S07ADSCOMa12

Consolidated Comments from D9 ballot (closed 11-April-2007)
Working Group decision 08-May-2007 except task force 09-May-2007 on items 057. 058, 079, 083, 088, 127, 131, 173
(task force: Dwyer, Olsen, Livshitz, Burse, Puckett, Storms)

Date	Document
10-May-2007	IEEE PC37.59™/D9 Standard Requirements for Conversion of Power Switchgear Equipment

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
001 Olsen-01 csv-074	Global	Global	E	C37.20.1 is shown with 2001 and 2002 dates. 2002 is correct.	Correct instances of a 2001 date on C37.20.1 to 2002.	Disagree. Change to undated references except in clauses 6.1.5.4, and subject to the discussion of the revision level of C37.20.7.
002 Wactor # 1 csv-090			General			Improper. Comment incomplete.
003 Barnhart # 1 csv-106			General	see attached comment file	see attached proposed changes	Principle Refer to comments listed individually.
004 Olsen # 1 csv-074			General	See comments list attached.	See comments list attached.	Principle. Refer to comments listed individually.
005 Storms # 1 csv-085			Editorial	See attached file	See attached file	Principle. Refer to comments listed individually.
006 Wactor-15 csv-090	General		G	I'm voting Affirmative with comments. Although I think there are many areas where the document is too confusing and numerous editorial issues, I don't see any glaring technical errors.	I would like to see the areas identified above addressed to make the document more user friendly and clear.	Principle. Refer to comments listed individually.
007 Morgan # 24 csv-030			General	should be plural		Not accepted. Comment appears incomplete.

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
008 Morgan # 19 csv-025	Global		General	clause' before nos. and sometimes not	document, use word 'clause' before 8.1,	Principle. Globally, review use of “clause” and make it consistent.
009 Morgan # 14 csv-020			General	after 6.1.10.8		Improper. Comment incomplete.
010 Anna Turzhitsky		Global 2.1 2.2 6.1.5.4.1 6.1.6 6.1.8 6.2.4	Technical	I noticed that C37.59-2002 document does not address electromagnetic compatibility (EMC), electromagnetic interference (EMI), and electrostatic discharge (ESD) questions which can be affected during the equipment conversion.	In pp. 2.1 and 2.2 Following applicable IEEE standards can be added**:** IEEE Std C37.90 C37.90-2005 Active - IEEE Standard for Relays and Relay Systems Associated with Electric Power Apparatus Revision of C37.90-1989 C37.90.1-2002 Active - C37.90.1 IEEE Standard for Surge Withstand Capability (SWC) Tests for Relays and Relay Systems Associated with Electric Power Apparatus C37.90.2-2004 Active - IEEE Standard for Withstand Capability of Relay Systems to Radiated Electromagnetic Interference from Transceivers Revision of C37.90.2-1995 C37.90.3-2001 Active - IEEE standard electrostatic discharge tests for protective relays In p.6.1.5.4.1 can add: Trip system changes shell undergo EMI test in accordance with IEEE Std C37.90 for design verification In p.6.1.6 can add: Wiring changes shell undergo test in accordance with IEEE Std C37.90	Disagree. These subjects should be considered in the “mother” standards, e.g., C37.20.1, C37.20.2, et al. Historically, C37.59 has not considered modifications of the relaying or instrumentation as “conversions”, particularly if these modifications did not affect the primary circuits (buses, circuit breakers, etc.). Therefore, addition of these references and requirements is not considered appropriate.

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(continued) 010 Anna Turzhitsky					for design verification. In p.6.1.8 can add: Control circuit changes shell undergo test in accordance with IEEE Std C37.90 for design verification. In p.6.2.4 can add: Instrumentation and control wiring changes shell undergo test in accordance with IEEE Std C37.90 for design verification.	
011 Wactor-01 csv-090	Introduction	3rd (ed 2nd) paragraph	E	Introduction, third (ed 2nd) paragraph, fourth line: The term "arc resistance" is used. This is not correct.	Change "resistance" to "resistant" in the fourth line of the third paragraph	Agree.
012 Burse # 1 csv-031	Introduction	para. 3 (ed 2nd)	Editorial	Introduction, third paragraph, fourth line: The term "arc resistance" is used. This is not correct.	Change "resistance" to "resistant" in the fourth line of the third paragraph	Agree.
013 Stone # 1 csv-065	Introduction	para. 3	Technical	Introduction, 4th (ed. 3rd) paragraph: This paragraph, beginning with "Converted circuit breakers may or may not" reads like a requirement of the standard. If this is so, doesn't it belong in the standard and not in the introduction	If a req't, add to standard and reword the introduction.	Disagree. The concept is covered in the body of the document.
014 Storms-01 csv-085	Introduction	para. 4 line 1	E	To highlight differences between design tests, and production tests	Add design between minimum and tests	Agree.
015 Storms-02 csv-085	Introd.	para. 4 line 4	E	To highlight differences between design tests, and production tests	Capitalize the word “not” at the end of line 4	Principle. Need to emphasize is understood. Instead of capitalizing, underline.
016 Stone # 2 csv-066	Introduction	para. 5	Editorial	Introduction, 5th paragraph, 6th line. The words "design verified" should be hyphenated	change to "design-verified".	Agree.
017 Storms-03 csv-085	Introduction	para. 8, just below the Note	E	Correct last line	Select either trip devices or trip systems	Agree. Change to “trip systems”.

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018 Burse # 2 csv-032	Introduction	para. 9	Editorial	Introduction, last (ed 9th) paragraph: The paragraph addresses two completely different subjects and should be split into two paragraphs.	Begin a new paragraph with the words "conversions are sometimes" Also, close the quotes around the word "retrofits".	Agree.
019 Wilson # 2 csv-051	TOC		Editorial	In the contents, the first two subclauses of 2 were blank and the third subclause was 2.1.	Consider changing the three to 2.1, 2.2, and 2.3.	Agree.
020 Wilson # 1 csv-050	page iv		Editorial	My printed copy of the document had two pages with the iv number.	Correct page numbers.	Agree. Paging will be fixed.
021 Wilson # 3 csv-052	TOC		Editorial	In the contents, the Bibliography was clause A.7.	Consider moving the Bibliography to its own Annex B.	Agree.
022 Wactor-02 csv-090	1. Overview	para. 1	G/E	Paragraph uses terms Low- and Medium-voltage. Isn't this a point of controversy in the IEEE community Should this be defined or actual voltage limits be inserted	Change as directed by IEEE.	Agree. Specific guidance from IEEE-SA Standards Board NesCom conventions: "For PARs for new projects, standards developers who use general terms to represent ranges (e.g., high, medium, low), within the title, scope, or purpose, shall numerically define such ranges in the title." Topic for working group discussion. Since terms such as "low-voltage" and "medium-voltage" are in the titles of certain of the "mother" standards, these terms should be OK. A possible solution would be to add a note at the end of clause 1, as follows: Note: In this document, "low-voltage", "medium-voltage", and "high-voltage" have meanings as follows: • "low-voltage" – up to 635Vac or 3200Vdc • "medium-voltage – voltages over 1000Vac and up to 38kVac. • "high-voltage" – voltages over 1000Vac.
023 Wactor-03 csv-090	1. Overview	para. 2	E	In the first sentence, the word "are" should be "is" to make the sentence correct.	Change "are" to "is".	Agree.

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024 Morgan # 1 csv-007	1	para. 2 Page 1 Line 6	Editorial	noun verb disagreement	"each test that is " or "all tests that are.."	Agree. See comment 023.
025 Barnhart-01 csv-106	1	para. 2	E	Grammatical error	This standard cannot detail each of the tests that are necessary to be carried…	Agree. See comment 023.
026 Stone # 3 csv-067	1	(para 2) Page 1	Editorial	Sub-clause 1 Overview, 2nd paragraph: number agreement: "each test that are necessary" should be "each test that is necessary".	Correct number agreement.	Agree. See comment 023.
027 Burse # 3 csv-033	1	(para 2) Page 1	Editorial	Overview, second paragraph, first sentence: The subject and verb are not in agreement.	Change " are necessary " to " is necessary "	Agree. See comment 023.
028 Olsen-02 csv-074	1	para 2	E	The first sentence uses mixed singular and plural forms. Correct to be consistent.	Change "… that are necessary …" to "… that is necessary …".	Agree.
029 Kogan # 1 csv-092	1	(para. 4, line 4) Page 1 Line 18	Editorial	Even if UL listed SWGR assembly is converted with UL listed circuit breaker, but different than an original UL listing, it needs to be submitted to UL and approved. Current revision may create a misunderstanding in UL listing procedure.	Any modification to a UL listed SWGR assembly affecting any criteria, identified in UL file, shall be followed by updated UL evaluation procedure.	Disagree. The present wording is essentially similar to that used in prior editions. The first sentence clearly states that conversions void the certification or listing. The remainder of the paragraph merely offers elaboration and examples.
030 Storms-04 csv-085	1.1	1 line 1	E	Emphasize qualified design	Add word 'previously' before qualified	Disagree. "Qualified design" has a defined meaning and the additional adjective is not needed.
031 Olsen-03 csv-074	1.2	1	E	Incorrect punctuation.	In line 1, add a comma after "known examples".	Agree.

