SLOVENSKI STANDARD
oSIST prEN 50496:2017

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Ugotavljanje izpostavljenosti delavca elektromagnetnemu sevanju in ocena tveganja na mestu oddajnika

Determination of workers' exposure to electromagnetic fields and assessment of risk at a broadcast site

Ermittlung der Exposition von Arbeitnehmern gegenüber elektromagnetischen Feldern und Bewertung des Risikos am Standort eines Rundfunksenders

Détermination de l'exposition des travailleurs aux champs électromagnétiques et évaluation des risques sur un site de radiodiffusion

Ta slovenski standard je istoveten z: **prEN 50496**

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Determination of workers' exposure to electromagnetic fields and assessment of risk at a broadcast site

Détermination de l'exposition des travailleurs aux champs électromagnétiques et évaluation des risques sur un site de radiodiffusion

Ermittlung der Exposition von Arbeitnehmern gegenüber elektromagnetischen Feldern und Bewertung des Risikos am Standort eines Rundfunksenders

This draft European Standard is submitted to CENELEC members for enquiry.
Deadline for CENELEC: 2017-03-03.

It has been drawn up by CLC/TC 106X.

If this draft becomes a European Standard, CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

This draft European Standard was established by CENELEC in three official versions (English, French, German).
A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

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Recipients of this draft are invited to submit, with their comments, notification of any relevant patent rights of which they are aware and to provide supporting documentation.

Warning : This document is not a European Standard. It is distributed for review and comments. It is subject to change without notice and shall not be referred to as a European Standard.

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

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European foreword

This document (prEN 50496:2016) has been prepared by CLC/TC 106X “Electromagnetic fields in the human environment”.

This document is currently submitted to the Enquiry.

This document will supersede EN 50496:2008.

The main changes included in the prEN 50496:2016 with respect to EN 50496:2008 are consequential to the replacement of Directive 2004/40/EC by Directive 2013/35/EU.

This document has been prepared under a mandate given to CENELEC by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

1 Scope

This standard provides methods for assessing compliance with the requirements of the Directive 2013/35/EU] at a site operating one or more broadcast transmitters.

This standard covers the frequency range up to 40 GHz.

NOTE The Council and European Parliament Directive 2013/35/EU will be transposed into national legislation in all the EU member countries. Users of this standard shall consult the national legislation related to this transposition in order to identify the national regulations and requirements. These national regulations and requirements can have additional requirements that are not covered by this standard.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 50413, *Basic standard on measurement and calculation procedures for human exposure to electric, magnetic and electromagnetic fields (0 Hz - 300 GHz)*

EN 50420, *Basic standard for the evaluation of human exposure to electromagnetic fields from a stand alone broadcast transmitter (30 MHz - 40 GHz)*

EN 50475, *Basic standard for the calculation and the measurement of human exposure to electromagnetic fields from broadcasting service transmitters in the HF bands (3 MHz - 30 MHz)*

EN 50499, *Procedure for the assessment of the exposure of workers to electromagnetic fields*

EN 62226-2-1, *Exposure to electric or magnetic fields in the low and intermediate frequency range — Methods for calculating the current density and internal electric field induced in the human body — Part 2-1: Exposure to magnetic fields — 2D models (IEC 62226-2-1)*

EN 50527-1, *Procedure for the assessment of the exposure to electromagnetic fields of workers bearing active implantable medical devices — Part 1: General*

EN 50527-2-1, *Procedure for the assessment of the exposure to electromagnetic fields of workers bearing active implantable medical devices — Part 2-1: Specific assessment for workers with cardiac pacemakers*

EN 50554, *Basic standard for the in-situ assessment of a broadcast site related to general public exposure to radio frequency electromagnetic fields*

Council Recommendation 1999/519/EC of 12 July 1999 on the limitation of exposure of the general public to electromagnetic fields (0 Hz to 300 GHz) (Official Journal L 199 of 30 July 1999)

Directive 2013/35/EU of the European parliament and of the council of 26 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 of Directive 89/391/EEC)

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
action levels
action levels (ALs)' means operational levels established for the purpose of simplifying the process of demonstrating the compliance with relevant ELVs or, where appropriate, to take relevant protection or prevention measures specified in Directive 2013/35/EU

Note to entry 1: For electric fields, 'low ALs' and 'high ALs' means levels which relate to the specific protection or prevention measures specified in Directive 2013/35/EU.

Note to entry 2: For magnetic fields, 'low ALs' means levels which relate to the sensory effects ELVs and 'high ALs' to the health effects ELVs.

3.2
AIMD
Active Implantable Medical Device

3.3
antenna
device that serves as a transducer between a guided wave (e.g. coaxial cable) and a free space wave, or vice versa

3.4
near-field region
region generally in proximity to an antenna or other radiating structure, in which the electric and magnetic fields do not have a substantially plane-wave character, but vary considerably from point to point

Note to entry 1: The near-field region is further subdivided into the reactive near-field region, which is closest to the radiating structure and that contains most or nearly all of the stored energy, and the radiating near-field region where the radiation field predominates over the reactive field, but lacks substantial plane-wave character and is complicated in structure.

