TEST REPORT # Simulated Surge Arrester-20170412-LMA

Test Object:	T&B 38kV Recloser with Beckwith M7-7679 Recloser Controller.	
Manufacturer:	(T&B) Elastimold 1Esna Dr. Hackettstown, NJ 07840 Beckwith Electric Co. Inc., 6190 118th Ave North, Lago, FL 33773	
Ratings:	Maximum voltage	38 kV
	Frequency	50/60 Hz
	Continuous current	800 A
	Interruption and short-time current	12.5 kA
	Lightning impulse (BIL)	170 kV
	Power frequency withstand voltage (Dry)	70 kV
Test performed:	Control electronic elements surge withstand capability (SWC) test.	
Test specification:	The above tests have been carried out in accordance with the procedures in IEC 62271-111:2012/C37.60 – 2012 section 6.111.3.2 & section 6.111.3.3	
Test date/location:	2017/04/12 ABB Inc., 655 Century Point, Lake Mary, FL, 32746, USA	
Test required by:	Beckwith Electric Co., Inc. 6190 118th Ave North, Lago, FL 33773	
Test Results:	Passed Simulated Surge Test, Recloser was operated before every set up.	
Date of issue:	2017/05/08	
Prepared:	E. Avis	
Checked:	B. Behl	
Approved:	R. Goodin	

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Description of tested objects:

Recloser:

. Type	T&B 38kV
. Version	MVR3-38-12-N2
. Serial Number	MVR125616B

Controller:

. Type	Beckwith
. Catalog number	M7679-V6L1ML6ELT2C0000
. Serial Number	1090
. Type	Beckwith M-7679
. Firmware	03.11.22

Tests performed:

Date	Description
04/10-12/2017	Simulated Surge Arrester Test

List of test participants:

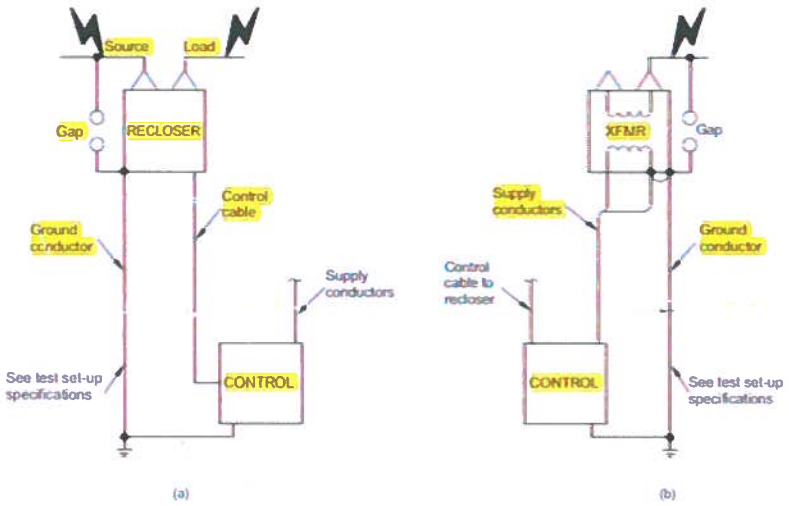
Test operators & witnesses

Eddy Avis	ABB Test Laboratory, Lake Mary, FL, USA
Joel Bryant	Beckwith Electric, Lago, FL, USA
Mitchell Shutterfield	Beckwith Electric, Lago, FL, USA

List of Equipment:

Equipment used
High current Phenix HC-2
Voltmeter Fluke 177
H.V. Probe Fluke 80K-40
BIL Machine Haugao 610-H
Transformer PPI Power T&D PP12A261985

Test Arrangements:



Surge test circuit

Test condition	15 positive surges applied to	15 negative surges applied to	Recloser Status	Surge test circuit
1	Source Terminal	Source Terminal	Open	a
2	Source Terminal	Source Terminal	Closed	a
3	Load Terminal	Load Terminal	Closed	a
4	Transformer	Transformer	Open	b
5	Transformer	Transformer	Closed	b

Surge test on main circuits:

Test Results

Condition of control after the surge tests:

The recloser and control were capable of performing normal functions without impairment after the surge tests, and the following verifications were made:

Communications with an external computer.

Open and close the Recloser before every set up.

Voltage sensing and Current injection, was done before and after Sim surge test.

