

## National Load Despatch Centre राष्ट्रीय भार प्रेषण केंद्र

## POWER SYSTEM OPERATION CORPORATION LIMITED पॉवर सिस्टम ऑपरेशन कारपोरेशन लिमिटेड

(Government of India Enterprise/ भारत सरकार का उद्यम)
B-9, QUTUB INSTITUTIONAL AREA, KATWARIA SARAI, NEW DELHI -110016
बी-9, क़ुतुब इन्स्टीट्यूशनल एरिया, कटवारिया सराये, न्यू दिल्ली-110016

Ref: POSOCO/NLDC/SO/Daily PSP Report

दिनांक: 04<sup>th</sup> Feb 2020

To,

- 1. कार्यकारी निदेशक, पू .क्षे .भा .प्रे .के.,14 , गोल्फ क्लब रोड , कोलकाता 700033 Executive Director, ERLDC, 14 Golf Club Road, Tollygunge, Kolkata, 700033
- 2. कार्यकारी निदेशक, ऊ. क्षे. भा. प्रे. के., 18/ ए, शहीद जीत सिंह सनसनवाल मार्ग, नई दिल्ली 110016 Executive Director, NRLDC, 18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi – 110016
- 3. कार्यकारी निदेशक, प .क्षे .भा .प्रे .के., एफ3-, एम आई डी सी क्षेत्र , अंधेरी, मुंबई -400093 Executive Director, WRLDC, F-3, M.I.D.C. Area, Marol, Andheri (East), Mumbai-400093
- 4. कार्यकारी निदेशक, ऊ. पू. क्षे. भा. प्रे. के., डोंगतिएह, लोअर नोंग्रह , लापलंग, शिलोंग 793006 Executive Director, NERLDC, Dongteih, Lower Nongrah, Lapalang, Shillong - 793006, Meghalaya
- 5. कार्यकारी निदेशक , द .क्षे .भा .प्रे .के.,29 , रेस कोर्स क्रॉस रोड, बंगलुरु -560009 Executive Director, SRLDC, 29, Race Course Cross Road, Bangalore-560009

Sub: Daily PSP Report for the date 03.02.2020.

महोदय/Dear Sir,

आई॰ई॰जी॰सी॰-2010 की धारा स.-5.5.1 के प्रावधान के अनुसार, दिनांक 03-फरवरी-2020 की अखिल भारतीय प्रणाली की दैनिक ग्रिड निष्पादन रिपोर्ट रा॰भा॰प्रे॰के॰ की वेबसाइट पर उप्लब्ध है ।

As per article 5.5.1 of the Indian Electricity Grid Code, the daily report pertaining power supply position of All India Power System for the date 03<sup>rd</sup> Feb 2020, is available at the NLDC website.

धन्यवाद,

Report for previous day Date of Reporting

A. Power Supply Position at All India and Regional level

	NR	WR	SR	ER	NER	Total
Demand Met during Evening Peak hrs(MW) (at 1900 hrs; from RLDCs)	47975	49234	42415	18407	2463	160494
Peak Shortage (MW)	539	0	0	0	20	559
Energy Met (MU)	959	1183	1006	359	41	3548
Hydro Gen (MU)	121	62	84	30	5	301
Wind Gen (MU)	8	51	33			92
Solar Gen (MU)*	39.48	24.10	85.81	1.54	0.05	151
Energy Shortage (MU)	13.8	0.0	0.0	0.0	0.7	14.5
Maximum Demand Met during the day (MW) & time	49115	57364	47649	18581	2529	170517
(from NLDC SCADA)	18:49	11:03	09:58	18:55	18:03	09:50

B. Frequency Profile (%)

Region	FVI	<49.7	49.7-49.8	49.8-49.9	<49.9	49.9-50.05	> 50.05
All India	0.067	0.00	3.09	14.17	17.26	72.71	10.03

