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

EVENT:	On 14th Jan 2023, As reported At 15:18 hrs Due to multiple tripping in solar park lead to tripping of evacuating lines at 765kV, 400kV , 220kV and resulted in generation loss of around 4780 MW resulted in Rajasthan RE generation loss 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 (15:18:24)	MW	5103	-8621	-5045	111	8280
2	Actual Net Interchange after the Event (15:19:24)	MW	8350	-9141	-7133	-1	7414
3	Change in Net Interchange (2-1)	MW	3247	-520	-2088	-112.4	-866
4	Generation Loss (+) / Load Throw off (-) during the Event	MW	4780	0	0	0	0
5	Control Area Response (3 - 4)	MW	-1533	-520	-2088	-112	-866
6	Frequency before the Event	HZ	50.04	50.04	50.04	50.04	50.04
7	Frequency after the Event	HZ	49.70	49.70	49.70	49.70	49.70
8	Change in Frequency (7 - 6)	HZ	-0.343	-0.343	-0.343	-0.343	-0.343
9	Frequency Response Characteristic (5 / 8)	MW/Hz	4468	1516	6088	328	2525
10	Net System Demand met before the Event	MW	51803	17669	58226	1918	50163
11	Internal Generation before the Event (10 - 1)	MW	46701	26290	63271	1807	41883
12	Ideal load response assuming 4% per Hz (0.04*Row 10)	MW/Hz	2072	707	2329	77	2007
13	Ideal generator response assuming 5% droop…….40% per Hz (40% of Row 11)	MW/Hz	18680	10516	25308	723	16753
14	Composite ideal response (12 + 13)	MW/Hz	20752	11223	27637	799	18760
15	Percentage ideal response	%	21.5%	13.5%	22.0%	41.0%	13.5%

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

Total Change in (MW)	4780
FRC for NEWS GRID (dp/df) MW/Hz	**13936**
Power Number (net change in MW/maximum change in frequency)	**10814**

Source Wise Generation (MW)	GAS	HYDRO	NUCLEAR	Thermal	WIND	SOLAR
	2198	**8855**	**4779**	**132726**	**2086**	**30617**