

IEEE PES Switchgear Committee, HVCB, C37.11 Meeting in Las Vegas, NV

1. Welcome and introductions of all participants. The WG meeting was attended by xx participants; xx members and xx guests.
2. Mike Crawford, the vice-chair, is presiding the meeting.
3. The WG Chair reviewed IEEE Policy on patents and Guidelines for IEEE WG Meetings
4. Changes made between draft 1 and draft 2 was presented to the audience.
5. John Webb explained how some ground protection relays can put a low-power 60V signal that can create a false command operation on some PLC type relays.
6. Section 3.a) Minimum trip signal duration of 50 ms was proposed by the chair. There was consensus among the WG.
7. Motion by Jeff Nelson, seconded by Mauricio Aristizabal to approve minutes of last meeting in Myrtle Beach.
8. Wording was updated on clause 3.f) and 3.g) with help of several members of the WG
9. Note on item 3.f) was deleted.
10. Electrical immunity tests: John Webb “C37.100.1 references two series of tests, IEC 61000-4-4 (also 61000-4-12) and C37.90 series of tests that are “similar”. He recommends maintaining the reference to C37.100.1” He’ll provide the presentation shown to the WG to be attached to the minutes. The WG members approve to maintain the reference to C37.100.1.
11. The chair proposes to remove the EMC test requirements from this document and include on the next revision of C37.04 but it was agreed by the WG to make a reference to C37.100.1 section 5.18. This is new item 3.k)
12. Section 4.d.1) Definition of “b” finger was updated by the chair, but reverted to the original definition by the WG.
13. Section 5.e) wording updated by WG members. The note was also updated
14. Note b) on figure 5 needs to be updated to reflect preferences on protection schemes by some users.
15. Preferred ratings for auxiliary contacts need to be described. John Webb to provide some wording.
16. Additional diagram on connection schemes for magnetically actuated circuit breaker needs to be added. Bill Long & John Webb to contribute
17. A new Draft 3 will be produced with editorial changes
18. A recirculation ballot of this new draft 3 will be made
19. Motion to adjourn.

OLD BUSINESS

- Preferred ratings for auxiliary contacts. John Webb offered to write up something for WG consideration.

NEW BUSINESS

- Do we need requirements for magnetic actuated mechs. John Webb had stuck extra words in about capacitor trip since the document doesn't mention a lot of specifics about specific mechs. Recommended a diagram to show the circuit for magnetic actuated mechs.

Slides from J. Webb attached:

EMC Requirements in C37.100.1

- C37.100.1 Section 6.9 – Electromagnetic Compatibility
 - 6.9.1 – Emission Tests
 - 6.9.2 – Immunity Tests
 - Electrical Fast Transient Burst
 - Either C37.90.1 or IEC 61000-4-4 @ 4kV
 - Oscillatory Wave Immunity Test
 - Either C37.90.1 or IEC 61000-4-12
 - For GIS: 100 kHz, 1 MHz, 10 MHz, 50 MHz
 - All others: 100 kHz, 1 MHz
 - Common Mode @ 2.5 kV, Differential Mode 1 kV

Comparison of C37.90.1 and IEC 61000-4-4

<u>Fast Transient Waveform</u>	IEEE Std C37.90.1	IEC 61000-4-4:1995
Waveform Polarity	Positive and Negative	Positive and Negative
Rise Time	5 ns	5 ns
Magnitude	4 kV	0.5 kV to 4 kV
Pulse Duration	50 ns	50 ns
<u>Repetition Rate:</u>		
<i>Burst Duration</i>	15 msec	15 msec @ 5 kHz 0.75 msec @ 100 kHz
<i>Repetition Rate during bursts:</i>	2.5 kHz	5 or 100 kHz
<i>Burst Period</i>	300 msec	300 msec
Duration:	Not less than 1 Min. ea.	
Source Impedence:	50 Ω fm. 1 - 100 MHz	50 Ω

Comparison of C37.90.1 and IEC 61000-4-4

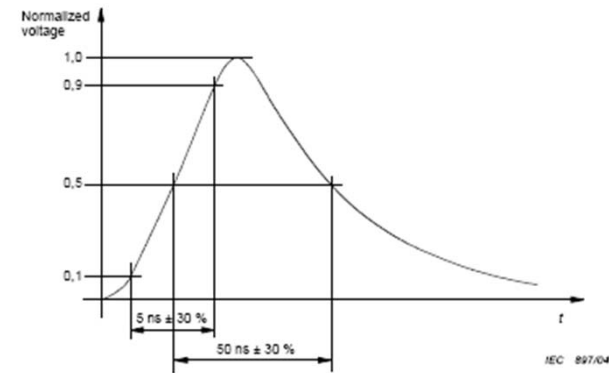
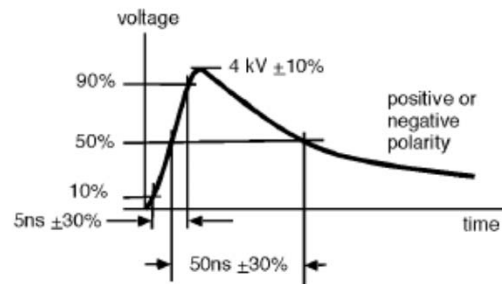


