

कार्यालय : बी-9, प्रथम एवं द्वितीय तल, कुतुब इंस्टीट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली - 110016  
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दिनांक : 07<sup>th</sup> March 2024

सेवा मे,

All SLDCs/RLDCs/RPCs

**विषय:** Publishing of Quantum of Reserves in line with Detailed Procedure For Estimation of the Requirement of Secondary Reserve Ancillary Service (SRAS) and Tertiary Reserve Ancillary Service (TRAS) at regional level

- संदर्भ:** 1. Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2023  
2. Detailed Procedure for Assessment of Quantum of Secondary & Tertiary Reserve Capacity, along with Information Exchange and Timelines, as approved by CERC vide letter no. L-1/265/2022/CERC dated 28<sup>th</sup> Sep 2023

महोदय,

This has reference to the letter dated 25<sup>th</sup> Jan 2024, issued by NLDC for declaration of secondary & tertiary reserves necessary to be maintained in the financial year 2024-25. (Link: <https://posoco.in/en/download/reference-contingency-and-reserves-requirement-of-sras-and-tras-for-2024-25/?wpdmdl=56116>). Considering the different contingencies that have recently occurred specially in solar hours, the requirement of reserves during solar and non-solar hours have been reviewed.

The reference contingency for Solar hours & Non-Solar hours at All India level has been considered as 7000 MW & 4500 MW respectively considering the largest contingency which occurred in the Indian grid. Consequentially, the total secondary and tertiary reserve requirement for solar hours is estimated as 7000 MW and 12676 MW respectively for FY 2024-25. Also, the total secondary and tertiary reserve requirement for non-solar hours is estimated as 4500 MW and 10176 MW respectively for FY 2024-25. The details for each control area are enclosed as per Formats RAS3, and RAS4.

सधन्यवाद,

भवदीय



(सुरजीत बनर्जी)

मुख्य महाप्रबंधक, रा.भा.प्रे.के.

प्रतिलिपि : Secretary, CERC



**GRID CONTROLLER OF INDIA LIMITED**  
**(Formerly known as Power System Operation Corporation Limited)**

**Format – RAS3**

**Reference contingency of Non-Solar Hours for Indian Power System**

<b>Date of Issue: 07<sup>th</sup> March 2024</b>	<b>Revision No.</b>	<b>1</b>
<b>Applicable for Financial Year 2024-25</b>		
<b>Reference Contingency for generation loss (MW)</b>	<b>4500</b>	
<b>Reference Contingency for load loss (MW)</b>	<b>4500</b>	

# GRID CONTROLLER OF INDIA LIMITED

(Formerly known as Power System Operation Corporation Limited)

