

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

**EVENT:** On 09th Feb 2023, As reported At 12:29hrs, due to oscillations and multiple tripping in Rajasthan RE generation complex drop of around 3510 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 (12:29:00)	MW	5471	-9090	-2680	-31	5850
2	Actual Net Interchange after the Event (12:30:56)	MW	7919	-9484	-3528	-69	4667
3	Change in Net Interchange (2-1)	MW	2447	-394	-848	-37.2	-1183
4	Generation Loss (+) / Load Throw off (-) during the Event	MW	3510	0	0	0	0
5	Control Area Response (3 - 4)	MW	-1063	-394	-848	-37	-1183
6	Frequency before the Event	HZ	50.04	50.04	50.04	50.04	50.04
7	Frequency after the Event	HZ	49.75	49.75	49.75	49.75	49.75
8	Change in Frequency (7 - 6)	HZ	-0.290	-0.290	-0.290	-0.290	-0.290
9	Frequency Response Characteristic (5 / 8)	MW/Hz	3665	1359	2923	128	4079
10	Net System Demand met before the Event	MW	57638	19780	66854	2010	56264
11	Internal Generation before the Event (10 - 1)	MW	52167	28870	69534	2041	50415
12	Ideal load response assuming 4% per Hz (0.04*Row 10)	MW/Hz	2306	791	2674	80	2251
13	Ideal generator response assuming 5% droop.....40% per Hz (40% of Row 11)	MW/Hz	20867	11548	27814	817	20166
14	Composite ideal response (12 + 13)	MW/Hz	23172	12339	30488	897	22417
15	Percentage ideal response	%	15.8%	11.0%	9.6%	14.3%	18.2%

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

Total Change in (MW)	3510
<b>FRC for NEWS GRID (dp/df) MW/Hz</b>	<b>12103</b>
Power Number (net change in MW/maximum change in frequency)	<b>10415</b>

<b>Source Wise Generation (MW)</b>	GAS	HYDRO	NUCLEAR	Thermal	WIND	SOLAR
	2507	9606	5377	144518	1980	39666