

Minutes of the Meetings held on  
April 24<sup>th</sup> to 26<sup>th</sup>, 2018 in Lake Buena Vista, USA

Joint IEC/IEEE Maintenance Team for IEC/IEEE 62271-37-013

The Working Group (WG) met on April 24<sup>th</sup> to 26<sup>th</sup>, 2018 in Lake Buena Vista, FL, USA with 14 members and 6 guests.

The meeting started with the introduction of all participants.

The following people attended the meetings: see Annex A.

Main points:

The agenda proposed for the three-day meeting was approved by the WG members.

No further comments have been received on the proposal for alignment of numbering system and references to the latest edition of IEC 62271-1 which was circulated on April 5<sup>th</sup>, 2018.

An agreement has been reached with SA regarding the definitions of enclosure and generator circuit-breaker system as follows:

**enclosure**

a component of a generator circuit-breaker system, not intended for use in equipment defined by any other standard, providing a specified degree of protection of equipment against external influences and a specified degree of protection against approach to or contact with live parts and against contact with moving parts

Note 1 to entry: For generator circuit-breakers applied in switchgear assemblies, the enclosure requirements are defined by the applicable standard.

Note 2 to entry: A three-phase enclosed generator circuit-breaker system has all three phases in a common enclosure.

Note 3 to entry: A single-phase enclosed generator circuit-breaker system has each phase in a single independent enclosure.

Note 4 to entry: For degrees of protection specified by protection provided by enclosures (IP coding) see IEC 60529 and for degrees of protection specified by external mechanical impact (IK coding) see IEC 62262.

[SOURCE: IEC 60050-441:1984, 441-13-01, modified – addition of new notes to entry and replacement of "assembly" by "generator circuit-breaker" in the definition]

### **generator circuit-breaker system**

an assembly, utilizing a generator circuit-breaker as one of the components

Note 1 to entry: For example an assembly that is not part of a switchgear assembly construction covered by IEC 62271-200, IEEE C37.20.2, or IEEE C37.20.3

Note 2 to entry: generator circuit-breaker systems are covered in this standard to ensure harmonization of requirements of the various components which form part of the system

As a result from the last STL TG16 meeting in Arnhem, the following proposal was made by Henk te Paske.

After a short-time withstand current and peak withstand current test, the generator circuit-breaker shall comply with the requirements according to subclause 7.6.4 where reference is made to subclause 7.6.4 of IEC 62271-1: 2017.

In the STL guide to the interpretation of IEC/IEEE 62271-37-013 the following sentence is added: "The no-load operations after the short-time and peak withstand current test shall be carried out at 100% of the rated value of voltage and /or pressure for operation". This is in line with similar sentence in the STL guide to the interpretation of IEC 62271-100.

The WG accepted to include the above sentence to cl. 7.6.4.

Leslie Falkingham made a proposal to include, or at least not to explicitly exclude, point on wave controlled switching for generator circuit-breakers. During the discussion within the WG, it appeared that the inclusion of this topic in the standard deserves deeper investigations and more time to properly amend the various parts of the standard related to it. Therefore it was agreed to address it in the revision of edition 2 after its publication.

The following action items have been reviewed.

#### *Action item 1*

The WG agreed on creating two normative annexes to standardise the TRV influenced by the capacitors of the generator circuit-breaker for out-of-phase and load current switching. Annex M is dedicated to out-of-phase current switching whereas Annex N covers load current switching.

It has been agreed to cover only one case (i.e. generator power class 201-400 MVA) for out-of-phase current switching for the first draft balloted. The remaining parts will be addressed in the second draft circulated.

#### *Action item 10*

This action item has been completed with the definitions of short-circuiting connection, manually mounted short-circuiting connection, and motor operated short-circuiting connection included in 3.4.128, 3.4.129, and 3.4.130 respectively.

#### *Action item 11*

A proposal for a guidance note for the selection of generator circuit-breakers in case of power station layouts consisting of more generators connected to one two-winding step-up transformer has been made by Lucas Pernitz.

The WG reviewed the proposal and included it in the new Annex E.

*Action item 14*

A proposal to address the requirements for generator circuit-breakers in case of doubly-fed induction machine applications has been made by Mirko Palazzo. The WG reviewed the proposal and included it in the new Annex K.

*Action item 15*

A proposal to address the requirements for generator circuit-breakers in case of wind farm applications has been made by Mirko Palazzo. The WG reviewed the proposal and included it in the new Annex L.

*Action item 39*

The proposal made by Jim van de Ligt to harmonize the use of test plant, facilities, etc throughout the document was reviewed by the WG and implemented throughout the document.

*Action items 43 & 45*

The proposal to address the amplitude of the last current loop for symmetrical currents and to include tolerances for out-of-phase current switching tests made by Lukas Zehnder was reviewed by the WG and implemented in cl 7.102.10.2.2, 7.102.10.2.3, 7.102.10.3.2, 7.102.10.3.3, 7.103.6, and Annex A.

*Action item 46*

The proposal made by Denis Frigiére to include a recommendation regarding the conditions of ambient air inside the enclosure of the generator circuit-breakers has been reviewed and included in cl. 6.14.1.

Next Steps and Agreed Actions:

Action number	Action description	Responsible	Status	Deadline
1	Develop an Annex in which a step-by-step procedure for the reproduction with computer simulations and in test laboratories of the prospective TRV for load current and out-of-phase current switching modified by the capacitors of generator circuit-breakers is described. Develop a set of formulas to calculate the actual TRV parameters depending on capacitors at each side of the GCB for each row of Table 6.	Henk te Paske, Mirko Palazzo	On going	next draft

Future Meetings and Schedule:

The next meeting is planned to take place most likely in Europe mid August 2018. The exact date is driven by the date when the compilation of comments received from the ballot of CD1 is sent to the WG. Details and location information will follow.

Role	Last name	First name	Initials	IEC NC	Affiliation	Attended April 24 <sup>th</sup> , 2018	Attended April 25 <sup>th</sup> , 2018	Attended April 26 <sup>th</sup> , 2018
Guest	Blair	Thomas	TB		Tampa Electric	√	√	
Guest	Cary	Steve	SC_G		GE	√	√	
Member	Chen	Steven	SC		Eaton	√	√	√
Guest	Chow	Chih	CC		PEPCO		√	
Member	Falkingham	Leslie	LF	GB	VIL	√	√	
Member	Flores	Sergio	SF		Schneider Electric	√	√	√
Member	Jacquier	Frank	FJ	FR	GE	√	√	√
Guest	Leufkens	Paul	PL		PPL	√	√	
Member	Livshitz	Albert	AL		CE Power	√	√	
Member	Meiners	Steven	SM		GE	√	√	
Chairman	Palazzo	Mirko	MP	CH	ABB	√	√	√
Member	Ricciuti	Anthony	AR		Eaton	√		
Guest	Sharkey	Jim	JS		EPRI	√		
Guest	Sippel	Kevin	KS		Eaton	√		
Member	te Paske	Henk	HtP	NL	DNVGL	√	√	√
Member	Trichon	Francois	FT	FR	Schneider Electric	√	√	
Member	van de Ligt	Jim	JvdL		CANA High Voltage Ltd		√	√
Member	Westerdale	Matt	MW		Bureau of Reclamation	√	√	
Member	Willieme	Jean-Marc	JMW	FR	GE	√	√	√
Member	Zehnder	Lukas	LZ	CH	ABB	√	√	√