TEST REPORT

Test Report No.	**2127**
Test Date	March 13, 2008
Type of Test	Mechanical Capability Under Wind
Product	EV-1 4000 A from 500 kV Disconnect Switch

Southern States

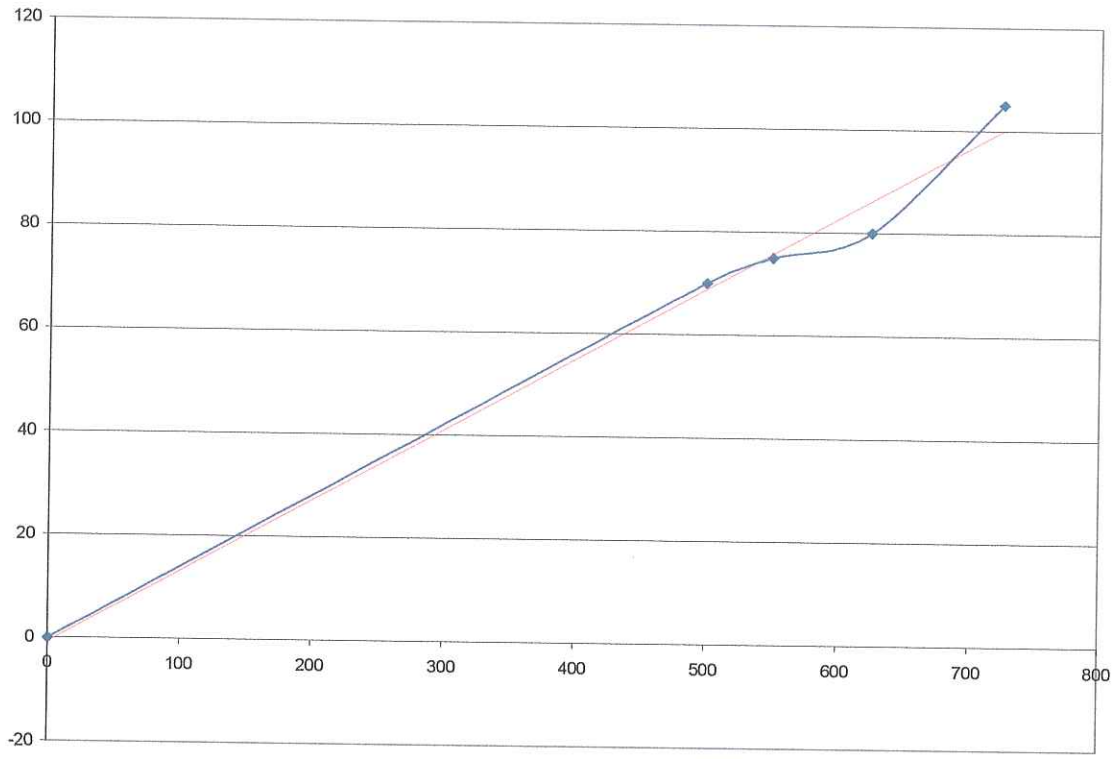
Wind Loading Withstand
For
EV-1 500kV, 1800BIL

Tests were performed in the outdoor laboratory of Southern States, Inc. in Hampton, Georgia on the subject switch.

Equipment
The tested switch was a type EV-1 500 kV 4000 A 1800 kV BIL switch.

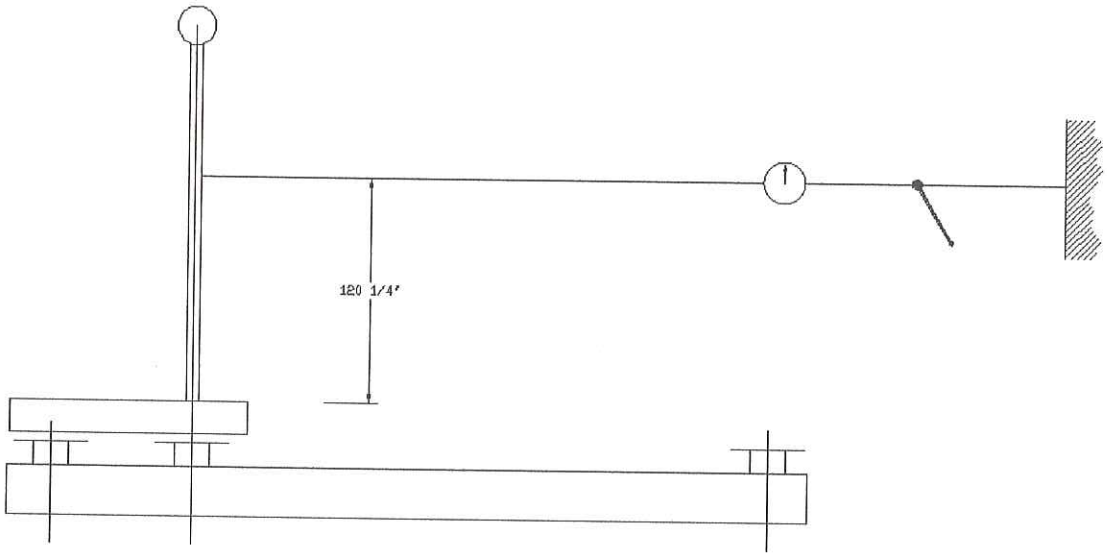
Purpose
The purpose of this test was to evaluate open withstand capability of EV-1 switch, when subject to severe wind condition.

