

Minutes of the Meetings held on  
May 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> 2014 in Orlando - FL, US

Joint IEC/IEEE revision of IEEE C37.013: IEEE Standard for AC High-Voltage  
Generator Circuit Breakers Rated on a Symmetrical Current Basis

IEC TC 17 / SC 17A / WG 52

IEEE P62271-37-013

The Working Group met on May 7<sup>th</sup>, 8<sup>th</sup> and 9<sup>th</sup> 2014 in Orlando - FL, US.

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

The following people attended the meetings: see Annex A.

Main points:

The 65 comments received from the ballot of CDV within IEC were reviewed and discussed. For each comment a resolution has been offered. Please refer to Annex B for more details.

Also the comments made by the IEC editors were reviewed and discussed. These comments mainly refer to editorial modifications, removal of requirements from the notes and bibliography update.

The addition of publication year to referenced standards (as required by IEC CO) has been addressed as well.

Jim Van de Ligt presented a table to compare IEC 62271-1:2007 and IEC 62271-1:2007/AMD1:2011. The impact of these changes on IEC/IEEE 62271-37-013 have been addressed.

The FDIS shall be submitted to IEC CO by the end of July 2014.

The WG proposes 2020 as stability date for the document.

Next Steps and Agreed Actions:

1. Coordinate with JH the redrawing of figure 10, deleting line DD' and adding  $I_{AC}$  and  $I_{DC}$  (BL)
2. Change text to "Time Constant ( $\tau$ ) = 133 ms" in figure 11 (MP)
3. Coordinate with JH the modification of figure 22, to shift the contact separation line (BL)
4. Investigate whether it is possible to produce figures in two overlapping layers, one for text and one for pictures (BL).
5. Coordinate with JH the modification of figure 1, to add  $U_1$ ,  $U_2$  and  $U_3$  and replace t with time (BL)
6. Coordinate with JH the modification of figure 13, to remove & E<sub>2</sub> and T<sub>2</sub> with the corresponding dotted line (BL)
7. Coordinate with JH the redrawing of figure 30, deleting line DD' and adding  $I_{AC}$  and  $I_{DC}$  (BL)
8. Create subclauses 8.103.6.3.7.1, 8.103.6.3.7.2 and 8.103.6.3.7.3 to replace the indents a), b) and c) and split in three parts the text of 8.103.6.3.7 (MP).
9. Provide the originals of figures 53, 54 and 55 (load current switching) to IEC CO (BL)
10. Coordinate with JH to add missing curves (10 MVA) to figures F.3 and F.4 (BL)
11. Coordinate with JH to move to the bottom the horizontal axis labelling of figures 16 to 19 (BL)

Future Meetings and Schedule:

The next step is to submit FDIS by the end of July 2014. A meeting or a phone conference might be arranged prior to submittal.

Annex A: List of attendees

Member/ Guest	Last name	First name	Affiliation	Attended May 7 <sup>th</sup> , 2014	Attended May 8 <sup>th</sup> , 2014	Attended May 9 <sup>th</sup> , 2014
Member	Biasse	Jean-Marc	Schneider Electric	√	√	
Member	Bufi	Arben	Hitachi HVB	√		
Guest	Cary	Stephen	Eaton	√		
Member	Carmona	Gilbert	Southern California Edison	√	√	
Member	Chow	Chih	Pepco	√		
Guest	Christian	Michael	ABB	√		
Guest	Eastman	John	Incon	√		
Member	Dufournet	Denis	Alstom Grid	√		
Member	Falkingham	Leslie	Vacuum Interrupters Limited	√		
Guest	Flores	Sergio	Schneider Electric	√	√	
Guest	Joseph	Jacob	Toshiba	√		
Guest	Lawrence	Matthew	Doble Engineering	√		
Guest	Liu	Hua Ying	Southern California Edison	√		
Convenor	Long	Bill	Retired	√	√	√
Secretary	Palazzo	Mirko	ABB	√	√	
Guest	Song	Hongbiao	GE	√		
Guest	Swing	Donnie	Powell Industries	√		
Guest	Tabakovic	Dragan	Hitachi HVB	√		
Member	Te Paske	Henk	DNVGL-KEMA	√	√	√
Member	Van de Ligt	Jim	CANA High Voltage Ltd.	√	√	√
Member	Webb	John	ABB	√	√	√
Member	Willieme	Jean-Marc	Alstom Grid	√	√	√
Member	Zehnder	Lukas	ABB	√	√	√