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032 Wactor-04 csv-090	2. References	1st paragraph	G	The paragraph states that for dated references only that edition applies and for undated references, the most current applies. All references given are dated (at least one is incorrect). Further, the next paragraph instructs the reader to apply the documents that were in effect when the original equipment was built. I think I know what you want to say here, but these words are not saying it.	Rewrite section. Do not include dated references. State that the converter is obligated to meet as a minimum, the requirements of the original equipment. Increased performance of the circuit breaker or other components due to newer standards requirements does not obligate the converter to update the switchgear unless that is in the scope of the conversion. Something to that effect would clarify the section.	Improper. Specific text to reflect these concepts is invited. The first paragraph is mandated by IEEE-SA style and cannot be altered. The language in the draft was selected (over IEEE-SA editor objections) to make it clear that a converted product might not meet the latest revisions of standard, but must (at least) meet the standard to which the original product was manufactured and rated.
033 Barnhart-02 csv-106	2	2	E	A paragraph should not start with "However"	~~However, w~~When conversions…	Agree.
034 Stone # 4 csv-068	2	(para. 2) Page 2	Editorial	Sub-clause 2, 2nd paragraph, 4th line; delete the words "at least" from sentence beginning: "The converted device shall also at least meet&"	delete unnecessary words "at least".	Disagree. This wording is meant to specify the minimum acceptable performance. The converted product must have ratings at least as high as the unconverted product.
035 Barnhart-03 csv-106	2	3	E	"may also not meet" is clumsy	…assemblies also may ~~also~~ not meet…	Agree.
036 Wilson # 7 csv-056	2	"Low-voltage equipment" "Medium-voltage equipment" Page 4	Editorial	Two subclauses above subclause 2.1 have no numbers.	Consider changing this subclause number to 2.3.	Agree. See comment 019.
037 Wilson # 4 csv-053	2	Page 2	Editorial	The Low-voltage equipment subclause did not have a subclause number.	Consider giving this subclause a number of 2.1.	Agree. See comment 019.
038 Wilson # 5 csv-054	2	Page 3	Editorial	The Medium- and high-voltage equipment subclause did not have a subclause number.	Consider giving this subclause a number of 2.2.	Agree. See comment 019.
039 Olsen-04 csv-074	2	C37.20.4 ref	E	Date is shown as 2001. Document was reaffirmed in 2006.	Add "(R2006)" to reference.	Disagree. See comment 001. Change to undated reference.
040 Olsen-05 csv-074	2	C37.20.6 ref	E	Date is shown as 1997. Document was reaffirmed in 2003.	Add "(R2003)" to reference.	Disagree. See comment 001. Change to undated reference.

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041 Morgan # 2 csv-008	2	Page 2	Editorial	C37.51-2003 not listed,	add C37.51- 2003 to reference list -LV equip	Agree. Add C37.51-2003 to references. Also, see comment 001 (undated reference).
042 Wilson # 6 csv-055	2	(just above clause 2.1) Page 4	Technical	ICS 3-2005 is listed here but ICS 3-1993 is listed on page 13.	Add ICS 3-1993 here or if these are the same, be consistent.	Principle. Remove date. See comment 001.
043 Olsen-06 csv-074	2 and global	C37.20.7 ref	E	Document was conditionally approved in 2006, but withdrawn. The date shown should be either the 2001 date or the new (likely 2007) date if final approval is received on C37.20.7 before approval is received on this document (C37.59).	See comment.	Principle. If the new C37.20.7 is approved before C37.59 is approved, then use the new date throughout the document. If the new C37.20.7 is not yet approved when C37.59 is approved, then use the draft reference of PC37.20.7-200X Dxx throughout the document. We cannot simply refer to the 2001 document as it does not cover testing of low-voltage switchgear.
044 Burse # 4 csv-034	2	Page 4	Editorial	The recent revision of C37.20.7 has not been approved by the IEEE SA.	Either change "C37.20.7 - 2006" to "C37.20.7 - 200X" or refer to the earlier edition.	Principle. See comment 043.
045 Coordination # 4 csv-004	2	Page 10	Editorial	NFPA 70-2005 - needs to be cited normatively in text or moved to the bibliography. I could not find it a citation to it.		Disagree. It is cited (albeit in incorrect style) in the sixth paragraph of clause 6. Reference will be fixed per comment 073.
046 Wactor-05 csv-090	2	Medium- and high-voltage equipment	E	Three issues - 1. See comment number 2 above concerning the use of low-, medium-, high-. 2. C37.20.7 - 2006 is unapproved. The current reference is the 2001 edition. 3. The 2006 edition of C37.20.7 will change its designation to cover all equipment up to 38kV, so you may want to move it to a general category.	Change items as necessary.	Principle. 1. See comment 022. 2. See comment 043. 3. See comment 043.
047 Morgan # 4 csv-010	2	Page 3	Editorial	NEMA ICS 2 & 1 not referenced	remove from reference list	Agree. Move to bibliography. ICS 1 and ICS 2 are necessary to the use and understanding of ICS 3, but they are not specifically cited in the normative text.

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048 Morgan # 3 csv-009	2		General	but used in 6.1.11.2, p 14		Agree. Comment incomplete. However, guess is that it is meant to add C37.51 to references. See comment 041.
049 Nigel	(ed 2) 3	MV and HV equipment		For some reason we have missed the reference to the generator circuit breaker standards, which are required for clause 6.1.11.1.	Add references to C37.013 - 1997, and C37.013a (draft).	Agree. See comment 125.
050 Burse # 5 csv-035	3	Page 4	Editorial	Definitions: The term "draft standard" is used in the first sentence of the first paragraph.	Remove the word "draft" that precedes the word "standard" in the first sentence of the first paragraph.	Agree.
051 Stone # 5 csv-069	3	Page 4	Editorial	Sub-clause 3, 1st paragraph: Do not believe this standard should be referred to as "draft standard" in the normative text.	Delete "draft"	Agree.
052 Bergman # 1 csv-005	3	Page 11	General	A distinction is made between low voltage" and "medium and high voltage" conversions, yet there is no definition of the voltage range. C37.04 and C37.09 apply to all circuit breakers >1000V.	For the convenience of reads add a definition or "special term" or note that defines the voltage level(s) to which the various reference standards apply.	Principle. See comment 022.
053 Wactor-06 csv-090	3. Definitions	1st paragraph	E	The word "draft" does not apply.	Remove	Agree.
054 Stone # 6 csv-070	3.5	Page 5	Editorial	Sub-clause 3, definition 3.5: number agreement: 3rd line should read, "terminals; that has been tested&.". Subject of sentence is circuit breaker element (singular)	Change "that have been" to "that has been"	Agree.
055 Bloethe # 1 csv-091	3.5	Page 5	Editorial	At end of sentence: A circuit breaker element ...; that have been tested and qualified to the appropriate industry standards.	A circuit breaker element ...; that has been tested and qualified to the appropriate industry standards.	Agree. Changes “have” to “has”.
056 Storms-05 csv-085	3.6	1	E	What is different between this and para. 3.12?		Improper. A 3.12 retrofill may use a 3.6 modular drawout assembly as a component of the retrofill. A 3.6 modular drawout assembly cannot use a 3.12 retrofill as a component of the 3.6 modular drawout assembly. Also, see comment 057.

