Minutes of Meeting

WG: C37.012a Guide for the Application of Capacitance Current Switching for AC High-Voltage Circuit Breakers above 1000 V Amendment Changing the Capacitive Inrush/Outrush Limitations of Switchgear

Chair: Roy Alexander
Vice-Chair: Brian Roberts

Wednesday April 25th, 2018 (10:15-12:00 PM)
Location: Lake Buena Vista, FL
Participants: 11 Members
29 Guests

Introductions of members and guests

Verbal call for patent identification
No essential patents identified

Introduction by the Vice-Chair
The WG Chair was unable to attend the meeting, so the Vice-Chair led the meeting. Meeting was kicked off by the Vice-Chair explaining the overall purpose of the Amendment and pointing out experience which shows frequency of the inrush current does not have a significant impact on the switchgear.

Discussion of the draft document
Neil McCord: Described testing procedures and how if an application has a frequency which exceeds test values, some customers require documentation or proof the switchgear is ok. Has performed testing to demonstrate the switchgear can handle higher frequencies.

Jeffrey Brogdon: Commented he would like to remove the current-limiting reactor for applications where it is installed to limit the frequency. Commented there may be other concerns such as for control cables, but it is not a concern for the switchgear.

Sushil Shinde: Commented that most concerns for the switchgear during capacitor switching have been experienced during opening, and there is no evidence of wear from inrush current being the cause.

Anne Bosma: Commented the e-mail sent to the WG from Edgar Dullni suggested that frequency does matter to the switchgear.

Helmut Heiermeier: Commented that it depends on several things such as breaker type, arcing time, etc.

Sushil Shinde: Commented this WG is not proposing to remove the test frequency (e.g., 4.3 kHz). Described testing performed for a 72 kV breaker which demonstrates frequency is not that important. Mentioned testing in progress at 245 kV to prove scalability. Commented that testing performed to date is proof that frequency doesn't matter and has suggested that others provide proof from testing that shows the contrary.

Jan Wisker: Commented there is not enough evidence to claim frequency doesn't matter. Has seen evidence (e.g., penciling of the contacts) suggesting frequency matters. Suggested a bigger sampling needs gathered to show frequency doesn't matter on other breaker types.

Sushil Shinde: Commented that testing has shown the duration of the inrush current is more important than frequency where a case with lower frequency but longer duration is worse. This is why the proposal is to use the ICI method. There have been applications where performance was better for the case with synchronous-close control with no current-limiting reactor than the case with only a current-limiting reactor.

Jeffrey Brogdon: Commented that high inrush currents can be observed even for small errors in the synchronous-close control target. Experience has been that the accuracy is not that good with such a long contact closing time and small target window. Especially when idle for a long time.

Arben Bufi: Commented most US cases have the configuration with a circuit breaker, lumped CLR, and then capacitor bank which is a concern for the breaker with a fault at the capacitor bank (i.e., reactor-limited fault). For 10 years some capacitors have been installed with a distributed inductor throughout the bank (e.g., an inductor in each can) which does not require additional mitigation. Suggested a task force is created to review the configuration of capacitor banks to see if the problems for the switchgear can be eliminated this way.

Jeffrey Brogdon: Commented that while this may fix new installations, it would not help with the numerous existing installations.

Anne Bosma: CIGRE WG A3.38 is doing similar work in parallel to this working group. Anne suggested this working group should wait until the CIGRE WG has collected data and investigated the ICI method.

Attendance

Last Name	First Name	Affiliation	Member/Guest
Alexander	Roy Alexander	RWA Engineering	Member (Chair)
Roberts	Brian Roberts	Southern States	Member (Vice Chair)
Bosma	Anne	ABB	Member
Bufi	Arben	HVB	Member
Crawford	Mike	MEPPI	Member
Eastman	John	Franklin Grid	Member
Frazier	Curtiss	Ameren	Member
Heiermeier	Helmut	ABB	Member
Schuetz	Carl	ATC	Member
Shinde	Sushil	ABB	Member
Weisker	Jan	Siemens	Member
Zhang	Will	HVB	Member
Zhu	Xi	GE Grid Solutions	Member
Behl	Bob	ABB	Guest
Brighae	Andrew	Entergy	Guest
Brogdon	Jeff	GTC	Guest
Carne	Clint	Schnieder Electric	Guest
Chow	Chih	PEPCO	Guest
Dragan	Tabanovic		Guest
Dwyer	Bernie	Peco Energy	Guest
Edwards	Doug	Siemens	Guest
Fennell	Bruce	NES	Guest
Gall	Elizabeth	MEPPI	Guest
Hall	John	TVA	Guest
Johnson	Cory	BPA	Guest
Lagree	James	Eaton	Guest
Lemmerman	Dave	Peco Energy	Guest
Marshall	Vincent	Southern Co	Guest
Martin	Gary	Entergy	Guest
Marzec	Pete	S&C Electric	Guest
McBride	Jim	JMX HV	Guest
McCord	Neil	KEC Precision	Guest
Mitchell	Dave	Dominion	Guest
Orosz	Mike	MCP	Guest
Owens	Mary	Eaton	Guest
Pellerito	Tom	DTE	Guest
Peterson	Andrew	ABB	Guest

Pintado	Zachary	Entergy	Guest
Rich	Bobby	Dominion	Guest
Tsuetanoff	Jordan	First Energy	Guest
Victor	Savulyak	KEMA	Guest
Woodard	Terry	Siemens	Guest