Standard Error Analysis II

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Background

- **An examination of the increasing number of replications required to reach convergence led to the realization that one cause of the excessive outages was the outage rates on the cable systems.**
- **One possible methodology will be to solve the Tan45 analysis with the full system data as in the past. But then the transmission outage rates will be set to zero and the capacities will be adjusted system wide to bring the LOLE back up to 0.10 events/year.**
- **The idea is that the system will be designed recognizing transmission *limits*, but not transmission *outages*. The additional capacity required to compensate for transmission outages will be the responsibility of the zone that they are delivering to.**

Summary of Results

	Case	IRM	J LCR	K LCR	MARS SE @ 3000 reps	Replication @ 0.025 SE	LOLE A-F	LOLE J	LOLE K	LOLE NYCA	Higest 3 replications		
A	IRM 26-27 SS	25.6	79.845	107.502	0.0304	-	0.04798	0.05838	0.07312	0.10027	3.12	2.817	2.253
B	cable outages at zero	25.6	79.845	107.502	0.0146	994	0.04207	0.04076	0.02461	0.04532	0.292	0.244	0.238
C	Bring system back to 0.1	22.854	77.758	104.956	0.0108	565	0.09455	0.09217	0.05535	0.09998	0.432	0.425	0.425
D1	Restore outages into K	22.854	77.758	104.956	0.0255	NA	0.09759	0.09425	0.12080	0.16376	4.091	3.601	2.99
D2	Bring back to 0.1 K only	23.919	77.758	111.532	0.0174	1661	0.08114	0.07918	0.05437	0.10018	1.667	1.614	1.158
E1	Restore outages into J	23.919	77.758	111.532	0.0168	1475	0.08617	0.10207	0.0614	0.12239	1.667	1.614	1.237
E2	Bring back to 0.1 J only	24.492	79.392	111.532	0.0187	1805	0.07161	0.07955	0.05355	0.10009	1.661	1.614	1.218

A	Tan45 solution to Special Senstivity case with all cable outages modeled.
B	Case A with all transmission outages set to zero, but no changes to capacity.
C	Case B with capacity removed system wide to restore 0.1 LOLE.
D1	Case C with outage rates restored on lines into zone K.
D2	Case D1 with capacity added into zone K only to bring system LOLE back to 0.10
E1	Case D2 with outage rates restored on lines into zone J.
E2	Case E1 with capacity added into zone J only to bring system LOLE back to 0.10

Observations

- **Eliminating cable outages or compensating for them with local capacity significantly reduced the highest replications and the convergence values.**
- **Possibly starting from a Tan45 curve based on zero cable outage rates would improve the results.**

Expected Values

- **Although all points on the Tan45 curve have an expected value of 0.10 events/year the convergence is significantly different.**
  - **At 3000 replications:**

IRM	Std Error	Highest value
22.540	0.011	0.668
28.500	0.035	3.127

  - **Recognition of the highest values could be balanced against the Tan45 calculation**
  - **In the future track and plot the highest replications at each Tan45 point. This may produce a different inflection point.**