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057 Burse # 6 csv-036	3.6	Page 4	Technical	3.6 - The definition does not agree with the terms found in C37.50 or C37.09.	Change the definition to read "A drawout circuit breaker together with a minimum volume or minimum-dimension single unit enclosure which is a qualified design."	Principle. Drop definition. Eliminated because of changes in response to comments 079, 083, 088, 127, 128, 131, 173.
058 Stone # 7 csv-071	3.6	Page 5	Technical	Sub-clause 3, definition 3.6:It seem strange to state that a [all] modular drawout assembly is a qualified design, by definition. What term would apply to a 'drawout circuit breaker together with its stationary frame' that IS NOT QUALIFIED?	Suggest that the WG review this definition. I am not familiar with the present (2002) revision of this standard. If this definition has already been accepted in the earlier revision, then I will withdraw this comment.	Principle. See comment 057.
059 Burse # 7 csv-037	3.8	Page 5	Technical	3.8 - The definition for racking does not include the test position.	Change the definition to read "The act of moving a removable element physically between the connected position and the test and/or disconnected position."	Disagree. The language is identical to that in the assembly standards, e.g., C37.20.2, clause 3.1.5, item a.
060 Wactor-07 csv-090	3.8		T	Not all designs rack to the disconnected position. As an example, breakers that do not use automatic secondary connections move to the test position.	Correct to say "test/disconnected position"	Disagree. The language is identical to that in the assembly standards, e.g., C37.20.2, clause 3.1.5, item a.
061 Stone # 8 csv-072	3.8	Page 5	Technical	Sub-clause 3, definition 3.8: This definition implies that only one direction fits the term. Doesn't racking also apply to the reverse direction i.e. racking to the connected position?	Suggest that the WG review this definition. I am not familiar with the present (2002) revision of this standard. If this definition has already been accepted in the earlier revision, then I will withdraw this comment.	Disagree. “Moving a removable element … between … connected … and … disconnected” does not imply direction.
062 Storms-06 csv-085	3.9 lin2		E		Eliminate ‘the’ before qualified	Agree.
063 Stone # 9 csv-073	3.10	Page 5	Editorial	Sub-clause 3, definition 3.10: 1st line, add comma after "utilizes all new parts".	Add comma	Agree.
064 Morgan # 6 csv-012	3.10x	Page 5	Editorial	definition not used in document	remove from definitions	Disagree. See 6.1.10.6
065 Morgan # 9 csv-015	(3.10 and 3.11)		General	xx	circuit breaker"	Improper. See comment 066.

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066 Morgan # 8 csv-014	(3.10 and 3.11)		General	words in different order	change to "non-interchangeable replacement	Agree. Guess: Comments 065 and 066 need to be read as a combination.
067 Morgan # 7 csv-013	3.11	Page 5	Editorial	definition used in document 6.2.1, but	change definition to match use in 6.2.1	Disagree. Usage in 3.11 and 6.2.1 seems consistent.
068 Coordination # 1 csv-001	5	Page 12	Editorial	* The use of "must" is deprecated except in cases where a statement of absolute fact is being made. Consider changing the sentence "When a circuit breaker is converted to a higher rating, the existing switchgear must also be design verified for capability at this higher rating...." according to 13.1 in the style manual as follows: The word shall is used to indicate mandatory requirements strictly to be followed in order to conform to the standard and from which no deviation is permitted (shall equals is required to). The use of the word must is deprecated and shall not be used when stating mandatory requirements; must is used only to describe unavoidable situations.		Improper. See comment 069.
069 Coordination # 2 csv-002	5	Page 12	Editorial	Please disregard the previous editorial comment about changing the verb "must" in Clause 5. After another review I feel the working group did this use this verb appropriately as well as the used of the verb "shall" throughout this draft.		Agree. See comment 068.
070 Wactor-08 csv-090	6	2nd paragraph	E	Sentence 1 does not require the word "the" before Clause 2.	Remove unnecessary word.	Agree

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071 Storms-07 csv-085	6	(para. 5) Last para.	E	Why is this included? NEC has nothing to do with design		Disagree. This NEC requirement is easily overlooked in a conversion situation. It is felt that this advice needs to be placed somewhere in the document, and clause 6 seems most logical. Alternatively, clause 6.1.5.4 might be suitable. We propose to leave this statement in clause 6.
072 Olsen-07 csv-074	6	5	E	In last sentence, we should be consistent in our reference to the NEC.	Change "NEC® " to "NFPA 70-2005".	Agree. Also see comment 045 (undated reference).
073 Barnhart-04 csv-106	6	5	E	Reference to NEC is not correct	Any alterations to breakers or switchgear to accommodate a new trip device shall comply with section 240.6(c) of the ~~must not violate~~ NEC® ~~Article 240, paragraph 240-6~~ for "restricted access" when applicable.	Agree. Also, see comment 045.
074 Bergman # 2 csv-006	6		General	There are presently no standard requirements for motorized or remote racking.	Consider (for future revisions), the possible testing requirements for remote or motorized racking of a conversion.	Principle. This is understood, but this standard is not the "mother" standard. This comment should be addressed by the standards for the assemblies, e.g., C37.20.1, C37.20.2, etc. It is noted that the assemblies' standards define a mechanical endurance requirement for racking mechanisms, but do not stipulate whether the means of applying racking mechanism motive power is a manual device or a power-operated device.
075 Barnhart-05 csv-106	6.1.4.1	a)	E	"or else" is inappropriate	Any parts used must be original manufacturer's recommended replacement parts or ~~else~~ must be design verified.	Agree.
076 Barnhart-08 csv-106	6.1.4.2	2	E	Add the words "be tested to" in the first sentence	Mechanical endurance testing of the converted circuit breaker is required to be tested to at least the "between servicing" operational level requirements listed in ANSI C37.06-2000.	Agree. Drop date from reference.

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077 Thonsgard # 1 csv-087	6.1.4.2		Technical	6.1.4.2 b) The MV conversion described is not a breaker conversion but rather a switchgear conversion.	There is presently not a reference document similar to C37.13.1 to include this type of MV conversion. Eliminate from this document.	Disagree. 6.1.4.2 b) does not refer (directly) to conversions of the type contemplated by C37.13.1. The type of conversion described in 6.1.4.2 b) has been common in the retrofit segment, particularly in the early years of retrofitting.
078 Barnhart-06 csv-106	6.1.4.2a)	1	E	Sentence is clumsy	Conversions utilizing individual interrupters to replace only the interrupting structure and contacts may require basic circuit breaker design changes such as changing the insulating structures for mounting and/or mechanism parts to modify stroke and force.	Agree.
079 Burse # 8 csv-038	6.1.4.2. b)	Page 7	Technical	6.1.4.2 b) There are no known MV circuit breaker conversions that utilize a modular drawout assembly in the design of the conversion. This standard is based solely upon known examples of conversions, therefore this must be removed.	Revert 6.1.4.2 b) to 6.1.4.2 b) of the 2002 edition.	Agree. Essentially, this requires the following changes: • In the first sentence of b), delete “or modular drawout assembly” in both instances. • In the following paragraph, delete the second sentence which begins “The modular drawout assembly shall be subjected …”. • In the same paragraph, in the present third sentence, delete “or modular drawout assembly”.
080 Barnhart-07 csv-106	6.1.4.2b)	2	E	In the last sentence, the list of tests should not be proceeded by an “a”	Additional design tests shall be made on the complete conversion and shall include ~~a~~ dielectric withstand, momentary current, short-time current, continuous current, interlock, and other operational tests including tests to verify correct function with MOC switch assemblies, if applicable (see IEEE Std C37.20.2-1999 and 6.1.7.2 of this standard).	Agree. Delete “a” from line 6 of the second paragraph of item b).
081 Morgan # 20 csv-026	6.1.4.2 6.1.5.2		General	xx	6.1.4.2 and 6.1.5.2 for example	Improper. Comment is incomplete.

