

**Ordinance
on Protection from Non-ionising Radiation
(NISV)**

of 23 December 1999

On the basis of Articles 12, paragraph 2, 13, paragraph 1, 16, paragraph 2, 38, paragraph 3 and 39, paragraph 1 of the Environmental Protection Act of 7 October 1983¹ and Article 3 of the Regional planning Act of 22 June 1979²,

The Swiss Bundesrat <Upper House>

hereby decrees:

Chapter 1: General Provisions

Article 1 Intended purpose

This Ordinance is intended to protect the general public from harmful or undesirable non-ionising radiation.

Article 2 Scope of validity

¹This Ordinance regulates:

- a. The control of emissions of electrical and magnetic fields with frequencies from 0 Hz to 300 GHz (radiation) which are generated during the course of operating stationary installations;
- b. The determination and evaluation of radiation emissions;
- c. The requirements relating to the setting aside of construction zones.

²It shall not regulate the delimitation of radiation emissions which are generated:

- a. In plants where the radiation impacts the operating staff;
- b. From the medicinal application of medical products pursuant to the Medical Products Ordinance of 24 January 1996³;
- c. From military installations, insofar as the radiation impacts members of the Armed Forces;
- d. From electrical equipment such as microwave ovens, stoves, power tools or mobile phones.

³Furthermore, it shall not regulate the limitation of the effects of radiation on electrical or electronic medical aids such as pacemakers.

¹ SR 814.01

² SR 700

³ SR 819.124

Article 3 Terminology

¹Installations shall be deemed "old" if the ruling enabling the construction work or the commencement of operation was legally valid at the time of this Ordinance's entry into force.

²Installations shall be deemed "new" if:

- a. The ruling enabling the construction work or the commencement of operation was not yet legally valid at the time of this Ordinance's entry into force;
- b. They are relocated to another site; or
- c. They are replaced at the current site, with the exception of railways and tramways (Appendix 1, point 5).

³The following shall be deemed "sensitive use locations":

- a. Rooms in buildings which are regularly occupied for significant periods of time;
- b. Public or private children's playgrounds which have been designated as such under regional planning laws.
- c. Areas of undeveloped land where the forms of utilisation defined under letters a and b are permitted.

⁴Measures to limit emissions shall be deemed "technically and operationally feasible" where:

- a. They have been successfully tested on comparable installations at home or abroad; or
- b. They have been successfully used in trials and may be applied to other installations in accordance with the technical rules.

⁵Measures to control emissions shall be deemed "financially viable" where these can reasonably be expected of an average, financially healthy company in that industry. If there are a wide range of size categories in a given industry, then an average company in the relevant size category shall be used as a basis.

⁶"Plant limit" refers to an emission limit for radiation generated by one individual plant.

⁷"Contact current" is the electrical current which flows when a person comes into contact with a conductive object not connected to a voltage source which is charged by an electrical or magnetic field.

⁸"Induced discharge current flowing through the human body" is the electrical current which is discharged to earth from a person standing in an electric field without having touched a conductive object.

⁹"Effective radiated power (ERP)" is the power delivered to a transmitting antenna, multiplied by the factor of gain in a specified direction of radiation, with reference to the half-wave dipole.

Chapter 2: Emissions

Section 1: Common provisions for new and old installations

Article 4 Precautionary emission control

¹Installations must be built and operated to comply with the precautionary emission controls specified in Appendix 1.

²In the case of installations not covered by the provisions of Appendix 1, the Authority shall prescribe emission controls to the extent which is technically and operationally feasible and financially viable.

Article 5 Additional and more stringent emission controls

¹If it is clear or foreseeable that one or more of the emission limits pursuant to Appendix 2 will be exceeded by a single installation or several installations combined, the Authority shall prescribe additional or more stringent emission controls.

²It shall prescribe additional or more stringent emission controls until the emission limits are met.

³If it is clear or foreseeable that the emission limit for contact current pursuant to Appendix 2 points 13 or 225 will be exceeded upon contact with conductive objects, the measures prescribed by the Authority shall primarily relate to these objects.

