

	A	B	C	D	E	F	G
	Calculations for Non-Detection Probability of Tampering, In a Constituency With 200 Voting Booths (With One EVM - VVPAT Pair In Each Booth, When VVPAT Counts Are Cross Checked With EVM Counts) (This is "Source Excel File-200 Booths" or "SEF-200 booths", Sheet-2) (Revised By Dr Ramesh Bellamkonda, 2019-02-10)						
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2	No. of booths in constituency =		200 Assumed No of Booths Tampered =			2	
3	Random Cross Check No. (for VVPAT-EVM Counts)	Total No. of EVM-VVPAT Pairs in the pool that are yet to be cross checked	Absolute no. of EVMs Assumed to be tampered in the constituency	Absolute no. of non-tampered EVMs that remain, given that no tampered EVMs detected thus far	Probability of not detecting tampering of any EVM, in the particular random cross check of VVPAT-EVM counts	Probability of not detecting tampering of any EVM, in the cumulative random cross checks of VVPAT-EVM counts, till that point	Probability of not detecting tampering of any EVM, in the cumulative random cross checks of VVPAT-EVM counts, till that point, % <u>age</u>
4	1	200	2	198	0.99	0.99	99.00%
5	2	199	2	197	0.989949749	0.980050251	98.01%
6	3	198	2	196	0.98989899	0.970150754	97.02%
7	4	197	2	195	0.989847716	0.960301508	96.03%
8	5	196	2	194	0.989795918	0.950502513	95.05%
9	6	195	2	193	0.98974359	0.940753769	94.08%
10	7	194	2	192	0.989690722	0.931055276	93.11%
11	8	193	2	191	0.989637306	0.921407035	92.14%
12	9	192	2	190	0.989583333	0.911809045	91.18%
13	10	191	2	189	0.989528796	0.902261307	90.23%
14	11	190	2	188	0.989473684	0.892763819	89.28%
15	12	189	2	187	0.989417989	0.883316583	88.33%
16	13	188	2	186	0.989361702	0.873919598	87.39%
17	14	187	2	185	0.989304813	0.864572864	86.46%
18	15	186	2	184	0.989247312	0.855276382	85.53%
19	16	185	2	183	0.989189189	0.846030151	84.60%
20	17	184	2	182	0.989130435	0.836834171	83.68%
21	18	183	2	181	0.989071038	0.827688442	82.77%
22	19	182	2	180	0.989010989	0.818592965	81.86%
23	20	181	2	179	0.988950276	0.809547739	80.95%
24	21	180	2	178	0.988888889	0.800552764	80.06%
25	22	179	2	177	0.988826816	0.79160804	79.16%
26	23	178	2	176	0.988764045	0.782713568	78.27%
27	24	177	2	175	0.988700565	0.773869347	77.39%
28	25	176	2	174	0.988636364	0.765075377	76.51%
29	26	175	2	173	0.988571429	0.756331658	75.63%
30	27	174	2	172	0.988505747	0.747638191	74.76%
31	28	173	2	171	0.988439306	0.738994975	73.90%
32	29	172	2	170	0.988372093	0.73040201	73.04%
33	30	171	2	169	0.988304094	0.721859296	72.19%
34	31	170	2	168	0.988235294	0.713366834	71.34%
35	32	169	2	167	0.98816568	0.704924623	70.49%
36	33	168	2	166	0.988095238	0.696532663	69.65%
37	34	167	2	165	0.988023952	0.688190955	68.82%
38	35	166	2	164	0.987951807	0.679899497	67.99%
39	36	165	2	163	0.987878788	0.671658291	67.17%
40	37	164	2	162	0.987804878	0.663467337	66.35%
41	38	163	2	161	0.987730061	0.655326633	65.53%
42	39	162	2	160	0.987654321	0.647236181	64.72%
43	40	161	2	159	0.98757764	0.63919598	63.92%
44	41	160	2	158	0.9875	0.63120603	63.12%
45	42	159	2	157	0.987421384	0.623266332	62.33%
46	43	158	2	156	0.987341772	0.615376884	61.54%
47	44	157	2	155	0.987261146	0.607537688	60.75%
48	45	156	2	154	0.987179487	0.599748744	59.97%
49	46	155	2	153	0.987096774	0.59201005	59.20%
50	47	154	2	152	0.987012987	0.584321608	58.43%
51	48	153	2	151	0.986928105	0.576683417	57.67%
52	49	152	2	150	0.986842105	0.569095477	56.91%
53	50	151	2	149	0.986754967	0.561557789	56.16%
54	51	150	2	148	0.986666667	0.554070352	55.41%
55	52	149	2	147	0.986577181	0.546633166	54.66%
56	53	148	2	146	0.986486486	0.539246231	53.92%
57	54	147	2	145	0.986394558	0.531909548	53.19%
58	55	146	2	144	0.98630137	0.524623116	52.46%
