

IEEE Power Engineering Society  
Switchgear Committee  
C37.20.7 Task Force Report  
28-September-2010

The task force met on Tuesday, September 28, at 8:00AM.

Patents:

IEEE-SA rules on Patents were reviewed prior to further discussions. The IEEE-SA patent slides of 2008 were shown and will govern the activities of the task force.

General:

This is a task force, as no PAR has been submitted yet.

Attendance included 29 task force members and 19 guests. Attendance is as shown below:

Members	Members	Members	Guests	Guests
C. Ball (P) **	J. Giacetti (P)	T. Olsen (P) **	G. Arce (P)	D. Moser (P)
P. Barnhart (P) **	R. Hartzel (P)	M Orosz (P) **	J. Beaver (P)	S. Panetta (P)
J. Baskin (P)	C. Kennedy (P)	A. Patel (P)	G. Carmona (P)	R. Parthasarathi (P)
R. Bugaris (P)	M. Lafond (P)	C. Schneider (P)	B. Cohn (P)	A. Patel (P)
E. Byron (P) **	D. Lemmerman (P) **	J. Smith (P) **	J. Hidaka (P)	A. Rowell (P)
J. Earl (P)	F. Mayle (P)	P. Sullivan (P)	R. Hughes (P)	M. Schacker (P)
D. Edwards (P)	D. Mazumdar (P) **	C. Tailor (P)	A. Jivanani (P)	G. Schoonenberg (P)
D. Gohil (P)	D. Mohla (P)	M. Wactor (P) **	H. Josten (P)	J. Shullaw (P)
M. Flack (P)	A. Morgan (P)	J. Zawadzki (P) **	T. Lagerstrom (P)	R. Warren (P)
K. Flowers (P)	A. Morse (P)		R. Morris (P)	

P = present, E = excused, A = absent, \*\* indicates members of the working group for C37.20.7-2007.

- The task force has been discussing proposals for revision of the present document.

Proposal for testing of MV motor control centers:

- One proposal is for revisions to address testing of MVMCC (medium-voltage motor control center) equipment. This proposal was submitted for consideration by NEMA. It was briefly reviewed and it was agreed unanimously to accept this proposal as a starting point for further discussion.

Request for interpretation:

- A request for interpretation has been received regarding accessibility type 2BC, excerpted below. The generic IEEE-SA policies on handling of requests for interpretation were reviewed.

Subject -IEEE C37.20.7-2007 - Request for Interpretation of Accessibility Type designation 1 BC and 2BC (ref - NOTE under Annex A. paragraph A.3)

Dear Sir/Madam,

We need IEEE interpretation of accessibility type designation 2BC for an arc resistant switchgear assembly.

I have noticed that certain manufacturers are claiming type 2BC for their arc resistant switchgear but at the same time they also state the suffix C is applicable only to certain compartments within the assembly and does not apply to certain other compartments, e.g. does not apply to cable compartment accessible from the rear of the equipment. According to IEEE C37.20.7, Annex A, paragraph A.3, suffix "C" is designated for equipment where isolation from the effects of an internal arcing fault is desired between all adjacent compartments within a switchgear assembly. Therefore, if certain compartments within an assembly do not meet suffix C requirements, can the manufacturer still use accessibility designation containing suffix letter "C" to describe

arc resistant characteristics of this equipment and still comply with IEEE C37.20.7?

To me if switchgear is to be designated Arc Resistant Type 2BC, all requirements for Type 2, all requirements for suffix B, and all requirements for suffix C must met.

Please provide your interpretation of what requirements must be met if the equipment is to be designated as Type 2BC.

The fundamental question is whether the existing guide allows for a portion of the equipment to have one accessibility type while allowing another accessibility type for another portion of the equipment.

The text of the present document is excerpted as follows:

#### A.3 Suffix "C"

This suffix is designated for equipment where isolation from the effects of an internal arcing fault is desired between all adjacent compartments within a switchgear assembly:

The application of suffix "C" to Accessibility Type 1 or Type 2 indicates that the equipment meets the additional requirements of A.3.1 and A.3.2. It does not imply that the equipment may be operated with doors, covers, or panels opened or removed and maintain its intended degree of protection (refer to 1.2.2).

Equipment qualified to the conditions described in A.3.1 and A.3.2 should be labeled as Type 1C or Type 2C (as appropriate) to differentiate it from the types described in 4.1. Note that this feature may not be applicable to all types of switchgear construction discussed in this guide. The suffix "C" designation is not applicable to equipment using open bus or open frame construction.

Subclause A.3.2 further states:

#### A.3.2

Assessment of the test requires that all criteria identified in 6.1 apply with the following modification of Criterion 3:

...

Type 2C – That arcing does not cause holes in the freely accessible front, sides, and rear of the enclosure or in the walls separating the compartment in which the arc is initiated from all adjacent compartments..."

The consensus is that the language of the existing document is clear and does not allow multiple accessibility types for different portions of the assembly. Accordingly, an interpretation is not necessary.

It was agreed to draft an explanation. The explanation was prepared and considered by the task force, and is attached to these minutes. A vote was taken of the members of the working group for the 2007 edition of C37.20.7, of whom 10 of the 15 members (one now deceased) were present. 9 members voted for the explanation draft, one member being absent from the meeting at the time of the vote. The explanation will be considered by the Switchgear Assemblies Subcommittee, and modified editorially to include the Switchgear Committee letterhead, and then forwarded to IEEE-SA for transmittal to the requestor.