## Format RAS4

Year-Ahead SRAS and TRAS Reserve requirement for Non-Solar hours Year 2024-25 (Scaled for reference contingency of 4500 MW)																	
State/UT	Actual 99 Percentile Negative ACE (MW)	Actual 99 Percentile Positive ACE (MW)	Scaled 99 Percentile Negative ACE (MW) (a)	Scaled 99 Percentile Positive ACE (MW) (b)	Max. Demand met (c)	Internal Gen. at the time of max demand (d)	Drawl from ISTS (e=c-d)	State Internal Generation/ State Maximum Demand (f=d/c)	State drawl from ISTS/ State Maximum Demand (g=e/c)	Secondary Reserves in ISGS (h=a*g)	Secondary Reserves at Regional Level (sum of reserves in all states of the region as given in "h")	Secondary Reserves within state (i=a*f)	Tertiary Reserves in ISGS (j = h)	Tertiary Reserves within state (k = i)	Largest Unit Size of internal generation (l)	Total Tertiary Reserves within state (m=k + 0.5*l)	
<b>UT Chandigarh</b>	49	55	19	21	428	0	428	0.00	1.00	19	792	0	19	0	0	0	
Delhi	277	357	109	133	7433	1216	6217	0.16	0.84	91		18	91	18	216	126	
Haryana	415	572	164	213	12881	2726	10155	0.21	0.79	129		35	129	35	660	365	
Himachal Pradesh	209	142	82	53	2193	537	1657	0.24	0.76	62		20	62	20	100	70	
UT of Jammu and Kashmir and UT of Ladakh*	425	402	168	150	3271	1564	1707	0.48	0.52	88		80	88	80	150	155	
Punjab	438	516	173	192	15314	6384	8930	0.42	0.58	101		72	101	72	700	422	
Rajasthan	653	955	258	356	17958	12332	5626	0.69	0.31	81		177	81	177	660	507	
Uttar Pradesh	761	829	300	309	28224	12806	15418	0.45	0.55	164		136	164	136	660	466	
Uttarakhand	217	259	86	97	2756	906	1850	0.33	0.67	57		28	57	28	76	66	
<b>NR state Sum</b>	<b>3444</b>	<b>4087</b>	<b>1358</b>	<b>1524</b>													<b>2177</b>
<b>Northern Region</b>	<b>3349</b>	<b>3549</b>	<b>1358</b>	<b>1524</b>													
Chhattisgarh	301	399	121	142	5939	2654	3285	0.45	0.55	67	532	54	67	54	500	304	
UT Daman and Diu & UT Dadra and Nagar Haveli	61	89	24	32	1352	0	1352	0.00	1.00	24		0	24	0	0	0	
Gujarat	975	957	393	342	24360	14736	9624	0.60	0.40	155		238	155	238	800	638	
Goa	82	53	33	19	705	0	705	0.00	1.00	33		0	33	0	0	0	
Madhya Pradesh	695	773	280	276	17525	7259	10266	0.41	0.59	164		116	164	116	660	446	
Maharashtra	799	743	322	265	29682	21555	8127	0.73	0.27	88		234	88	234	660	564	
<b>WR States Sum</b>	<b>2913</b>	<b>3013</b>	<b>1174</b>	<b>1076</b>													<b>1952</b>
<b>Western Region</b>	<b>2895</b>	<b>2505</b>	<b>1174</b>	<b>1076</b>													
Andhra Pradesh	681	580	266	192	13400	8087	5313	0.60	0.40	105	610	160	105	160	800	560	
Karnataka	729	779	285	258	16934	9849	7085	0.58	0.42	119		166	119	166	800	566	
Kerala	216	122	84	40	5019	1676	3344	0.33	0.67	56		28	56	28	130	93	
UT Puducherry	45	90	18	30	521	0	521	0.00	1.00	18		0	18	0	0	0	
Tamil Nadu	754	1034	294	342	19556	7310	12246	0.37	0.63	184		110	184	110	600	410	
Telangana	632	558	247	185	15467	7485	7982	0.48	0.52	127		119	127	119	800	519	
<b>SR State Sum</b>	<b>3058</b>	<b>3163</b>	<b>1193</b>	<b>1046</b>													<b>2149</b>
<b>Southern Region</b>	<b>2942</b>	<b>2437</b>	<b>1193</b>	<b>1046</b>													
Bihar	317	432	121	144	7547	222	7325	0.03	0.97	118	329	4	118	4	250	129	
DVC	338	247	129	82	4556	4968	-413	1.09	-0.09	0		129	0	129	600	429	
Jharkhand	185	278	71	93	1989	409	1580	0.21	0.79	56		15	56	15	210	120	
Orissa	311	408	119	136	7073	3260	3813	0.46	0.54	64		55	64	55	660	385	
Sikkim	57	34	22	11	155	0	155	0.00	1.00	22		0	22	0	0	0	
West Bengal	313	499	120	166	11771	4939	6831	0.42	0.58	69		50	69	50	500	300	
<b>ER state Sum</b>	<b>1521</b>	<b>1898</b>	<b>581</b>	<b>633</b>													<b>1362</b>
<b>Eastern Region</b>	<b>1432</b>	<b>1475</b>	<b>581</b>	<b>633</b>													
Arunachal Pradesh	45	50	20	25	223	0	223	0.00	1.00	20	172	0	20	0	0	0	
Assam	196	166	89	83	2405	228	2178	0.09	0.91	81		8	81	8	50	33	
Manipur	29	42	13	21	253	0	253	0.00	1.00	13		0	13	0	0	0	
Meghalaya	53	49	24	25	407	14	393	0.04	0.96	23		1	23	1	51	26	
Mizoram	12	35	6	17	157	0	157	0.00	1.00	6		0	6	0	30	15	
Nagaland	15	34	7	17	176	0	176	0.00	1.00	7		0	7	0	8	4	
Tripura	74	65	34	33	419	147	272	0.35	0.65	22		12	22	12	21	22	
<b>NER State Sum</b>	<b>424</b>	<b>441</b>	<b>193</b>	<b>221</b>													<b>101</b>
<b>North-Eastern Region</b>	<b>476</b>	<b>515</b>	<b>193</b>	<b>221</b>													
All India (sum of regions)	11094	10481	4500	4500							2435	2065	2435	2065		7741	
<b>Total Tertiary Reserves Requirement in India</b>																	10176

