SLOVENSKI STANDARD
SIST ETS 300 019-1-4/A1 E1:2006

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Inženiring opreme (EE) - Pogoji okolja in preskusi vpliva okolja na telekomunikacijsko opremo - Del 1-4: Klasifikacija pogojev okolja - Mirujoča (stacionarna) uporaba na lokaciji, nezaščiteni pred vremenskimi vplivi

Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-4: Classification of environmental conditions; Stationary use at non-weatherprotected locations

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ICS:

19.040	Preskušanje v zvezi z okoljem	Environmental testing
33.050.01	Telekomunikacijska terminalska oprema na splošno	Telecommunication terminal equipment in general

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AMENDMENT

ETS 300 019-1-4

A1

June 1997

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This amendment A1 modifies the European Telecommunication Standard ETS 300 019-1-4 (1992)

Equipment Engineering (EE); Environmental conditions and environmental tests for telecommunications equipment; Part 1-4: Classification of environmental conditions Stationary use at non-weatherprotected locations

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Foreword

This amendment to ETS 300 019-1-4 (1992) has been produced by the Equipment Engineering (EE) Technical Committee of the European Telecommunications Standards Institute (ETSI).

Transposition dates	
Date of adoption of this amendment:	20 June 1997
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Date of withdrawal of any conflicting National Standard (dow):	31 March 1997

Amendments

Contents

Add:

5.6 Earthquake conditions

Clause 2

Add the following references:

[5] IEC 721-2-6: "Environmental conditions appearing in nature - Earthquake vibration and shock".

[6] IEC 68-3-3: "Environmental testing - Part 3: Background information - Subpart 3: Guidance. Seismic test methods for equipment".

Clause 4

In subclause 4.1 after the second sentence, add:

Seismic environment: **zone 4** as defined in IEC 721-2-6 [5]. Option zone 4 (modified Mercalli scale ≥ 9): if earthquake conditions are specified by the customer, the conditions stated in subclause 5.6 apply.

Clause 5

After the end of subclause 5.5, add a new subclause:

5.6 Earthquake conditions

The dynamic environment which an equipment experiences during an earthquake depends on several parameters including the intensity of the ground motion and the characteristics of the structures used to support and/or house the equipment itself.

The conditions hereafter stated refer only to equipment mounted at ground level or on structures of high rigidity. Earthquake conditions for equipment mounted on pylons, poles and any other non-rigid structures can differ significantly. For equipment mounted on top of buildings using a structure of high rigidity, the conditions and tests stated in parts 1-3 and 2-3 of the present ETS apply.

The most common used way to specify seismic conditions is through the definition of a Response Spectrum (RS).

A RS is the graphical representation of the maximum responses (i.e. acceleration), of an array of single degree-of-freedom oscillators as a function of oscillator frequency, in response to an applied transient base motion.

In other words the RS may be used to describe the motion that equipment is expected to experience at its mounting during a postulated seismic event.

To define an RS it is necessary to define the postulated base motion and the characteristics of the array of the single degree-of-freedom oscillators, including their damping ratio.

The high frequency asymptotic value of the acceleration of the response spectrum is normally called *Zero Period Acceleration* (ZPA) and represents the largest peak value of acceleration of the base motion.

In absence of a detailed knowledge of the possible seismic motion, the ZPA value can be obtained by the following formula (see IEC 68-3-3, ref. [6]):

$$ZPA = a_f = a_g \times K \times D \times G$$

where:

a_f *floor acceleration;*

a_g *ground acceleration* that depends on the intensity of the earthquake;

K *superelevation factor* that takes into account the amplification of the ground acceleration resulting from the vibrational behaviour of buildings and structures;

D *direction factor* that takes into consideration possible intensity differences of the seismic motion between the horizontal and vertical axes;

G *geometric factor*, normally specified among testing parameters when single axis excitation is used for testing to take into account the interaction, due to installation location, along the different axes of the equipment of simultaneous multi-directional input vibrations.

The parameter severities that shall be used for classes 3.1 to 3.5 are shown in table 6.

The severities have been chosen among those stated in IEC Publication 68-3-3 [6].

Table 6: Earthquake parameters for class 4.1

Parameters	Description	Severity
earthquake intensity	strong to very strong earthquakes (Richter scale magnitude > 7, Modified Mercalli intensity scale > IX)	$a_g = 5$ m/s^2
superelevation factor	mounting of equipment on rigid foundations or on structures of high rigidity	$K = 1$ (1)
direction factor	no intensity differences among axes	$D_{xyz} = 1$
geometric factor	single-axis excitation with no interaction with the other axes	$G = 1$

NOTE 1: If the equipment is not mounted on structures of high rigidity, i.e. pylons, poles, etc., the structure should be included in the test, or a corrected Response Spectrum should be determined selecting the appropriate K value from those reported in IEC Publication 68-3-3 [6].

The corresponding Response Spectrum, assuming a damping ratio of the single degree-of-freedom oscillators N = 2 %, is described in figure 3 and table 7.

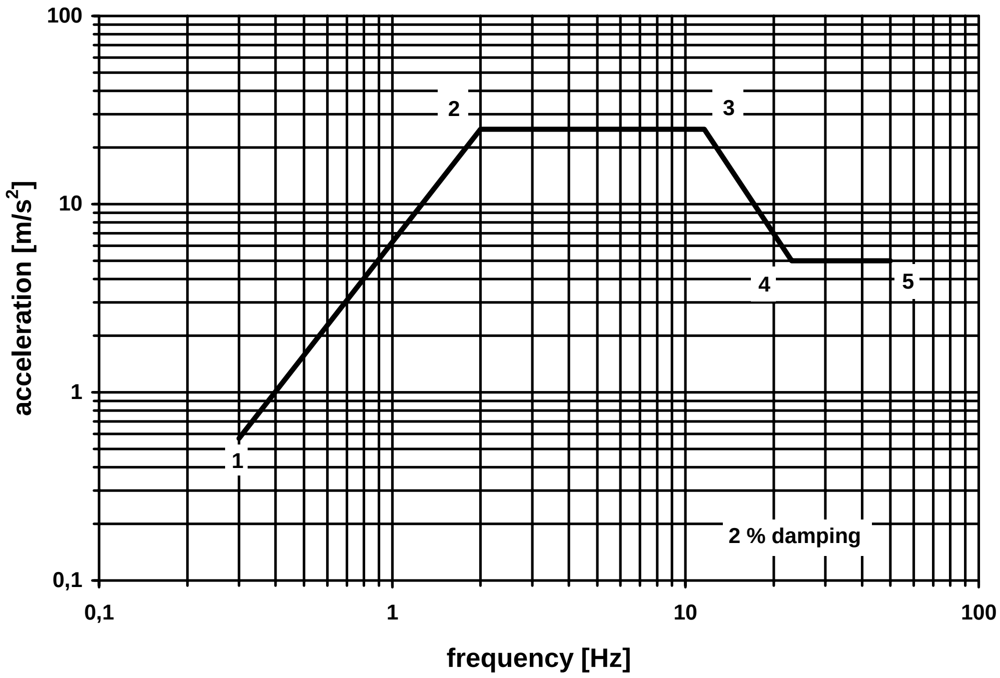

Figure 3: Earthquake Response Spectrum.

Table 7: Acceleration co-ordinates for the Response Spectrum

Co-ordinate point	Frequency [Hz]	Ground acceleration [m/s²]
1	0,3	0,57
2	2,0	25
3	11,6	25
4	23,0	5
5	50,0	5