**Annex B: Observations to the comments received from IEC ballot on CDV**

#	MB/N C	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment	Comments	Proposed change	Observations of WG 52
1.	CA			G	Canada generally agrees with the technical content of the document and casts a positive vote. This document needs to be slightly improved. Canada is giving the following comments.		Noted.
2.	CA			G/E	In several location, notes start with "Note to entry"	Change "NOTE to entry" by "NOTE"	Not acceptable, see D.4.8 of the ISO/IEC directives Part 2.
3.	CH-1			G	The Swiss national committee is in favour of the document but would like to submit the following editorial documents		Noted.
4.	CN			G	China National Committee casts a positive vote on the CDV with the following comments:		Noted.
5.	JP1			G	Japanese national committee considers this document as CDV still includes some issues to be improved and clarified.	Japanese NC will cast positive vote with assumption of following requirements/ comments being improved.	Noted.
6.	KR			ge	The Korean National Committee casts a POSITIVE vote on 17A/1057/CDV with the following comments		Noted.
7.	US			Ge	"Asy <sub>cs</sub> " is defined by equations three separate times in the document.	Consider reducing to one equation definition, and reference that equation in future uses.	Not acceptable. The equations in 4.101.2 and in 6.103.7 are different depending on the use.
8.	US	1.1	1	Ed	The word "of" should be inserted before IEC 62271 for clarity in English.	"This part of IEC 62271 is applicable to..."	Accepted.
9.	KR	1.2		ed	For dated references of document, the latest edition of IEC 62271-1, -100 applies	IEC 62271-1 : <del>2007</del> 2011 IEC 62271-100 : <del>2008</del> 2012	Accepted, in principle. Following document AC/4/2014, the proper references should be IEC 62271-1: 2007 + AMD1: 2011 CSV and IEC 62271-100: 2008 ? AMD 1:2012 CSV.
10.	CH-2	3.1.107	F 1	ed	$U_1$ , $U_2$ and $U_3$ are missing in drawing	Add $U_1$ , $U_2$ and $U_3$	Held for next edition.

#	MB/N C	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment	Comments	Proposed change	Observations of WG 52
11.	CH-3	3.1.107	F 1	te	At the time of making, 3 different moments should be distinguished: 1) voltage breakdown across 1st pole (for instance pole 2) 2) voltage breakdown across 2nd pole (for instance pole 1) and start of current flow in 1st and 2nd pole (poles 2 and 1) 3) voltage breakdown across 3rd pole (pole 3) and establishment of current flow in all 3 poles	Make these moments visible and therefore add an additional $t$ -line into figure. As a consequence: $t_4$ changes to $t_5$ $t_5$ changes to $t_6$ $t_6$ changes to $t_7$ $t_7$ changes to $t_8$	Held for next edition.
12.	CH-4	3.1.107	F 1	ed	Straight line in phase 1 from (peak) making current to the left (like in phases 2 and 3) is missing	Add straight line in phase 1 from (peak) making current to the left (like in phases 2 and 3)	Held for next edition.
13.	CH-5	3.1.107	F 1	ed	The moment of contact separation (= beginning of arc voltage) of pole 2 does not match with the corresponding dashed line	Shift corresponding dashed line of pole 2 exactly to the start of the arc voltage.	Held for next edition.
14.	CH-6	3.1.107	F 1	ed	Label $b$ is missing for poles 2 and 3	Add label $b$ for poles 2 and 3	Held for next edition.
15.	CH-7	3.1.107	F 1	ed	Some of the labelling in the legend is not correct	Change as follows: $i$ into $j$ $j$ into $k$ $k$ into $l$ $l$ into $m$ $m$ into $n$ $n$ into $p$ $o$ into $q$ (In case the decision is taken vice versa, hence changing the labels in the figure instead, take into account that other subclauses, referencing to figure 1 are also affected)	Accepted. The following changes will be made: $i$ into $j$ $j$ into $k$ $k$ into $l$ $l$ into $m$ $m$ into $n$ $n$ into $p$ $o$ into $q$
16.	CH-8	3.1.107	F 1	ed	The word "current" is missing in legend, label $c$	Change to: "peak value of the alternating current component"	Accepted.
17.	KR	3.1.107	F 1	ed	Review the Figures format, $U_1$ , $U_2$ and $U_3$ disappeared on the oscillogram of Figure.	As comment	Held for next edition.
18.	KR	3.1.107	F 1	ed	Modify the symbol in the key as proposed change.	$\dot{i} j$ opening time $\dot{j} k$ arcing time $k l$ break time $\dot{t} m$ make time $\# n$ major loop $\# p$ minor loop $\rightarrow q$ major extended loop	Accepted.