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082 Olsen-08 csv-074	6.1.5.2	iIem b, para. 2	E	In referring to the "between servicing" interval, we are not consistent. Suggest emulating format used in 6.1.4.2.	Change "… is required to between servicing requirements …" to "… is required to at least the "between servicing" operational level requirements …".	Agree.
083 Thonsgard # 2 csv-088	6.1.5.2		Technical	6.1.5.2 b) The LV conversion described is not a breaker conversion but rather a switchgear conversion. It is not applicable in this section.	Eliminate from this section. Section 6.2 covers switchgear vertical sections.	Principle. See comment 079.
084 Wilson # 8 csv-057	6.1.5.2	Page 8	Technical	Near the end of the paragraph below b), is there something missing between the words is required to between servicing	If so add what was missing. If not reword to easier to understand.	Principle. See comment 082.
085 Barnhart-09 csv-106	6.1.5.2	1	E	Items a) and b) need a "lead-in" clause, similar to what was done in 6.1.4.2. Add this sentence between the header and item a)	**6.1.5.2 Conversion of low voltage circuit breakers** When a conversion is made to a low voltage circuit breaker, there are alternatives that vary in complexity as outlined in the following examples: a) Conversion in which the existing circuit breaker is replaced with a different circuit breaker….	Agree.
086 Barnhart-10 csv-106	6.1.5.2	3 (after item b), 2nd to last sentence.	E	"assure" should be "ensure"	All testing shall ~~assure~~ ensure that the conversion meets the requirements in accordance with IEEE C37.20.1-2002 equipment. .	Agree.
087 Morgan # 10 csv-016	6.1.5.2	Page 8	Editorial	title: low-voltage not hyphenated	hyphenate as done thru out document	Agree.

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088 Burse # 9 csv-039	6.1.5.2 b)	Page 8	Technical	6.1.5.2 b) There are no known LV circuit breaker conversions that utilize a modular drawout assembly in the design of the conversion. This standard is based solely upon known examples of conversions, therefore this must be removed. The known LV conversions that utilize a modular drawout assembly in the design of the conversion do not reuse any portion of the original circuit breaker. Rather, the original circuit breaker is replaced with a modern technology circuit breaker. The new circuit breaker is then installed in the existing equipment using a compartment adaptor. Since there is no conversion of the original circuit breaker, this type of conversion should be moved to 6.2, Switchgear vertical sections, as clause 6.1.5 is specific to low voltage circuit breaker conversions.	Revert 6.1.5.2 b) to 6.1.5.2 b) of the 2002 edition. (Also see Burse comment on 6.2.11.2)	Accept. Principle. Delete “or modular drawout assembly” from the second sentence of the second paragraph.
089 Barnhart-11 csv-106	6.1.5.3	1	E	In first sentence, change “shall be required” to “is required”. In 2nd to last sentence, remove the ambiguous word “satisfactorily”	When fused low-voltage circuit breaker current limiting fuses are changed from the exact model and rating initially qualified in the configuration, design verification ~~shall be~~ is required in accordance with ANSI C37.50-1989. ….. Dielectric testing is required to verify the ability of the fused conversion to ~~satisfactorily~~ withstand rated maximum voltage from either the line or load connections with blown, open or removed fuses.	Agree.

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
090 Telander # 1 csv-084	6.1.5.3	Page 9 Line 5	General	My Technical comment is on: When fused low-voltage circuit breaker current limiting fuses are changed from the exact model and rating initially qualified in the configuration, design verification shall be required in accordance with ANSI C37.50-1989. Dielectric withstand, continuous current, and short-circuit current tests shall be performed as appropriate to prove suitability of the application. It shall be verified by test that the maximum fuse let-through current does not exceed the capability of the circuit breaker without the fuse.	The statement "and short-circuit current tests shall be performed as appropriate to prove suitability of the application" is not specific enough and leaves this determination in the eyes of the beholder. Revise to state "The short-circuit tests shall be performed in accordance with C37.50-3.9.2.1, 3.9.2.2, 3.9.2.3, and 3.9.2.4. Test 10 of table 3 is especially important since the ability of the fused low-voltage circuit breaker to close cannot be demonstrated without testing." The third sentence shall be deleted since the ability of the fused breaker combination to function is proven by test over the entire period of interruption and not just by the value of maximum fuse let-through current. Fuses of equal maximum let-through currents do not always provide equal protection of the circuit breaker over the entire interrupting period.	Principle. Delete present third sentence (begins “It shall be verified…”) and replace with the following: (with dated refernce) The short-circuit tests shall be performed in accordance with ANSI C37.50-1989, clauses 3.9.2.1, 3.9.2.2, 3.9.2.3, and 3.9.2.4. Test 10 of ANSI C37.50-1989, table 3 is especially important, since the ability of the fused low-voltage circuit breaker to close cannot be demonstrated without testing.
091 Olsen-09 csv-074	6.1.5.4	1	T	This clause should deal with tripping systems, not just with the actuator.	In the title and in the first two lines, change “actuator” or “actuators” to “system” or “systems”. In the fourth line, do NOT change the word “actuator”.	Agree.
092 Livshitz # 2 csv-076	6.1.5.4	Line 2	Editorial	Use of words "electronic actuator.." is inappropriate	" or conversion of electronic trip systems with different electronic trip systems,"	Principle. Comment not fully understood, but it is believed that it is addressed in comment 091.

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
093 Livshitz # 1 csv-075	6.1.5.4.1 6.1.5.4.2 6.1.5.4.3		Technical	Addition of these paragraphs misleading the users and puts unnecessary burden on the converters. It does not provide guidance for how and when to apply these tests, doesn't say anything about the test circuit requirements and conditions. In another words, we either have to insert here 7+ pages from C37.50 plus as many pages from C37.14, add some more justifications to why and when we selected these test arrangements over any other suggested by the existing test standards or &.delete it	Delete all three paragraphs or move them into the Annex and mark as "sample test programs"	Disagree. We do not insert 50 pages excerpted from C37.09, so why would we have to insert 7 pages excerpted from C37.50?
094 Olsen-10 csv-074	6.1.5.4.2	1	E	In the first line, change DC to lower case. It should be upper case only in titles or at the beginning of a sentence.	See comment.	Agree.
095 Morgan # 11 csv-017	6.1.5.4.2		Editorial	"and" left out between "C37.14-2000 is"	insert "and", " 2000 and is required "	Agree.
096 Barnhart-12 csv-106	6.1.6	2	T	Change “shall be” to “shall have” for clarity. Also, current wording mentions temperature rating, dielectric, etc., but doesn’t mention flammability, which is a critical part of the insulation, especially when determining equivalency to SIS wire. Do we need to add the word “flammability”? Also, the phrase “or as required by the converted control system design.” might imply a lesser insulation is acceptable. Add the word “better” to clarify	The replacement wiring shall have ~~be~~ at least the same insulation temperature and <u>flammability</u> rating, ampacity, dielectric withstand capability, and flexibility as the original, or <u>better</u> as required by the converted control system design	Principle. Make changes as shown, but include a comma after “better”.
097 Burse # 10 csv-040	6.1.6	Page 10	Technical	6.1.6 - C37.20.1 and C37.20.2 do not apply to the wiring of circuit breakers.	Change the references in the second paragraph to C37.13, C37.14 and C37.11. Remove the references to C37.20.1 and C37.20.2 from the last paragraph.	Principle. Delete references to C37.20.1 and C37.20.2, and substitute C37.13, C37.14, and C37.09.

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
098 Kogan # 3 csv-094	6.1.7.1	Page 11 Line 8	Editorial	Definition is subject for interpretation: "...are separated by a safe distance"	"...are in Connected or Test position".	Disagree. The phrase “safe distance” is used in the defining assembly standards (e.g., C37.20.2, clauses 7.2, 7.10.b) and in the Switchgear Definitions standard, C37.100, which says: Safe distance, as used here, is a distance at which the equipment will meet its withstand ratings, both power frequency and impulse, between line and load stationary terminals and phase-to-phase and phase-to-ground on both line and load stationary terminals with the switching device in the closed position
099 Morgan # 12 csv-018	6.1.7.1	Page 11	Editorial	last sentence, need comma	previously outlined, although modifications	Agree.
100 Kogan # 2 csv-093	6.1.7.1	Page 11 Line 7	General	Typing error "...the circuit breaker SHALL BE OPEN and closing shall be prevented..."	"...the circuit breaker opening and closing shall be prevented..."	Disagree. The concept is that the circuit breaker shall either be open before racking can be performed, or must open before movement begins. The suggested language is definitely not what we want to say. However, it would seem appropriate to insert a comma in the phrase “… open, and closing shall …”.
101 Olsen-11 csv-074	6.1.7.2	2	E	The second sentence uses mixed singular and plural forms. Suggest changes to convert to singular form, and correct a punctuation error.	In the second line, delete the period (ed. comma) after “new”. In the third line, change “… breakers they replace, they …” with “… breaker it replaces, it …”.	Agree.
102 Livshitz # 4 csv-078	6.1.7.2		Editorial	In the second sentence of the second paragraph delete an extra comma	"However, since the new modular assembly"	Agree.