Section 2: Special provisions for new installations

Article 6

If a new installation is modified after commissioning as per the definition of Appendix 1, the regulations governing emission control in new installations shall apply.

Section 3: Special provisions for old installations

Article 7 Obligation to modernise

¹The Authority shall ensure that old installations which fail to meet the requirements outlined in Articles 4 and 5 are modernised.

²It shall issue the necessary orders, stating the time limit for modernisation pursuant to Article 8. If necessary, it shall decree operating restrictions or the shutdown of the plant for the duration of the modernisation work.

³Modernisation may be waived provided the owner undertakes to shut down the installation within the specified time limit for modernisation.

Article 8 Time limit for modernisation

¹The time limit for implementing precautionary emission controls shall be based on the provisions of Appendix 1. If Appendix 1 does not contain any provisions in this respect, then a maximum time limit of five years shall apply. Upon request, the Authority may extend the

time limit by a maximum of 50% if it would not be financially viable to implement the emission controls within the regular time limit.

²In the case of additional or more stringent emission controls, the maximum time limit for modernisation shall be three years. The Authority may specify shorter time limits, but no less than three months, provided the measures may be implemented without major investments.

Article 9 Modification of old installations

¹If an old installation as per the definition in Appendix 1 is modified, the following requirements must be met in the authoritative operating state:

- a. At sensitive use locations where the plant limit was exceeded prior to the modification, the magnetic flux density or electrical field strength must not be allowed to increase.
- b. At other sensitive use locations, the plant limit pursuant to Appendix 1 must not be exceeded.

²The Authority may authorise exemptions pursuant to the provisions of Appendix 1.

Section 4: Co-operation and control

Article 10 Obligation to co-operate

Upon request, the owner of a plant is obliged to submit to the Authority the necessary information required for implementation - namely, the data pursuant to Article 11, paragraph 2. If necessary, he must carry out measurements and other clarification measures or acquiesce to these.

Article 11 Obligation to notify

¹The owner of an installation for which emission limits are specified in Appendix 1 must submit to the Authority a site data sheet by way of the authorisation or licensing procedure if the installation is re-constructed, relocated to a different site, replaced at the existing site or modified in accordance with the definition in Appendix 1. Interior electrical installations are exempt from this (Appendix 1, point 4).

²The site data sheet must contain the following information:

- a. The current and planned technical and operational data for the installation where relevant to the generation of radiation
- b. The authoritative operating state pursuant to Appendix 1
- c. Details of the radiation generated by the installation
 1. At the publicly accessible location where radiation is at its most powerful
 2. At the three sensitive use locations where radiation is at its most powerful
 3. At all sensitive use locations where the plant limit pursuant to Appendix 1 is exceeded
- d. A location diagram showing the information pursuant to letter c.

Article 12 Control

¹The Authority shall monitor compliance with the emission controls.

²In order to control compliance with the plant limit pursuant to Appendix 1, it shall itself perform measurements or calculations, have these performed on its behalf, or shall rely upon the investigations of third parties. The Federal Office for the Environment, Forestry and Agriculture (BUWAL) shall recommend suitable measurement and calculation methods.

³If the plant limit pursuant to Appendix 1 is exceeded in the case of new or modified installations on the basis of permitted exemptions, the Authority shall measure the radiation generated by these plants at regular intervals or have it measured on its behalf. Within six months of commissioning, it shall check whether:

- a. The operational data on which the order is based is accurate; and
- b. The instructions issued are being followed.

Chapter 3: Emissions

Article 13 Validity of the emission limits

¹The emission limits pursuant to Appendix 2 must be met at all publicly accessible points.

²They shall only apply to radiation which affects the entire human body in equal measure.

Article 14 Measuring emissions

¹The Authority shall measure emission levels if there is reason to suppose that emission limits pursuant to Appendix 2 are being exceeded.

²To this end, it shall perform measurements or calculations, have them performed on its behalf, or rely on the investigations of third parties. The BUWAL shall recommend suitable measurement and calculation methods.

³When measuring radiation in operational premises, emissions from in-house sources shall be disregarded.

