SLOVENSKI STANDARD

SIST EN 50341-2-13:2017/A1:2018

01-junij-2018

Nadzemni električni vodi za izmenične napetosti nad 1 kV - 2-13. del: Nacionalna normativna določila (NNA) za Italijo (na podlagi EN 50341-1:2012) - Dopolnilo A1

Overhead electrical lines exceeding AC 1 kV - Part 2-13: National Normative Aspects (NNA) for ITALY (based on EN 50341-1:2012)

Ta slovenski standard je istoveten z: EN 50341-2-13:2017/A1:2017

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29.240.20	Daljnovodi	Power transmission and distribution lines

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 50341-2-13:2017/A1

June 2017

ICS 29.240.20

English Version

Overhead electrical lines exceeding AC 1 kV - Part 2-13: National Normative Aspects (NNA) for ITALY (based on EN 50341-1:2012)

This amendment A1 modifies the European Standard EN 50341-2-13:2017; it was approved by CENELEC on 2017-05-17.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Bulgaria, Croatia, Cyprus, the Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

CENELEC

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

CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels

Ref. No. EN 50341-2-13:2017/A1:2017 E

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European foreword

1. The Italian National Committee (NC) is identified by the following address:

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Committee 11/7 – Overhead electrical lines
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2. The Italian NC has prepared this Part 2-13/A1 (EN 50341-2-13/A1) listing the Italian National Normative Aspects Amendment 1 (NNA/A1) under its sole responsibility and duly passed this document through the CENELEC and CLC/TC 11 procedures.

   NOTE: The Italian NC takes sole responsibility for the technically correct co-ordination of this EN 50341-2-13/A1 with Part 2-13 (EN 50341-2-13:2017) and with Part 1 (EN 50341-1:2012). It has performed the necessary checks in the frame of quality assurance/control. However, it has been noted that this quality control has been already made in the framework of the general responsibility of a standards committee under the national laws/regulations.

3. This NNA/A1 is normative in Italy and informative for other countries.

4. This NNA/A1 shall be read in conjunction with Part 2-13 and Part 1. All clause numbers used in this NNA/A1 correspond to those of Part 2-13 and Part 1. Specific sub-clauses that are prefixed "IT" are to be read as amendments to the relevant text in Part 1 and Part2-13. Any necessary clarification regarding the application of NNA/A1 in conjunction with Part 2-13 and Part 1, shall be referred to the Italian NC who will, in co-operation with CLC/TC 11, clarify the explanations.

   Where no reference is made in this NNA/A1 to a specific sub-clause, then Part 1 shall apply.

5. In case of "boxed values" defined in Part 1, in Italy amended values (if any), which are defined in this NNA/A1, shall be taken into account.

   However no "boxed value" either defined in Part 1 or in this NNA/A1, can be modified in the direction of increased risk in the Project specifications.

6. The Italian National standards/regulations related to overhead electrical lines exceeding 1 kV AC are listed in subclause 2.1/IT.1 Part 1.

   NOTE: All national standards referred to in this NNA/A1 will be replaced by the relevant European Standards as soon as they become available and are declared by the Italian NC to be applicable and thus reported to the secretary of CLC/TC 11.

1 Modifications to 4.5.1 General

Replace:

Load type 2 (snow)

Regions: Valle d'Aosta, Piemonte, Liguria, Lombardia, Trentino Alto Adige, Emilia Romagna, Friuli Venezia Giulia, Veneto e Marche, Abruzzo, Molise, Toscana (with exclusion of the provinces of Livorno and Grosseto), Umbria, Lazio (with exclusion of the provinces of Viterbo, Roma and Latina), Campania (with exclusion of the provinces of Napoli and Caserta), Puglia (with exclusion of the provinces of Brindisi and Lecce), Basilicata, Calabria (with exclusion of the province of Reggio Calabria):

Snow density ρ_l = 500 kg/m³

S_k =24 mm for $a_s \leq 600$ m

S_k =24 + 20 (a_s - 600)/1000 mm for $a_s > 600$ m.