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
103 Barnhart-13 csv-106	6.1.7.2	2 (second sentence)	E	Reword as shown for clarity. Remove "sealed interrupter", since this statement could apply to any modular assembly, not just those with sealed interrupters	~~However,~~ s~~S~~ince a ~~the~~ new, modular assembly ~~with sealed interrupter,~~ may have much less mechanism power than the circuit breakers ~~they~~ it replaces, ~~they~~ it may not necessarily have sufficient reserve power to operate all installed MOC switches.	Agree. Also coordinates with comments 101 and 102.
104 Barnhart-14 csv-106	6.1.7.2	2 (last sentence)	E	Remove ambiguous word "satisfactorily"	The converted circuit breaker shall ~~satisfactorily~~ operate with the maximum number of MOC switch contacts and spring return mechanisms that are recommended by the converter to be installed.	Agree.
105 Olsen-12 csv-074	6.1.8	1	E	The first sentence uses mixed singular and plural forms. Suggest change to singular form.	Change from: "The modular assemblies used in conversions may have operators with different operating characteristics than the original circuit breaker." Change to: "The modular assembly used in a conversion may have an operator with different operating characteristics than the original circuit breaker."	Agree.
106 Barnhart-15 csv-106	6.1.8	1	E	Strike the leading "The"	~~The m~~Modular assemblies used in conversions may have operators with different operating characteristics than the original circuit breaker.	Principle. Other changes made require the retention of "The". See comment 105.
107 Livshitz # 3 csv-077	6.1.10	para. 2	Editorial	In the second paragraph starting with the third sentence, this information is almost verbatim repeats the statements made in the first paragraph	Delete the third, fourth and fifth sentences of the second paragraph	Agree. Actually, third through sixth.

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
108 Barnhart-18 csv-106	6.1.10	para. 2	E	Add period and paragraph break after 6.1.10.8 in the second sentence. There may be other standards available, so we shouldn't use the word "only".	IEEE C37.13.1-2006 addresses the use of ac contactors in low-voltage power circuit breaker switchgear. AC contactors used in conversions to replace circuit breakers shall meet the requirements of C37.13.1. Additional consideration are given in 6.1.10.1 through 6.1.10.8. There is no corresponding ANSI or IEEE standard for the conversion of medium-voltage circuit breakers to ac fused contactors, utilizing modular ac contactor assemblies. ~~The only available~~ ~~s~~Standards that ~~apply for~~ may be applicable include ~~medium-voltage in some manner are~~ NEMA ICS 3 and UL 347. ~~However,~~ ~~s~~Since ac fused contactor conversions do occur subclauses 6.1.10.1 through 6.1.10.8 will provide guidance.	Principle. See comment 107, which deletes sentences 3-6 in paragraph 2. In the first paragraph, Change the second sentence from "The only available standards that can apply in some manner are …" to "Standards that can apply in some manner include…".
109 Barnhart-16 csv-106	6.1.10	para. 1	E	There may be other standards available, so we shouldn't use the word "only". We also probably should delete the dates of the standards, since future editions would also be applicable.	~~The only available s~~Standards that ~~can apply in some manner are~~ may be applicable include NEMA ICS Series, UL 347, ~~(1993),~~ and UL 508.~~(1999).~~	Principle. See comment 108.
110 Barnhart-17 csv-106	6.1.10	1 (last sentence)	E	Strike the word "however". The last clause adds no useful information and is confusing.	~~However,~~ ~~s~~Since ac fused contactor conversions do occur and since they are somewhat similar to low-voltage fused circuit breakers, Clause 6.1.10.1 through 6.1.10.8 will provide guidance. ~~using the fused low-voltage circuit breaker approach~~.	Agree.
111 Nourse # 1 csv-048	6.1.10 para. 2	Page 12 Line 3	Editorial	There is a period missing after "through 6.1.10.8". Wording beginning with "There is no corresponding-" is a new sentence.	"Additional consideration are given in 6.1.10.1 through 6.1.10.8. There is no corresponding ANSI ---"	Agree, but sentences 3-6 deleted per comment 107.

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
112 Storms-08 csv-085	6.1.10	2nd para. Line 2	E	This does not apply to Mv contactors.	Add 'Lv' before 'circuit breakers'	Principle. Agree in principle, but sentences 3-6 deleted per comment 107. The remaining 2 sentences in the paragraph are consistent in relating only to low-voltage conversions
113 Morgan # 13 csv-019	6.1.10x	(para 2) Page 12	Editorial	2nd paragraph, missing period and space	change to "through 6.6.10.8. There is&."	Principle. Agree in principle, but sentences 3-6 deleted per comment 107.
114 Olsen-13 csv-074	6.1.10	1-2	E	Several punctuation errors.	• In line 2, insert comma following "assemblies". • In line 5, change "Clause" to "clause". • In line 9, insert a period and a space following "6.1.10.8". • In line 12, insert a comma following "occur".	Principle. Changes in lines 2 and 5 accepted. Change in line 9 is not accepted. Change in line 12 unnecessary as sentences 3-6 in paragraph 2 deleted per comment 107.
115 Morgan # 15 csv-021	6.1.10	last sentence	General	add 's' to conversions	add 's' "conversions do occur"	Principle. However, sentence deleted per comment 107 so change is not needed.
116 Livshitz # 5 csv-079	6.1.10.1		Editorial	In the first sentence the words "modular assembly" and "qualified modular ac contactor" refer to the same device	Remove the words " the qualified modular ac contactor "	Principle. Modify to delete "the modular assembly,".

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117 Barnhart-19 csv-106	6.1.10.2	1	E	Change “assure” to “ensure” in two places. Remove the word “Therefore,”	Alteration to the insulating structure of the circuit breaker shall be limited to ~~assure~~ ensure continued dielectric integrity. Medium-voltage ac fused contactors are not required to have an impulse withstand basic impulse insulation level (BIL) rating across the open contacts. ~~Therefore, t~~The insulation coordination of the total installation must be re-evaluated to ~~assure~~ ensure compatibility with the dielectric capabilities of the converted switchgear assembly. The exposure to over-voltages at the point of application in the distribution system shall be evaluated, and action taken to coordinate the insulation strength of the converted switchgear assembly with expected over-voltages, and to determine if supplemental surge protective devices are necessary.	Agree.
118 Burse # 11 csv-041	6.1.10.1	Page 12	Technical	6.1.10.1 - There are no known contactor conversions using a "cradle adaptor". (Refer to earlier Burse comments on "known examples".)	Remove the last sentence of 6.6.10.1	Principle. Remove last sentence of 6.1.10.1.
119 Livshitz # 6 csv-080	6.1.10.2		Editorial	See proposed change	In second sentence delete the words "an impulse withstand"	Principle Change “an impulse withstand” to “a”.
120 Barnhart-20 csv-106	6.1.10.8	1	E	Strike date from UL standards, as later editions will be applicable	…. The NEMA Industrial Control Standard ICS 3-1993 as well as UL 347-~~1993~~ standards provide…..	Agree.
121 Wilson # 9 csv-058	6.1.10.8	Page 13	Technical	In the second line, ICS 3-1993 is listed. This date does not agree with clause 2.	Either add ICS 3-1993 to clause 2 or be consistent.	Principle. See comment 120.

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
122 Morgan # 5 csv-011	6.1.10.8		General	several drafts back referenced in 6.1.10.8		Improper. Comment is incomplete. Several revisions required: • Drop date for ICS 3. • Delete date from UL 347 (see comment 120. • In the second reference to ANSI C37.50, change the period preceding the date to a hyphen.
123 Maurice # 1 csv-083	6.1.11	Page 14	Editorial	Remove the paragraph 6.1.11. This paragraph adds nothing to the standard.	Renumber paragraph 6.1.11.1 and 6.1.11.2 to number 6.1.11 and 6.1.12	Principle. The IEEE-SA style requires a lead-in paragraph to the subclauses. However, refer to comment 127 which eliminates 6.1.11.2. This, in turn, requires consolidation of 6.1.11 and 6.1.11.1. In effect, the suggested change is accepted.
124 Barnhart-21 csv-106	6.1.11.1	1	E	Runon sentence	Generator circuits experience certain conditions that are not common to, and may be more demanding than, those in normal distribution circuits.~~, and~~ This may require circuit breakers that are designed and tested for these special application conditions. ~~Therefore t~~The conversion of older station class switchgear circuit breakers requires careful consideration of the unusual characteristics of the generator circuit, and the capabilities of the circuit breaker being considered for the application.	Agree.