#	MB/N C	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment	Comments	Proposed change	Observations of WG 52
19.	CA	3.1.110		T	As defined by IEC 60060-1 or 60071-1, this concept applies only for the application of a test voltage.	Use the definition of IEC 60060-1 or IEC 60071-1.	Not acceptable. The definition we used is taken from 62271-100 and is broader in scope covering both testing and application.
20.	CA	3.1.111		T	As defined by IEC 60060-1 or 60071-1, this concept applies only for the application of a test voltage.	Use the definition of IEC 60060-1 or IEC 60071-1.	Not acceptable. The definition we used is taken from 62271-100 and is broader in scope covering both testing and application.
21.	CA	3.4.105		T	Is it always the case that air is at atmospheric pressure? Be more general.	Remove the words "at atmospheric pressure"	Not acceptable. 3.4.110 is air-blast.
22.	CA	3.7.139		T	Insulation level for generator circuit-breakers are always defined by two values, BIL and power frequency withstand voltage.	Review the definition accordingly.	Accepted.
23.	KR	31.107	F 1	ed	According to #13 of 17A/1040/CC, the word "key" shall be placed above the explanation of the item references of figures..	As comments	Accepted.
24.	CA	4.10	T 7	T	The rated power-frequency withstand voltage should be part of the nameplate information.	Add the rated power-frequency withstand voltage on the nameplate information.	Not acceptable. The reason is to avoid misuse during PFWV field test.
25.	CA	4.10	T 7	T	Rated current of closing, opening and control circuits are not necessary to be shown on nameplate.	Delete the values of rated current for closing, opening and control circuits.	Not acceptable. If the ratings are not assigned they do not need to be on the nameplate.
26.	CA	4.10	T 7	T	Are the reference to resistors given in Table 7 on page 61 be the opening resistor?	Change "resistor/ for "opening resistor".	Accepted.
27.	JP4	4.101.2		E	b) "system-source" should be "generator source"	As commented	Not acceptable. 4.101.2 is for system source; 4.101.3 is for generator-source.
28.	US	4.101.2	F 10	Ed	Figure needs updating.	See attached image below created in Microsoft Excel, " <b>Figure 10 – Asymmetrical making and breaking currents (updated)</b> ". See US annex (1).	Accepted.

