SLOVENSKI STANDARD
SIST EN 62751-2:2014/A1:2020

01-januar-2020

Ugotavljanje izgub moči v napetostnih pretvorniških ventilih za visokonapetostne enosmerne sisteme - 2. del: Modularni večnivojski pretvorniki (IEC 62751-2:2014/A1:2019)

Power losses in voltage sourced converter (VSC) valves for high-voltage direct current (HVDC) systems - Part 2: Modular multilevel converters (IEC 62751-2:2014/A1:2019)

Bestimmung der Leistungsverluste in Spannungszwischenkreis-Stromrichtern (VSC) für Hochspannungsgleichstrom(HGÜ)-Systeme - Teil 2: Modulare Mehrpunkt-Stromrichter (IEC 62751-2:2014/A1:2019)

Pertes de puissance dans les valves à convertisseur de source de tension (VSC) des systèmes en courant continu à haute tension (CCHT) - Partie 2: Convertisseurs multiniveaux modulaires (IEC 62751-2:2014/A1:2019)

Ta slovenski standard je istoveten z: **EN 62751-2:2014/A1:2019**

ICS:

29.200	Usmerniki. Pretvorniki. Stabilizirano električno napajanje	Rectifiers. Convertors. Stabilized power supply
29.240.01	Omrežja za prenos in distribucijo električne energije na splošno	Power transmission and distribution networks in general

SIST EN 62751-2:2014/A1:2020 **en,fr,de**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 62751-2:2014/A1

October 2019

ICS 29.200; 29.240

English Version

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This amendment A1 modifies the European Standard EN 62751-2:2014; it was approved by CENELEC on 2019-09-27. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this amendment the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CENELEC member.

This amendment exists 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.

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

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

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

European foreword

The text of document 22F/479/CDV, future IEC 62751-2/A1, prepared by SC 22F "Power electronics for electrical transmission and distribution systems" of IEC/TC 22 "Power electronic systems and equipment" was submitted to the IEC-CENELEC parallel vote and approved by CENELEC as EN 62751-2:2014/A1:2019.

The following dates are fixed:

- latest date by which the document has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 2020-06-27
- latest date by which the national standards conflicting with the document have to be withdrawn (dow) 2022-09-27

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CENELEC shall not be held responsible for identifying any or all such patent rights.

Endorsement notice

The text of the International Standard IEC 62751-2:2014/A1:2019 was approved by CENELEC as a European Standard without any modification.

Annex ZA
(normative)

Normative references to international publications with their corresponding European publications

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

NOTE 1 Where an International Publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

NOTE 2 Up-to-date information on the latest versions of the European Standards listed in this annex is available here: www.cenelec.eu.

Publication	Year	Title	EN/HD	Year
IEC 61803	-	Determination of power losses in high-voltage direct current (HVDC) converter stations	EN 61803	-

IEC 62751-2

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INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

AMENDMENT 1
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Power losses in voltage sourced converter (VSC) valves for high-voltage direct current (HVDC) systems – Part 2: Modular multilevel converters

Pertes de puissance dans les valves à convertisseur de source de tension (VSC) des systèmes en courant continu à haute tension (CCHT) – Partie 2: Convertisseurs multiniveaux modulaires

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

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FOREWORD

This amendment has been prepared by subcommittee 22F: Power electronics for electrical transmission and distribution systems, of IEC technical committee 22: Power electronic systems and equipment.

The text of this amendment is based on the following documents:

CDV	Report on voting
22F/479/CDV	22F/488B/RVC

Full information on the voting for the approval of this amendment can be found in the report on voting indicated in the above table.

The committee has decided that the contents of this amendment and the base publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

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2 Normative references

Add the following new reference:

IEC 61803, *Determination of power losses in high-voltage direct current (HVDC) converter stations*

3.1.11
no-load operating state

Add, after the existing definition, the following new note:

Note 1 to entry: In the no-load state, in principle no switching should occur as the valve is blocked. However, in some designs, it may be necessary to make occasional switching operations to balance voltages between different parts of the converter. Here, some losses may occur and need to be accounted for.

4 General conditions

4.1 General

Replace, in the third sentence of the existing paragraph, the abbreviated term "CTLC" by "CTL".

4.2 Principles for loss determination

Add, to the end of the first existing paragraph, the following new sentence:

The manufacturer shall justify, in the loss calculation report, how the uncertainties have been considered.

Replace the last two sentences of the third existing paragraph by the following new sentences:

In practice, this measurement would require the use of state-of-the-art measurement equipment that rivals the best equipment available at national metrology institutes. To date, although some industry/academic partnership projects have demonstrated prototypes of measurement equipment claiming sufficient accuracy, there is little industry experience with using such equipment on site. The feasibility of using laboratory measurements on VSC valves to support a more accurate determination of valve losses is now under study in CIGRÉ WG B4-75.

4.4 Loss calculation method

Replace the first sentence of the existing second paragraph by the following new sentence:

An important requirement for such simulations is an accurate modelling of the system under investigation.

4.5.2 Input data for numerical simulations

Replace the last item of the existing dash list by the following new items:

– For calculating converter valve currents and MMC building block capacitor currents, which are the basis for the calculation of corresponding losses, it is sufficient to use a simplified model in which the on-state and switching characteristics of the IGBTs and diodes are represented by worst-case characteristics applicable to their maximum rated junction temperature.

– For the detailed calculation of losses, the simulation shall also consider the junction temperature dependent semiconductor properties, such as on-state voltages, switching and recovery losses. These properties are based on the characterisation testing as described in IEC 62751-1:2014, 4.4.2. The steady-state junction temperatures of the semiconductors are calculated iteratively for the relevant operating point to derive the semiconductor losses.

4.5.3 Input data coming from numerical simulations

Add, to the last existing paragraph, the following new sentence:

The mean and rms currents in IGBTs and diodes are not required if conduction losses in IGBTs and diodes are calculated using polynomials as discussed in 5.1.

4.5.4 Converter station data

Add, to the sixth dash of the existing list, the words "(for CTL designs)".