⁴Emissions shall be determined in the form of electrical field strength, magnetic field strength, magnetic flux density, induced discharge current flowing through the human body or contact current for the operating status of the installation at which they are highest.

⁵Where an averaging time is specified in Appendix 2, the emissions occurring during the averaging time shall be determined in the form of a root mean square; otherwise, the highest actual level shall be decisive.

Article 15 Evaluating the emissions

The Authority shall evaluate whether the emissions exceed one or more of the emission limits pursuant to Appendix 2.

Chapter 4: Requirements relating to the setting aside of construction zones

Article 16

Construction zones may only be set aside in areas where the plant limits pursuant to Appendix 1 from existing and future installations in accordance with regional planning specifications are or can be met subject to planning or structural measures.

Chapter 5: Concluding provisions

Section 1: Implementation

Article 17: Implementation by the Cantons

The Cantons shall implement this Ordinance subject to the proviso of Article 18.

Article 18: Implementation by the Federal Government

If the Federal Authorities apply other federal laws or international agreements affecting the subject of this Ordinance, this Ordinance will thus likewise be implemented by them. Article 41, paragraphs 2 and 4 of the Act shall apply to the co-operation of the BUWAL and the Cantons; statutory obligations to secrecy shall be reserved.

Article 19: Co-ordinating authority

¹In cases where several installations are jointly responsible for exceeding the emission limits pursuant to Appendix 2 and where different authorities are responsible for the implementation of this Ordinance at those installations, the Authorities involved shall designate one Authority to be responsible for co-ordination.

²The co-ordinating Authority shall follow the principles of co-ordination as defined in the Regional Planning Act of 22 June 1979.

Section 2: Transitional provisions and entry into force

Article 20: Transitional provisions

The Authority shall issue the modernisation order pursuant to Article 7 within two years of this Ordinance's entry into force. In this respect, it shall make due allowance for the urgency of modernisation. For non-urgent cases, the two-year time limit may be exceeded in exceptional circumstances.

Article 21: Entry into force

This Ordinance shall enter into force on 1 February 2000.

23 December 1999

On behalf of the Swiss *Bundesrat* <Upper House>

Federal President: Ruth Dreifuss

Federal Chancellor: François Couchepin

Precautionary emission controls

1 Overhead and underground cables for the transmission of electrical power

11 Scope of validity

¹The provisions under this point apply to the following installations with a rated voltage of at least 1000 V:

- a. Overhead alternating current lines
- b. Underground alternating current lines with single-conductor cables in separate pipes.

²Point 5 applies to the overhead cable systems of railways.

12 Terminology

¹A phase conductor is a single, live conductor.

²A cable phase comprises all phase conductors belonging to the same circuit. For three-phase systems, these are the three phase conductors R, S and T, and for single-phase systems the two phase conductors U and V.

³A cable refers to the totality of all phase and earth conductors on a supporting structure or in an underground cable system. This may comprise one or more cable phases.

⁴Within the section of cable under evaluation, the term "installation" shall refer to all cables within close proximity of one another.

⁵The cable transmission route is the area beneath an overhead cable or above an underground cable. It is delimited at the sides by the outermost phase conductors.

⁶A modification to an installation shall refer to any modification to the conductor arrangement, phase assignment or authoritative operating state.

13 Authoritative operating state

¹The authoritative operating state of the installation shall refer to the simultaneous operation of all cable phases, whereby each conductor phase is operated:

- a. With its thermal current limit at 40°C and
- b. In the most frequently occurring direction of load flow.

²If the planning permission order specifies a maximum current value other than the thermal current limit, then this value may be used as a basis when determining the authoritative operating state.

14 Plant limit

The plant **limit** for the **actual value of the magnetic flux density is 1 μ T**.

15 New installations

¹New installations must meet the plant limit in their authoritative operating state at sensitive use locations.