#	MB/N C	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment	Comments	Proposed change	Observations of WG 52
29.	US	4.101.2	F 10	Ed	The rms total line D-D' is neither listed in the legend nor mentioned elsewhere in the document.	EITHER add it to the legend as "DD' rms total of $I_{ac}$ and $I_{dc}$ " OR remove the line from the Figure. See attached image below that I created in Microsoft Excel, "Figure 10 – Asymmetrical making and breaking currents (updated and with line D-D' removed)". See US annex (2).	Accepted in principle. D-D' will be removed.
30.	US	4.101.2	F 10	Ed	"Asy" and "Asy <sub>cs</sub> " are mentioned in the legend of the figure, but they do not appear on the figure itself. "Asy" also introduces two more terms that are not in the Figure, " $I_{dc}$ " and " $I_{ac}$ ".	Move "Asy" and "Asy <sub>cs</sub> " into the body text of 4.101.2 between Figure 10 and Figure 11: "[ Figure 10 ] The degree of asymmetry (Asy) is expressed as a percentage and is calculated by the following equation: $Asy = 100\% \times \frac{I_{dc}}{I_{ac}}$ where Asy degree of asymmetry $I_{dc}$ d.c. component of the fault $I_{ac}$ a.c. component of the fault In Figure 10 the degree of asymmetry at the instant of contact separation (Asy <sub>cs</sub> ), line E-E', is found by $Asy_{cs} = 100\% \times \frac{I_{d_{ccs}}}{I_{a_{ccs}}} = \frac{\overline{ON} - \overline{OM}}{\overline{MN}}$ $= \left( \frac{2 \times \overline{ON}}{\overline{MN}} - 1 \right)$ where Asy <sub>cs</sub> degree of asymmetry at contact separation $I_{d_{ccs}}$ d.c. component at contact separation $I_{a_{ccs}}$ a.c. component at contact separation [ Figure 11 ]"	Accepted in principle. The text will be corrected.
31.	US	4.101.2	F 11	Ed	The figure should have the variable " $\tau$ " shown in the "Time Constant = 133 ms".	Change inlaid text to "Time Constant ( $\tau$ ) = 133 ms".	Accepted. Also the time scale will be changed from (s) to (ms).

#	MB/N C	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment	Comments	Proposed change	Observations of WG 52
32.	JP2	4.101.3		T	The last paragraph “ Demonstrating the capability of .... Taking into account results derived from test-duties in cl. 6.105.12.” seems not be appropriate as a main body of chapter 4 which is ratings. This nuance of expression will be a note.	Put this paragraph into a NOTE. The term “shall” will be changed to “should”.	Not acceptable. However the text has been improved.
33.	JP3	4.101.3		T	Last para: This paragraph is not clear enough whether conducting the test itself is difficult or applying the results into the field condition is difficult or both.	Pls. clarify.	Accepted. The text is reworded.
34.	US	4.101.4		Te	The last sentence is very broad and non-specific: “Most generator circuit-breakers can easily break this current.”	Consider deleting the last sentence.	Accepted in part. The word “most” will be removed.
35.	FR	4.105		T	TRVs are not ratings, as it has been recently considered by MT36 in charge of revision of IEC 62271-100.	Consider to move the TRV clause from clause 4 ratings to clause 6 type tests. Change standard values by test values.	Held for next edition. This comment has been considered, but it is not possible to include it in this revision and it will be considered in the next edition.
36.	US	4.107.1		Te	Equation: The explanation of variable “T” uses the word “period”. This should be changed to “cycle” for clarity and consistency with the power industry. Also consider adding the word “full” in front of “cycle” for clarity.	Change text to: “T is one full cycle of the power frequency (20 ms for 50 Hz, 16,7 ms for 60 Hz)”	Not acceptable.
37.	CA	4.8		T	IEC 62271-1 defines clear tolerances on the rated voltage of closing and of auxiliary and control circuits to 85% to 110% and 70% to 110% for opening devices. The values given in the Table 2 differ significantly from those given in IEC 62271-1 mainly for the upper limit of the AC voltages.	Review the applicable voltage ranges in accordance with the tolerances specified in IEC 62271-1.	Not Acceptable. The wider ranges for the supply voltages for generator circuit breakers are to insure that the circuit breaker can operate under extreme conditions.
38.	KR	6	P 5	te	Add the wording “(equal to a coverage probability of approximately 95 %)” or “(equal to coverage factor of 2.0)” in the last of last paragraph.	As comments	Not acceptable. This text was in an earlier draft but was removed as “not needed.”
39.	CN	6.10.6		T	The last paragraph: “Lower test voltage values are under consideration for auxiliary components”. This sentence is not clear.	We suggest changing “lower test voltage values” into “lower test voltage values are specified by manufacture”.	Accepted in principle. The sentence will be removed.