Note: \* UT of Jammu and Kashmir and UT of Ladakh have been considered as single entity inline with data availability at NLDC.

# GRID CONTROLLER OF INDIA LIMITED

(Formerly known as Power System Operation Corporation Limited)

## Format RAS4

State/ Union Territory UT	Year-Ahead Reserve Requirement of Non-Solar Hours ( 2024 - 2025)								
	Secondary Reserves			Tertiary Reserves			Total Reserves (Secondary + Tertiary)		
	Within in ISGS	Within state	Total	Within in ISGS	Within state	Total	Within in ISGS	Within state	Total
UT of Chandigarh	19	0	19	19	0	19	39	0	39
Delhi	91	18	109	91	126	217	183	144	327
Haryana	129	35	164	129	365	494	258	399	657
Himachal Pradesh	62	20	82	62	70	132	124	90	215
UT of Jammu and Kashmir and UT of Ladakh*	88	80	168	88	155	243	175	235	411
Punjab	101	72	173	101	422	523	201	494	696
Rajasthan	81	177	258	81	507	588	161	684	845
Uttar Pradesh	164	136	300	164	466	630	328	602	930
Uttarakhand	57	28	86	57	66	124	115	94	209
Chhattisgarh	67	54	121	67	304	371	134	358	493
UT Daman and Diu & UT Dadra and Nagar Haveli	24	0	24	24	0	24	49	0	49
Gujarat	155	238	393	155	638	793	311	876	1186
Goa	33	0	33	33	0	33	66	0	66
Madhya Pradesh	164	116	280	164	446	610	328	562	890
Maharashtra	88	234	322	88	564	652	176	798	974
Andhra Pradesh	105	160	266	105	560	666	211	721	932
Karnataka	119	166	285	119	566	685	238	731	969
Kerala	56	28	84	56	93	149	112	121	234
UT of Puducherry	18	0	18	18	0	18	35	0	35
Tamil Nadu	184	110	294	184	410	594	368	520	888
Telangana	127	119	247	127	519	647	255	639	893
Bihar	118	4	121	118	129	246	235	132	367
Damodar Valley Corporation	0	129	129	0	429	429	0	558	558
Jharkhand	56	15	71	56	120	176	113	134	247
Odisha	64	55	119	64	385	449	128	439	567
Sikkim	22	0	22	22	0	22	44	0	44
West Bengal	69	50	120	69	300	370	139	350	489
Arunanchal Pradesh	20	0	20	20	0	20	41	0	41
Assam	81	8	89	81	33	114	162	42	204
Manipur	13	0	13	13	0	13	26	0	26
Meghalaya	23	1	24	23	26	50	46	27	74
Mizoram	6	0	6	6	15	21	11	15	26
Nagaland	7	0	7	7	4	11	14	4	18
Tripura	22	12	34	22	22	44	44	34	78
<b>Region-wise and All-India</b>									
Northern Region	792	566	1358	792	2177	2969	1585	2743	4328
Western Region	532	642	1174	532	1952	2484	1065	2594	3659
Southern Region	610	584	1193	610	2149	2758	1220	2732	3952
Eastern Region	329	252	581	329	1362	1691	658	1614	2272
North-Eastern Region	172	21	193	172	101	273	344	122	466
All India	2435.40	2064.60	4500	2435.40	7740.60	10176	4870.81	9805.19	14676