C. Power Supply Position in States

Region	States	Max. Demand Met during the day (MW)	Shortage during maximum Demand (MW)	Energy Met (MU)	Drawal Schedule (MU)	OD(+)/UD(-) (MU)	Max OD (MW)	Energy Shortage (MU)
	Punjab	5912	0	113.0	64.8	-1.0	46	0.0
	Harvana	6338	0	123.6	85.6	-0.2	286	0.0
	Rajasthan	13830	0	245.1	79.4	1.3	512	0.0
	Delhi	4223	0	70.7	55.1	-0.9	186	0.0
NR	UP	15964	0	283.5	115.0	0.7	740	1.4
	Uttarakhand	2097	0	38.3	21.2	-0.1	111	0.0
	HP	1712	0	30.2	23.8	-0.9	108	0.0
	J&K(UT) and Ladakh(UT)	2349	587	50.2	45.6	-1.5	160	12.4
	Chandigarh	262	0	4.1	4.1	0.0	21	0.0
	Chhattisgarh	3788	0	80.9	34.8	-0.2	252	0.0
	Gujarat	15921	0	332.1	71.3	7.8	697	0.0
	MP	14785	0	270.1	131.6	-1.4	537	0.0
WR	Maharashtra	22649	0	459.1	131.9	0.5	479	0.0
WK	Goa	482	0	9.5	9.4	-0.4	41	0.0
	DD	320	0	7.0	6.5	0.5	63	0.0
	DNH	794	0	18.4	17.7	0.7	104	0.0
	Essar steel	759	0	5.4	5.7	-0.3	217	0.0
	Andhra Pradesh	9225	0	184.4	65.2	-1.8	251	0.0
	Telangana	10767	0	208.6	104.2	-0.6	602	0.0
SR	Karnataka	12381	0	233.6	69.2	-1.0	677	0.0
311	Kerala	3618	0	73.3	57.2	0.8	211	0.0
	Tamil Nadu	14383	0	298.9	149.4	-1.2	431	0.0
	Pondy	358	0	7.2	7.4	-0.2	47	0.0
	Bihar	4415	0	77.3	69.7	3.4	495	0.0
	DVC	3084	0	65.0	-35.0	-1.3	131	0.0
ER	Jharkhand	1251	0	25.8	16.5	0.0	110	0.0
-11	Odisha	4009	0	76.0	1.0	-0.8	312	0.0
	West Bengal	6348	0	113.4	25.4	0.5	263	0.0
	Sikkim	136	0	2.0	1.5	0.6	42	0.0
	Arunachal Pradesh	121	3	2.2	2.1	0.0	32	0.0
	Assam	1382	5	22.4	19.3	0.4	143	0.4
	Manipur	210	3	2.7	3.1	-0.4	29	0.0
NER	Meghalaya	385	0	6.7	6.0	-0.2	37	0.3
	Mizoram	105	1	1.7	1.6	-0.1	33	0.0
	Nagaland	127	2	2.3	2.0	0.1	10	0.0
	Tripura	223	0	3.4	1.5	-0.3	19	0.0

D. Transnational Exchanges (MU) - Import(+ve)/Export(-ve)

The state of the s	Bhutan	Nepal	Bangladesh
Actual(MU)	1.9	-10.7	-11.4
Day peak (MW)	429.7	-552.0	-860.0

 $E.\ Import/export\ By\ Regions (in\ MU)\ -\ Import(+ve)/Export(-ve);\ OD(+)/UD(-)$ 

	NR	WR	SR	ER	NER	TOTAL
Schedule(MU)	232.6	-263.1	105.8	-82.2	6.7	-0.2
Actual(MU)	211.7	-254.6	114.3	-73.7	3.5	1.2
O/D/U/D(MU)	-21.0	8.5	8.6	8.5	-3.2	1.4

F. Generation Outage(MW)

	NR	WR	SR	ER	NER	Total
Central Sector	5688	15613	7432	2555	737	32025
State Sector	12560	14983	5530	4480	11	37564
Total	18248	30595	12962	7035	748	69588

G. Sourcewise generation (MU)

	NR	WR	SR	ER	NER	All India
Coal	480	1210	533	420	11	2654
Lignite	22	12	50	0	0	85
Hydro	121	62	84	30	5	301
Nuclear	24	33	39	0	0	96
Gas, Naptha & Diesel	31	41	18	0	23	113
RES (Wind, Solar, Biomass & Others)	77	86	165	2	0	329
Total	754	1443	889	452	39	3577

Share of RES in total generation (%)	10.17	5.93	18.52	0.35	0.13	9.18
Share of Non-fossil fuel (Hydro, Nuclear and RES) in total generation (%)	29.35	12.47	32.35	7.03	12.64	20.28

H. All India Demand Diversity Factor

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Based on Regional Max Demands	1.028
Based on State Max Demands	1.083

