

Frequency Response Characteristic Calculation for All India based on NLDC SCADA Data

EVENT:	As reported, On 8th April, 230 kV TTPS-TTN AUTO-1 and 230 kV TTPS_STERLITE tripped at 03:29 hrs due to Y-phase conductor cut and All other 230KV evacuating lines connected from Tuticorin Thermal Power station(TTPS) tripped due to overloading which resulted in tripping of Unit 1,2,4 and 5(210MW each) of Tuticorin.Total generation loss reported was 700MW.Later It was confirmed that a Generation loss of 1045 MW in all five units (5x210 MW) was observed and accordingly the same figure has been considered for FRC calculation.						
S No	Particulars	Dimension	NR	ER	WR	NER	SR
1	Actual Net Interchange before the Event (03:31:30)	MW	6780	-1911	-14738	343.0	9850
2	Actual Net Interchange after the Event (03:32:50)	MW	6639	-1977	-15086	339.2	10416
3	Change in Net Interchange (2 - 1)	MW	-141	-66	-348	-3.8	567
4	Generation Loss (+) / Load Throw off (-) during the Event	MW	0	0	0	0	1045
5	Control Area Response (3 - 4)	MW	-141	-66	-348	-4	-479
6	Frequency before the Event	HZ	49.99	49.99	49.99	49.99	49.99
7	Frequency after the Event	HZ	49.95	49.95	49.95	49.95	49.95
8	Change in Frequency (7 - 6)	HZ	-0.044	-0.044	-0.044	-0.044	-0.044
9	Frequency Response Characteristic (5 / 8)	MW/Hz	3205	1489	7909	86	10875
10	Net System Demand met before the Event	MW	40517	22671	53516	1557	45185
11	Internal Generation before the Event (10 - 1)	MW	33737	24582	68254	1214	35336
12	Ideal load response assuming 4% per Hz (0.04*Row 10)	MW/Hz	1621	907	2141	62	1807
13	Ideal generator response assuming 5% droop.....40% per Hz (40% of Row 11)	MW/Hz	13495	9833	27302	485	14134
14	Composite ideal response (12 + 13)	MW/Hz	15116	10740	29442	548	15942
15	Percentage ideal response	%	21.2%	13.9%	26.9%	15.8%	68.2%

(*) - Data may be constant/suspected during the event
 Note: +ve exchange=> import ; (-)ve exchange => export

Total Change in (MW)	1045
FRC for NEWS GRID (dp/df) MW/Hz	23750
Power Number (net change in MW/maximum change in frequency)	11484