



ELECTROMAGNETIC FIELDS (EMF)

This Policy Standard states the requirements placed on the University and its Colleges and Professional Services with regards to the safe use of equipment that produce high levels of electromagnetic fields (EMF) and for the safeguarding of those at particular risk to EMF effects; in compliance with the Control of Electromagnetic Fields at Work Regulations.

The Policy Standard applies to:

- *EMF in the range of 0 – 300 Gigahertz.*
- *The University and its Colleges and Professional Services.*
- *All equipment producing applicable (power frequencies, radio frequencies and microwaves) levels of EMF used by, at or for the University.*
- *All staff, students, contractors and visitors who could be adversely affected by EMF or/and considered as Persons at Particular Risk.*
- *All persons who work with equipment creating high levels of EMF.*

The Policy Standard does not consider:

- *Natural and atmospheric EMF.*
- *EMF from the electrical grid and related infrastructure outside of the control of the University.*

Approved by Health & Safety Committee:	23 rd May 2018
Date of Implementation:	23 rd May 2018

1. POLICY STATEMENT

It is the policy of Bangor University, so far as is reasonably practicable, but in accordance with the relevant legislation, statutory requirements and good practice, to ensure the health and safety of staff, students and visitors to the University.

2. INTRODUCTION

In addition to those general duties in law, the University and its constituent Colleges and Professional Services, has a specific obligation under the Control of Electromagnetic Fields at Work Regulations (CEMFAWR) to ensure no person is harmed as a result of exposure to electromagnetic fields (EMF).

3. TERMINOLOGY AND DEFINITIONS

For the purpose of this Policy Standard the following terms and definitions apply:

- i. **Persons at Particular Risk:** *Any person with a medical condition that may lead to a higher susceptibility, including direct biophysical effect, from exposure to EMF, e.g. those in close proximity to relevant equipment and at particular risk of adverse effects from high EMF levels. This includes those with active or passive implanted medical devices, or body-worn medical devices (e.g. cardiac devices, stents, heart valve prostheses, annuloplasty rings, brainstem implants, cochlea implants, orthopaedic implants & joints, pins, plates, screws, insulin or hormone pumps, hearing aids, metalized drug-delivery patches, glucose monitoring devices, drug infusions, metallic contraceptive devices, penile implants), and expectant mothers.*
- ii. **Gigahertz (GHz):** A unit of measurement for electromagnetic wave frequencies.
- iii. **Electromagnetic Field (EMF):** Static electric, static magnetic and time-varying electric, magnetic and electromagnetic (radio wave) field with frequencies up to 300 GHz.
- iv. **Non-ionising Radiation (NIR):** Term used to describe the part of the electromagnetic spectrum covering two main regions, namely optical radiation (ultraviolet (UV), visible and infrared) and electromagnetic fields (EMFs) (power frequencies, microwaves and radio frequencies). *This Policy Standard considers EMF only.*
- v. **Action Levels (ALs):** Set of values contained within the CEMFAWR to provide an indication of risk, based on direct measurement of an electric or magnetic field. *If the AL is not exceeded, the corresponding ELV cannot be exceeded.*
- vi. **Exposure Limit Values (ELVs):** Are the legal limitations of exposure of employees to EMFs and must not be exceeded. ELV Tables are contained within the CEMFAWR¹.
- vii. **Indirect Effects:** An effect, caused by the presence of an object or substance in an EMF, which may present a safety hazard (e.g. *electrical discharge igniting an explosive atmosphere, local heating to flashpoint or even auto-ignition temperatures*).

4. BACKGROUND AND INFORMATION

The Control of Electromagnetic Fields Regulations was introduced in 2016 and seeks to address potential health and sensory effects arising from exposure to high levels of EMF in the workplace.

¹ In practice calculation of ELVs, is expensive and complicated so employers can chose to work to the ALs. Only if the AL is exceeded is further consideration and assessment against the corresponding ELV then required

EMF is a form of non-ionising radiation with both natural and anthropogenic sources, for example the earth's natural magnetic field and everyday items of electrical equipment used in the home that produce low levels of EMF.

Exposure to high EMF levels can, at least in the short-term, be potentially harmful to a person, causing 'thermal' effects on the body and interference with the body's nervous system; for example by disturbing a person's sensory perceptions.

Also, and dependent on the frequency and intensity of the EMF, 'indirect' effects can impact on both animate and inanimate objects. This includes, interference with active body-worn and implanted medical devices, projectile risk from the movement of loose objects containing ferromagnetic metals, fires or explosions from ignition of flammable or explosive substances or atmospheres, and local heating effects causing reactions or auto-ignition.

This Policy outlines the core management arrangements that should be implemented to ensure people are safeguarded and the requirements of the Regulations are met. The Policy should be read in conjunction with the relevant Information Sheet and Guidance, which provide practical direction on day to day controls and risks.

The University's use of some EMF sources in clinical and sensory research and analysis require particular attention to ensure certain regulatory exemption criteria are met and user safety is assured. In operating such exemptions, that expose a person to high-levels of EMF, it is critical suitable controls are in place to also safeguard the member of Staff or other Operator who could be exposed.

5. DUTIES OF THE UNIVERSITY

In accordance with the University's Health and Safety Policy, day to day managerial responsibility for health and safety has been delegated to each College and Professional Service. It is the responsibility of these to implement this Policy Standard and associated guidance.