Note:

\* UT of Jammu and Kashmir and UT of Ladakh have been considered as single entity inline with data availability at NLDC.



**GRID CONTROLLER OF INDIA LIMITED**  
**(Formerly known as Power System Operation Corporation Limited)**

**Format – RAS3**

**Reference contingency of Solar Hours for Indian Power System**

<b>Date of Issue: 07<sup>th</sup> March 2024</b>	<b>Revision No.</b>	<b>1</b>
<b>Applicable for Financial Year 2024-25</b>		
<b>Reference Contingency for generation loss (MW)</b>	<b>7000</b>	
<b>Reference Contingency for load loss (MW)</b>	<b>7000</b>	

# GRID CONTROLLER OF INDIA LIMITED

(Formerly known as Power System Operation Corporation Limited)

## Format RAS4

Year-Ahead SRAS and TRAS Reserve requirement for Solar Hours of Year 2024-25 (Scaled for reference contingency of 7000 MW)																				
State/UT	Actual 99 Percentile Negative ACE (MW)	Actual 99 Percentile Positive ACE (MW)	Scaled 99 Percentile Negative ACE (MW) (a)	Scaled 99 Percentile Positive ACE (MW) (b)	Max. Demand met (c)	Internal Gen. at the time of max demand (d)	Drawl from ISTS (e=c-d)	State Internal Generation/ State Maximum Demand (f=d/c)	State drawl from ISTS/ State Maximum Demand (g=e/c)	Secondary Reserves in ISGS (h=a*g)	Secondary Reserves at Regional Level (sum of reserves in all states of the region as given in "h")	Secondary Reserves within state (i=a*f)	Tertiary Reserves in ISGS (j = h)	Tertiary Reserves within state (k = i)	Largest Unit Size of internal generation (l)	Total Tertiary Reserves within state (m=k + 0.5*l)				
UT Chandigarh	49	55	30	32	428	0	428	0.00	1.00	30	1233	0	30	0	0	0				
Delhi	277	357	170	207	7433	1216	6217	0.16	0.84	142		28	142	28	216	136				
Haryana	415	572	255	332	12881	2726	10155	0.21	0.79	201		54	201	54	660	384				
Himachal Pradesh	209	142	128	83	2193	537	1657	0.24	0.76	97		31	97	31	100	81				
UT of Jammu and Kashmir and UT of Ladakh*	425	402	261	233	3271	1564	1707	0.48	0.52	136		125	136	125	150	200				
Punjab	438	516	269	299	15314	6384	8930	0.42	0.58	157		112	157	112	700	462				
Rajasthan	653	955	401	554	17958	12332	5626	0.69	0.31	126		275	126	275	660	605				
Uttar Pradesh	761	829	467	481	28224	12806	15418	0.45	0.55	255		212	255	212	660	542				
Uttarakhand	217	259	133	150	2756	906	1850	0.33	0.67	89		44	89	44	76	82				
<b>NR state Sum</b>	<b>3444</b>	<b>4087</b>	<b>2113</b>	<b>2370</b>													<b>2492</b>			
<b>Northern Region</b>	<b>3349</b>	<b>3549</b>	<b>2113</b>	<b>2370</b>																
Chhattisgarh	301	399	189	222	5939	2654	3285	0.45	0.55	104	828	84	104	84	500	334				
UT Daman and Diu & UT Dadra and Nagar Haveli	61	89	38	49	1352	0	1352	0.00	1.00	38		0	38	0	0	0				
Gujarat	975	957	611	531	24360	14736	9624	0.60	0.40	242		370	242	370	800	770				