Procedure
The following tests were performed during August of 2003.
Switches equipped with gear drive mechanism were chosen during a production run. They were checked to provide a ratio of output-input torque required to move the blade, or applied to blade to turn the drive.



This ratio was later was put in place, when a specimen was placed on ground, and live parts were attached directly to the base. A calculated force was applied to blade, while readings were taken at switch bearing.

The force was calculated based on NEMA SG-6 standard ($P=SV^2$, Where S is 0.0025 for cylindrical, and 0.004 for flat surfaces). The resulted data is pressure per square feet.
These forces were them applied to a VM-1 motor operator.



Switches from 15.5 kV to 245 kV 900 kV BIL are the same as the test specimen, except they have shorter switch blade. Test performed on EV-2 245 kV 1050 kV BIL switch is the worst case test.

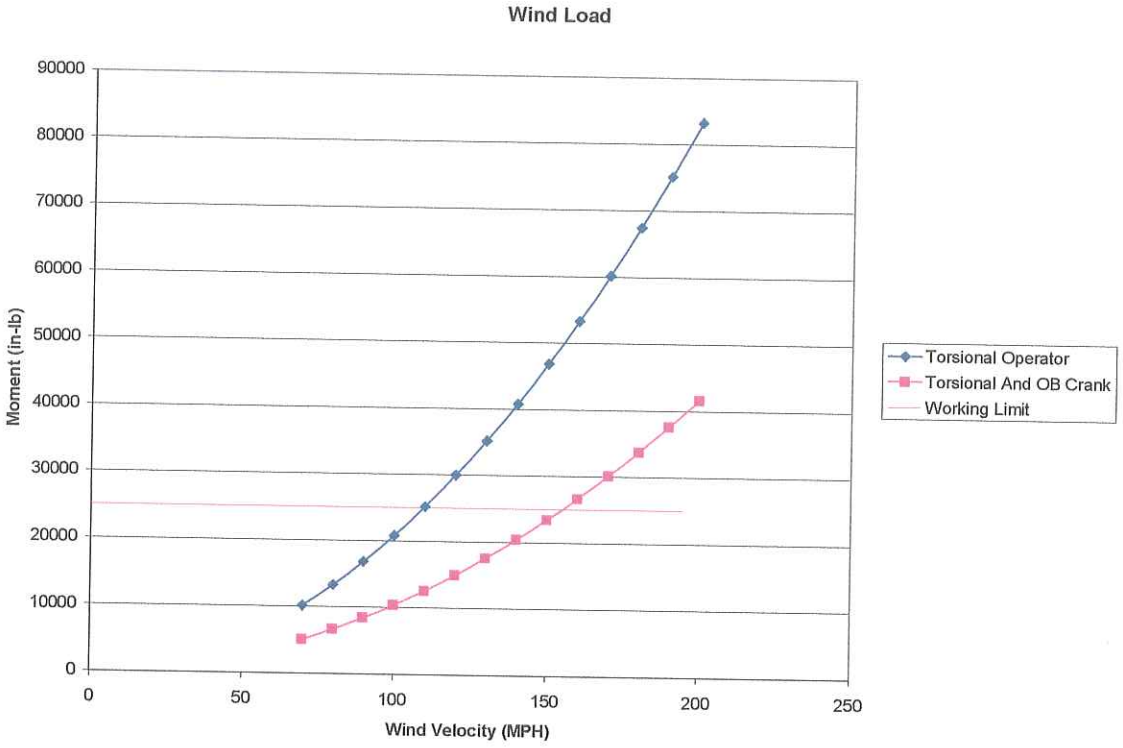
Results:
The following data was gathered

	TYPE	AREA (in2)	DIST (in)	REF. CALCULATED AT 100MPH FORCES (Lb)	MOMENT (in-Lb)
Ball	R	113	216	20.40277778	4407
Tip	S	84	199	24.5	4875.5
Corona	R	28.5	188.5	5.145833333	969.9896
Blade	R	855	95.5	154.375	14742.81
Total				204.4236111	24995.3

Blade opening

Φb=	90	Deg
Wt=	150.25	Lbs
CG@=	106.00	in
Eff Wt	0	in-Lb
Eff Arm	122.27	in
Gear Efficiency	80	%
OR Ratio	4.8	

Wind (MPH)	Forces (Lbs)	Moment (in-Lb)	Mechanism: Torsional And OB Crank	Mechanism: Torsional Operator
70	100	12248	5103	10206
80	131	15997	6665	13331
90	166	20246	8436	16872
100	204	24995	10415	20829
110	247	30244	12602	25204
120	294	35993	14997	29994
130	345	42242	17601	35202
140	401	48991	20413	40826
150	460	56239	23433	46866
160	523	63988	26662	53323
170	591	72236	30099	60197
180	662	80985	33744	67487
190	738	90233	37597	75194
200	818	99981	41659	83318



Conclusion

VM-1 motor mechanism can hold the blades of a three (3) phase EV-1 500kV, 1800BIL, in open position, when forces applied to blade, and carried though mechanism.

Written By: _____

Danny M. Hoss, Chief Engineer, Switch Products