6. COLLEGE AND PROFESSIONAL SERVICE RESPONSIBILITIES

As appropriate to their activities and that of their staff and students, each College and Professional Service is required to identify potentially significant sources of EMF and, if identified, apply the following management arrangements to ensure no person is harmed as a result of exposure to high levels of EMFs within their areas of control:

- a) Assess or calculate the level of exposure created by the 'EMF Sources' to ensure levels are below the Action Levels (ALs) and the Exposure Limit Values (ELVs) stipulated within the CEMFAWR ^(see Footnote 1).
- b) Take immediate action if EMFs potentially exceed the ELVs.
- c) If required, devise and put in place an Action Plan to ensure compliance with the ALs / ELVs.
- d) Where potential risk is identified, prepare a suitable and sufficient Risk Assessment to either eliminate and / or control those risks.
- e) Where there is a potential risk to any '*Person at Particular Risk*'² ensure a suitable Risk Assessment is prepared and suitable controls introduced.

² Persons who have declared a condition which may lead to higher susceptibility to the potential effects of exposure to EMFs eg persons wearing passive / active implants or body-worn medical devices, pregnant woman, persons with photo-sensitivity or persons working in close proximity to electro-explosive devices, explosive materials or flammable atmospheres

- f) Provide information and, if appropriate, training to relevant persons on the particular risks posed by EMFs, together with details of any action taken to remove or control them.
- g) Identify and implement appropriate controls and affix signage to all rooms/areas/equipment where levels of EMF may impact *Persons at Particular Risk*.
- h) Seek the advice of specialists, where required; e.g. *medical implant manufacturer to assess potential interference with EMFs*.
- i) Although there is no requirement for routine health surveillance (unless exposure exceeds ELVs), seek the advice of the Occupational Health Practitioner if the Risk Assessment identifies a significant risk and / or a '*Person at Particular Risk*' is required to work with significant EMF generating equipment or work within an area housing such equipment.

NOTE: Property and Campus Services (PACS) will, as appropriate, consider potential risks from electrical infrastructure and any other installation placed within or on University buildings by others (e.g. mobile phone antennae).

7. STAFF, STUDENTS, CONTRACTORS AND VISITORS RESPONSIBILITIES

As with those duties placed upon the University and its Colleges / Professional Services, staff, students, visitors and contractors also have responsibilities in law. With regards to this Policy they must:

- a) For Staff and Students; advise their own College/School or Professional Service when they have a medical implant or medical device which may be impacted by high levels of EMF or are expecting a child, and may access areas or use equipment generating high levels of EMF.
- b) For Visitors who are at Particular Risk: be aware of EMF signage and seek advice of local staff if accessing any areas of EMF which may impact devices or implants, or unborn child.
- c) For Contractors; advise the employing College/Professional Service of any staff who may be susceptible to EMF and work with the University to safeguard their well-being.
- d) Follow all management controls implemented by the College / Professional Service.
- e) Immediately inform an appropriate person if they believe their work could create high EMF levels.
- f) Only use systems they have been instructed and / or trained and authorised to operate.
- g) Not interfere with or mis-use systems put in place to protect against EMFs.
- h) Immediately report concerns or defects with any equipment / controls to an appropriate person.

8. SPECIFIC EXEMPTIONS FOR USE OF MRI AND OTHER APPLICABLE EMF GENERATING EQUIPMENT

In accordance with Regulation 4(3) the development, testing, installation, use and maintenance of, or research related to, magnetic resonance imaging equipment for patients in the health sector, is exempt from the wider duties provided (i) the exposure of employees to electromagnetic fields is as low as is reasonably practicable; and (ii) employees are protected against any health effects and safety risks related to that exposure.

In addition and in accordance with the Certificate of Exemption, No1 of 2016, the Health and Safety Executive (HSE) has granted an exemption in relation to exposure which occurs during the following work activities:

- a) electrolysis as part of a manufacturing process;

- b) the use of dielectric heating equipment;
- c) the use of induction heating equipment;
- d) the use of manually-operated resistance welding equipment; and
- e) the use of magnetic resonance imaging equipment other than for patients in the health sector.

The above apply only where the exposure of employees to electromagnetic fields is as low as is reasonably practicable and employees are protected against any health effects and safety risks arising from that exposure.

NOTE: A Risk Assessment is still required even if an exemption exists. For example, use of the MRI Scanner and Transcranial Magnetic Stimulator (TMS) devices still require an assessment and the implementation of controls for operators and those at *Particular Risk*, such as expectant mothers or those with medical devices.

9. EQUALITY ASSURANCE

It is recognised that there will be a requirement to treat *'Persons at Particular Risk'* differently in order to safeguard them from potential adverse impacts of high levels of EMF. In such circumstances the person affected will normally be involved in the assessment and where required, advice of specialist medical practitioners or medical device manufacturers will be sought.

For example, it is recognised that expectant mothers and others fitted with medical devices/implants may be prohibited from operating the equipment or remaining in the room during treatment/testing.

10. FURTHER INFORMATION AND PRACTICAL GUIDANCE

Further information on control of EMF risk is available from the Health and Safety Website, associated Information Sheets and example risk assessments.

11. REVIEW AND AUDIT PROCEDURES

Health and Safety Services will carry out general and periodic audits to assess compliance against this Policy Standard and legislation in general.

Colleges / Professional Services must periodically review their own procedures to ensure the requirements of this Policy Standard are implemented, suitable and effective.

In addition, the University's Health and Safety Committee may from time to time review the effectiveness of the University's system for the management of EMF across Colleges and Professional Services.

End.