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
125 Nigel	14	6.1.11.1	3	Add references to generator circuit breaker standards.	"…..application conditions; per C37.013 and C37.013a."	Principle. Add new second sentence as follows: Guidance on special conditions applicable for circuit breakers used with generators of 10MVA and larger is given in IEEE Std C37.013 and IEEE Std C37.013a. Also, add these documents to the bibliography. • IEEE Std C37.013, AC High-Voltage Generator Circuit Breakers Rated on a Symmetrical Current Basis • IEEE Std C37.013a, AC High Voltage Generator Circuit Breakers Rated on a Symmetrical Current Basis - Amendment 1: Supplement for Use with Generators Rated 10-100 MVA
126 Gray # 1 csv-086	6.1.11.1	Page 14 Line 10	General	Comment to 6.1.11.1 There have been a number of cases where a user has specified the replacement of a standard rated breaker with a new one of equivalent rating for generator applications. This is done on the basis that there have been no problems with the older breaker and therefore the rating is suitable. It is not known if any of the older breakers have ever interrupted these types of faults or if they are capable of it. More specific guidance should be given for this case.	Insert after the first sentence of 6.1.11.1 Standard rated breakers in generator locations in earlier small hydro installations were frequently used before the special application conditions were specified and it is not known if these air magnetic breakers are, in fact, capable of interrupting these types of faults. The specification of a direct replacement of equivalent rating is not suitable and the user must identify the duty to which any replacement will be subjected.	Disagree. This degree of specification is not considered appropriate to this document. The HVCB subcommittee working groups may wish to consider language of this form for inclusion in C37.010 or C37.013. For this document, the language in comment 125 is considered appropriate.

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
127 Burse # 12 csv-042	6.1.11.2	Page 14	Technical	6.1.11.2 - This is a switchgear conversion, not a circuit breaker conversion. (See comment on 6.1.5.2 b)	Remove this Clause from 6.1.11 and move to new clause 6.2.1.1	Principle. Accept, but relocate to a new clause 6.2.5. This would eliminate 6.1.11.2, leaving only the introductory text in 6.1.11 and a single subclause 6.1.11.1. This is not in accord with document principles. Resolve by: • Revise title of 6.1.11 to "Generator circuit breakers". • Delete existing text under 6.1.11. • Move text under 6.1.11.1 to 6.1.11. Also see comment 123.
128 Burse # 13 csv-043	6.1.11.2 (proposed new 6.2.1.1)	Page 16	Technical	Create new clause 6.2.1.1	Add text removed from 6.1.11.2 to form a new clause 6.2.1.1.	Principle. See comment 127. Relocate 6.1.11.2 to a new clause 6.6. Change "modular drawout assembly" to "drawout circuit breaker" (3 instances). In the third paragraph, change "momentary" to "short-circuit withstand current".
129 Livshitz # 7 csv-081	6.1.11.2		Editorial	See proposed change	In the fourth paragraph second line should be changed to " may be inserted to or withdrawn from the connected position "	Agree.
130 Barnhart-22 csv-106	6.1.11.2	6 (not counting the bulleted items)	E	Strike the word "are"	Closing of the circuit breaker with either the circuit breaker or the compartment adapter ~~are~~ in any intermediate position shall not be possible.	Agree.
131 Wactor-09 csv-090	6.1.11.2	All	G	Two issues- 1. Conversions using a compartment adaptor should fall under the category of switchgear modifications, not circuit breaker modifications. 2. This technique also applies to MV equipment.	Correct as necessary and move to section 6.2.	Principle. See comment 127.
132 Thonsgard # 3 csv-089	6.1.11.2		Technical	6.1.11.2 - The LV compartment adapter described is not a breaker conversion but rather a switchgear conversion. It is not applicable in this section.	Eliminate from this section. Section 6.2 covers switchgear vertical sections.	Principle. See comment 127.

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133 Wilson # 11 csv-060	6.1.11.2	Page 14	Technical	ANSI C37.51-2003 was not listed in clause 2.	Add to clause 2.	Agree. See comment 041.
134 Wilson # 10 csv-059	6.1.11.2	Page 14	Technical	Is 2001 the correct date for C37.20.1?	If so, correct date in clause 2. If not be consistent.	Agree. Use undated reference.
135 Kogan # 4 csv-095	6.1.11.2	Page 15 Line 6	General	Typing error "...or racked from test position to or from the connected position..."	"...or racked to or from the connected position..."	Principle. See comment 129.
136 Kogan # 5 csv-096	6.1.11.2	Page 15 Line 6	General	Typing error: "...with either the circuit breaker or the compartment adapter are in any..."	"...with either the circuit breaker or the compartment adapter (being) in any..."	Principle. See comment 130.
137 Coordinatio n # 3 csv-003	6.1.11.2	Page 21	Editorial	ANSI Std C37.51-2003 is cited in 6.1.11.2 but it is not cited in the Reference Clause nor the Bibliography. Is this a normative reference? If so it should be added to the Reference Clause, if not, then it should go in the bibliography.		Agree. See comment 041.
138 Storms-09 csv-085	6.2.1 b)	Line 6	E	Add MOC assemblies	Add at end of line 6	Agree. Also, add TOC assemblies.
139 Wactor-10 csv-090	6.2.1 b)	b)	E	Paragraph is unclear. A circuit breaker designed to <u>replace</u> another circuit breaker should not require modifications to the functional components.	Clarify that this is a retrofit, not a replacement or explain more clearly what is meant.	Disagree. A replacement circuit breaker may be interchangeable or non-interchangeable (see 3.10 and 3.11), and in either event, requires consideration of proper functionality, such as those items discussed in item b). Also see change in response to comment 140.
140 Burse # 14 csv-044	6.2.1 b)	Page 15	Technical	6.2.1 b) - The first sentence is incorrect as written if the circuit breaker is a replacement interchangeable circuit breaker.	Change the second line to read "another design of circuit breaker that requires functional component replacement"	Agree.
141 Storms-10 csv-085	6.2.1 d)	Line 2	E	The whole vertical assembly must be requalified.	Suggest adding word ‘entire’ at end of line 2	Disagree. The conversion may not involve a complete vertical section. The language in the existing text is more generic.

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142 Nourse # 2 csv-049	6.2.1 c)	Page 15 Line 4	Editorial	There is an extra space in "IEEE Std C37.20.2 -1999," between the "2" and the "-".	Remove extra space.	Agree. Also, delete the date.
143 Barnhart-23 csv-106	6.2.1e)	e)	E	First sentence is incomplete. Second sentence is somewhat redundant Revise as shown	Conversion of medium-voltage metal enclosed switchgear not previously qualified as "arc-resistant" to achieve "arc-resistant" performance ~~in accordance with the requirements of IEEE C37.20.7-2006. Conversion of switchgear to provide arc-resistant performance~~ requires design verification to substantiate the performance of the modified equipment during internal arcing tests in accordance with IEEE C37.20.7-2006. In addition, design verification is necessary to confirm that the performance required during design tests in accordance with IEEE C37.20.2-1999 or IEEE C37.20.3-2001 is not degraded. See Clause 6.4 for more details.	Agree. Also, correct date for C37.20.7. See comment 043.
144 Josten # 2 csv-099	6.2.1.e	Page 15 Line 6	General	same	Add: IEEE C37.20.1-2002	Principle. Add "IEEE Std C37.20.1," before IEEE C37.20.2. Also see comment 145.
145 Josten # 1 csv-098	6.2.1.e	Page 15 Line 1	General	Because arc-resistant low voltage metal enclosed switchgear is available in today's market, I believe that it should be addressed in this standard. Please consider adding the text as shown.	Change to read: low or medium voltage	Agree. In the first line, change "Conversion of medium-voltage …" to "Conversion of low-voltage or medium-voltage …".