3.5
broadcasting service
radiocommunication service in which the transmissions are intended for direct reception by the general public

Note to entry 1: This service can include sound transmissions, television transmissions or other types of transmission, e.g. data.

3.6
broadcast site
site operating one or more broadcast transmitters

3.7
contact current
current flowing into the body resulting from contact with a conductive object in an electromagnetic field

Note to entry 1: This is the localized current flow into the body (usually the hand, for a light brushing contact).

Note to entry 2: Shocks and burns can be the adverse indirect effects.

Note to entry 3: Contact current relates to a short-term effect and cannot be time-averaged.

3.8
induced current
current flowing inside a human body resulting directly from an exposure to an electromagnetic field

3.9
Employer
any natural or legal person who has an employment relationship with the worker and has responsibility for the undertaking and/or establishment (Directive 89/391/EEC)

3.10
exposure limit values (ELVs)
limits on exposure to electromagnetic fields in Directive 2013/35/EU established on the basis of biophysical and biological considerations, in particular on the basis of scientifically well-established short-term and acute direct effects, i.e. thermal effects (SAR, Power density) and electrical stimulation of tissues (internal electric field):

— health effects ELVs: ELVs above which workers might be subject to adverse health effects, such as thermal heating or stimulation of nerve and muscle tissue;

— sensory effects ELVs: sensory effects ELVs apply to frequency ranges of 0 Hz to 400 Hz (magnetic field) and 0,3 GHz to 6 GHz (pulsed signals) and above which workers might be subjected to transient disturbed sensory perceptions and minor changes in brain functions

3.11
local safety instruction
safety instructions relating to a specific broadcast site and containing the information specified in Clause 8:

— it needs to include all the necessary safety-related indications and, if applicable, point out the possible risk of exposure to electromagnetic fields where these are at levels above the worker action levels;

— it could include all the necessary safety-related indications and, if applicable, point out the possible risk of exposure to electromagnetic fields where these are at levels above the limits for the general public

3.12
magnetic flux density
magnetic flux density (B) is a vector quantity resulting in a force that acts on moving charges, expressed in tesla (T)

Note to entry 1: In free space and in biological materials, magnetic flux density and magnetic field strength (H) can be interchanged using the magnetic field strength of H = 1 A/m equivalence to magnetic flux density of $B = 4\pi\ 10^{-7}$ T (approximately 1,25 microtesla).

3.13
power density
appropriate quantity used for very high frequencies, where the depth of penetration in the body is low

Note to entry 1: It is the radiant power incident perpendicular to a surface, divided by the area of the surface.

Note to entry 2: It is expressed in watt per square metre (W / m^2).

3.14
transmitter
device to generate the radio frequency broadcast signal which is fed into the antenna system

3.15
worker
any person employed by an employer, including trainees and apprentices but excluding domestic servants (Directive 89/391/EEC [7])

3.16
work place
location where workers have access as part of their duties

Note to entry 1: Particular place of work within the broadcast site as for example the area near a transmitter with an open enclosure, the area inside a transmitting antenna, on a ladder inside a broadcast mast / tower and platforms under and above the antennas, the area around feed lines, etc

4 Assessment methods

4.1 Worker exposure assessment

The assessment should be done using the steps outlined below:

– collection of technical data (Clause 5);

– determination of exposure levels by calculation or measurement (Clause 6). This includes checking of operating procedures in the different exposure work places (Clause 8).

The results of the assessment process are:

– zoning of exposure work places (Clause 7);

– information and training (Clause 9);

– assessment report (Clause 10).

In the case of simultaneous exposure to multiple sources, the combined exposure shall be considered, referring to Annex A.

4.2 Use of public exposure assessment

If an evaluation has already been undertaken in accordance with the provisions of Council Recommendation 1999/519/EC, and the restrictions as specified therein are respected, then the exposure limit values for workers of Directive 2013/35/EU are also met.

4.3 Assessment after technical modification

After a technical modification to the installation or the environment, it is necessary to consider repeating or revising the assessment. This is particularly necessary if an additional transmitter or antenna is added to a site.

5 Collection of technical data

Information on the following items may be needed:

– with regard to the surrounding area:

  - information on the nature of the field from any external sources should be obtained from the operators of those sources. Examples of useful information are the frequency, the radiated power, the type of service, and whether the transmissions are intermittent. However, it should be noted that much of the detailed information may be commercially sensitive;

– with regard to the site:

  - the area controlled e.g. information on property, fencing, where the controlled area is bounded;

  - the site map showing all facilities, e.g. buildings, towers, anchor cables, earth mat…;

  - the several areas:

    - where a public assessment has been carried out in compliance with Council Recommendation 1999/519/EC or national regulation;

    - where workers have access without specific care;

    - where workers only have access under specific circumstances;