Diversity factor = Sum of regional or state-wise maximum demands / All India maximum demand

4-Feb-20

 $<sup>\</sup>textbf{*Source} : \textbf{RLDCs for solar connected to ISTS; SLDCs for embedded solar. Limited visibility of embedded solar data.}$ 

		<u>IN'.</u>	TER-REGI	ONAL EXCH	ANGES	Date of l	Reporting :	4-Feb-20
1								Import=(+ve) /Export =(-ve) for NET (MU)
Sl No	Voltage Level	Line Details	Circuit	Max Import (MW)	Max Export (MW)	Import (MU)	Export (MU)	NET (MU)
_	Export of	ER (With NR)	1		1			
5	HVDC	ALIPURDUAR-AGRA PUSAULI B/B	S/C	3	0 297	0.0	7.0	-7.0
1		GAYA-VARANASI	D/C	79	855	0.0	8.9	-8.9
2	765kV	SASARAM-FATEHPUR	S/C	77	408	0.0	3.5	-3.5
3		GAYA-BALIA	S/C	0	459	0.0	6.9	-6.9
6 7		PUSAULI-VARANASI PUSAULI -ALLAHABAD	S/C S/C	0	235 150	0.0	4.4 2.4	-4.4 -2.4
8	1	MUZAFFARPUR-GORAKHPUR	D/C	0	646	0.0	5.1	-5.1
9	400 kV	PATNA-BALIA	Q/C	0	740	0.0	8.1	-8.1
10		BIHARSHARIFF-BALIA	D/C	0	439	0.0	5.7	-5.7
11		MOTIHARI-GORAKHPUR	D/C	0	255	0.0	4.0	-4.0
12	220 kV	BIHARSHARIFF-VARANASI PUSAULI-SAHUPURI	D/C S/C	115 31	312 57	0.0	1.7 0.4	-1.7 -0.4
14	220 KV	SONE NAGAR-RIHAND	S/C	0	0	0.0	0.0	0.0
15		GARWAH-RIHAND	S/C	30	0	0.7	0.0	0.7
16	132 kV	KARMANASA-SAHUPURI	S/C	0	0	0.0	0.0	0.0
17		KARMANASA-CHANDAULI	S/C	0	0	0.0	0.0	0.0
Import/F	vnout -	ED (With WP)			ER-NR	0.7	58.1	-57.4
_	xport of	ER (With WR)						
18	765 kV	JHARSUGUDA-DHARAMJAIGARH	Q/C	1506	0	19.1	0.0	19.1
19 20		NEW RANCHI-DHARAMJAIGARH	D/C	542	0	7.0	0.0	7.0
21		JHARSUGUDA-DURG JHARSUGUDA-RAIGARH	D/C Q/C	70 70	124 478	0.5	0.0 5.4	0.5 -5.4
22	400 kV	RANCHI-SIPAT	D/C	222	0	2.7	0.0	2.7
23	220 kV	BUDHIPADAR-RAIGARH	S/C	0	0	0.0	0.0	0.0
24		BUDHIPADAR-KORBA	D/C	65	21	0.6	0.0	0.6
Import/F	vnort of	ER (With SR)			ER-WR	29.8	5.4	24.4
26		JEYPORE-GAZUWAKA B/B	D/C	0.0	537.0	0.0	12.3	-12.3
27	HVDC	TALCHER-KOLAR BIPOLE	D/C	0.0	1747.0	0.0	32.8	-32.8
25	765 kV	ANGUL-SRIKAKULAM	D/C	0.0	2279.0	0.0	44.0	-44.0
28	400 kV	TALCHER-I/C	D/C	720.0	501.0	5.5	0.0	5.5
29	220 kV	BALIMELA-UPPER-SILERRU	S/C	1.0	0.0	0.0	0.0	0.0
Import/F	export of	ER (With NER)			ER-SR	0.0	89.1	-89.1
30	Ĺ	BINAGURI-BONGAIGAON	D/C	236	185	2.2	0.0	2
31	400 kV	ALIPURDUAR-BONGAIGAON	D/C	364	203	3.8	0.0	4
32				73				
	220 kV	ALIPURDUAR-SALAKATI	D/C	/3	41	0.7	0.0	1
			D/C	73	41 ER-NER	0.7 <b>6.7</b>	0.0	6.7
Import/E	Export of	NER (With NR)	D/C		ER-NER	6.7	0.0	6.7
			D/C	476	ER-NER	11.2	0.0	<b>6.7</b> 11.2
Import/E	Export of HVDC	NER (With NR)	D/C		ER-NER	11.2	0.0	6.7
Import/E	Export of HVDC	NER (With NR) BISWANATH CHARIALI-AGRA	D/C - D/C		ER-NER	11.2	0.0	<b>6.7</b> 11.2
33 Import/E 34 35	Export of HVDC	NER (With NR) BISWANATH CHARIALI-AGRA WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B	- D/C D/C	476 0 447	0 NER-NR 2503 0	6.7 11.2 11.2 0.0 12.1	0.0 0.0 0.0 32.2 0.0	6.7 11.2 11.2 -32.2 12.1
33 Import/E 34 35 36	Export of HVDC	NER (With NR) BISWANATH CHARIALI-AGRA WR (With NR) CHAMPA-KURUKSHETRA V'CHAL B/B APL -MHG	D/C D/C D/C	476 0 447 0	2503 0 1925	6.7 11.2 11.2 0.0 12.1 0.0	0.0 0.0 0.0 32.2 0.0 39.7	6.7 11.2 11.2 -32.2 12.1 -39.7
