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

EVENT:	On 06th August 2023, As reported, Due to snapping of Y phase Jumper of Amarsagar – ludarva circuit 2 caused multiple tripping of 132 kV Ludarva-Amarsagar ckt 2, 132kV Amarsagar Jaisalmer 2, 220/132KV 100 MVA T/F-1,2 & 3 at Amarsagar substation at 09:48hrs.Due to these multiple tripping, wind generation loss of around 1600 MW observed in Rajasthan wind.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 (09:48:56)	MW	5799	-3082	-10192	-113	6997
2	Actual Net Interchange after the Event (09:50:00)	MW	6844	-3208	-10384	-161	6528
3	Change in Net Interchange (2-1)	MW	1046	-127	-192	-47.8	-469
4	Generation Loss (+) / Load Throw off (-) during the Event	MW	1600	0	0	0	0
5	Control Area Response (3 - 4)	MW	-554	-127	-192	-48	-469
6	Frequency before the Event	HZ	50.05	50.05	50.05	50.05	50.05
7	Frequency after the Event	HZ	49.97	49.97	49.97	49.97	49.97
8	Change in Frequency (7 - 6)	HZ	-0.087	-0.087	-0.087	-0.087	-0.087
9	Frequency Response Characteristic (5 / 8)	MW/Hz	6370	1455	2209	549	5393
10	Net System Demand met before the Event	MW	61539	24303	53416	2364	53151
11	Internal Generation before the Event (10 - 1)	MW	55741	27385	63608	2477	46154
12	Ideal load response assuming 4% per Hz (0.04*Row 10)	MW/Hz	2462	972	2137	95	2126
13	Ideal generator response assuming 5% droop…….40% per Hz (40% of Row 11)	MW/Hz	22296	10954	25443	991	18462
14	Composite ideal response (12 + 13)	MW/Hz	24758	11926	27580	1085	20588
15	Percentage ideal response	%	25.7%	12.2%	8.0%	50.6%	26.2%

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

Total Change in (MW)	1600
FRC for NEWS GRID (dp/df) MW/Hz	**18391**
Power Number (net change in MW/maximum change in frequency)	**11594**

Source Wise Generation (MW)	GAS	HYDRO	NUCLEAR	Thermal	WIND	SOLAR
	2745	**29823**	**5872**	**111353**	**20648**	**26328**