Getting to grips with the ‘invisible enemy’ of RF radiation

Litchfield, Ian

Institute of Engineering and Technology

"Comments" Article **February 2018**

Getting to grips with the 'invisible enemy' of RF radiation

The use of radiofrequency radiation (RF) has become intrinsic to modern life and the connectivity it provides central to the way we communicate with colleagues, clients, friends and families. The technology has been with us since the turn of the 20th century and part of the working environment since the introduction of radio broadcasting in the 1930's. Its use now extends beyond broadcasting to include applications across healthcare, engineering and manufacturing.

Radio frequency radiation refers to electromagnetic fields that lie between 3 kHz and 300 GHz, the variation in the properties of these fields alters not only their commercial use but also the way in which they interact with the human body. Compared to many hazards RF cannot be seen, heard or felt and has been termed "the invisible enemy". With continuing concern over the possible effects of RF exposure in the workplace the European Union produced the Physical Agents Directive for EMF designed to reduce the risk from short-term acute exposures transposed into UK law in July 2016. The Control of Electromagnetic Fields at Work Regulations (CEMFAW) was refined following extended conversations between the Health & Safety Executive (HSE) and representatives from a range of relevant industries including engineering and manufacturing sectors. The HSE has strived to ensure that the impact on UK business is minimised with many of the duties placed on employers reflecting those already in place in the existing Management of Health and Safety at Work Regulations such as requirements for risk assessments, and health surveillance. In supporting compliance CENELEC the European Committee for Electrotechnical Standardization has

developed guidance for employers in the form of standardised assessment protocols produced for small businesses, involving practical advice presented in plain English.

The current exposure limits are based on the prevention of scientifically proven short-term effects. At lower frequencies these manifest as disturbances to the nervous system leading to peripheral nerve stimulation or dizziness or nausea. At higher frequencies there are heating effects causing partial or whole body, heat stress. However there is a growing body of evidence that has explored the potential wider impact of RF frequency radiation on living systems. The International Agency for Research into Cancer, the body responsible for promoting international collaboration in cancer research, collated much of this scientific evidence and in 2011 they decided that RF was a possible carcinogen with limited evidence of an association with cancer in humans. Notably they concluded that the existing evidence base exploring health-effects in those occupationally exposed was inadequate. The lack of quality research into the health of those working with RF might be seen as surprising when you consider that occupational exposure guidelines are higher than the equivalent public exposure limits. It's therefore reasonable to assume that if there is the potential for adverse health-effects they would be more likely to emerge in the working population first i.e. within the group that has the potential to be more exposed than the general public. However, linking exposure data for specific groups of employees to their health records presents a challenge in a workforce as diverse as those that utilise RF Radiation. In response the HSE worked with the University of Birmingham to establish the National Register of RF Workers – the first database of its kind created specifically to explore the effects of long-term occupational exposure to RF. The Register is a resource designed to allow an agile response to any emergent health concerns and is already supporting an investigation into the prevalence of cancer amongst those exposed to RF through their work. The initiative has been welcomed by Public Health England and the recruitment to the Register of employees with the potential to be exposed above public guidelines is continuing and the University of

Birmingham welcomes enquiries from those wishing to find out more about the Register. It's imperative that we never become complacent about the safety of our work force and if we are continue to support safe working with RF that we understand as much as possible about the "invisible enemy".

Ian Litchfield is a Research Fellow at the University of Birmingham