Load type 3 (snow)

Regions: Toscana (provinces of Livorno e Grosseto), Lazio (provinces of Viterbo, Roma and Latina); Campania (provinces of Napoli and Caserta), Puglia (provinces of Brindisi and Lecce), Sardegna, Calabria (province of Reggio Calabria), Sicilia:

Snow density ρ_l = 500 kg/m³

S_k = 0 mm for $a_s \leq 600$ m

S_k = 20 + 15 (a_s - 600) /1000 mm for $a_s > 600$ m

with:

Load type 2 (snow)

Regions: Valle d'Aosta, Piemonte, Liguria, Lombardia, Trentino Alto Adige, Emilia Romagna, Friuli Venezia Giulia, Veneto, Marche, Abruzzo, Molise, Toscana (with exclusion of the provinces of **Pisa**, Livorno and Grosseto), Umbria, Lazio (with exclusion of the provinces of Viterbo, Roma and Latina), Campania (with exclusion of the provinces of Napoli and Caserta), Puglia (with exclusion of the provinces of Brindisi and Lecce), Basilicata, Calabria (with exclusion of the **provinces** of **Vibo Valentia and** Reggio Calabria):

Snow density ρ_l = 500 kg/m³

S_k =24 mm for $a_s \leq 600$ m

S_k =24 + 20 (a_s - 600)/1000 mm for $a_s > 600$ m.

Load type 3 (snow)

Regions: Toscana (provinces **of Pisa**, Livorno **and** Grosseto), Lazio (provinces of Viterbo, Roma and Latina); Campania (provinces of Napoli and Caserta), Puglia (provinces of Brindisi and Lecce), Sardegna, Calabria (**provinces** of **Vibo Valentia and** Reggio Calabria), Sicilia:

Snow density ρ_l = 500 kg/m³

S_k = 0 mm for $a_s \leq 600$ m

S_k = 20 + 15 (a_s - 600) /1000 mm for $a_s > 600$ m

2 Modifications to 4.7 Temperature effects

Replace:

(snc) **IT.1 Temperature effects**

For the calculation of the tensile load on conductors and earth-wires, and of related forces transmitted to supports, as well as for geometrical verifications of height above ground for electrical clearances and insulating distances, the temperatures below reported shall apply:

a) EDS temperature (Every Day Stress) is 15°C: in this condition, in absence of wind, the tensile load of conductors shall not be greater than 25% of the breakage load.

On the basis of specific project conditions, to limit wind vibration effects, special attention should be paid to laying conditions when the parameter value (the ratio, between the horizontal tension and the mass per linear meter of conductor = 2000 m) is exceeded. Criteria and conditions of installation should be defined in project specifications.

with:

(snc) **IT.1 Temperature effects**

For the calculation of the tensile load on conductors and earth-wires, and of related forces transmitted to supports, as well as for geometrical verifications of height above ground for electrical clearances and insulating distances, the temperatures below reported shall apply:

a) EDS temperature (Every Day Stress) is 15°C: in this condition, in absence of wind, the tensile load of conductors shall not be greater than 25% of the **breaking** load.

On the basis of specific project conditions, to limit wind vibration effects, special attention should be paid to laying conditions when the **catenary constant** (the ratio, between the horizontal tension and the mass per linear meter of conductor) **exceeds a value of** 2000 m. Criteria and conditions of installation should be defined in project specifications.

3 Modifications to 4.8 Security loads

Replace:

(ncpt) **IT.1 Breaking of conductors case**

For conductors supported by suspension insulator sets, the differential loads shall be calculated taking into consideration the swing of the string. For calculating the actions due to a broken conductor (single o in a bundle) on a support, the maximum tensile load of the section inside which the supported is included can be used.

with:

(ncpt) **IT.1 Breaking of conductors case**

For conductors supported by suspension insulator sets, the differential loads **can** be calculated taking into consideration the swing of the string. For calculating the actions due to a broken conductor (single o in a bundle) on a support, the maximum tensile load of the section inside which the supported is included can be used.

4 Modifications to 4.12.2 Standard load cases

Replace:

With reference to figures in subclause 4.2.10.2 of EN 50341-1 § 4.2.10.2 for the determination of load cases 2b, 2c, 2d, the following reduction factors due to ice load I_T apply:

$\alpha = 0{,}5$ $\alpha_1 = 0{,}3$ $\alpha_2 = 0{,}7$ $\alpha_3 = 0{,}3$ $\alpha_4 = 0{,}7$

For longitudinal bending scheme, if necessary, and if so indicated in the project specifications, the case of $\alpha_1 = 0$, $\alpha_2 = 1$ in absence of wind can also be considered; this load case represents the "slope" condition which should be applied only to supports placed at the peak of the hills/mountains and which separate line sections on opposite slopes.