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
146 Barnhart-24 csv-106	6.2.1 f)	f	E	First sentence is incomplete. Second sentence is somewhat redundant Revise as shown	~~Alteration of medium-voltage metal-enclosed switchgear previously qualified as "arc-resistant" in accordance with the requirements of IEEE C37.20.7-2006.~~ Any alteration of ~~arc-resistant~~ switchgear previously qualified as "arc-resistant" requires design verification of the modified installation to substantiate that the performance of the modified equipment during internal arcing tests in accordance with IEEE C37.20.7-2006 is not reduced. See Clause 6.5 for more details.	Agree.
147 Josten # 3 csv-100	6.2.1.f	Page 16 Line 1	General	same	Change to read: low or medium-voltage	Principle. See comment 146. The changes in comment 146 remove the distinction between low-voltage and medium-voltage.
148 Barnhart-25 csv-106	6.2.4	1	E	In the third sentence, we address ampacity, dielectric withstand and flexibility of replacement wiring, terminal blocks and connections. There are many more concerns for wiring, and flexibility does not apply to terminal blocks. Suggest breaking this up, as shown, and adding information specific to wiring. (Note that where large portions were unchanged, I've used "…" to signify existing text that wasn't changed, and was therefore not repeated in the proposed changes.	When current or voltage transformers, … design wherever practical. Replacement MOC or TOC switches shall … for the application. Replacement ~~wiring,~~ terminal blocks and terminal connections shall be as described in IEEE Std C37.20.1-2002, IEEE Std C37.20.2-1999, and IEEE Std C37.20.3-2001, and of at least the same ampacity, voltage rating, and dielectric withstand capability~~, and flexibility~~ as the original. Control wiring shall be in accordance with IEEE Std C37.20.1-2002, IEEE Std C37.20.2-1999, and IEEE Std C37.20.3-2001 and shall have ~~be~~ at least the same insulation temperature and flammability	Agree. Change the sentence "Control wiring shall …" to "Replacement control wiring …". References will be undated.

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
(continued) 148 Barnhart-25 csv-106					rating, ampacity, dielectric withstand capability, and flexibility as the original, or better, as required by the altered control system design For metal-clad switchgear, …and current transformer terminals. Wiring changes shall undergo the necessary continuity checks and a dielectric withstand test in accordance with IEEE Std C37.20.1-2002, , IEEE Std C37.20.2-1999, or IEEE Std C37.20.3-2001 for design verification. Any replacement of moving parts by … in accordance with IEEE Std C37.20.1-2002, IEEE Std C37.20.2-1999 and IEEE Std C37.20.3-2001.	
149 Kogan # 6 csv-097	6.2.4	Page 16 Line 6	Technical	Subject for interpretation: Requirement for the replacement wiring to be at least the same ampacity as the original. Converting original equipment with new circuit breaker of a significantly lower control power consumption places an ease on the associated auxiliary control devices and control wiring.	Replacement wiring.... shall be of an adequate ampacity...to the converted application and governing Standards. Control fuse(s) coordination shall be performed if auxiliary components and control wiring is different from the original.	Principle. Changes in comment 148 cover the situation. Checking of control fuse sizes is covered in clause A.3.12 and 6.1.8.
150 Barnhart-26 csv-106	6.3	c)	E	Items a) and b) are specific types of conversion. Item c) is merely informative information, and is not a separate choice. Suggest making item c) a stand-alone paragraph following items a) and b) so that it is applicable to all cases.	~~c)~~Fuses should be applied in accordance with the guidance given in IEEE C37.48-1997 and IEEE C37.48.1-2002	Agree. Use undated references.
151 Wilson # 12 csv-061	6.3	Page 17	Technical	Is 1997 the correct date for IEEE C37.48?	If so, correct date in clause 2. If not be consistent.	Principle. Change to undated reference.

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
152 Olsen-14 csv-074	6.3	Title	E	We should use the official term of reference from C37.20.3 instead of an abbreviated form.	In the title, change “Interrupter switchgear…” to “Metal-enclosed interrupter switchgear …”.	Agree.
153 Olsen-15 csv-074	6.3	item a	E	In line three, the comma is misplaced.	In line 3, relocate the comma. Move it from just after “designed” to just after “C37.58-2003”.	Principle. • Delete the comma from line 1. • In line 2, delete the comma following “designed”.
154 Olsen-16 csv-074	6.3	item c	E	For C37.48, the year shown is 1997. The latest edition is 2005.	Change 1997 to 2005.	Principle. Change to undated. See comment 151.
155 Morgan # 17 csv-023	6.3 c)	Page 17	Editorial	incorrect date for IEEE C37.48	date should be 2005	Principle. Change to undated. See comment 151.
156 Wactor-11 csv-090	6.4	Title	E	Non-Arc Resistant switchgear is not defined by any document. There is switchgear and arc resistant switchgear.	Change "non-arc-resistant switchgear" to "switchgear"	Agree.
157 Wactor-12 csv-090	6.4	1st and 3rd paragraph	E	Non-Arc Resistant switchgear is not defined by any document. There is switchgear and arc resistant switchgear.	Change "non-arc-resistant switchgear" to "switchgear"	Principle. In both places, change “non-arc-resistant switchgear” to “switchgear not previously qualified as “arc- resistant” “.
158 Wactor-13 csv-090	6.4	3rd paragraph General, a) and b)	E	C37.20.7 dates are mixed. The current document is dated 2001. There is a draft in ballot dated 2006. The final document will be dated either 2007 or 2008.	Correct use of 2006 date. Either refer to the D12 2006 document or change all dates to the current 2001 version.	Principle. See comment 043.
159 Barnhart-27 csv-106	6.4	2	E	In the first sentence, structure is clumsy. Strike the words “in contrast”	In the case of an internal arcing fault, ~~in contrast,~~ the major source of concern is not the mechanical forces between conductors.	Agree.
160 Burse # 16 csv-046	6.4	Page 17	Editorial	6.4 - The recent revision of C37.20.7 has not been approved by the IEEE SA.	Either change "C37.20.7 - 2006" to "C37.20.7 - 200X" or refer to the earlier edition. (This occurs in several places in the clause.)	Principle. See comment 043.
161 Burse # 15 csv-045	6.4	Page 17	Technical	6.4 - It has been argued that all metal-enclosed, metal-clad switchgear is resistant to arcing due to the insulated bus designs, metal barriers, etc. Also, the term "non-arc-resistant" is not defined.	Change the title of the clause to "Conversion of metal enclosed switchgear to arc-resistant"	Principle. See comment 156.
162 Wilson # 13 csv-062	6.4	Page 17	Technical	Is 2001 the correct date for C37.20.7?	If so, correct date in clause 2. If not be consistent.	Principle. See comment 043.

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
163 Josten # 4 csv-101	6.4	Page 17 Line 1	General	same	Change to read: low and medium-voltage	Agree.
164 Josten # 5 csv-102	6.4 c)	Page 18 Line 1	General	same	Change to read: A medium-voltage switchgear structure	Agree.
165 Josten # 6 csv-103	6.4.d	Page 18 Line 3	General	same	Add: IEEE C37.20.1-2002 or	Agree. Add preceding IEEE C37.20.2. Use undated reference.
166 Josten # 8 csv-105	6.4 e)	Page 18 Line 6	General	same	Add: IEEE C37.20.1-2002,	Agree. Add preceding IEEE C37.20.2. Use undated reference.
167 Barnhart-28 csv-106	6.4 e)	1	T	Temperature tests may also be necessary where allowance for pressure relief affects the air movement in the unit. Add this to the first sentence.	Alteration of the enclosure <u>to allow for pressure relief during an internal arcing fault, or</u> to increase the enclosure strength to withstand the pressures generated during an internal arcing fault will usually change the pattern of internal ventilation in the units, which is critical to the performance of the equipment during the continuous current tests required by IEEE C37.20.2-1999 and IEEE C37.20.3-2001. Therefore, continuous current tests are required to confirm that the temperatures and temperature rises attained meet the requirements of IEEE C37.20.2-1999 or IEEE C37.20.3-2001.	Principle. Modify as shown, but include the changes in comments 165, 166, and 168. Use undated references.
168 Josten # 7 csv-104	6.4 e)	Page 18 Line 4	General	same	Add: IEEE C37.20.1-2002,	Principle. Change to undated. Add preceding IEEE C37.20.2.