59	56	145	2	143	0.986206897	0.517386935	51.74%
60	57	144	2	142	0.986111111	0.510201005	51.02%
61	58	143	2	141	0.986013986	0.503065327	50.31%
62	59	142	2	140	0.985915493	0.495979899	49.60%
63	60	141	2	139	0.985815603	0.488944724	48.89%
64	61	140	2	138	0.985714286	0.481959799	48.20%
65	62	139	2	137	0.985611511	0.475025126	47.50%
66	63	138	2	136	0.985507246	0.468140704	46.81%
67	64	137	2	135	0.98540146	0.461306533	46.13%

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3	Random Cross Check No. (for VVPAT-EVM Counts)	Total No. of EVM-VVPAT Pairs in the pool that are yet to be cross checked	Absolute no. of EVMs Assumed to be tampered in the constituency	Absolute no. of non-tampered EVMs that remain, given that no tampered EVMs detected thus far	Probability of not detecting tampering of any EVM, in the particular random cross check of VVPAT-EVM counts	Probability of not detecting tampering of any EVM, in the cumulative random cross checks of VVPAT-EVM counts, till that point	Probability of not detecting tampering of any EVM, in the cumulative random cross checks of VVPAT-EVM counts, till that point, % <u>age</u>
68	65	136	2	134	0.985294118	0.454522613	45.45%
69	66	135	2	133	0.985185185	0.447788945	44.78%
70	67	134	2	132	0.985074627	0.441105528	44.11%
71	68	133	2	131	0.984962406	0.434472362	43.45%
72	69	132	2	130	0.984848485	0.427889447	42.79%
73	70	131	2	129	0.984732824	0.421356784	42.14%
74	71	130	2	128	0.984615385	0.414874372	41.49%
75	72	129	2	127	0.984496124	0.408442211	40.84%
76	73	128	2	126	0.984375	0.402060302	40.21%
77	74	127	2	125	0.984251969	0.395728643	39.57%
78	75	126	2	124	0.984126984	0.389447236	38.94%
79	76	125	2	123	0.984	0.38321608	38.32%
80	77	124	2	122	0.983870968	0.377035176	37.70%
81	78	123	2	121	0.983739837	0.370904523	37.09%
82	79	122	2	120	0.983606557	0.364824121	36.48%
83	80	121	2	119	0.983471074	0.35879397	35.88%
84	81	120	2	118	0.983333333	0.35281407	35.28%
85	82	119	2	117	0.983193277	0.346884422	34.69%
86	83	118	2	116	0.983050847	0.341005025	34.10%
87	84	117	2	115	0.982905983	0.335175879	33.52%
88	85	116	2	114	0.982758621	0.329396985	32.94%
89	86	115	2	113	0.982608696	0.323668342	32.37%
90	87	114	2	112	0.98245614	0.31798995	31.80%
91	88	113	2	111	0.982300885	0.312361809	31.24%
92	89	112	2	110	0.982142857	0.30678392	30.68%
93	90	111	2	109	0.981981982	0.301256281	30.13%
94	91	110	2	108	0.981818182	0.295778894	29.58%
95	92	109	2	107	0.981651376	0.290351759	29.04%
96	93	108	2	106	0.981481481	0.284974874	28.50%
97	94	107	2	105	0.981308411	0.279648241	27.96%
98	95	106	2	104	0.981132075	0.274371859	27.44%
99	96	105	2	103	0.980952381	0.269145729	26.91%
100	97	104	2	102	0.980769231	0.263969849	26.40%
101	98	103	2	101	0.980582524	0.258844221	25.88%
102	99	102	2	100	0.980392157	0.253768844	25.38%
103	100	101	2	99	0.98019802	0.248743719	24.87%
104	101	100	2	98	0.98	0.243768844	24.38%
105	102	99	2	97	0.97979798	0.238844221	23.88%
106	103	98	2	96	0.979591837	0.233969849	23.40%
107	104	97	2	95	0.979381443	0.229145729	22.91%
108	105	96	2	94	0.979166667	0.224371859	22.44%
109	106	95	2	93	0.978947368	0.219648241	21.96%
110	107	94	2	92	0.978723404	0.214974874	21.50%
111	108	93	2	91	0.978494624	0.210351759	21.04%
112	109	92	2	90	0.97826087	0.205778894	20.58%
113	110	91	2	89	0.978021978	0.201256281	20.13%
114	111	90	2	88	0.977777778	0.19678392	19.68%
115	112	89	2	87	0.97752809	0.192361809	19.24%
116	113	88	2	86	0.977272727	0.18798995	18.80%
117	114	87	2	85	0.977011494	0.183668342	18.37%
118	115	86	2	84	0.976744186	0.179396985	17.94%
119	116	85	2	83	0.976470588	0.175175879	17.52%
120	117	84	2	82	0.976190476	0.171005025	17.10%
121	118	83	2	81	0.975903614	0.166884422	16.69%
122	119	82	2	80	0.975609756	0.16281407	16.28%
