

# Implementation of the EMF Directive 2013/35/EU in Germany

## Introduction

The European Directive 2013/35/EU [1] which lays down the minimum health and safety requirements regarding the exposure of workers to the risks arising from electric, magnetic and electromagnetic fields (EMF) came into force in June 2013. All European member states shall implement this Directive in their national law by July 2016. In order to support employers to understand what they will have to do in order to comply with the Directive, the European Commission provided the *Non-binding guide to good practice for implementing Directive 2013/35/EU Electromagnetic Fields*, which consists of two volumes and a short guide for small and medium enterprises (SMEs) [2, 3, 4].

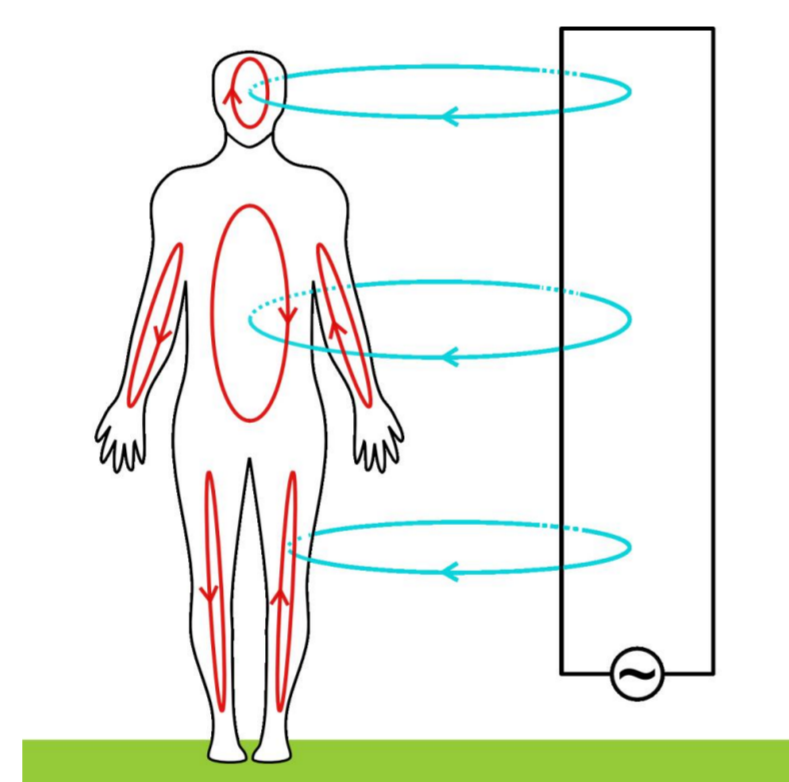
At present, the legal basis for the protection of workers against risks arising from EMF in Germany is the *German Occupational Safety Act (Arbeitsschutzgesetz)* [5] in conjunction with the *Accident Prevention Regulation DGUV 15 "Electromagnetic Fields"* [6] (formerly *Unfallverhütungsvorschrift BGV B11*) of the German Statutory Accident Insurance (Deutsche Gesetzliche Unfallversicherung - DGUV). The Directive 2013/35/EU is going to be implemented into German national legislation [7] by the *Occupational Safety and Health Ordinance on Electromagnetic Fields - the EMF-Ordinance (Verordnung zum Schutz der Beschäftigten vor Gefährdungen durch elektromagnetische Felder)*. The German Federal Ministry of Labour and Social Affairs (BMAS) is responsible for the implementation of the EMF-Directive. The implementation of the Directive is supported by an EMF expert group of the BMAS and the Advisory Board, in which all relevant stakeholders are involved. The EMF-Ordinance will be binding upon any risks resulting from the exposure to EMF at workplaces.

## EMF-Ordinance

The new EMF-Ordinance covers all known direct and indirect effects resulting from the exposure to static electric, static magnetic and time-varying electric, magnetic and electromagnetic fields with frequencies up to 300 GHz.