²The Authority may authorise exemptions, provided the owner of the installation is able to prove that:

- a. Phase assignment has been optimised in such a way that the magnetic flux density outside of the cable transmission route is minimised in the authoritative operating state; and
- b. All other measures have been taken to limit radiation, provided these are technically and operationally feasible and financially viable, such as a different location, an alternative conductor arrangement, cabling or shielding.

16 Old installations

¹If the radiation generated by the installation in the authoritative operating state exceeds the plant limit at sensitive use locations, phase assignment must be optimised in such a way as to minimise magnetic flux density at these locations.

²The maximum time limit for modernisation pursuant to Article 8, paragraph 1 shall be three years.

17 Modification of old installations

If an old installation is modified, the Authority may authorise exemptions to the requirements outlined in Article 9, paragraph 1, provided the owner of the installation can prove that the conditions of point 15, paragraph 2 are met.

2 Transformer stations

21 Scope of validity

The provisions of this point shall apply to installations for the transformation of high voltage to low voltage.

22 Terminology

¹Installation shall refer to the current-carrying parts of a transformer station, including the low voltage connections and the low voltage distributor.

²An increase in the rated voltage shall constitute a modification to an installation.

23 Authoritative operating state

Operation at the rated output shall constitute the authoritative operating state.

24 Plant limit

The plant **limit** for the actual value of the magnetic flux density is **1 μ T**.

25 New and old installations

¹New and old installations must meet the plant limit in their authoritative operating state at sensitive use locations.

²The Authority may authorise exemptions, provided the owner of the installation is able to prove that all technically and operationally feasible and financially viable measures have been taken to limit radiation, such as a different location or shielding.

3 Substations and switching stations

31 Scope of validity

The provisions of this point apply to installations for transformation between two different high voltage levels as well as high voltage switching stations.

32 Terminology

¹"Installation" shall refer to those parts of a substation or switching station which are carrying high voltage.

²"Modification" shall refer to an increase in the rated output, or the relocation or expansion of parts carrying high voltage.

33 Authoritative operating state

Operation at the rated output shall constitute the authoritative operating state.

34 Plant limit

The plant **limit** for the actual value of the magnetic flux density is **1 μ T**.

35 New and old installations

¹New and old installations must meet the plant limit in their authoritative operating state at sensitive use locations.

²The Authority may authorise exemptions, provided the owner of the installation is able to prove that all technically and operationally feasible and financially viable measures have been taken to limit radiation, such as a different location or shielding.

36 Modification of old installations

If an old installation is modified, the Authority may authorise exemptions to the requirements outlined in Article 9, paragraph 1, provided the conditions of point 35, paragraph 2 are met.

4 Interior electrical installations

41 Scope of validity

The provisions under this point apply to interior installations as defined in Article 16 of the Electricity Act of 24 June 1902⁴, with the exception of permanently connected and stationary plug-in products.

42 New installations

New interior installations must be implemented in accordance with the recognised best available technology. In particular, the following measures must be taken:

- a. Supply lines from distributor boards should be arranged in a star configuration wherever possible.
- b. Loops in supply lines are to be avoided.
- c. Main distribution systems must not be laid in the vicinity of sleeping areas.

5 Railways and trams

51 Scope of validity

The provisions of this point apply to railways and trams which are operated with alternating current.

52 Terminology

¹The term "installation" shall refer to the contact line system as defined in Article 3 of the Ordinance of 5 December 1994⁵ on electrical rail installations and traction return conductors.

²Expanding the number of tracks shall constitute a modification.

53 Authoritative operating state

Operation with passenger and goods trains as per the timetable shall constitute the authoritative operating state.

⁴ SR 734.0

⁵ SR 734.42

54 Plant limit

The plant **limit** for the actual value of magnetic flux density is **1 μ T**, measured as the mean over 24 hours.

55 New installations

¹New installations must meet the plant limit in their authoritative operating state at sensitive use locations.

²The Authority may authorise exemptions, provided the owner of the installation is able to prove that:

- a. The installation is equipped with a return conductor as close as possible to the contact wire; and
- b. All other technically and operationally feasible and financially viable measures have been taken to limit radiation, such as a different location or shielding.