Import/E 33  Import/E 34 35 36 37	Export of HVDC	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL-MHG GWALIOR-AGRA	D/C D/C D/C D/C	0 447 0 0	2503 0 1925 2582	6.7 11.2 11.2 0.0 12.1 0.0 0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3	6.7 11.2 11.2 -32.2 12.1 -39.7 -48.3
33 Import/E 34 35 36	Export of HVDC HVDC	NER (With NR) BISWANATH CHARIALI-AGRA WR (With NR) CHAMPA-KURUKSHETRA V'CHAL B/B APL -MHG	D/C D/C D/C	476 0 447 0	2503 0 1925	6.7 11.2 11.2 0.0 12.1 0.0	0.0 0.0 0.0 32.2 0.0 39.7	6.7 11.2 11.2 -32.2 12.1 -39.7
Import/E 33  Import/E 34 35 36 37 38	Export of HVDC	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR	D/C D/C D/C D/C D/C D/C	0 447 0 0 0	2503 0 1925 2582 1566	0.0 12.1 0.0 0.0 0.0 0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3	6.7 11.2 11.2 -32.2 12.1 -39.7 -48.3 -22.3
Import/E 33  Import/E 34 35 36 37 38 39 40 41	Export of HVDC HVDC	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA V'CHAL B/B APL -MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI GWALIOR-ORAI SATNA-ORAI	D/C D/C D/C D/C D/C D/C S/C S/C	0 447 0 0 0 0 0 0 0 770	2503 0 1925 2582 1566 943 0 1396	6.7 11.2 11.2 0.0 12.1 0.0 0.0 0.0 0.0 12.0 0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3	6.7 11.2 11.2 12.1 -39.7 -48.3 -22.3 -33.9 12.0 -29.3
Import/E  33  Import/E  34  35  36  37  38  39  40  41  42	Export of HVDC HVDC	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA V'CHAL B/B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI GWALIOR-ORAI SATNA-ORAI CHITTORGARH-BANASKANTHA	D/C D/C D/C D/C D/C D/C S/C S/C D/C	476  0  447  0  0  0  0  0  0  770  0  202	2503 0 1925 2582 1566 943 0 1396 893	6.7 11.2 11.2 0.0 12.1 0.0 0.0 0.0 0.0 12.0 0.0 0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9	6.7  11.2  11.2  11.2  12.1  -39.7  -48.3  -22.3  -33.9  12.0  -29.3  -4.9
Import/E 33  Import/E 34 35 36 37 38 39 40 41 42 43	Export of HVDC HVDC	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI GWALIOR-ORAI SATNA-ORAI CHITTORGARH-BANASKANTHA ZERDA-KANKROLI	D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C	476  0  447  0 0 0 0 0 0 770 0 202 161	2503 0 1925 2582 1566 943 0 1396 893	6.7 11.2 11.2 0.0 12.1 0.0 0.0 0.0 12.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1	6.7  11.2  11.2  11.2  12.1  -39.7  -48.3  -22.3  -33.9  12.0  -29.3  -4.9  -0.1
Import/E 33  Import/E 34 35 36 37 38 39 40 41 42 43 44	Export of HVDC HVDC	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL -MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI GWALIOR-ORAI SATNA-ORAI CHITTORGARH-BANASKANTHA ZERDA-KANKROLI ZERDA -BHINMAL	D/C D/C D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C S/C	0 447 0 0 0 0 0 770 0 202 161 139	ER-NER  0 NER-NR  2503 0 1925 2582 1566 943 0 1396 893 157 404	6.7 11.2 11.2 0.0 12.1 0.0 0.0 0.0 0.0 12.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1 2.8	6.7 11.2 11.2 11.2 11.2 12.1 -39.7 -48.3 -22.3 -33.9 12.0 -29.3 -4.9 -0.1 -2.8