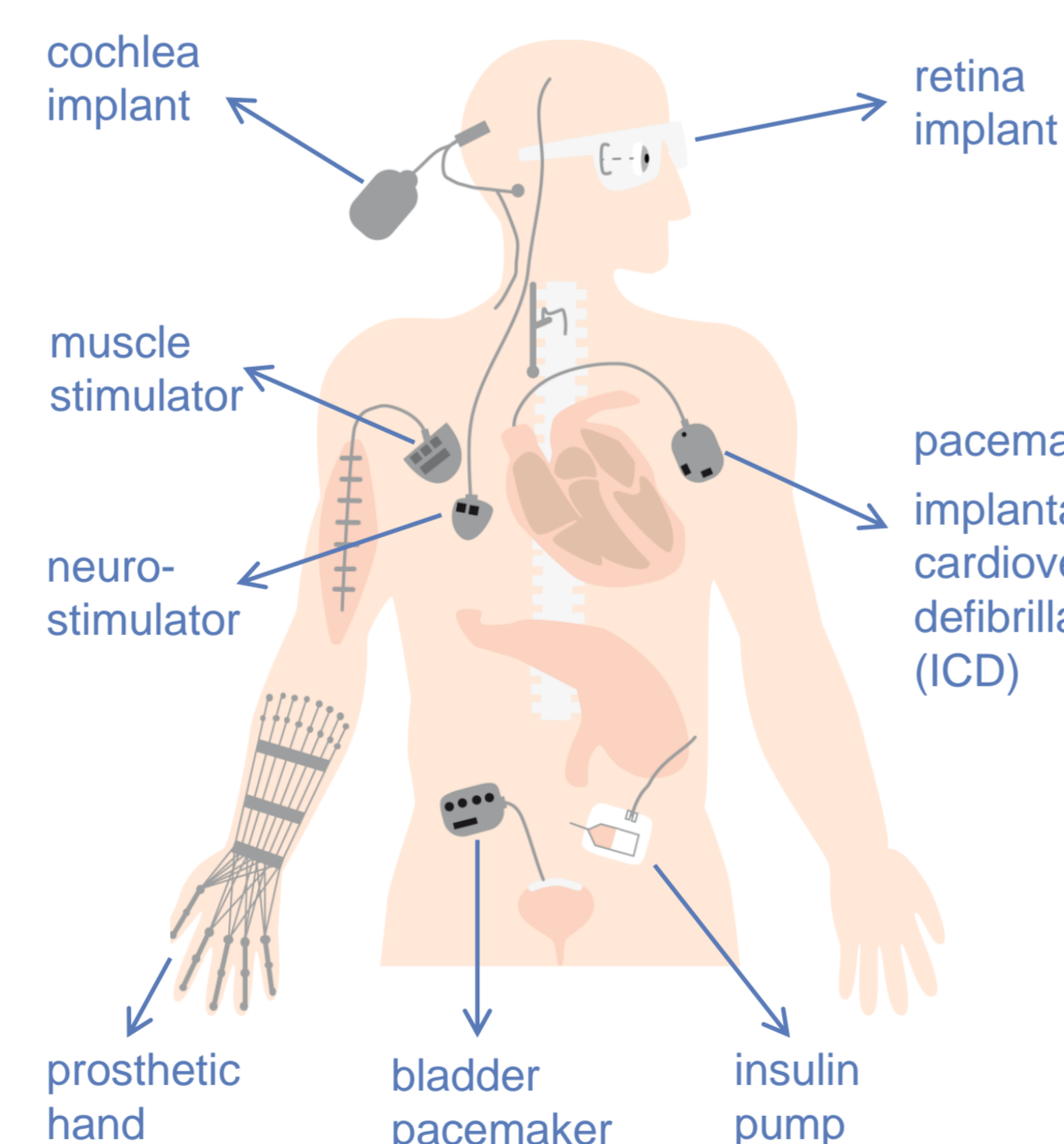
### ➤ Direct effects, such as

- electrophysiological effects – stimulation of muscles, nerves or sensory organs,
- thermal effects (tissue heating due to energy absorption from electromagnetic fields in the tissue or due to induced currents);



### ➤ Indirect effects, such as

- interference with medical electronic equipment and devices, including cardiac pacemakers and other active and passive implants or medical devices worn on the body,
- the projectile risk from ferromagnetic objects in static magnetic fields,
- contact currents caused by touching grounded objects.

