

Minutes of the Meetings held on  
April 30<sup>th</sup> – May 2<sup>nd</sup>, 2019 in Burlington, VT, USA

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

The Working Group (WG) met on April 30<sup>th</sup>, May 1<sup>st</sup>, and 2<sup>nd</sup>, 2019 in Burlington, VT USA with 13 members and 10 guests.

The meeting started with the introduction of all participants.

The following people attended the meetings:

Role	Last name	First name	Attended	Attended	Attended
			April 30 <sup>th</sup> , 2019	May 1 <sup>st</sup> , 2019	May 2 <sup>nd</sup> , 2019
Member	Chen	Steven	√	√	√
Guest	Eftink	Emily	√		
Member	Flores	Sergio	√	√	√
Member	Frigiere	Denis	√	√	√
Guest	Gohil	Dave	√		
Guest	Leufkens	Paul		√	
Member	Livshitz	Albert	√		
Guest	Marx	Benjamin	√		
Guest	Nayar	Raj	√	√	
Guest	Nenning	Audveas	√		
Guest	O'Neil	Brian	√		
Chairman	Palazzo	Mirko	√	√	√
Member	Pernitz	Lucas	√	√	√
Member	Ricciuti	Anthony	√		
Guest	Schneider	Carl	√		
Guest	Shaefer	Selena	√		
Member	te Paske	Henk	√	√	√
Member	van de Light	Jim	√	√	√
Guest	Venna	Karthik Reddy	√		
Member	Webb	John	√		
Secretary	Westerdale	Matt	√	√	√
Member	Willieme	Jean-Marc	√	√	√
Member	Zehnder	Lukas	√	√	√

Main points:

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

The minutes of the previous meeting were approved and a status update of the document was provided. A draft of the document has gone out for ballot with a deadline to submit comments within IEC by June 28<sup>th</sup> and a deadline to submit comments within IEEE by May 30<sup>th</sup>.

The WG discussed David Peelo's email proposal for out of phase and load current switching tests, and drafted the following response with the main concerns of the WG:

- The circuit proposed seems to be insufficient to adequately reproduce the required time delay of the TRV as typical time delay control elements (e.g. additional capacitors and resistors) are missing.
- Therefore the impact of added surge capacitors on prospective TRV cannot be correctly assessed with the proposed circuit and formulas.
- To the WG the relationship between the circuit parameters for system-source faults/generator-source faults and those for out of phase and load current switching is not clear.
- A face to face clarification on the proposed approach and specifically the above points is recommended to get a concluding agreement.

Annex 1 shows the results of out-of-phases 90° calculations for a number of voltage – current combinations. The “KEMA” calculations for OP90° were made in Matlab, using TRV parameters for system source side (Table 3) and generator source side (Table 4) as input.

Many combinations for different voltage and current combinations were simulated without added capacitors and with added capacitors of 200nF and 400nF on generator source side, system source side respectively both sides. Results are shown in the bleu colored columns. As far as possible (capacitance only added at generator source side is not covered in Annex M) the same calculations were made, using 17A/1222/CD, Annex M. Results are shown in the green colored columns. The three rightmost columns show the difference between the two approaches.

Conclusion.

Larger differences in time-delay are found for a power rating 100 – 400 MVA, in case capacitance is only added to system source side. For a large power rating (>801 MVA) differences in time-delay are smaller.

The WG decided to proceed with the approach and tables currently adopted in Annex M and extend the methodology to Annex N. The WG also decided to amend Annex A of the document to enlarge the tolerances applicable to the TRV time delay calculated as per Annexes M and N.

The WG accepted the proposed corrections from Anne Bosma on removing repetition of the document title in the sub clause headings and harmonizing the use of “switchgear and controlgear” to align with IEC 62271-100.

The term AT-switch has been replaced by Tee-OFF-switch throughout the document. The nameplate info required for Tee-OFF generator circuit-breaker has been added to Annex J.

The rated voltage of the starting switch part of the generator circuit-breaker system has been defined and clauses 5.2 and 5.3 have been modified accordingly.

The WG discussed expected comments to be received from IEC and IEEE in the upcoming ballot and revised the draft of this document.

The WG added content in Annex L to address low and high frequency breaking capability for Wind Farm applications.

Next Steps and Agreed Actions:

Action numbers 54, 65, and 67 were presented to the WG and are now completed.

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	Ongoing	30.09.2019
54	Prepare a proposal for Figure 1 specifically addressing the details during making operations	Sergio F.	Completed	01.05.2019
65	Introduce the definition of tested asymmetrical system-source and generator-source short-circuit breaking currents	Mirko	Completed	31.03.2019
67	Compare results of TRV parameters derived from Annex M with those used for some 90° out-of-phase switching current tests	Jean-Marc, Henk	Completed	30.04.2019
68	Ensure the term power-frequency is used in IEC 62271-100 as well	Joachim	Not started	30.04.2019
69	Share Figure 1 developed by Sergio F. with Anne Bosma and MT36 for use in IEC 62271-100 for alignment purposes	Mirko	Not started	31.07.2019
70	Introduce formula for asymmetrical system-source and generator-source short-circuit breaking currents in cl 9.103.6.3.2 indent b)	Mirko	Not started	31.07.2019

Future Meetings and Schedule:

The next meeting is planned to take place either in Bergamo, Italy; Berlin, Germany; or Lyon, France for two days on July 16<sup>th</sup> and 17<sup>th</sup>. Further coordination on the next meeting will occur within the working group to provide more specific details soon.

