- The sign-in/sign-out procedure
- A list of known hazards

A suspected over-exposure should be referred to their employer to determine what investigations are needed. Work practices may also be reviewed. In many cases, even if a worker was within the exclusion zone, they will not have been over-exposed according to the basic restrictions. The vast majority of over-exposures result in no symptoms at all because of the large safety margin in the standards but workers may require reassurance. Where symptoms are present, treatment should be the same as for similar injuries from any other cause.

The instruments in Figure 5 are not personal monitors but field monitors which are devices that can measure the instantaneous value of EMF level in real time and over a broad frequency range. The measured value can then be compared to the *reference levels* defined in the ICNIRP guidelines. There are several different models available on the market

Hand-held field monitors - The measurement accuracy is normally higher with a hand-held monitor than with a body-worn monitor. Hand-held monitors typically give numerical values of the EMF levels.

Most field monitors provide an audible and/or vibration alarm which can usually be set to some fraction of the safety limit. When using field monitors to assure compliance to EMF limits workers must be trained accordingly and the monitors used as recommended by the manufacturer.

Figure 5

More information on EMF and health can be found on these websites:

- Mobile Operators Association (www.mobilemastinfo.com)
- Mobile Manufacturers Forum (www .mmfai .org)
- GSM Association (www .gsmworld .com/health)
- Health Protection Agency (www.hpa.org.uk)
- ICNIRP (www.icnirp.de)
- HSE http://hse.gov.uk/radiation/nonionising/index.htm
- WHO who.int/peh-emf/en

As well as health and safety issues relating to RF Frequencies there is also a technical notice on the member's area of the LEIA website 'Are You Aware' Issue 25 'Mobile phone masts close to lifts' that gives information on the effect this equipment may have on the operation of a lift if the guidelines for the installation of masts are not followed.

This document has been prepared using information and documentation provided by the UK Cellular Operators.