

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

EVENT:	At 13:01 Hrs of 17th December 2023, 400kV Bhadla-Bikaner ckt-1 tripped due to Y-B fault. Due to this tripping, solar generation loss of around 1600 MW observed in Rajasthan RE complex. Accordingly same has been considered in the FRC calculation.						
S No	Particulars	Dimension	NR	ER	WR	NER	SR
1	Actual Net Interchange before the Event (13:01:04)	MW	7072	-5927	-7922	180	6274
2	Actual Net Interchange after the Event (13:02:04)	MW	8240	-5991	-8454	145	5570
3	Change in Net Interchange (2-1)	MW	1168	-63	-531	-35	-705
4	Generation Loss (+) / Load Throw off (-) during the Event	MW	1600	0	0	0	0
5	Control Area Response (3 - 4)	MW	-432	-63	-531	-35	-705
6	Frequency before the Event	Hz	50.09	50.09	50.09	50.09	50.09
7	Frequency after the Event	Hz	50.04	50.04	50.04	50.04	50.04
8	Change in Frequency (7 - 6)	Hz	-0.054	-0.054	-0.054	-0.054	-0.054
9	Frequency Response Characteristic (5 / 8)	MW/Hz	7995	1173	9841	644	13049
10	Net System Demand met before the Event	MW	54238	17107	64154	1796	46575
11	Internal Generation before the Event (10 - 1)	MW	47166	23034	72077	1616	40301
12	Ideal load response assuming 4% per Hz (0.04*Row 10)	MW/Hz	2170	684	2566	72	1863
13	Ideal generator response assuming 5% droop.....40% per Hz (40% of Row 11)	MW/Hz	18867	9214	28831	647	16120
14	Composite ideal response (12 + 13)	MW/Hz	21036	9898	31397	718	17983
15	Percentage ideal response	%	38.0%	11.8%	31.3%	89.6%	72.6%

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

only interchange of 132kv Surjamani-comilla D/c.

Total Change in (MW)	1600
FRC for NEWS GRID (dp/df) MW/Hz	29630
Power Number (net change in MW/maximum change in frequency)	10738

Source Wise Generation (MW)	GAS	HYDRO	NUCLEAR	Thermal	WIND	SOLAR
	2159	5390	5304	130658	7513	32160

Percentage of Non responsive generation to Primary frequency response (nuclear+ wind+ solar) as a percentage of total generation	24.55%
Percentage of non rotating generation (wind+ solar) as a percentage of total generation	21.66%