#	MB/N C	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment	Comments	Proposed change	Observations of WG 52
40.	US	6.101.3.4		Te	Point n) NOTE: The note seems to state that all applications should refer to C37.24 for solar radiation effects, and not just in instances of significant effect.	Change Note text to:  "NOTE If the effect of solar radiation is expected to be significant and non-negligible, then this is considered to be an unusual (special) service condition. Refer to IEEE C37.24-2003 [30] for more information about solar radiation."	Accepted in principle. The text has been improved.
41.	CA	6.102.10.1.2	F 23	T/E	The delay of 18° on the contact separation is not clearly shown. The point of contact separation seems the same as shown on Figure 22.	Correct accordingly Figure 23.	Accepted in principle. Figure 22 will be modified instead of Figure 23.
42.	CA	6.102.4.2.1		E		Re-arrange indent numbering	Accepted.
43.	CA	6.102.4.2.1		T	In clause 5.101, a maximum time interval between units of a pole of 1/6 <sup>th</sup> of a cycle is defined during a closing operation and 1/8 <sup>th</sup> of a cycle for opening operation. Here the same time interval of 1/8 <sup>th</sup> of a cycle is mentioned for both closing and opening operations.	Harmonize the values with clause 5.101.	Accepted.
44.	CA	6.102.6		T	As discussed in MT36 for amendment 2 of -100, the number of no-load tests to be performed before and after making and breaking tests should be minimized and only limited to the important operations for example, one O, one C and one CO at only one or two operating voltages. Tests at minimum, nominal and maximum control voltage are not necessary, only tests at one or two control voltages are sufficient.	Modify the clause as per the discussion within MT36 and reduce the number of required no-load operation to a minimum.	Accepted.
45.	CA	6.102.7		T	The demonstration that an alternative mechanism is suitable shall not be limited to the making and breaking verification tests. Mechanical endurance test and if applicable, low and high temperature tests, should be also required.	Add a clause similar to the new clause 6.1.102 of amendment 2 of IEC 62271-100 (under 17A/1059e/CD).	Accepted in principle. A note has been added to clarify that mechanical endurance tests have to be performed as well.

#	MB/N C	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment	Comments	Proposed change	Observations of WG 52
46.	CN	6.102.7	P 2	T	b) "the three-phase verification test for making consists of performing a three-phase making test at the <b>rated short-circuit current</b> ". For some circuit, even if satisfied the rated circuit current, it also could not satisfied the rated short-circuit making current	We suggest to add the requirement "at the same time the outer phase at 2.74 I <sub>sc</sub> " after the sentence.	Not acceptable. 2.74 I <sub>sc</sub> applies only to the prospective test circuit. The test procedure shall be the same as the verification for making according to 6.102.4.1 a).
47.	CA	6.102.9		T	Procedure A: The prescribed maximum value for the contact resistance variation (200%) after making and breaking tests may be correct for some technologies such as vacuum interrupters but could be definitively too high for other technologies (e.g. large SF6 generator breaker including disconnectors) or if the contact resistance cannot be measured close to the circuit-breaker contacts themselves.	Add a note that the permissible contact resistance variation is under consideration by MT34 of SC17A. Add also that the prescribed value of 200% is generally applicable to vacuum generator circuit-breakers or when the contact resistance can be measured close the actual contact location. Nevertheless, this value may be too high for other technologies or where the measuring points are physically far from the actual contacts location.	Not acceptable. In the text it is already written that procedure A applies to sealed for life interrupters.
48.	CA	6.103.7		T	The same tolerance on the product "I x t" shall be specified for direct and synthetic tests.	Change the tolerance for the "I x t" product for direct tests to 90% to 110%.	Not acceptable. The tolerances are the same for both synthetic and direct prospective tests. No tolerance can be given for the actual direct test.
49.	US	6.103.7		Te	Point b): In the equation there are two time variables that use a capital "T", T <sub>op</sub> and T <sub>r</sub> . This could be confusing (as it initially was to me) and appear at first to be temperature variables. These should be changed to a lower case "t" for consistency.	Change text of point b) to: "b) Asymmetrical breaking current The degree of asymmetry during test duty 2 at contact separation is determined by the following equation: $Asy_{CS} = 100\% \times e^{\frac{-(t_{op}+t_r)}{\tau}}$ where Asy degree of asymmetry; t <sub>op</sub> minimum opening time declared by the manufacturer; t <sub>r</sub> relay time (0,5 cycle; 10 ms for 50 Hz and 8,3 ms for 60 Hz); τ d.c. time constant"	Accepted.