Goa	82	53	51	29	705	0	705	0.00	1.00	51		0	51	0	0	0				
Madhya Pradesh	695	773	436	429	17525	7259	10266	0.41	0.59	255		181	255	181	660	511				
Maharashtra	799	743	501	413	29682	21555	8127	0.73	0.27	137		364	137	364	660	694				
<b>WR States Sum</b>	<b>2913</b>	<b>3013</b>	<b>1827</b>	<b>1673</b>													<b>2309</b>			
<b>Western Region</b>	<b>2895</b>	<b>2505</b>	<b>1827</b>	<b>1673</b>																
Andhra Pradesh	681	580	414	298	13400	8087	5313	0.60	0.40	164	949	250	164	250	800	650				
Karnataka	729	779	443	401	16934	9849	7085	0.58	0.42	185		257	185	257	800	657				
Kerala	216	122	131	63	5019	1676	3344	0.33	0.67	87		44	87	44	130	109				
UT Puducherry	45	90	27	47	521	0	521	0.00	1.00	27		0	27	0	0	0				
Tamil Nadu	754	1034	458	532	19556	7310	12246	0.37	0.63	287		171	287	171	600	471				
Telangana	632	558	384	287	15467	7485	7982	0.48	0.52	198		186	198	186	800	586				
<b>SR State Sum</b>	<b>3058</b>	<b>3163</b>	<b>1856</b>	<b>1628</b>													<b>2473</b>			
<b>Southern Region</b>	<b>2942</b>	<b>2437</b>	<b>1856</b>	<b>1628</b>																
Bihar	317	432	188	224	7547	222	7325	0.03	0.97	183	512	6	183	6	250	131				
DVC	338	247	201	128	4556	4968	-413	1.09	-0.09	0		201	0	201	600	501				
Jharkhand	185	278	110	144	1989	409	1580	0.21	0.79	88		23	88	23	210	128				
Orissa	311	408	185	212	7073	3260	3813	0.46	0.54	99		85	99	85	660	415				
Sikkim	57	34	34	18	155	0	155	0.00	1.00	34		0	34	0	0	0				
West Bengal	313	499	186	259	11771	4939	6831	0.42	0.58	108		78	108	78	500	328				
<b>ER state Sum</b>	<b>1521</b>	<b>1898</b>	<b>904</b>	<b>985</b>													<b>1502</b>			
<b>Eastern Region</b>	<b>1432</b>	<b>1475</b>	<b>904</b>	<b>985</b>																
Arunachal Pradesh	45	50	32	39	223	0	223	0.00	1.00	32	267	0	32	0	0	0				
Assam	196	166	139	129	2405	228	2178	0.09	0.91	126		13	126	13	50	38				
Manipur	29	42	21	32	253	0	253	0.00	1.00	21		0	21	0	0	0				
Meghalaya	53	49	37	39	407	14	393	0.04	0.96	36		1	36	1	51	27				
Mizoram	12	35	9	27	157	0	157	0.00	1.00	9		0	9	0	30	15				
Nagaland	15	34	11	27	176	0	176	0.00	1.00	11		0	11	0	8	4				
Tripura	74	65	52	51	419	147	272	0.35	0.65	34		18	34	18	21	29				
<b>NER State Sum</b>	<b>424</b>	<b>441</b>	<b>300</b>	<b>344</b>												<b>113</b>				
<b>North-Eastern Region</b>	<b>476</b>	<b>515</b>	<b>300</b>	<b>344</b>																
All India (sum of regions)	<b>11094</b>	<b>10481</b>	<b>7000</b>	<b>7000</b>							<b>3788</b>	<b>3212</b>	<b>3788</b>	<b>3212</b>	<b>11352</b>	<b>8888</b>				
<b>Total Tertiary Reserves Requirement in India</b>																	<b>12676</b>			

Note: \* UT of Jammu and Kashmir and UT of Ladakh have been considered as single entity inline with data availability at NLDC.