Figure 3 – Waveshape of a single pulse into a 50 Ω load

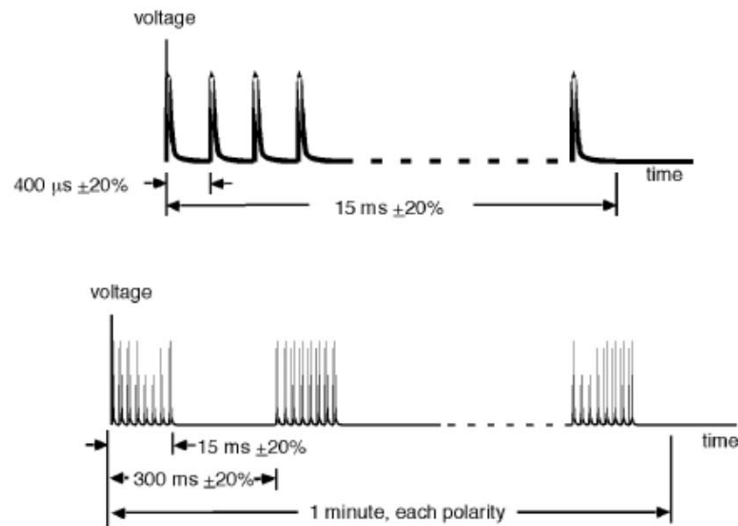
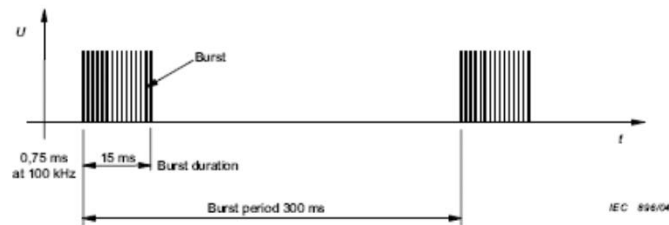
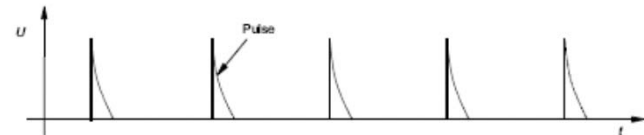


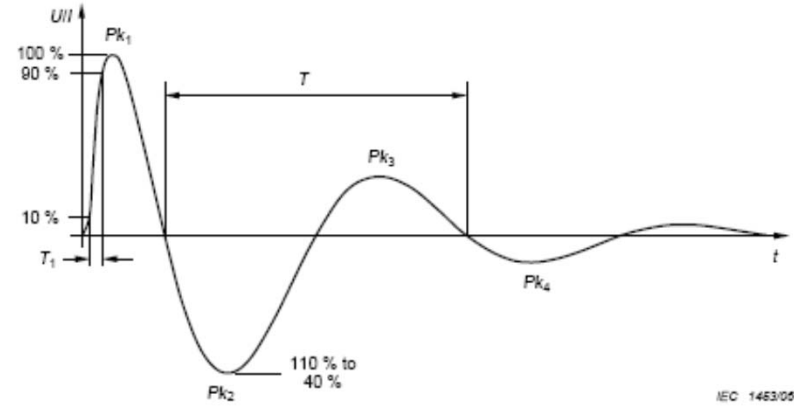
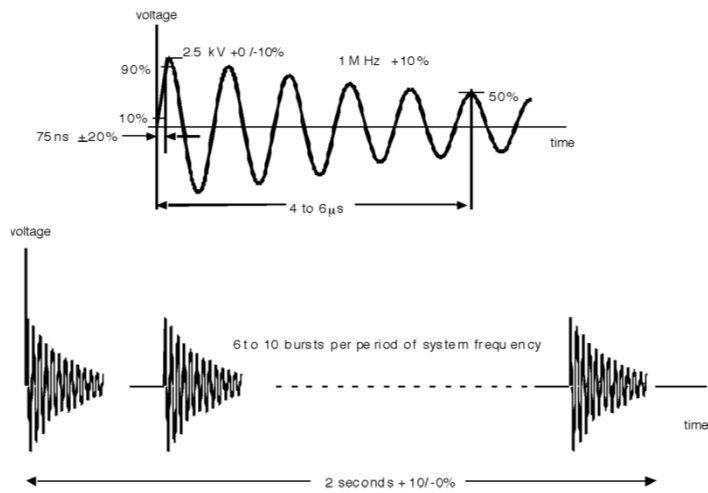
Figure 2—Fast transient burst waveform



Comparison of C37.90.1 and IEC 61000-4-12

<u>Oscillatory Waveform</u>	C37.90.1	IEC 61000-4-12
Waveform Envelope	Damped Oscillatory Wave	Damped Oscillatory Wave
Decay Period	50% between 3rd & 5th pd.	0.4 < Ratio of Pk ₂ to Pk ₁ < 1.1 0.4 < Ratio of Pk ₃ to Pk ₂ < 0.8 0.4 < Ratio of Pk ₄ to Pk ₃ < 0.8
Frequency	1 MHz	0.1 MHz
Rise Time of 1st Peak:	75 ns	500 ns
Test Voltage Magnitude	2.5 kV	250 V to 4 kV
Repetition Rate:	6 - 10 bursts / period	1 to 60 Transients / min.
Duration	2 sec.	
Source Impedence	200 Ω @ 1 Mhz	12 Ω and 30 Ω

Comparison of C37.90.1 and IEC 61000-4-12



Other EMC Testing Options

- IEC 61000-4-1 Overview of EMC Test Series
- Lists 27 Types of Immunity Standards
- Believe C37.100.1 has done the work for us
- Unless otherwise indicated no need for further work here