Import/E 33  Import/E 34 35 36 37 38 39 40 41 42 43	Export of HVDC Export of HVDC - 765 kV	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI GWALIOR-ORAI SATNA-ORAI CHITTORGARH-BANASKANTHA ZERDA-KANKROLI	D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C	476  0  447  0 0 0 0 0 0 770 0 202 161	2503 0 1925 2582 1566 943 0 1396 893	6.7 11.2 11.2 0.0 12.1 0.0 0.0 0.0 12.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1	6.7  11.2  11.2  11.2  12.1  -39.7  -48.3  -22.3  -33.9  12.0  -29.3  -4.9  -0.1
Import/E 33  Import/E 34 35 36 37 38 39 40 41 42 43 44	Export of HVDC Export of HVDC - 765 kV	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI GWALIOR-ORAI SATNA-ORAI CHITTORGARH-BANASKANTHA ZERDA-KANKROLI ZERDA - BHINMAL VCHAL - RIHAND	D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C S/C S/C	0 447 0 0 0 0 0 770 0 202 161 139 980	2503 0 1925 2582 1566 943 0 1396 893 157 404	6.7 11.2 11.2 0.0 12.1 0.0 0.0 0.0 12.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1 2.8 0.0	6.7  11.2  11.2  11.2  -32.2  12.1  -39.7  -48.3  -22.3  -33.9  12.0  -29.3  -4.9  -0.1  -2.8  23.0
Import/E 33  Import/E 34 35 36 37 38 39 40 41 42 43 44 45	Export of HVDC Export of HVDC - 765 kV	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI GWALIOR-ORAI SATNA-ORAI ZERDA-KANKROLI ZERDA-BHINMAL VCHAL -RIHAND RAPP-SHUJALPUR	D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C S/C S/C S/C S/C S/C S	476  0  447  0  0  0  770  0  202  161  139  980  125	ER-NER  0 NER-NR  2503 0 1925 2582 1566 943 0 1396 893 157 404 0 396	6.7 11.2 11.2 0.0 12.1 0.0 0.0 0.0 0.0 12.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1 2.8 0.0 2	6.7  11.2  11.2  11.2  11.2  -32.2  12.1  -39.7  -48.3  -22.3  -33.9  12.0  -29.3  -4.9  -0.1  -2.8  23.0  -2
Import/E 33  Import/E 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49	Export of HVDC Export of HVDC - 765 kV	NER (With NR)  BISWANATH CHARIALI-AGRA  WR (With NR)  CHAMPA-KURUKSHETRA  V'CHAL B/B  APL -MHG  GWALIOR-AGRA  PHAGI-GWALIOR  JABALPUR-ORAI  GWALIOR-ORAI  SATNA-ORAI  CHITTORGARH-BANASKANTHA  ZERDA-KANKROLI  ZERDA -BHINMAL  V'CHAL -RIHAND  RAPP-SHUJALPUR  BHANPURA-RANPUR  BHANPURA-MORAK  MEHGAON-AURAIYA	D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C S/C S/C S/C S/C S/C S	0 447 0 0 0 0 0 770 0 202 161 139 980 125 24 1	ER-NER  0 NER-NR  2503 0 1925 2582 1566 943 0 1396 893 157 404 0 396 93 140 0	6.7  11.2  11.2  11.2  0.0  12.1  0.0  0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1 2.8 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	6.7  11.2  11.2  11.2  11.2  12.1  -39.7  -48.3  -22.3  -33.9  12.0  -29.3  -4.9  -0.1  -2.8  23.0  -2  -0.7  -1.6  1.3
