

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

**EVENT:**

At 11:51 Hrs Dated 29th-April-2022, As reported, 400kV Pavagada-BPS-1 tripped on LL fault and Line-2 is already under outage on fault. Due to this all the lines at Bellary Pooling station(BPS) tripped and resulted in the loss of evacuation lines for the YTPS station as 400kV Jagalur SS also went in to black out.consequently generation loss of around 1536 MW occured at 400kV YSTPS(1036 MW) and 400kV Jindal(500 MW) and same is considered in FRC Calculation.

S No	Particulars	Dimension	NR	ER	WR	NER	SR
1	Actual Net Interchange before the Event (11:51:00)	MW	3677	-2979	-6869	214	5256
2	Actual Net Interchange after the Event (11:52:30)	MW	3328	-3229	-7603	211	6319
3	Change in Net Interchange (2 - 1)	MW	-349	-250	-734	-2.6	1063
4	Generation Loss (+) / Load Throw off (-) during the Event	MW	0	0	0	0	1536
5	Control Area Response (3 - 4)	MW	-349	-250	-734	-3	-473
6	Frequency before the Event	HZ	49.82	49.82	49.82	49.82	49.82
7	Frequency after the Event	HZ	49.74	49.74	49.74	49.74	49.74
8	Change in Frequency (7 - 6)	HZ	-0.078	-0.078	-0.078	-0.078	-0.078
9	Frequency Response Characteristic (5 / 8)	MW/Hz	4472	3201	9405	34	6064
10	Net System Demand met before the Event	MW	57750	22349	65183	2125	54376
11	Internal Generation before the Event (10 - 1)	MW	54073	25328	72052	1911	49120
12	Ideal load response assuming 4% per Hz (0.04*Row 10)	MW/Hz	2310	894	2607	85	2175
13	Ideal generator response assuming 5% droop.....40% per Hz (40% of Row 11)	MW/Hz	21629	10131	28821	765	19648
14	Composite ideal response (12 + 13)	MW/Hz	23939	11025	31428	850	21823
15	Percentage ideal response	%	18.7%	29.0%	29.9%	4.0%	27.8%

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

<b>Total Change in (MW)</b>	<b>1536</b>
<b>FRC for NEWS GRID (dp/df) MW/Hz</b>	<b>19692</b>
<b>Power Number (net change in MW/maximum change in frequency )</b>	<b>10667</b>