with:

With reference to figures in subclause **4.12.2** of EN 50341-1 for the determination of load cases 2b, 2c, 2d, the following reduction factors due to ice load I_T apply:

$\alpha = 0{,}5$ $\alpha_1 = 0{,}3$ $\alpha_2 = 0{,}7$ $\alpha_3 = 0{,}3$ $\alpha_4 = 0{,}7$

For longitudinal bending scheme, if necessary, and if so indicated in the project specifications, the case of $\alpha_1 = 0$, $\alpha_2 = 1$ in absence of wind can also be considered; this load case represents the "slope" condition which should be applied only to supports placed at the peak of the hills/mountains and which separate line sections on opposite slopes.

5 Modifications to 5.8 Internal clearences within the span and at the top of the tower

Replace:

(A-dev) **IT.1 Clearances calculations**

The clearances, in general, shall be calculated as follows.

In the design of the towers, the following minimum air clearance shall be maintained:

Table 5.8/IT.1 – Minimum air clearances

Minimum air clearances	Unit	
Minimum distance between conductor within the span among points susceptible of approach: this spacing is reduced to D_{pp} in case of points not susceptible of approaching each others	m	$k \cdot \sqrt{(f + l_k)} + D_{pp}$
Minimum distance between conductor and earth-wire within the span	m	$k \cdot \sqrt{(f + l_k)} + D_{el}$
Minimum clearance between live metal parts and earthed metal parts with wind speed V = 7,5 m/s	m	$k_1 \cdot D_{el}$
Minimum clearance between live metal parts and earthed metal parts of suspension towers with max swing (wind speed with return period of 3 years)	m	$D_{50Hz\_p\_e}$

Where:

f	is the sag, in metres, of the conductor at a temperature of +15°C in still air;
l_k	is the length, in metres, of that part of any insulator set swinging orthogonal to the line direction; in case of different swinging amplitudes on both supports of the span, the medium value shall be assumed;
k	is a coefficient equal to 0,6 for homogeneous aluminium or aluminium alloy conductors, and equal to 0,5 for the other conductors;
k_1	is a coefficient assumed equal to 0,75;
D_{pp}	is the minimum clearance voltage dependent (phase-phase), in metres, according to EN 50341-1;
D_{el}	is the minimum clearance voltage dependent (phase-earth), in metres, according to EN 50341-1.
$D_{50Hz\_p\_p}$	is the minimum air clearances (phase-phase) in metres, voltage dependent, required to prevent a disruptive discharge at power frequency voltages corresponding to distances of Table 5.5 of EN 50341-1; for overhead lines with voltages ≤ 45 kV, a distance of 0,17 x U_n/45 (m) shall be assumed;
$D_{50Hz\_p\_e}$	is the minimum clearance (phase-earth) in metres, voltage depending, required to withstand power frequency voltage, corresponding to the distances of Table 5.5 of EN 50341-1; for overhead lines voltage ≤ 45 kV, a distance of 0,11 x U_n/45 (m) shall be assumed.

These distances are not suitable for performing live works.

In case of supports where the conductors are secured by means of tension insulators, V-chains on transversal plane, or post insulators, *Ik* shall be assumed equal to 0 (*Ik* = 0); moreover, for overhead lines voltage ≤ 45 kV equipped with post insulators, the resulting values from the above formulas shall be reduced by 30 %.

The above mentioned minimum distance formulas shall not apply to spans of lines where $f + l_k > 40$ m.

In such cases it is merely necessary that the spacing, in metres, between the conductors are not less than:

($3{,}8 + D_{pp}$) m for aluminium or aluminium alloy conductors;

($3{,}2 + D_{pp}$) m for other conductors.

The previous requirements are not applicable to conductor in bundles or to single sub-conductors of the same bundle.

For loading case 1a of subclause 4.2.10.2, but with a conductor temperature of 15°C, the spacing d, in metres, shall not be less than $D_{50Hz\_p\_e}$; for overhead lines voltage with voltages ≤ 45 kV, a distance if 0,11 x U_n/45 (m) is assumed.

At conductor temperature of 15°C, with a wind speed of 7,5 m/s, the spacing d, in metres, shall not be less than k_1 x D_{el} with k_1 = 0,75.

The above requirements shall not apply to any insulation spark gaps for coordination.

with: