

Minutes of the Meetings held on
April 25th to 27th, 2017 in Charlotte, USA

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

The Maintenance Team (MT) met on April 25th to 27th, 2017 in Charlotte, NC, USA with 17 members and 8 guests.

The chairman started the meeting with the introduction of all participants.

The following people attended the meetings: see Annex A

Main points:

The minutes of the meeting held in Berlin in January 2017 were approved.

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

A new member has been appointed in IEC representing France: Mr Denis Frigiére.

The chairman shared with the MT the status update which was given during the last IEC SC17A meeting in Frankfurt in April 2017 (see Annex B).

The status of the corrigendum 1 as per April 2017 is the following:

- No. of balloters: 71
- Ballot close date: March 5st, 2017
- Actual response rate: 77%
- Actual approval rate: 98%
- Actual abstain rate: 5%
- No. of comments: 2 (must be satisfied: 0)

Based on the above results P62271-37-013-2015/Cor 1 (PE/SWG) "IEEE/IEC Draft International Standard for high-voltage switchgear and controlgear - Part 37-013: Alternating current generator circuit breakers/Corrigendum 1" will be reviewed by RevCom for its meeting on 14 June 2017.

The PAR for the project "Revision to IEEE Standard 62271-37-013-2015" was approved last December 7th, 2016 and will expire on December 31st, 2020.

The target is to submit the first CD within 2017 for circulation.

The following action items have been reviewed.

Action item 1

The MT discussed the proposal made by HtP regarding 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 (see Annex C). The proposal is based on single-phase circuits in which capacitors on one side of the generator circuit-breaker do not influence the phase-to-ground voltage oscillation on the other side after generator circuit-breaker's tripping operation.

It was also discussed whether the TRV parameters laid down in the standard should be modified: the MT decided not to change these parameters.

The MT decided that the main goal of this task is to let the user of the standard derive the TRV parameters in case the generator circuit-breaker is equipped with capacitors without the need for computer simulations.

The MT team decided that the proposed approach should be based on three-phase circuits.

The MT decided that also the time delay for the first-pole-to-clear and the RRRV, TRV peak and time delay of the last-pole-to-clear should be taken into account.

Action item 10

The MT decided that the proposal to harmonize the requirements of individual components with those of generator circuit-breakers when part of the system shall be in the main body of the standard.

Lukas Zehnder has been appointed leader of this new task force.

Action item 12

The MT reviewed the proposal made by MP. This proposal is described in Annex J of the current draft of IEC/IEEE 62271-37-013.

It was decided to check if, in case the associated generator circuit-breaker is equipped with capacitors of at least 100 nF/phase installed phase to ground, the time delay of the TRV will be longer than 1.0 μ s for the Tee-OFF circuit-breaker.

Action item 13

It was decided to address the requirements for pumped-storage power plants with respect to mechanical endurance (class M3 10,000 COs has been introduced) and electrical endurance (the requirement to provide the number of allowed load current making and breaking operations has been introduced).

Action item 15

LF presented the status of collection of requirements for wind farm applications. Renewable UK and Wind Europe have been contacted. Generator power and voltage are expected to increase thus making necessary the setting of requirements for generator circuit-breakers application. If LF can get the requested information, a dedicated Annex will be developed to address it.

Action item 16

JO presented a proposal to address the next revision of IEC 62271-1 expected to be published within 2017.

The MT's decisions are listed in Annex D.

Action items 17 and 18

A proposal from LZ and FT on how to harmonize the various definitions of arcing times has been discussed and implemented (see Annex E). The changes are visible in the latest draft (v15) of IEC/IEEE 62271-37-013.

Action item 20

A proposal from LZ to address adequate tests to ensure the successful commutation for generator circuit-breakers with separated main and arcing contact systems has been discussed. The MT decided to include a dedicated clause (6.103.13) visible in the latest draft (v15) of IEC/IEEE 62271-37-013.

Action item 21

FJ mentioned that the outcome of his investigation is that the typical IPB temperatures for 50 Hz applications (90 °C / 70 °C) might change in the future after the new edition of IEC 62271-1 is published. Nevertheless, this topic still needs some more work to clarify the rationale behind these requirements.

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	31.07.2017
7	Take actions according to the document "FDIS comments.xlsx", column H	Mirko Palazzo, Matsuki Masashi, Lukas Zehnder	On going	

10	Make a proposal to harmonize the requirements of individual components with those of generator circuit-breakers when part of a system	Task force leader: Lukas Zehnder general (Michael) disconnecter (Steven, Joachim, Lucas) earthing switch (Steven, Joachim, Lucas) voltage transformer (with or without fuse) (Frank) current transformer (Frank) surge arrester (Frank, Francois) capacitor (Frank) disconnecter for SFC (with or without fuse) (Albert, Joachim, Lucas) disconnecter for excitation transformer (Mirko) disconnecter for unit auxiliary transformer/back-to-back start-up (Albert, Jean-Marc, Frank) short-circuiting connection (permanently mounted) (Lukas) enclosure (Emanuele, Lukas) cable and any other connecting element (Emanuele, Lukas) bushings (Emanuele)	On going	06.06.2017
11	Make a proposal for a guidance note for the selection of generator circuit-breakers in case of power station layouts consisting of two generators connected to one two-winding step-up transformer. Add also the generator circuit-breaker connected at the MV terminals of the step-up transformer.	Lucas Pernitz, Matt, Shawn	On going	31.05.2017
14	Collect requirements for doubly-fed induction machines applications	Mirko Palazzo, Jean-Marc	On going	31.05.2017
15	Collect requirements for wind farm applications (onshore and offshore, DFIMs, PMGs, AGs)	<u>Francois Trichon (TF leader)</u> , Leslie Falkingham, Mirko Palazzo, Jim van de Ligt, Albert Livshitz	On going	31.05.2017
19	Check the group vector and connection of windings of step-down transformers in microgrids	Francois Trichon	On going	28.02.2017
20	Make a proposal to address adequate tests to ensure the successful commutation for GCBs with separated main and arcing contact systems	Lukas Zehnder	On going	31.05.2017
21	Check whether the temperature limits for isolated phase busducts (today typically set for 50	Frank Jacquier	On going	28.02.2017

	Hz applications as 90 °C for main current path and 70 °C for phase enclosure) will change based on the new edition of IEC 62271-1.			
22	Update references to IEC 62271-1 and adjust clause numbering system and text where needed		To start	
23	Check if, in case the associated generator circuit-breaker is equipped with capacitors of at least 100 nF/phase installed phase to ground, the time delay td will be longer than 1,0 us for the Tee-OFF circuit-breaker.	Mirko Palazzo	To start	31.05.2017

Future Meetings and Schedule:

The next meeting will take place in Villeurbanne, France, on June 13th and 14th, 2017. For more information refer to Annex F.

Role	Last name	First name	Initials	Affiliation	Attended April 25 th , 2017	Attended April 26 th , 2017	Attended April 27 th , 2017
Guest	Ashtekar	Koustubh	KA	Eaton	√		
Guest	Cary	Steve	SC_G	GE	√		
Member	Chen	Steven	SC	Eaton	√	√	√
Guest	Chow	Chih	CC	PEPCO	√		
Guest	Christian	Michael	MC_G	ABB	√		
Member	Colesanti	Michael	MC	Google	√	√	
Member	Falkingham	Leslie	LF	VIL	√	√	√
Member	Flores	Sergio	SF	Schneider Electric	√	√	√
Member	Jacquier	Frank	FJ	GE	√	√	√
Guest	Leccia	Brad	BL	Eaton	√		
Member	Livshitz	Albert	AL	CE Power	√		√
Member	Meiners	Steven	SM	GE	√		
Member	Oemisch	Joachim	JO	Siemens	√	√	√
Guest	O'Neil	Brian	BO	CE Power	√		√
Chairman	Palazzo	Mirko	MP	ABB	√	√	√
Member	Ricciuti	Anthony	AR	Eaton	√		
Member	te Paske	Henk	HtP	DNVGL	√	√	√
Member	Trichon	Francois	FT	Schneider Electric	√	√	√
Member	van de Ligt	Jim	JvdL	CANA High Voltage Ltd	√	√	√
Guest	Warren	Robert	RW	KEMA			√
Member	Webb	John	JW	ABB		√	
Member	Westerdale	Matt	MW	Bureau of Reclamation	√	√	
Member	Willieme	Jean-Marc	JMW	GE	√	√	√
Guest	Wisnewski	Joe	JW_G	UL	√		
Member	Zehnder	Lukas	LZ	ABB	√	√	√