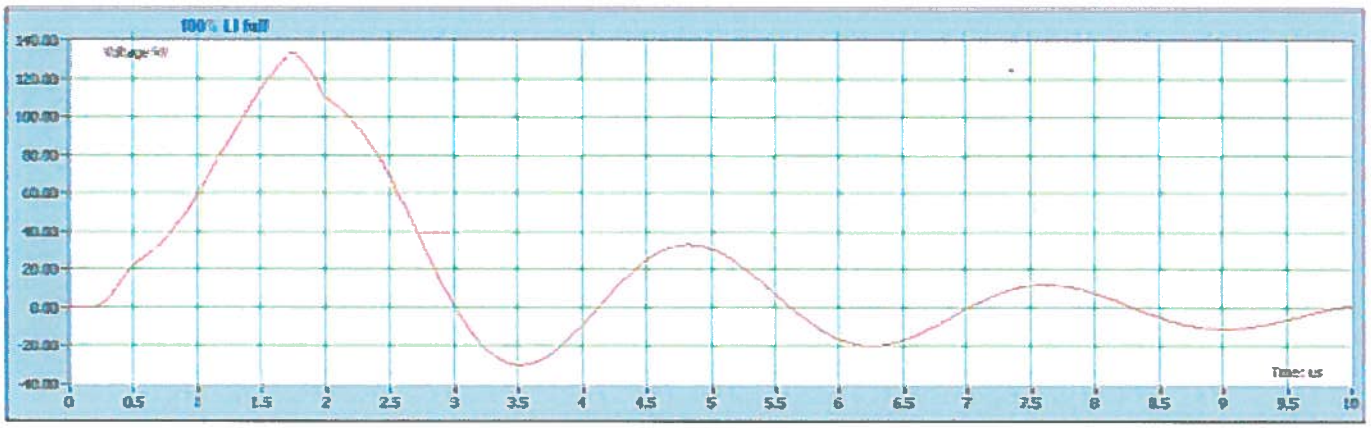
Note: All the above tests were performed successfully.

These are the test parameters and results. The graphs are on pages 7 & 8.

U_{peak} (119kV-153kV)	T_1 (.7-1.7)	I_{peak} (5.4-6.6)	t_{Rise} 2kA (.20-.40)	Rate of rise (kA/us) (5-10)
-132.5kV	1.33µs	-5.96kA	0.31µs	6.45
133.5kV	1.26µs	5.96kA	0.23µs	8.70

Oscillograms:

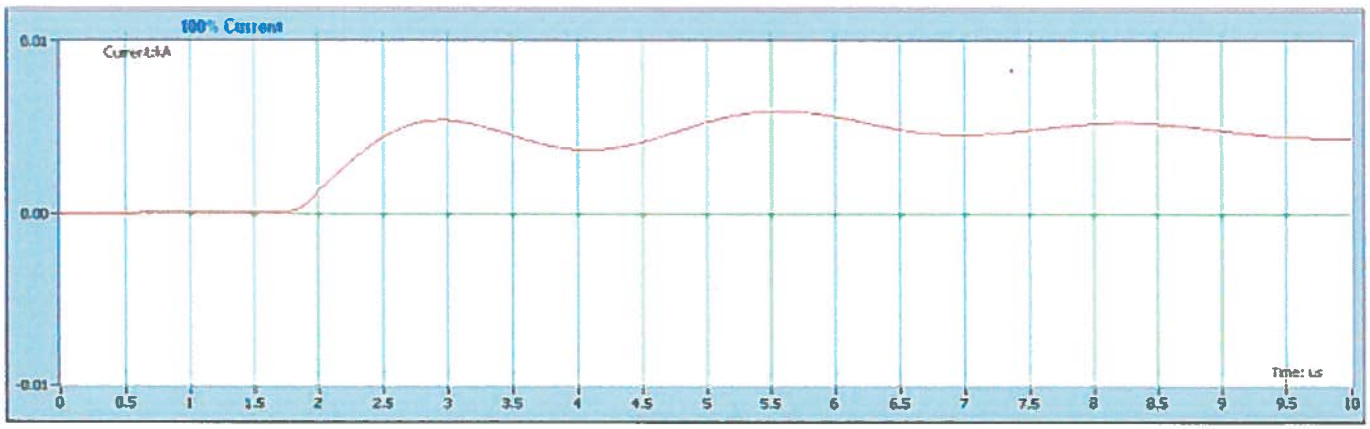
Typical voltage wave form for positive impulse for the Simulated Surge test.