#### Issues arising from IEC 62271-200:

- IEC limits current to ground to 100A or less during arcing tests. IEEE requires that the enclosure be connected to the source in such a manner that there is no significant limitation on ground current. Significant discussion occurred relative to which testing arrangement produces the most

onerous conditions. Several report that testing with solid grounding produces more dramatic results during testing. Others report that testing with limited ground current forces the arcing to remain as three-phase arcing and produces the highest pressure on the enclosure.

Other issues:

- One firm has been asked to provide a full neutral bus in equipment. How does this affect an internal arcing rating? Is there a need for additional arcing tests?
- Do we wish to extend the document to cover metal-enclosed bus as covered in C37.23? Metal-enclosed bus always connects to differing equipment at each end, e.g., to metal-enclosed switchgear at one end and to a power transformer at the other end, we would have consider the connecting equipment transitions.
- Testing of low-voltage motor control centers introduces several different considerations than for higher voltage equipment or for metal-enclosed low-voltage switchgear. Do we wish to revise C37.20.7 to encompass low-voltage MCCs? It was suggested that the NEMA working group on low-voltage MCCs be requested to prepare a suggestion for appropriate revisions to address testing of low-voltage MCCs. This is similar to medium-voltage MCCs, where the NEMA proposal was discussed earlier in this meeting.

Future Steps:

- We should resolve whether major changes (e.g., metal-enclosed bus, low-voltage MCCs, etc.) are to be incorporated before we prepare for a PAR submittal. The objective is to resolve these issues by the next meeting, and submit a PAR following the Spring 2011 meeting.

The meeting adjourned at 11:54AM.

Report submitted by:

M. Wactor, WG Chair



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29-September-2010

Eaton Corporation  
Electrical Assemblies Division  
2210 Highway 72/221 East  
Greenwood, South Carolina 29649

Attention: Chand Tailor, PE  
Manager, Product Applications  
chandztailor@eaton.com

SUBJECT: IEEE C37.20.7-2007 – Request for Interpretation  
of Accessibility Type designation 1BC and 2BC

We have your request for interpretation (copy attached) concerning  
C37.20.7 IEEE Guide for Testing Metal-Enclosed Switchgear Rated  
up to 38kV for Internal Arcing Faults.

In response, the Switchgear Assemblies Subcommittee referred this  
request to the working group for C37.20.7-2007, who provides the  
following explanation:

The Guide, IEEE C37.20.7 Guide for Testing Metal-Enclosed  
Switchgear Rated up to 38kV for Internal Arcing Faults, is clear with  
regard to this subject. There is no need for an interpretation.

Subclause A.3 of the guide specifically states that to apply the Suffix  
C rating to equipment, all compartments must meet the  
requirements.

#### A.3 Suffix “C”

This suffix is designated for equipment where isolation from the effects  
of an internal arcing fault is desired between all adjacent compartments  
within a switchgear assembly.

One exception is identified in subclause A.3.2 for the main bus  
compartment.

Type 2C—That arcing does not cause holes in the freely accessible  
front, sides, and rear of the enclosure or in the walls separating the  
compartment in which the arc is initiated from all adjacent  
compartments. Exception: In metal-clad (IEEE Std C37.20.2-1999)  
equipment, a fault in a main bus bar compartment of a vertical section is  
allowed to propagate into the main bus bar compartment of the adjacent  
vertical sections if the main bus bars are in the same circuit but not if the  
main bus bars are in different circuits. Connections from the main bus  
bar to switchgear components are not considered to be part of the main  
bus, and propagation of a fault along these connections into the  
compartment containing the component is not allowed.



THE INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, Inc.

WEBSITE : <http://www.ewh.ieee.org/soc/pes/switchgear/index.htm>

This wording states the intent of the Suffix C rating applies to all compartments within the assembly and to claim this rating, all compartments must meet the requirements as stated above.

The requirements to meet a rating of Type 2BC are exactly as stated in Annex A of C37.20.7. The requirements for each specific rating, Type 2, Suffix B, and Suffix C must be met as described in the document.

Sincerely;

M. Wactor  
Chair, C37.20.7-2007 Working Group

Attachment: Request for interpretation as received:

JUL 20 2010



Eaton Corporation  
Electrical Assemblies Division  
2210 Highway 72/221 East  
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Tel: 864 942-6201

July 9, 2010

Secretary, IEEE-SA Standards Board  
445 Hoes Lane  
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USA

Subject – IEEE C37.20.7-2007 – Request for Interpretation of Accessibility Type designation 1BC and 2BC (ref – NOTE under Annex A. paragraph A.3)

Dear Sir/Madam,

We need IEEE interpretation of accessibility type designation 2BC for an arc resistant switchgear assembly.

I have noticed that certain manufacturers are claiming type 2BC for their arc resistant switchgear but at the same time they also state the suffix C is applicable only to certain compartments within the assembly and does not apply to certain other compartments, e.g. does not apply to cable compartment accessible from the rear of the equipment. According to IEEE C37.20.7, Annex A, paragraph A.3, suffix "C" is designated for equipment where isolation from the effects of an internal arcing fault is desired between all adjacent compartments within a switchgear assembly. Therefore, if certain compartments within an assembly do not meet suffix C requirements, can the manufacturer still use accessibility designation containing suffix letter "C" to describe arc resistant characteristics of this equipment and still comply with IEEE C37.20.7?

To me if switchgear is to be designated Arc Resistant Type 2BC, all requirements for Type 2, all requirements for suffix B, and all requirements for suffix C must met

Please provide your interpretation of what requirements must be met if the equipment is to be designated as Type 2BC.

Thank you.

Sincerely,

A handwritten signature in cursive script that reads "Chand Taylor".

Chand Taylor, PE  
Manager, Product Applications  
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