

# C37.012 Study Group meeting minutes

## October 12 2016 Pittsburgh PA

Meeting called to order followed by the customary introductions of workers and observers.

15 workers in attendance and 27 observers

Major tasks

1) The Main purpose is to eliminate the ages incorrect reference to inrush frequency as an application concern for non- oil breakers. This is also known as the  $I \times f$  issue.  $di/dt$  is not a concern for practical capacitor bank application thus  $I \times f$  should not be used as an applications criterion. Several years of testing have shown that for SF6 and Vacuum technologies the concern for inrush/outrush is current magnitude and the natural ringing frequency of the inrush, so long as it is  $>1\text{kHz}$  is not an applications concern.

The concern is for contact wear and that is driven by current magnitude. In Vacuum there is some concern when the current magnitude exceeds 7 – 10 kA when diffuse arcing becomes more concentrated, and future retriangles may be more likely.

2) Review of the switching surge overvoltage language to be removed from C37.09 and C37.04 for suitability for inclusion in C37.012.

Specific areas in need of revision:

4.3.3 the statement about capacitors being capable of inrush currents up to 100x normal current is applicable strictly to IEC designed units (possibly those with internal fuses) IEEE 1036 describes discharge current capability that is limited by the internal connections and not related to normal current. In most cases the capability results in currents that will exceed 400x normal current. In any case, the guidance in IEEE 1036 should be followed.

5.3.3.1 frequency of the inrush is not a concern nor is the rate of change of current ( $di/dt$  not concern)

6.2.1 lines or belted cable can also be modeled as a wye capacitor grounded through a neutral capacitor.

9.4.1 from a practical point of view, when cable charging current exceeds about 300A the capacitance is usually compensated with shunt reactors. Typical maximum cable ampacity is about 1200A and to free up ampacity for load, shunt reactors are used to compensate much of the charging current.

9.11.2.3???

we no longer care about  $di/dt$  only the peak current is a concern. Change the examples.

Pg 51 Rarely is the close and latch peak current exceeded

10.3 add CIGRE Brochure that Anne Chaired.

I'm sure there are more.

My plan is to complete breaker capacitor discharge testing and prepare a transactions paper covering the subject. That can be used as a reference to justify the peak current only approach. After that I will get a PAR to revise C37.012 Then we form a WG.

PAR anticipated by 8/2017 with ballot by 8/2018 complete by 2/2019..

name	worker	observer
Roy Alexander	Chair	
Xi Zhu	x	
Denis Dufournet	x	
David Caverly		x
Sushil Shinde	x	
Anton Poeltl		x
Helmut Heirmeier	x	
Jim VandeLigt	x	
Abn Bufi	x	
Joe Kausek		x
Andrew Peterson		x
Jerry Wen		x
Devki Sharma		x
Steven Brown		x
Tom Pellerito		x
Nigel McQuin		x
Don Steigerwalt		x
Vernon Toups		x
Dave Feldmann		x
Carl Schuetz	x	
Joe Jasinski		x
Rich York		x
Mauricio Aristizabal	x	
Alexander Ebbert		x
John Eastman		x
Kim Jinho		
Luke collette	x	
Jason Connigham		x
Dan Schiffbauer		
Jim McBride		x
Neil Hutchins		x
Partick Dilillo		x
Alexander Hoover		x
Vincent Marshall		x
Hua Ying liu	x	
Bob Behl	x	
Dave Lemmerman		x
Victor Hermosillo	x	
Casey Weeks	x	
Aasim Atiq	x	
Mike Skidmore	x	
John Webb	x	
Anne Bosma	x	