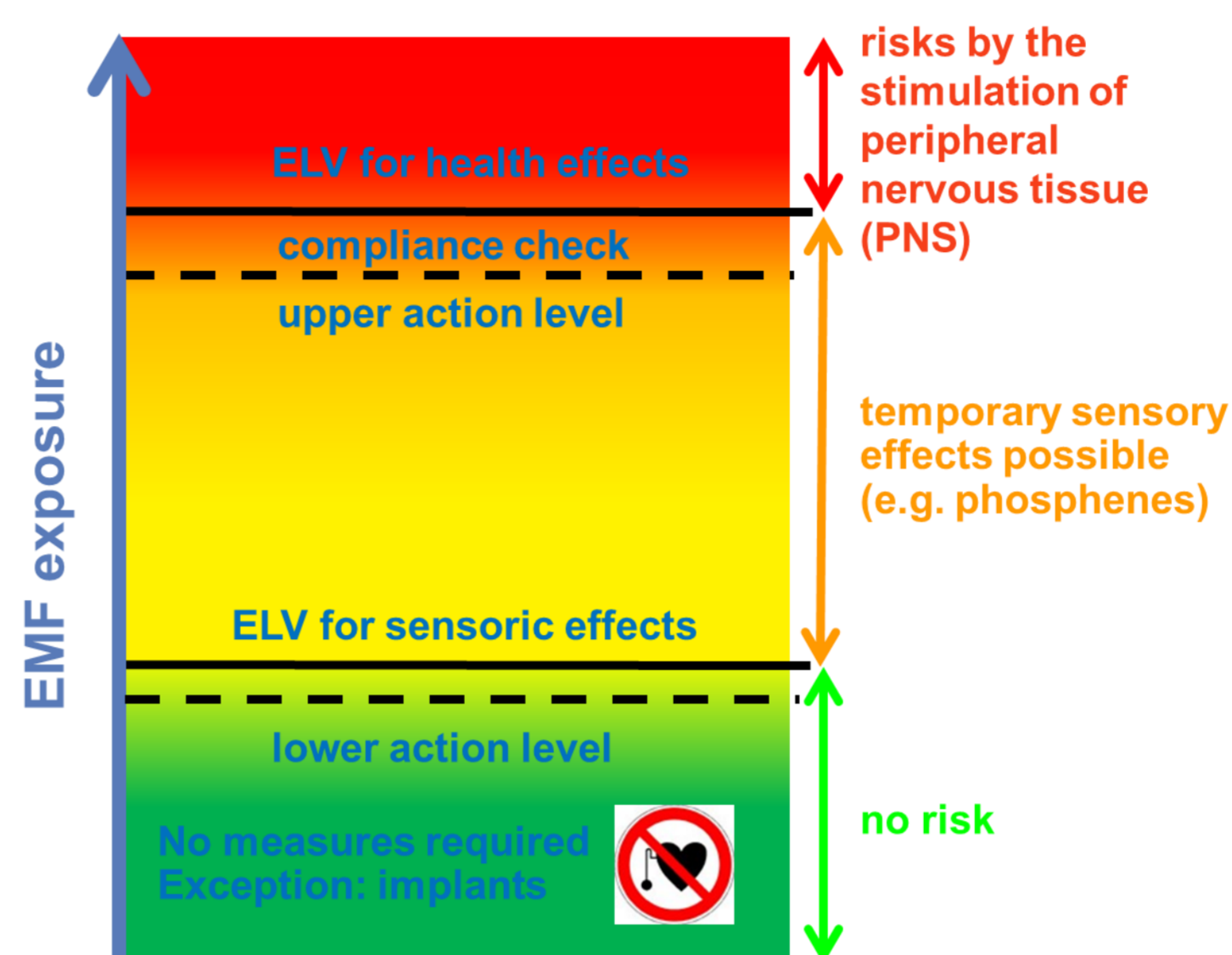


The EMF-Ordinance will be similar in structure to current occupational safety and health ordinances on noise, vibrations and artificial optical radiation. However, because of a slightly higher level of detail of the Directive 2013/35/EU, the operative part and the annexes to the EMF-Ordinance will be more detailed and more specific, too. In addition to the general provisions on the scope of application, definitions and rules on instruction and exceptions, the EMF-Ordinance will also contain the principles for carrying out risk assessment and concrete actions.