Import/E  33  Import/E  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49  50	Export of HVDC Export of HVDC - 765 kV - 400 kV	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI GWALIOR-ORAI SATNA-ORAI CHITTORGARH-BANASKANTHA ZERDA-BHISMAL VCHAL-RIHAND RAPP-SHUJALPUR BHANPURA-RANPUR BHANPURA-MORAK MEHGAON-AURAIYA MALANPUR-AURAIYA	D/C D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C S/C S/C S/C S/C S/C S	0 447 0 0 0 0 770 0 202 161 139 980 125 24 1	ER-NER  0 NER-NR  2503 0 1925 2582 1566 943 0 1396 893 157 404 0 396 93 140 0 25	6.7  11.2  11.2  0.0  12.1  0.0  0.0  0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1 2.8 0.0 2 0.0 0.0 0.0 0.0 0.0 0.0	6.7  11.2  11.2  11.2  11.2  12.1  -39.7  -48.3  -22.3  -33.9  12.0  -29.3  -4.9  -0.1  -2.8  23.0  -2  -0.7  -1.6  1.3  0.4
Import/E  33  Import/E  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49	Export of HVDC Export of HVDC - 765 kV	NER (With NR)  BISWANATH CHARIALI-AGRA  WR (With NR)  CHAMPA-KURUKSHETRA  V'CHAL B/B  APL -MHG  GWALIOR-AGRA  PHAGI-GWALIOR  JABALPUR-ORAI  GWALIOR-ORAI  SATNA-ORAI  CHITTORGARH-BANASKANTHA  ZERDA-KANKROLI  ZERDA -BHINMAL  V'CHAL -RIHAND  RAPP-SHUJALPUR  BHANPURA-RANPUR  BHANPURA-MORAK  MEHGAON-AURAIYA	D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C S/C S/C S/C S/C S/C S	0 447 0 0 0 0 0 770 0 202 161 139 980 125 24 1	ER-NER  0 NER-NR  2503 0 1925 2582 1566 943 0 1396 893 157 404 0 396 93 140 0 25 0	6.7  11.2  11.2  0.0  12.1  0.0  0.0  0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1 2.8 0.0 2 0.0 0.0 0.0 0.0 0.0 0.0	6.7  11.2  11.2  11.2  11.2  11.2  12.1  -39.7  -48.3  -22.3  -33.9  12.0  -29.3  -4.9  -0.1  -2.8  23.0  -2  -0.7  -1.6  1.3  0.4  0.0
Import/E  33  Import/E  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51	Export of HVDC Export of HVDC - 765 kV - 400 kV	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI GWALIOR-ORAI SATNA-ORAI CHITTORGARH-BANASKANTHA ZERDA-BHISMAL VCHAL-RIHAND RAPP-SHUJALPUR BHANPURA-RANPUR BHANPURA-MORAK MEHGAON-AURAIYA MALANPUR-AURAIYA	D/C D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C S/C S/C S/C S/C S/C S	0 447 0 0 0 0 770 0 202 161 139 980 125 24 1	ER-NER  0 NER-NR  2503 0 1925 2582 1566 943 0 1396 893 157 404 0 396 93 140 0 25	6.7  11.2  11.2  0.0  12.1  0.0  0.0  0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1 2.8 0.0 2 0.0 0.0 0.0 0.0 0.0 0.0	6.7  11.2  11.2  11.2  11.2  12.1  -39.7  -48.3  -22.3  -33.9  12.0  -29.3  -4.9  -0.1  -2.8  23.0  -2  -0.7  -1.6  1.3  0.4
Import/E  33  Import/E  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51	Export of HVDC Export of HVDC  765 kV  400 kV  132kV  Export of	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI SATNA-ORAI CHITTORGARH-BANASKANTHA ZERDA-KANKROLI ZERDA - BHINMAL VCHAL - RIHAND RAPP-SHUJALPUR BHANPURA-RANPUR BHANPURA-MORAK MEHGAON-AURAIYA MALANPUR-AURAIYA GWALIOR-SAWAI MADHOPUR	D/C D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C S/C S/C S/C S/C S/C S	0 447 0 0 0 0 770 0 202 161 139 980 125 24 1	ER-NER  0 NER-NR  2503 0 1925 2582 1566 943 0 1396 893 157 404 0 396 93 140 0 25 0	6.7  11.2  11.2  0.0  12.1  0.0  0.0  0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1 2.8 0.0 2 0.0 0.0 0.0 0.0 0.0 0.0	6.7  11.2  11.2  11.2  11.2  11.2  12.1  -39.7  -48.3  -22.3  -33.9  12.0  -29.3  -4.9  -0.1  -2.8  23.0  -2  -0.7  -1.6  1.3  0.4  0.0
