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

EVENT:	As reported at 10:05 Hrs on 15th of August 2021,Solar Generation loss of around 1100 MW occurred in Bhadla(Rajasthan) of Northern Region. At 09:50 Hrs 400/220kV 500 MVA ICT-II tripped on differential operation, Later remaining 400/220 kV 500 MVA ICT-I and ICT-III tripped at 10:05 Hrs on overcurrent and led to solar generation loss of around 1100 MW..

S No	Particulars	Dimension	NR	ER	WR	NER	SR
1	Actual Net Interchange before the Event (10:05:40)	MW	7391	-4227	-5114	-599	2246
2	Actual Net Interchange after the Event (10:07:00)	MW	8236	-4298	-5496	-604.6	1895
3	Change in Net Interchange (2 - 1)	MW	844	-72	-382	-5.7	-351
4	Generation Loss (+) / Load Throw off (-) during the Event	MW	1100	0	0	0	0
5	Control Area Response (3 - 4)	MW	-256	-72	-382	-6	-351
6	Frequency before the Event	HZ	49.97	49.97	49.97	49.97	49.97
7	Frequency after the Event	HZ	49.92	49.92	49.92	49.92	49.92
8	Change in Frequency (7 - 6)	HZ	-0.050	-0.050	-0.050	-0.050	-0.050
9	Frequency Response Characteristic (5 / 8)	MW/Hz	5115	1434	7647	114	7017
10	Net System Demand met before the Event	MW	61096	19121	52095	2007	44930
11	Internal Generation before the Event (10 - 1)	MW	53705	23348	57209	2606	42684
12	Ideal load response assuming 4% per Hz (0.04*Row 10)	MW/Hz	2444	765	2084	80	1797
13	Ideal generator response assuming 5% droop……….40% per Hz (40% of Row 11)	MW/Hz	21482	9339	22884	1042	17073
14	Composite ideal response (12 + 13)	MW/Hz	23926	10104	24967	1123	18871
15	Percentage ideal response	%	21.4%	14.2%	30.6%	10.1%	37.2%

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

Total Change in (MW)	1100
FRC for NEWS GRID (dp/df) MW/Hz	22000
Power Number (net change in MW/maximum change in frequency)	11000