

Activity report of RWG 01

RWG 01: „Regional aspects on creation of NNA for new standard for overhead lines EN 50341“

RWG 01 Convener: Kresimir Bakic, Slovenia

Background :

New CENELEC (CLC) standard (EN 50341-1) for design and construction of overhead lines above 1 kV AC from December 2012 obligated countries members of CLC to prepare National Normative Aspects (NNA) reflecting national practices. In general these national normative includes special national conditions (i.e. weather conditions), legal deviations and national complements. Due to novel approach in designing considering reliability approaches and strengthening's of actins on lines as well as new technologies in OHLs, some SEERC members expressed common interest to set up working group with intention to exchange information on this very actual topic.

Scope :

- **Basic principles for new designing approaches (based on EN 50341-1)**
- **Action on lines comparison (wind loads, ice loads, combination)**
- **Electrical requirements comparison (clearances, corona effect, EMF)**
- **Standardization of conductors (classical and HTLS)**
- **Regional particularities**
- **Report**

Participation at meeting in Zagreb on September 23, 2016

Austria (1), Croatia (4), Slovenia (4), Serbia (1), Ukraine (4), Macedonia(6) = 20

Announced to participate: Italy (4), Hungary (1) and Bosnia(2).

Countries in region SEERC who already proposed NNAs to CENELEC:

Czech Republic, Slovakia, Italy

Countries in region SEERC who announced to propose NNA in 2017:

Austria, Slovenia, Croatia, Macedonia

Countries in region SEERC who working on this subject :

Serbia, Montenegro, Ukraine, B-H (not members of CLC)

SEERC countries with no answer: (members of CENELEC)

Turkey, Romania, Greece, Hungary

Target of Zagreb meeting:

- Discussion on ToR and possibilities for cooperation,
- Basic principles for new designing approaches (based on EN 50341-1)

1. Discussion on Questionnaire with potential Q's: **STANDARDS FOR OHL's**

- a. Review of experience and design practices related to
Reliability of Overhead power lines
 - b. Review of experience and design practices related to
Wind velocities and ice loads
 - c. Review of experience and design practices related to
Electrical clearances
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2. NEXT meeting agreed to be in March 2017 in Macedonia.



Q1: Reliability of Overhead power lines

Clause 3.2.2 - Table 3.1		EN 50341-1	
Reliability level	Return period T [years]	Annex B.2	Annex B.3
		Wind velocity	Ice load per conductor length
	3	Nominal wind velocity V_3	Nominal ice load $I_3 = I_H$
1	50	Extreme wind velocity V_{50}	Extreme ice load I_{50}
2	150	Extreme wind velocity V_T	Extreme ice load $I_T = I_L$
3	500		



Q2: Wind velocities and ice loads

Q2 could be useful to improving the reliability of overhead line networks on regional level. Atmospheric icing is a general term for several types of ice accretions. Most relevant types for electrical power overhead lines are in-cloud icing (**rime icing**), freezing rain (**glaze ice**) and **wet snow**.

(more detailed description is in CIGRE TB 291 “Guidelines for meteorological icing models, statistical methods and topographical effects (Cigré, 2006), and ISO 12494 “Atmospheric icing” (ISO, 2001)

This Survey could be broken into following parts:

Part 1: Freezing rain (**glaze ice**) loadings as treated in design codes, standards and operational experience

Part 2: **Wet snow** loadings as treated in design codes, standards and operational experience

Part 3: Collection of specific data for **glaze ice** load assessments

Part 4: Collection of specific data for **wet snow** load assessments

Part 5: Restoration measures

Part 6: Electrical failures due to glaze ice and wet snow

Part 7: Methods used for Removal



Q3: Electrical clearances collection by countries

- **Method used, mathematical formula**
 - **Internal clearances**
 - **External clearances**
- **Collection of the regulations for EMF, corona noise,...**

Members of CENELES in SEERC area:

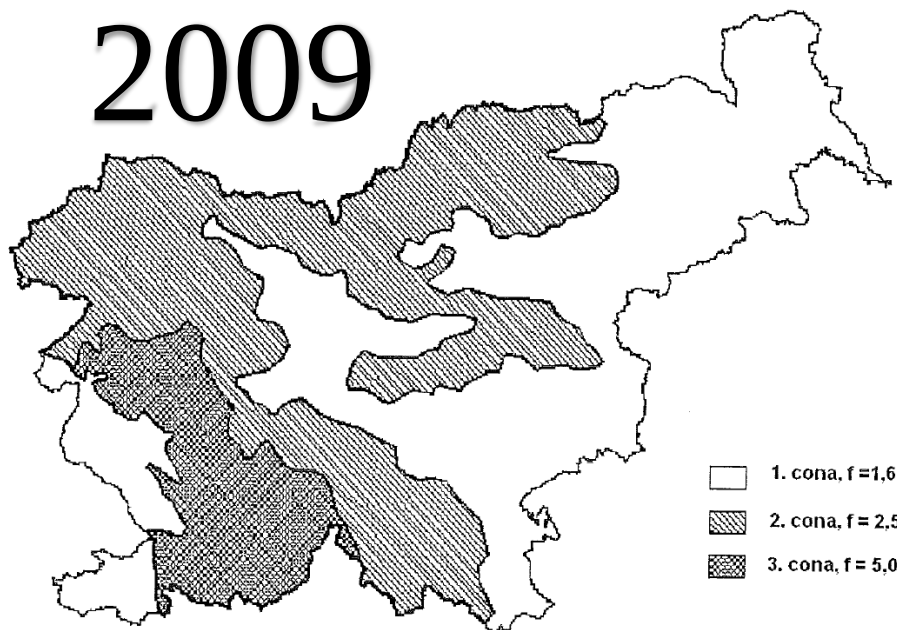
Italy	29	
Turkey	29	
Romania	14	
Hungary	12	
Czech R	12	
Greece	12	
Austria	10	
Croatia	7	
Slovakia	7	
FYROM	4	
Slovenia	4	
<i>Total</i>	<i>140</i>	<i>weighting points</i>

Non-members of CENELEC:

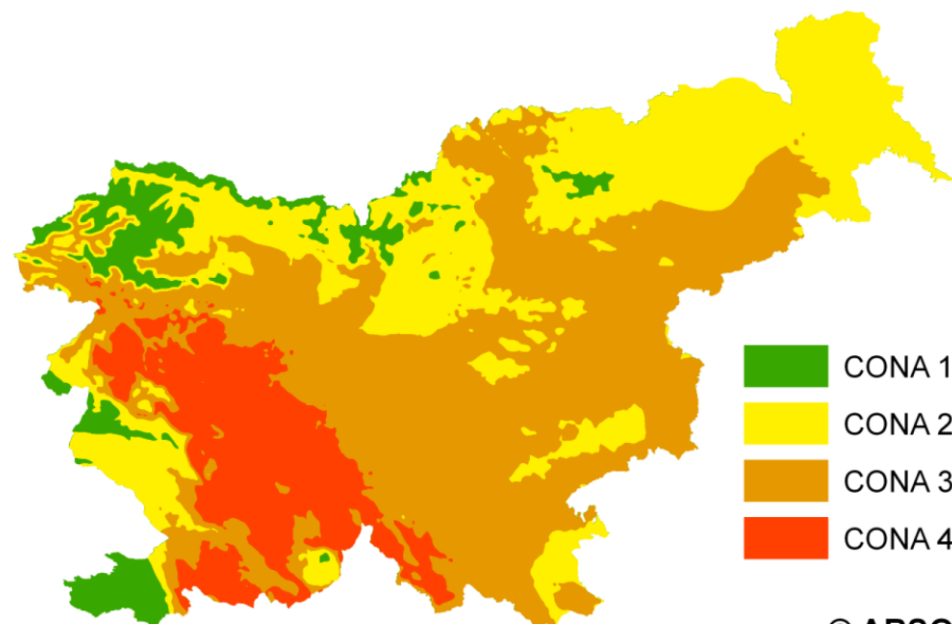
**Bosnia & Herzegovina,
Serbia,
Montenegro, and
Ukraine.**

Slovenian maps for ice loads in 2009 and 2017

2009



2017



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What is situation with NNA available in English on CENELEC TC11 web site

SEERC

Country	
Germany	EN 50341-2-4
Finland	EN 50341-2-7
UK	EN 50341-2-9
Italy	EN 50341-2-13
Norway	EN 50341-2-16
Sweden	EN 50341-2-18
Czech Republic	EN 50341-2-19
Estonia	EN 50341-2-20
Slovenia	EN 50341-2-21
Poland	EN 50341-2-22
Slovak Republic	EN 50341-2-23

Danmark



Thank you for your attention