123	120	81	2	79	0.975308642	0.15879397	15.88%
124	121	80	2	78	0.975	0.154824121	15.48%
125	122	79	2	77	0.974683544	0.150904523	15.09%
126	123	78	2	76	0.974358974	0.147035176	14.70%
127	124	77	2	75	0.974025974	0.14321608	14.32%
128	125	76	2	74	0.973684211	0.139447236	13.94%
129	126	75	2	73	0.973333333	0.135728643	13.57%
130	127	74	2	72	0.972972973	0.132060302	13.21%
131	128	73	2	71	0.97260274	0.128442211	12.84%

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132	129	72	2	70	0.972222222	0.124874372	12.49%
133	130	71	2	69	0.971830986	0.121356784	12.14%
134	131	70	2	68	0.971428571	0.117889447	11.79%
135	132	69	2	67	0.971014493	0.114472362	11.45%
136	133	68	2	66	0.970588235	0.111105528	11.11%
137	134	67	2	65	0.970149254	0.107788945	10.78%
138	135	66	2	64	0.96969697	0.104522613	10.45%
139	136	65	2	63	0.969230769	0.101306533	10.13%
140	137	64	2	62	0.96875	0.098140704	9.81%
141	138	63	2	61	0.968253968	0.095025126	9.50%
142	139	62	2	60	0.967741935	0.091959799	9.20%
143	140	61	2	59	0.967213115	0.088944724	8.89%
144	141	60	2	58	0.966666667	0.085979899	8.60%
145	142	59	2	57	0.966101695	0.083065327	8.31%
146	143	58	2	56	0.965517241	0.080201005	8.02%
147	144	57	2	55	0.964912281	0.077386935	7.74%
148	145	56	2	54	0.964285714	0.074623116	7.46%
149	146	55	2	53	0.963636364	0.071909548	7.19%
150	147	54	2	52	0.962962963	0.069246231	6.92%
151	148	53	2	51	0.962264151	0.066633166	6.66%
152	149	52	2	50	0.961538462	0.064070352	6.41%
153	150	51	2	49	0.960784314	0.061557789	6.16%
154	151	50	2	48	0.96	0.059095477	5.91%
155	152	49	2	47	0.959183673	0.056683417	5.67%
156	153	48	2	46	0.958333333	0.054321608	5.43%
157	154	47	2	45	0.957446809	0.05201005	5.20%
158	155	46	2	44	0.956521739	0.049748744	4.97%
159	156	45	2	43	0.955555556	0.047537688	4.75%
160	157	44	2	42	0.954545455	0.045376884	4.54%
161	158	43	2	41	0.953488372	0.043266332	4.33%
162	159	42	2	40	0.952380952	0.04120603	4.12%
163	160	41	2	39	0.951219512	0.03919598	3.92%
164	161	40	2	38	0.95	0.037236181	3.72%
165	162	39	2	37	0.948717949	0.035326633	3.53%
166	163	38	2	36	0.947368421	0.033467337	3.35%
167	164	37	2	35	0.945945946	0.031658291	3.17%
168	165	36	2	34	0.944444444	0.029899497	2.99%
169	166	35	2	33	0.942857143	0.028190955	2.82%
170	167	34	2	32	0.941176471	0.026532663	2.65%
171	168	33	2	31	0.939393939	0.024924623	2.49%
172	169	32	2	30	0.9375	0.023366834	2.34%
173	170	31	2	29	0.935483871	0.021859296	2.19%
174	171	30	2	28	0.933333333	0.02040201	2.04%
175	172	29	2	27	0.931034483	0.018994975	1.90%
176	173	28	2	26	0.928571429	0.017638191	1.76%
177	174	27	2	25	0.925925926	0.016331658	1.63%
178	175	26	2	24	0.923076923	0.015075377	1.51%
179	176	25	2	23	0.92	0.013869347	1.39%
180	177	24	2	22	0.916666667	0.012713568	1.27%
181	178	23	2	21	0.913043478	0.01160804	1.16%
182	179	22	2	20	0.909090909	0.010552764	1.06%
183	180	21	2	19	0.904761905	0.009547739	0.95%
184	181	20	2	18	0.9	0.008592965	0.86%
185	182	19	2	17	0.894736842	0.007688442	0.77%
186	183	18	2	16	0.888888889	0.006834171	0.68%
187	184	17	2	15	0.882352941	0.006030151	0.60%
188	185	16	2	14	0.875	0.005276382	0.53%
189	186	15	2	13	0.866666667	0.004572864	0.46%
190	187	14	2	12	0.857142857	0.003919598	0.39%
191	188	13	2	11	0.846153846	0.003316583	0.33%
192	189	12	2	10	0.833333333	0.002763819	0.28%
193	190	11	2	9	0.818181818	0.002261307	0.23%
194	191	10	2	8	0.8	0.001809045	0.18%
195	192	9	2	7	0.777777778	0.001407035	0.14%

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196	193	8	2	6	0.75	0.001055276	0.11%
197	194	7	2	5	0.714285714	0.000753769	0.08%
198							
199	Percent of Booths that will need to be cross checked to detect any tampering of EVMs with 99.9% Probability = (A197/C2) =						97.00%