# GRID CONTROLLER OF INDIA LIMITED

(Formerly known as Power System Operation Corporation Limited)

## Format RAS4

Year-Ahead Reserve Requirement of Solar Hours ( 2024 - 2025)									
State/ Union Territory UT	Secondary Reserves			Tertiary Reserves			Total Reserves (Secondary + Tertiary)		
	Within in ISGS	Within state	Total	Within in ISGS	Within state	Total	Within in ISGS	Within state	Total
UT of Chandigarh	30	0	30	30	0	30	60	0	60
Delhi	142	28	170	142	136	278	284	164	448
Haryana	201	54	255	201	384	585	401	438	839
Himachal Pradesh	97	31	128	97	81	178	193	113	306
UT of Jammu and Kashmir and UT of Ladakh*	136	125	261	136	200	336	272	325	597
Punjab	157	112	269	157	462	619	313	574	887
Rajasthan	126	275	401	126	605	731	251	880	1131
Uttar Pradesh	255	212	467	255	542	797	510	754	1264
Uttarakhand	89	44	133	89	82	171	179	126	304
Chhattisgarh	104	84	189	104	334	439	209	419	627
UT Daman and Diu & UT Dadra and Nagar Haveli	38	0	38	38	0	38	76	0	76
Gujarat	242	370	611	242	770	1011	483	1140	1623
Goa	51	0	51	51	0	51	103	0	103
Madhya Pradesh	255	181	436	255	511	766	511	691	1202
Maharashtra	137	364	501	137	694	831	274	1058	1332
Andhra Pradesh	164	250	414	164	650	814	328	899	1227
Karnataka	185	257	443	185	657	843	370	915	1285
Kerala	87	44	131	87	109	196	175	153	327
UT of Puducherry	27	0	27	27	0	27	55	0	55
Tamil Nadu	287	171	458	287	471	758	573	642	1215
Telangana	198	186	384	198	586	784	396	771	1167
Bihar	183	6	188	183	131	313	366	136	502
Damodar Valley Corporation	0	201	201	0	501	501	0	701	701
Jharkhand	88	23	110	88	128	215	175	150	325
Odisha	99	85	185	99	415	515	199	500	699
Sikkim	34	0	34	34	0	34	68	0	68
West Bengal	108	78	186	108	328	436	216	406	622
Arunanchal Pradesh	32	0	32	32	0	32	64	0	64
Assam	126	13	139	126	38	164	251	51	303
Manipur	21	0	21	21	0	21	41	0	41
Meghalaya	36	1	37	36	27	63	72	28	100
Mizoram	9	0	9	9	15	24	17	15	32
Nagaland	11	0	11	11	4	15	21	4	25
Tripura	34	18	52	34	29	63	68	47	115
<b>Region-wise and All-India</b>									
Northern Region	1233	881	2113	1233	2492	3724	2465	3372	5837
Western Region	828	999	1827	828	2309	3137	1656	3307	4963
Southern Region	949	908	1856	949	2473	3421	1897	3380	5278
Eastern Region	512	392	904	512	1502	2014	1023	1894	2917
North-Eastern Region	267	33	300	267	113	380	535	146	681
<b>All India</b>	<b>3788.40</b>	<b>3211.60</b>	<b>7000</b>	<b>3788.40</b>	<b>8887.60</b>	<b>12676</b>	<b>7576.81</b>	<b>12099.19</b>	<b>19676</b>

Note:

\* UT of Jammu and Kashmir and UT of Ladakh have been considered as single entity inline with data availability at NLDC.