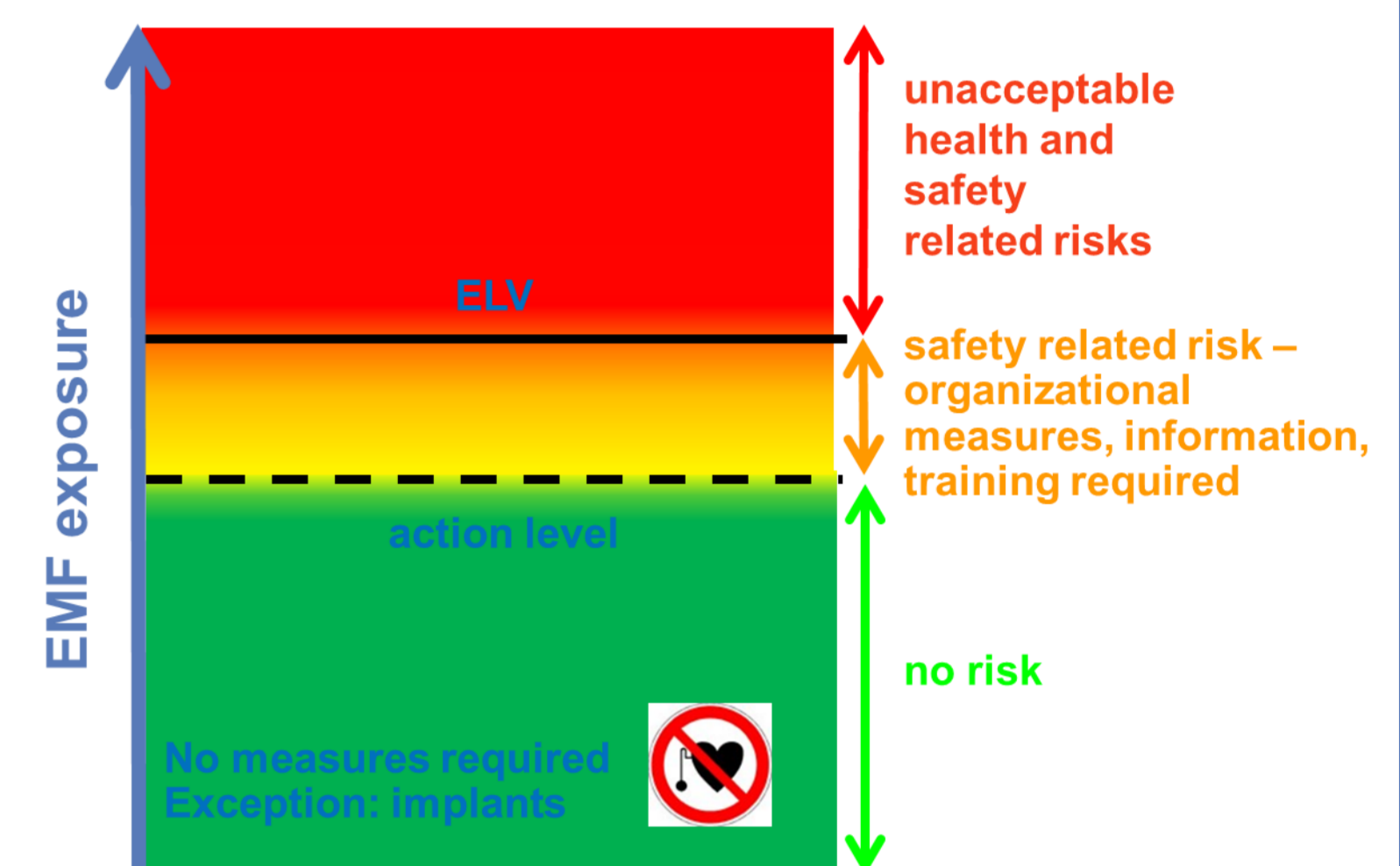
Just as in occupational safety and health ordinances on noise, vibrations and artificial optical radiation, the state-of-the-art for measurements, calculations, assessment procedures, as well as the definition and implementation of protective measures will play an equally important role. For assessment of non-sinusoidal or pulsed electromagnetic fields in the low-frequency range, aside of the Weighted Peak Method recommended by the Directive 2013/35/EU, also a time-domain method (*Zeitbereichs-Bewertungs-Methode*) described in [2, 8] will be possible to apply.

