

## CHAPTER 6

### NON-IONISING RADIATION PROTECTION POLICY

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#### INTRODUCTION

1 Non-ionising (NIR) radiation covers a range of the electromagnetic spectrum from the ultraviolet through visible light and radiofrequencies to static fields. The common designations for the division of non-ionising radiation into named regions are shown in Table 1.

2 This Chapter is not intended to be applied to the exposure of patients undergoing exposure to NIR for therapeutic or diagnostic reasons.

#### PRINCIPLES OF RADIOLOGICAL PROTECTION

3 There have been formal guidelines for the protection of personnel from non-ionising radiation for decades (certainly 1960 for radio frequencies and 1965 for lasers). In the United Kingdom, the Radiation Protection Division of the Health Protection Agency (HPARPD) (formerly the National Radiological Protection Board) advises the government providing guidance and recommendations on protection from both ionising and non-ionising radiation. The international body representing radiation protection professionals world-wide, the International Radiation Protection Association (IRPA), has chartered the International Commission on Non-Ionizing Radiation Protection (ICNIRP) as an independent Commission "for the purpose of advancing Non-Ionising Radiation Protection for the benefit of people and the environment" .

#### LEGISLATION

4 There is no UK legislation specific to non-ionising radiation protection. Therefore, the following legislation is most relevant: the Health and Safety at Work etc Act 1974; the Management of Health and Safety at Work Regulations 1999 and the Health and Safety (Safety Signs and Signals) Regulations 1996.

5 The agencies enforcing UK legislation refer to the advice given to government by the HPARPD.

6 For electromagnetic field (EMF), the European Union (EU) has adopted Directive 2004/40/EC on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields) that lays down the basis for controlling occupational exposure. This will be transposed into UK legislation by 30 April 2012 and uses a scheme of basic restrictions and reference levels drawn from the ICNIRP guidelines.

7 Similarly the EU has adopted Directive 2006/25/EC on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (artificial optical radiation). This Directive was implemented into UK legislation on 27 April 2010 and is based on the limit values incorporated in the guidelines issued by the ICNIRP. This legislation will apply to both coherent (laser) and non-coherent (broadband) optical<sup>1</sup> radiation that is not of natural origin. However, the employer must assess all optical radiation exposures both natural and artificial.

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<sup>1</sup> Optical radiation is radiation between the wavelengths 100nm to 1mm, not all of this radiation is in the visible region of the spectrum.

**MOD POLICY**

8 The Secretary of State's Policy is discussed under ionising radiation protection policy and exactly the same principles apply to non-ionising radiation protection.

9 It is MOD policy that exposure of personnel to EMF and artificial optical radiation will conform to the guidance supplied by the Radiological Protection Division of the Health Protection Agency wherever reasonably practicable. Such exposure should, in addition, be kept to as low a level as is reasonably practicable. There is more information in Leaflet 22 of JSP 375 the MOD Health & Safety Handbook for electromagnetic fields and waves (0 Hz to 300 GHz) and JSP 390 Military Laser Safety.

Table 1 Nomenclature for non-ionising radiation

EM Spectrum Designations					
Non-ionising	Static fields	0 Hz	Radiofrequency (RF)	electromagnetic fields (EMF)	
	ELF	30 Hz			
		300 Hz			
	VLF	3 kHz			
		30 kHz			
	LF	300 kHz			
	MF	3 MHz			
	HF	30 MHz			
	VHF	300 MHz			
	UHF	3 GHz			Microwaves Electromagnetic
	SHF	30 GHz			
	EHF	300 GHz or 1 mm			
	IRC	3 µm	Infrared	optical radiations	
	IRB	1.4 µm			
	IRA	760 nm			
	Visible	400 nm	Vis		
		315 nm			
	UVA	280 nm	Ultraviolet		
	UVB	100 nm			
	UVC	10 nm			
	Ionising	continuation of UVC	10 nm		X & γ rays
		X & γ rays	< 10 nm		