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

EVENT:	On 09th Feb 2023, As reported At 11:45 hrs, due to oscillations and multiple tripping in Rajasthan RE generation complex drop of around 4590 MW RE generation observed in Rajasthan RE generation complex of Northern Region and same figure has been considered in FRC Calculation.

S No	Particulars	Dimension	NR	ER	WR	NER	SR
1	Actual Net Interchange before the Event (11:45:00)	MW	4499	-8780	-2813	-35	6602
2	Actual Net Interchange after the Event (11:47:08)	MW	7960	-9076	-4568	-78	4885
3	Change in Net Interchange (2-1)	MW	3461	-296	-1754	-43.0	-1717
4	Generation Loss (+) / Load Throw off (-) during the Event	MW	4590	0	0	0	0
5	Control Area Response (3 - 4)	MW	-1129	-296	-1754	-43	-1717
6	Frequency before the Event	HZ	49.98	49.98	49.98	49.98	49.98
7	Frequency after the Event	HZ	49.55	49.55	49.55	49.55	49.55
8	Change in Frequency (7 - 6)	HZ	-0.433	-0.433	-0.433	-0.433	-0.433
9	Frequency Response Characteristic (5 / 8)	MW/Hz	2606	683	4052	99	3965
10	Net System Demand met before the Event	MW	59030	19996	68069	1987	56678
11	Internal Generation before the Event (10 - 1)	MW	54531	28776	70882	2022	50076
12	Ideal load response assuming 4% per Hz (0.04*Row 10)	MW/Hz	2361	800	2723	79	2267
13	Ideal generator response assuming 5% droop…….40% per Hz (40% of Row 11)	MW/Hz	21812	11510	28353	809	20030
14	Composite ideal response (12 + 13)	MW/Hz	24174	12310	31076	888	22297
15	Percentage ideal response	%	10.8%	5.5%	13.0%	11.2%	17.8%

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

Total Change in (MW)	4590
FRC for NEWS GRID (dp/df) MW/Hz	**10600**
Power Number (net change in MW/maximum change in frequency)	**9787**

Source Wise Generation (MW)	GAS	HYDRO	NUCLEAR	Thermal	WIND	SOLAR
	2545	**10107**	**5388**	**145137**	**1801**	**41273**