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50.	US	6.105.11	P 2	Ed	The second sentence does not contribute to this section and convolutes the point.	Delete this sentence and change other text to leave:  "Due to test plant limitations, it may not be possible to achieve the 30 min time interval of the rated operating sequence. In such cases, the actual time interval between operations and the reason for such a delay shall be recorded in the test report. Prolonged time intervals shall not be due to faulty operation of the generator circuit-breaker."	Accepted.
51.	JP8	6.105.12.3		T	In case the circuit breaker which the arc voltage is high comparing with (system impedance x fault current ), the delayed current-zero phenomena would be disappeared earlier, and then the arcing time would be shorter. The period of delayed current zero is strongly affected by the system voltage and system impedance. It is not adequate to specify test tolerances of the arcing time for the test with delayed current-zero. If the source voltage of the test circuit is low and the delayed current-zero would be disappeared earlier, the calculation which is simulated with the rated voltage should be done based on that test data. And, if the result of the calculation would be same as that of the test, test results are recognized.	1) The current wave and the separation point of the contacts would be specified in the standards as shown in fig.32A. 2) Calculation shall be done using system voltage (rated voltage) and the data obtained from the test circuit to evaluate delayed current zero period and possibility of interruption.	Not acceptable. Current waveforms like that depicted in figure 12 cannot be reproduced in test laboratories. Therefore test requirements on arcing time are used to reproduce the same stress that would occur to the generator circuit-breaker in actual service conditions. Calculations based on test results shall be used to demonstrate the capability of the generator circuit-breaker to interrupt actual currents like that depicted in figure 12.
52.	JP9	6.105.12.3		T	The test with > 130 %DC component is required (see Table 18,Table 19). The tests larger than certain capacity will not be possible to conduct at the test laboratories. Also special test circuits may be necessary.	More explanation and example of test circuits are preferably to be indicated (somewhere of -306 or other TR for example). In case it often happens for the type test not to be able to conduct, then the appropriate countermeasure is necessary to be indicated.	Not acceptable. Test requirements are clear. It is not within the scope of this standard to provide details of the test circuit.
53.	JP5	6.105.3	P 1	E	"system-source" should be "generator source"	As commented	Accepted.