## Exposure Limit Value (ELV) Concept

### Low-frequency range ( $f < 400$ Hz)



### Low-frequency range ( $f > 400$ Hz) and high-frequency range



## Technical Rules for the EMF-Ordinance

Subsequently, in order to improve the comprehensibility and usability of the EMF-Ordinance, Technical Rules will be developed, which will describe the current state-of-the-art, occupational medicine and occupational hygiene and explain in detail the obligations of employers. The BMAS will assign this task to the Advisory Committee on Operational Safety (Ausschuss für Betriebssicherheit - ABS). Technical Rules will be officially published in Germany and will provide presumption of conformity with the provisions of the EMF-Ordinance upon application. With the new EMF-Ordinance and associated Technical Rules, the *DGUV 15 "Electromagnetic Fields"* will be repealed.

The Technical Rules will clarify indeterminate legal terms and illustrate specialist technical terms. Detailed information on risk assessment of EMF at the workplace, the evaluation of measurement results and calculations, provisions on health surveillance, prevention and protection measures as well as the implementation of instruction and training of employees will be given. Indirect effects of EMF and the possible effects of EMF at work on specific groups of workers at particular risk, such as wearers of implanted medical devices, will also be considered.

Two Technical Rules, one related to hazards in the low-frequency range and the other one related to the high-frequency range will be developed. The Technical Rules will take into account the *Accident Prevention Regulation DGUV 15 "Electromagnetic Fields"*, as well as the BMAS reports *FB 400 "Electromagnetic fields at workplaces"* [9], *FB 451 "Electromagnetic fields at workplaces - Safety of employees with active and passive medical implants exposed to electromagnetic fields"* [10] and *FB 457 "Electromagnetic fields at workplaces - Assessment of non-sinusoidal and pulsed fields"* [8].

In order to ensure a generally accepted and sustainable approach with practicable methods, all stakeholders - such as representatives of employers, employees, accident insurance associations, of OSH institutions of the federal states and of the scientific community - will be involved in the process of development of Technical Rules.

## References

- [1] Directive 2013/35/EU of the European Parliament and of the Council of 2 June 2013 on the minimum health and safety requirements regarding the exposure of workers to the risks arising from physical agents (electromagnetic fields) (20th individual Directive within the meaning of Article 16(1) of Directive 89/391/EEC) and repealing Directive 2004/40/EC
- [2] Non-binding guide to good practice for implementing Directive 2013/35/EU Electromagnetic Fields - Volume 1 - Practical guide
- [3] Non-binding guide to good practice for implementing Directive 2013/35/EU Electromagnetic Fields - Volume 2 - Case studies
- [4] Non-binding guide to good practice for implementing Directive 2013/35/EU Electromagnetic Fields - Guide for SMEs
- [5] Act on the Implementation of Measures of Occupational Safety and Health to Encourage Improvements in the Safety and Health Protection of Workers at Work (Arbeitsschutzgesetz, ArbSchG)
- [6] DGUV Vorschrift 15 - Elektromagnetische Felder (formerly BGV B11)
- [7] Hilpert, G.; Neuschulz, H.: „Nationale Umsetzung der EMF-Richtlinie in Deutschland“. *Strahlenschutzpraxis*, 4/2015
- [8] Heinrich, H.: „Elektromagnetische Felder am Arbeitsplatz - Bewertung nicht sinusförmiger und gepulster Felder. Teil 1: Anpassung der Zeitbereichs-Bewertungsmethode (ZBM) für „Gepulste Felder“ an die Rahmenbedingungen der Richtlinie 2013/35/EU“, FB 457, BMAS (2015)
- [9] Börner, F.; Brüggemeyer, H.; Eggert, S.; Fischer, M.; Heinrich, H.; Hentschel, K.; Neuschulz, H.: „Electromagnetic fields at workplaces“, FB 400, BMAS (2011)
- [10] Heinrich, H.; Börner, F.: „Elektromagnetische Felder am Arbeitsplatz - Sicherheit von Beschäftigten mit aktiven und passiven Körperhilfsmitteln bei Exposition gegenüber elektromagnetischen Feldern“ FB 451, BMAS (2014)