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

EVENT:	At 14:16 Hrs Dated 23rd Jan 2022,As reported multiple element tripping occurred in Rajasthan Solar complex of Northern Region at 765/400kV Fatehgarh2(PG), 765/400kV Bhadla(PG) 2 & 765kV Bikaner(PG) and led to effective solar generation loss of approx.1110MW (960MW at Fatehgarh2(PG) & 250MW at Bhadla(PG)). Same has been considered for FRC calculation as per reported region.

S No	Particulars	Dimension	NR	ER	WR	NER	SR
1	Actual Net Interchange before the Event (14:16:00)	MW	4861	-6948	-2194	304	3767
2	Actual Net Interchange after the Event (14:17:30)	MW	5676	-7108	-2444	302.7	3524
3	Change in Net Interchange (2 - 1)	MW	815	-160	-250	-1.3	-243
4	Generation Loss (+) / Load Throw off (-) during the Event	MW	1110	0	0	0	0
5	Control Area Response (3 - 4)	MW	-295	-160	-250	-1	-243
6	Frequency before the Event	HZ	50.05	50.05	50.05	50.05	50.05
7	Frequency after the Event	HZ	50.03	50.03	50.03	50.03	50.03
8	Change in Frequency (7 - 6)	HZ	-0.020	-0.020	-0.020	-0.020	-0.020
9	Frequency Response Characteristic (5 / 8)	MW/Hz	14727	7996	12500	67	12128
10	Net System Demand met before the Event	MW	42549	15412	52092	1858	40435
11	Internal Generation before the Event (10 - 1)	MW	37688	22360	54286	1554	36668
12	Ideal load response assuming 4% per Hz (0.04*Row 10)	MW/Hz	1702	616	2084	74	1617
13	Ideal generator response assuming 5% droop…….40% per Hz (40% of Row 11)	MW/Hz	15075	8944	21714	621	14667
14	Composite ideal response (12 + 13)	MW/Hz	16777	9561	23798	696	16285
15	Percentage ideal response	%	87.8%	83.6%	52.5%	9.6%	74.5%

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

Total Change in (MW)	1110
FRC for NEWS GRID (dp/df) MW/Hz	**55500**
Power Number (net change in MW/maximum change in frequency)	**11100**