

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

**EVENT:**

On 12th Jan 2023, As reported At 05:52 hrs 765kV Bara-Mainpuri line tripped on R-N fault, due to non availability of evacuation path all three units at Bara TPS tripped and resulted in Generation loss of around 1250 MW. Accordingly for FRC Calculation figure of 1250MW has been considered.

S No	Particulars	Dimension	NR	ER	WR	NER	SR
1	Actual Net Interchange before the Event (05:52:40)	MW	9169	-10541	-8513	-178	9512
2	Actual Net Interchange after the Event (05:53:48)	MW	10319	-10723	-9362	-181	9371
3	Change in Net Interchange (2-1)	MW	1150	-182	-849	-3.2	-141
4	<b>Generation Loss (+) / Load Throw off (-) during the Event</b>	<b>MW</b>	<b>1250</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>
5	Control Area Response (3 - 4)	MW	-100	-182	-849	-3	-141
6	Frequency before the Event	Hz	49.91	49.91	49.91	49.91	49.91
7	Frequency after the Event	Hz	49.88	49.88	49.88	49.88	49.88
8	Change in Frequency (7 - 6)	Hz	-0.033	-0.033	-0.033	-0.033	-0.033
9	<b>Frequency Response Characteristic (5 / 8)</b>	<b>MW/Hz</b>	<b>3017</b>	<b>5527</b>	<b>25712</b>	<b>98</b>	<b>4268</b>
10	Net System Demand met before the Event	MW	46597	16595	54186	1763	40804
11	Internal Generation before the Event (10 - 1)	MW	37429	27136	62699	1941	31292
12	Ideal load response assuming 4% per Hz (0.04*Row 10)	MW/Hz	1864	664	2167	71	1632
13	Ideal generator response assuming 5% droop.....40% per Hz (40% of Row 11)	MW/Hz	14971	10854	25080	776	12517
14	Composite ideal response (12 + 13)	MW/Hz	16835	11518	27247	847	14149
15	Percentage ideal response	%	17.9%	48.0%	94.4%	11.5%	30.2%

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

<b>Total Change in (MW)</b>	<b>1250</b>
<b>FRC for NEWS GRID (dp/df) MW/Hz</b>	<b>37879</b>
<b>Power Number (net change in MW/maximum change in frequency )</b>	<b>12255</b>

<b>Source Wise Generation (MW)</b>	GAS	HYDRO	NUCLEAR	Thermal	WIND	SOLAR
	<b>2836</b>	<b>7721</b>	<b>4790</b>	<b>140755</b>	<b>4671</b>	<b>28</b>