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
169 Wactor-14 csv-090	6.5			C37.20.7 - 2006 is not released. It will be dated 2007 or 2008.	Correct use of 2006 date. Either refer to the D12 2006 document or change all dates to the current 2001 version.	Principle. See comment 043.
170 Barnhart-29 csv-106	6.5	1	E	Redundancy – strike first reference to C37.20.7.	Conversions of existing switchgear qualified as arc-resistant ~~in accordance with IEEE C37.20.7-2006~~ shall require design verification to confirm that the performance during internal arcing tests is not degraded, as required by IEEE C37.20.7-2006.	Agree.
171 Morgan # 16 csv-022	6.6.11.2 (6.1.11.2)	Page 15	Editorial	1st paragraph extra word "are"	remove "are" - adapter in any &..	Agree. The correct reference is 6.1.11.2, para. 6, which begins “Closing of the circuit breaker …”.
172 Barnhart-30 csv-106	8	a) b) c)	G	It is unclear what marking is required if the ratings are not changed. I am unsure of what is intended, so I can’t provide a proposed change at this time	NEED TO DISCUSS	Principle. Delete the phrase “, if the ratings of the conversion are not changed” from a), b), and c). Add after item c, at the margin, a new paragraph: “If the ratings are changed by the conversion, a new rating label in accordance with the applicable standards shall be provided indicating the new ratings.” In the first paragraph, after “interchangeability and ratings”, add “, name of converter, and date of conversion. In 8.2 and 8.3, add “, as applicable” at the end of the clause. In 8.3, add a new sentence at the end. “The nameplate shall include the identification number of the design verification form as required by clause 10.”

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
173 Burse # 17 csv-047	8	Page 19	Editorial	8.2 If the WG accepts my comments and adds a new clause 6.2.1.1, the references to 6.1.4.2 and 6.1.5.2 will need to be changed to 6.2.1.1.	Change references to 6.2.1.1	Principle. Change references to 6.6. Also modify references to other clauses if affected by other changes made. Rewrite entire clause 8 to simplify. Suggest listing of required data with exceptions if needed. *(See proposed rewritten clause at end of the comments list).*
174 Morgan # 18 csv-024		Page 19	Editorial	inconsistent - sometimes use word	this needs to be reviewed thru out the	Improper. Comment is incomplete.
175 Barnhart-31 csv-106	8	a)	E	Clarification of marking requirements.	For conversions of qualified high-voltage circuit breakers or G&T device structures described in clauses 6.1.4 and 6.1.9, the original ~~manufacturer's ratings~~ equipment shall be marked ~~"Converted by"~~ to indicate the conversion as described in 8.1 or 8.2, if the ratings of the conversion are not changed.	Agree.
176 Barnhart-32 csv-106	8	b)	E	Clarification of marking requirements.	For low-voltage circuit breaker conversions covered by clause 6.1.5, the original ~~nameplate~~ equipment shall be marked ~~"Converted by" as shown~~ to indicate the conversion as described in 8.1 or 8.2, if the ratings of the conversion are not changed.	Agree.
177 Barnhart-33 csv-106	8.1	1	E	Replace "and" with "or" since one or the other is applicable	… in accordance with the nameplate requirements of IEEE Std C37.04-1999 ~~and~~ or IEEE Std C37.13-1990, whichever is applicable.	Agree.

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
178 Barnhart-34 csv-106	9	1	E	In the first sentence, add comma between “manuals” and “complete” In the last sentence, change “assure” to “ensure”	Installation, field test, maintenance, and renewal parts instruction manuals, complete with drawings that cover the assembly/equipment installed or revised in the conversion process shall be provided. … … criteria of circuit breaker compartment mounted equipment such as interlocks and MOC switches to ~~assure~~ ensure proper operation.	Agree.
179 Barnhart-35 csv-106	10	All	G	Is this intended to apply to Certification Organizations, such as UL or CSA, or is this intended to apply to the organization making the conversion/alteration? There may be a problem with confidentiality agreements, etc.	Discussion item	Improper This text applies to the converter. Change title from “Recommended design verification form” to “Design verification form”. In the second paragraph, change “drawing number” to “drawing number or other identification”. Also, change “controlled drawing” to “controlled drawing or similar form.”
180 Olsen-17 csv-074	10	item a	E	We refer to the C37 standards, but the relevant standards may not merely be the C37 standards. We should be more generic.	Delete “C37”. Alternatively, change “C37” to “relevant”.	Agree.
181 Olsen-18 csv-074	A.1	3	E	The term “production/field tests” is a bit of slang. Suggest we be more formal.	Change “production/field tests” to “production tests or field tests”.	Agree.
182 Olsen-19 csv-074	A.3.1	1	E	For consistency, we should use the quotation marks around the words “between servicing”.	Move the second quotation mark in line 4 so that it follows “servicing” instead of “level”.	Agree.
183 Olsen-20 csv-074	A.3.7	Title	E	See earlier comment in connection with 6.1.5.4.	Change “devices” to “systems”.	Agree.

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
184 Storms-11 csv-085	A.3.7	Para 3, line1	E	Is 'makng release device' defined anywhere?		Principle. "Making current release" is not defined in IEEE documents (to our knowledge), but the text is clear as the meaning is in the portion of the sentence immediately following "making release device". However, there are several words missing from the text, and the clause number of C37.50 is incorrect. • Change 3.5.9 to 3.9.5 • Change "elements during closing" to "elements effective only during closing".
185 Wilson # 14 csv-063	A.3.7	Page 23	Technical	In clause A.3.7, in the second last paragraph, I did not see C37.59 listed in clause 2.	Add to clause 2.	Improper. C37.59 is this document. We do not need to show this document in our references.
186 Morgan # 23 csv-029	A.3.7	Page 23	Editorial	2nd paragraph, last sentence - actuator	change to "actuators"	Disagree. The actual reference is para. 4 of the clause. The use of the singular form "actuator" is correct. A low voltage circuit breaker tripping system generally incorporates multiple sensors, but only one tripping actuator.
187 Morgan # 22 csv-028	A.3.7		General	not hyphenated	last paragraph of A.3.7	Improper. Comment is incomplete.
188 Morgan # 21 csv-027	A.3.7	Page 22	Editorial	Thru out document "Direct acting" is	remove hyphen from title and 1st sentence,	Principle. "Direct-acting" should be hyphenated throughout the document. Global change. Guess: this comment and comment 187 should be combined.
189 Livshitz # 8 csv-082	A3.8	Page 23	Editorial	In A3.8 the first and third paragraphs are the same	Delete the third paragraph	Agree.
190 Olsen-21 csv-074	A.3.9	Title	E	See earlier comment in connection with 6.3	Change "metal-enclosed switchgear" to "metal-enclosed interrupter switchgear".	Agree.
191 Olsen-22 csv-074	A.3.9	3	E	In the third line from the bottom, correct the spelling of "arresters".	Change "arrestors" to "arresters".	Agree.

Discusser's name	Clause/ Subclause	Paragraph Figure/ Table	Type of comment (G=General/ T=Technical/ E=Editorial)	COMMENTS	Proposed change	WORKING GROUP DECISION on each comment submitted
192 Olsen-23 csv-074	A.4.1	1	E	In line 5, a comma is missing.	In line 5, change "… hold-in mechanism if altered" to "… hold-in mechanism, if altered".	Agree.
193 Wilson # 15 csv-064	A.7	Page 31	Technical	The Bibliography is in clause A.7.	Consider moving to it's own Annex B.	Agree.

Refer to comment 173: Proposed complete rewrite of clause 8. This proposal created after working group meeting.

8.0 Nameplates

In order to ensure that the converted equipment performance ratings and responsibility for design are properly established, additional nameplates are necessary. Regardless of the complexity of the conversions, the original manufacturer's nameplate shall be retained on the equipment for traceability (safety recall and/or renewal parts), and a conversion nameplate shall be added near the original equipment rating label.

Information on the conversion nameplate shall include:

a) nature of the conversion

b) limitations in interchangeability and ratings

c) name of firm performing the conversion

d) date of conversion (month and year)

e) instruction manual number

f) for switchgear multiple section lineups, listing of those switchgear sections converted, unless all sections of the lineup were converted

g) if ratings are changed, new rating nameplates in accordance with the relevant standards (IEEE Std C37.04, IEEE Std C37.13, IEEE Std C37.14, IEEE C37.20.1, IEEE Std C37.20.2, IEEE Std C37.20.3, or IEEE Std C37.20.4)

h) the identification number of the design verification form or file (see clause 10).