56 Old installations

If the radiation generated by the installation in the authoritative operating state exceeds the plant limit in sensitive use locations, the installation must be equipped with a return conductor as close as possible to the contact wire.

57 Modification of old installations

If an old installation is modified, the Authority may authorise exemptions to the requirements outlined in Article 9, paragraph 1, provided the conditions of point 55, paragraph 2 are met.

6 Transmission stations for mobile telephones and wireless subscriber lines

61 Scope of validity

¹The provisions under this point shall apply to the transmission stations of cellular mobile communications networks and transmission stations for wireless subscriber lines with a total effective radiated power (ERP) of at least 6 W.

²They shall not apply to radio relay systems.

62 Terminology

¹The term "installation" shall apply to all transmitting antennae for radio communication services as defined under point 61 which are mounted on the same mast or in close proximity to one another, namely on the roof of the same building.

²Any increase in the maximum effective radiated power (ERP) or change in transmission directions shall constitute a modification.

63 Authoritative operating state

The authoritative operating state shall be defined as the maximum voice and data traffic at maximum transmission output.

64 Plant limit

The plant limit for the actual value of the electrical field strength is as follows:

- a. For installations which transmit solely within a frequency range of approximately 900 MHz: 4.0 V/m;
- b. For installations which transmit solely within a frequency range of approximately 1800 MHz or a higher frequency range: 6.0 V/m;
- c. For installations which transmit in frequency ranges as defined under both letter a and letter b: 5.0 V/m.

65 New and old installations

New and old installations must meet the plant limit in their authoritative operating state at sensitive use locations.

7 Transmission stations for broadcasting and other radio applications

71 Scope of validity

¹The provisions under this point apply to transmission stations for broadcasting and other radio applications having a total effective radiated power (ERP) of at least 6 W and which transmit from the same location for at least 800 hours per year.

²They do not apply to radio communication services as defined under point 6 or to radio relay systems.

72 Terminology

¹The term "installation" shall apply to all transmitting antennae for radio applications as defined under point 71 which are mounted on the same mast or in close proximity to one another.

²Any increase in the maximum effective radiated power (ERP) or change in transmission directions shall constitute a modification.

73 Authoritative operating state

Operation at the maximum transmission output shall constitute the authoritative operating state.

74 Plant limit

The plant limit for the actual value of the electrical field strength is as follows:

- a. For long-wave and medium-wave transmitters: 8.5 V/m;

- b. For all other transmission stations: 3.0 V/m.

75 New and old installations

¹New and old installations must meet the plant limit in their authoritative operating state at sensitive use locations.

²The Authority may authorise exemptions, provided the owner of the installation is able to prove that:

- a. The installation is operated at the lowest transmission output necessary in order to meet the envisaged purpose of the installation; and
- b. All other technically and operationally feasible and financially viable measures to limit radiation have been taken, such as a different location or shielding.

76 Modification of old installations

If an old installation is modified, the Authority may authorise exemptions to the requirements outlined in Article 9, paragraph 1, provided the conditions of point 75, paragraph 2 are met.

8 Radar installations

81 Scope of validity

The provisions under this point apply to radar transmission stations having a total effective radiated power (ERP) of at least 6 W and which transmit from the same location for at least 800 hours per year.

82 Terminology

¹The term "installation" shall refer to all radar transmitting antennae in close proximity to one another.

²Any increase in the maximum effective radiated power (ERP) or change in transmission directions or sampling cycles shall constitute a modification.

83 Authoritative operating state

Authoritative operating state shall refer to the monitoring of the envisaged air space with the maximum transmission output.

84 Plant limit

The plant limit for the actual value of the electrical field strength is 5.5 V/m, measured as the mean value during a complete sampling cycle.

85 New and old installations

¹New and old installations must meet the plant limit in their authoritative operating state at sensitive use locations.

²The Authority may authorise exemptions, provided the owner of the installation is able to prove that:

- a. The installation is operated with the lowest transmission output necessary in order to meet the envisaged purpose of the installation; and
- b. All other technically and operationally feasible and financially viable measures to limit radiation have been taken, such as a different location or shielding.