#	MB/N C	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment	Comments	Proposed change	Observations of WG 52
54.	JP6	6.105.7.2	P 2	T	"The capability of the generator CB to interrupt the current with delayed current zero crossings shall be ascertained by computations that consider the effect of the arc voltage on the prospective short-circuit current." should not be the appropriate requirement as "type test". This should be a reference or additional clarification.	These sentences are to be removed from the main body of type test and maybe put in the NOTE.	Not acceptable. A test alone cannot verify the capability. The text has been improved accordingly.
55.	JP7	6.105.76.2	P 2	T	"The determining arc-voltage model is derived from tests with comparable magnitudes of current (see 8.103.5.3.5.3)". This measurement result of arc-voltage shall be described in the type test report.	Add a description that "the measurement arc-voltage shall be described in the type test report."	Accepted. B.2.5 h) has been modified accordingly.
56.	US	6.2.6		Te	See previous comment regarding the scope of the document "1 kV and up to 38 kV".	Change the title of 6.2.6 to: "Tests of generator circuit-breakers of $U_r \leq 38$ kV".	Not acceptable. There is a rule that the title must be the same as the relevant subclause of 62271-1.
57.	US	6.2.7		Te	The title of this section suggests that generator circuit-breakers with a rated voltage at or above 245 kV exist. There does not seem to be any reason why such a device would exist, but if they do, then there should be a reference in this section that points readers to the applicable document in which these tests reside (or acknowledge that no such document is in print). Otherwise revise the text to reflect industry applications. The scope of this document specifically says "...designed for indoor or outdoor installation and for operation at frequencies of 50 Hz and 60 Hz on systems having voltages above 1 kV and up to 38 kV", so there should be no mention of rated voltages above 38 kV.	Change the title of 6.2.7 to: "Tests when $U_r > 38$ kV".  AND change the body text of 6.2.7 to:  "Power generation at extra-high voltages (i.e. greater than 38 kV) is not practical and therefore generator circuit-breakers generally do not exist at these voltages. Tests for $U_r > 38$ kV are not applicable for generator circuit-breakers and thus are not covered in this document."	Not acceptable. There is a rule that the title must be the same as the relevant subclause of 62271-1.
58.	CA	8.102.2.2		T	The dielectric withstand of external insulation is also affected by altitude.	Add that the dielectric withstand of external insulation is also affected by altitude.	Not acceptable. 2.2.1 of IEC 62271-1 already addresses this item.

#	MB/N C	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment	Comments	Proposed change	Observations of WG 52
59.	CA	8.103.10		T	The surge capacitance of 0,2 $\mu$ F, referred in the note, is never connected alone on the generator bus as a load for the generator circuit-breaker. It is always connected to the LV winding terminals of the step-up transformer. The case given in the note can never happen.	Delete the note.	Not acceptable. The note is revised and is useful in some applications.
60.	US	8.103.10		Te	NOTE: This note is technical in nature, and such technical details void the statement in the body text which says that capacitance current switching is not addressed in this standard. "Very low probability of restrike" is terminology from C37.66-2005 concerning a "C2" class capacitor switch, so this should be referenced here.	EITHER consider including the Note text in the body text of 8.103.10 and adding a reference to C37.66-2005 such as:  "The generator circuit-breaker normally is not called upon to switch purely capacitive currents because in practical cases, the auxiliary transformer is connected to the bus between the generator circuit-breaker and generator step-up transformer. If the generator circuit-breaker is required to have a capacitive current switching capability, the manufacturer should be consulted. In the case of a surge capacitor connected to the lower voltage side of the transformer, its capacitance value is usually in the order of 200 nF. The resulting current is less than 4 A, and generator circuit-breakers are typically capable of switching such capacitive currents with a very low probability of restrike (see IEEE C37.66-2005 for more information on capacitance current switching and restrike probability (section 6.5.3.3))."  OR remove the Note.	Not acceptable. The note is revised and is useful in some applications.
61.	CA	8.103.5.3.5	P 2	E		The pink curve of Figure 39 cannot be found. Make appropriate correction.	Accepted.
62.	JP10	8.103.5.3.5 .3	P 3	T	Calculation would be done by a mathematical model, but is there concrete calculation methods are obtained by time domain analysis?	A concrete example should be shown.	Held for next edition.

#	MB/N C	Clause/ Subclause (e.g. 3.1)	Paragraph/ Figure/ Table/ (e.g. Table 1)	Type of comment	Comments	Proposed change	Observations of WG 52
63.	Fr	8.103.5.3.6		G	This subclause "Guide for the selection of the class of the generator circuit-breaker" does not belong to a standard. It should be covered in a separate document e.g. an application guide.	<u>In the next revision transfer all or parts of section 8 in a separate document.</u>	Not acceptable. The application is too closely tight to the rest of the standard.
64.	CA	B		T/E	This Annex refers only to tests performed in a high power laboratory.	Change the title accordingly or add other type test report requirements such as dielectric tests, mechanical tests, etc.	Accepted. The title was changed accordingly.
65.	US	C		Ge	This can be deleted.	Delete the blank annex.	Held for next edition.