LI full Voltage: kV

Up= 133.45 kV T1= 1.26 us T2= 2.47 us

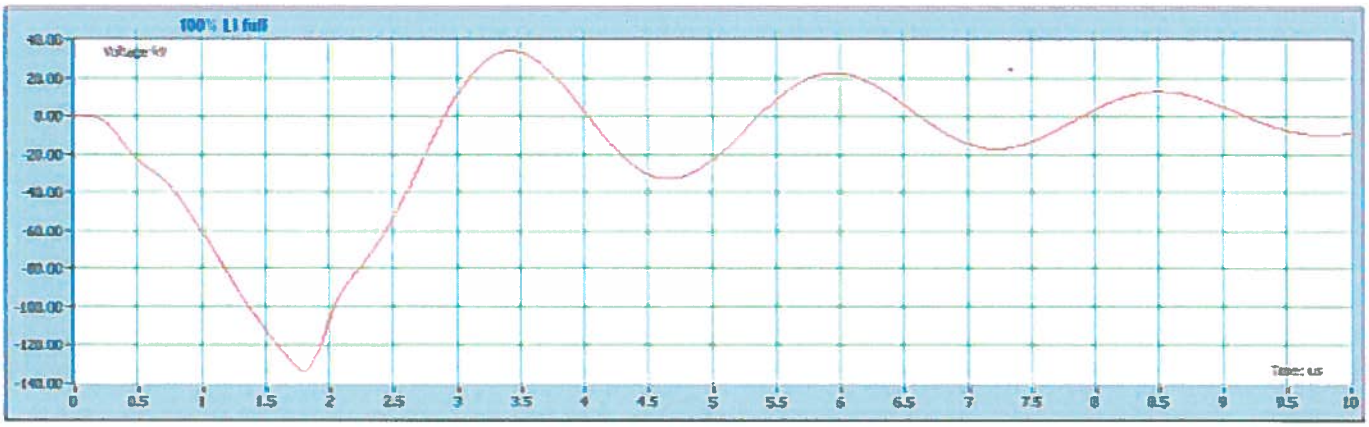
Typical current wave form for positive impulse for the Simulated Surge test.



Current: kA

Ip= 5.96 A

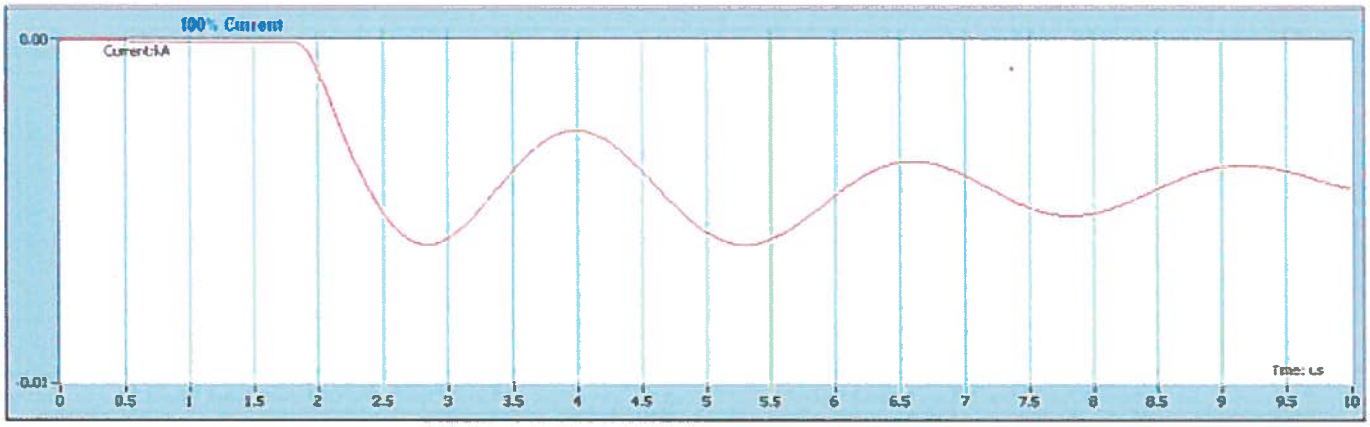
Typical voltage wave form for negative impulse of the Simulated Surge test.



LI full Voltage: kV

Up= -132.52 kV T1= 1.33 us T2= 2.81 us

Typical current wave form for negative impulse of the Simulated Surge test.



Current: kA

Ip= -5.96 A

Photos of test objects:

LV Cabinet

HV Cabinet