86 Modification of old installations

If an old installation is modified, the Authority may authorise exemptions to the requirements outlined in Article 9, paragraph 1, provided the conditions of point 85, paragraph 2 are met.

Emission limits**1 Emissions with a single frequency****11 Emission limits for field variables**

¹The emission limits for the actual value of the electrical field strength, the magnetic field strength and the magnetic flux density are as follows:

Frequency	Emission limit for the actual value of			Averaging time (minutes)
	Electrical field strength $E_{G,f}$ (V/m)	Magnetic field strength $H_{G,f}$ (A/m)	Magnetic flux density $B_{G,f}$ (μ T)	
< 1 Hz	--	32 000	40 000	-- ⁶⁾
1 - 8 Hz	10 000	$32\,000 / f^2$	$40\,000 / f^2$	-- ⁶⁾
8 - 25 Hz	10 000	$4000 / f$	$5000 / f$	-- ⁶⁾
0.025 - 0.8 kHz	$250 / f$	$4 / f$	$5 / f$	-- ⁶⁾
0.8 - 3 kHz	$250 / f$	5	6.25	-- ⁶⁾
3 - 100 kHz	87	5	6.25	-- ⁶⁾
100 - 150 kHz	87	5	6.25	6
0.15 - 1 MHz	87	$0.73 / f$	$0.92 / f$	6
1 - 10 MHz	$87 / \sqrt{f}$	$0.73 / f$	$0.92 / f$	6
10 - 400 MHz	28	0.073	0.092	6
400 - 2000 MHz	$1.375 \cdot \sqrt{f}$	$0.0037 \cdot \sqrt{f}$	$0.0046 \cdot \sqrt{f}$	6
2 -10 GHz	61	0.16	0.20	6
10 - 300 GHz	61	0.16	0.20	$68 / f^{1.05}$

f stands for frequency in the unit specified in the first column of the table.

⁶ The highest actual value shall be decisive (Article 14, paragraph 5)

²In addition to paragraph 1, in the case of pulsed emissions, the following emission limits apply to the actual value of electrical field strength, magnetic field strength and magnetic flux density as an average over the pulse duration :

Frequency	Emission limit for the actual value of			Averaging time
	Electrical field strength $E_{P,f}$ (V/m)	Magnetic field strength $H_{P,f}$ (A/m)	Magnetic flux density $B_{P,f}$ (μ T)	
10 - 400 MHz	900	2.3	2.9	Pulse duration
400 - 2000 MHz	$44 \cdot \sqrt{f}$	$0.12 \cdot \sqrt{f}$	$0.15 \cdot \sqrt{f}$	Pulse duration
2 - 300 GHz	1950	5.1	6.4	Pulse duration

f refers to the frequency in MHz.

12 Emission limit for induced discharge current flowing through the human body

For frequencies between 10 and 110 MHz, the emission limit for the actual value of an electrical current discharged via an extremity of the body is 45 mA. The averaging time is 6 minutes.

13 Emission limit for contact current

The emission limit for the actual value of the contact current is:

Frequency	Emission limit for the actual value of the contact current $I_{B,G,f}$ (mA)
< 2.5 kHz	0.5
2.5 - 100 kHz	$0.2 \cdot f$
0.1 - 110 MHz	20

f refers to the frequency in kHz.

2 Emissions with multiple frequencies

21 Basic principles

¹If various frequencies occur simultaneously, the emissions are determined separately for each frequency.

²The frequencies determined in this way are weighted and summated in accordance with point 22 using a frequency-dependent factor.

³The emission limit for each of the totals calculated in accordance with point 22 is 1.

22 Summation requirements

Point	Frequency range	Physical factor	Summation requirements	Averaging time
221	1 Hz – 10 MHz	Electrical field strength	$\sum_{1\text{Hz}}^{1\text{MHz}} \frac{E_f}{E_{G,f}} + \sum_{>1\text{MHz}}^{10\text{MHz}} \frac{E_f}{87}$	-- ⁷⁾
		Magnetic field strength	$\sum_{1\text{Hz}}^{65\text{kHz}} \frac{H_f}{H_{G,f}} + \sum_{>65\text{kHz}}^{10\text{MHz}} \frac{H_f}{5}$	-- ⁷⁾
		Magnetic flux density	$\sum_{1\text{Hz}}^{65\text{kHz}} \frac{B_f}{B_{G,f}} + \sum_{>65\text{kHz}}^{10\text{MHz}} \frac{B_f}{6.25}$	-- ⁷⁾
222	100 kHz – 300 GHz	Electrical field strength	$\sqrt{\sum_{100\text{kHz}}^{1\text{MHz}} \left(\frac{E_f}{87}\right)^2 \cdot f + \sum_{>1\text{MHz}}^{300\text{GHz}} \left(\frac{E_f}{E_{G,f}}\right)^2}$	6 minutes
		Magnetic field strength	$\sqrt{\sum_{100\text{kHz}}^{1\text{MHz}} \left(\frac{H_f}{0.73}\right)^2 \cdot f^2 + \sum_{>1\text{MHz}}^{300\text{GHz}} \left(\frac{H_f}{H_{G,f}}\right)^2}$	6 minutes
		Magnetic flux density	$\sqrt{\sum_{100\text{kHz}}^{1\text{MHz}} \left(\frac{B_f}{0.92}\right)^2 \cdot f^2 + \sum_{>1\text{MHz}}^{300\text{GHz}} \left(\frac{B_f}{B_{G,f}}\right)^2}$	6 minutes
223	Additionally for pulsed emissions 10 MHz – 300 GHz	Electrical field strength	$\sqrt{\sum_{10\text{MHz}}^{300\text{GHz}} \left(\frac{E_f}{E_{P,f}}\right)^2}$	Pulse duration
		Magnetic field strength	$\sqrt{\sum_{10\text{MHz}}^{300\text{GHz}} \left(\frac{H_f}{H_{P,f}}\right)^2}$	Pulse duration
		Magnetic flux density	$\sqrt{\sum_{10\text{MHz}}^{300\text{GHz}} \left(\frac{B_f}{B_{P,f}}\right)^2}$	Pulse duration
224	10 MHz – 110 MHz	Induced discharge current flowing through the human body	$\sqrt{\sum_{10\text{MHz}}^{110\text{MHz}} \left(\frac{I_{K,f}}{45}\right)^2}$	6 minutes
225	1 Hz – 110 MHz	Contact current	$\sum_{1\text{Hz}}^{110\text{MHz}} \frac{I_{B,f}}{I_{B,G,f}}$	-- ⁷⁾

Summation occurs within the frequency range specified by the summation sign across all frequencies f where emissions occur simultaneously.

Key to symbols:

⁷ The highest actual values are decisive (Article 14, paragraph 5)

f	Frequency in MHz
E_f	Actual value of electrical field strength in V/m for frequency f
$E_{G,f}$	Emission limit for the actual value of electrical field strength in V/m at frequency f in accordance with point 11, paragraph 1
$E_{P,f}$	Emission limit for the actual value of electrical field strength in V/m at frequency f in accordance with point 11, paragraph 2
H_f	Actual value of magnetic field strength in V/m for frequency f
$H_{G,f}$	Emission limit for the actual value of magnetic field strength in A/m at frequency f in accordance with point 11, paragraph 1
$H_{P,f}$	Emission limit for the actual value of magnetic field strength in A/m at frequency f in accordance with point 11, paragraph 2
B_f	Actual value of magnetic field strength in μT at frequency f
$B_{G,f}$	Emission limit for the actual value of magnetic flux density in μT at frequency f in accordance with point 11, paragraph 1
$B_{P,f}$	Emission limit for the actual value of magnetic flux density in μT at frequency f in accordance with point 11, paragraph 2
$I_{K,f}$	Actual value of the electrical current discharged via an extremity of the body in mA at frequency f
$I_{B,f}$	Actual value of the contact current in mA at frequency f
$I_{B,G,f}$	Emission limit for the actual value of the contact current in mA at frequency f in accordance with point 13