Import/E  33  Import/E  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51  Import/E	Export of HVDC Export of HVDC - 765 kV - 400 kV	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI GWALIOR-ORAI SATNA-ORAI ZERDA-KANKROLI ZERDA -BHINMAL VCHAL -RIHAND RAPP-SHUJALPUR BHANPURA-RANPUR BHANPURA-MORAK MEHGAON-AURAIYA MALANPUR-AURAIYA GWALIOR-SAWAI MADHOPUR	D/C D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C S/C S/C S/C S/C S/C S	476  0  447  0  0  0  0  0  770  0  202  161  139  980  125  24  1  98  49  0	ER-NER  0 NER-NR  2503 0 1925 2582 1566 943 0 1396 893 157 404 0 396 93 140 0 25 0 WR-NR	6.7  11.2  11.2  0.0  12.1  0.0  0.0  0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1 2.8 0.0 2 0.8 1.6 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	6.7  11.2  11.2  11.2  11.2  11.2  11.2  11.2  12.1  -39.7  -48.3  -22.3  -33.9  12.0  -29.3  -4.9  -0.1  -2.8  23.0  -2  -0.7  -1.6  1.3  0.4  0.0  -168.6
Import/E  33  Import/E  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51  Import/E  52  53  54	Export of HVDC Export of HVDC  765 kV  400 kV  132kV  Export of	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI SATNA-ORAI CHITTORGARH-BANASKANTHA ZERDA-BHISMAL VCHAL -RIHAND RAPP-SHUJALPUR BHANPURA-RANPUR BHANPURA-RANPUR BHANPURA-WORAI GWALIOR-SAWAI MADHOPUR  WR (With SR) BHADRAWATI B/B BARSUR-L.SILERU SOLAPUR-RAICHUR	D/C D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C S/C S/C S/C S/C S/C S	0 447 0 0 0 0 0 770 0 202 161 139 980 125 24 1 98 49 0	ER-NER  0 NER-NR  2503 0 1925 2582 1566 943 0 1396 893 157 404 0 396 93 140 0 25 0 WR-NR	6.7  11.2  11.2  0.0  12.1  0.0  0.0  0.0	0.0 0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1 2.8 0.0 2 0.8 1.6 0.0 0.0 2 1.7 0.0 0.0 1.7 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	6.7  11.2  11.2  11.2  11.2  12.1  -39.7  -48.3  -22.3  -33.9  12.0  -29.3  -4.9  -0.1  -2.8  23.0  -2  -0.7  -1.6  1.3  0.4  0.0  -168.6
Import/E  33  Import/E  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51  Import/E  52  53  54	Export of HVDC Export of HVDC  765 kV  220 kV  132kV  Export of HVDC  765 kV	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI GWALIOR-ORAI SATTA-ORAI CHITTORGARH-BANASKANTHA ZERDA-KANKROLI ZERDA -BHINMAL VCHAL -RIHAND RAPP-SHUJALPUR BHANPURA-RANPUR BHANPURA-MORAK MEHGAON-AURAIYA MALANPUR-AURAIYA GWALIOR-SAWAI MADHOPUR  WR (With SR) BHADRAWATI B/B BARSUR-L.SILERU SOLAPUR-RAICHUR WARDHA-NIZAMABAD	D/C D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C S/C S/C S/C S/C S/C D/C S/C S/C S/C D/C S/C S/C S/C D/C S/C S/C S/C D/C S/C S/C S/C S/C S/C S/C S/C S/C S/C S	0 447 0 0 0 0 0 770 0 202 161 139 980 125 24 1 98 49 0	ER-NER  0 NER-NR  2503 0 1925 2582 1566 943 0 1396 893 157 404 0 396 93 1440 0 25 0 WR-NR	6.7  11.2  11.2  0.0  12.1  0.0  0.0  0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1 2.8 0.0 0.0 217.6	6.7  11.2  11.2  11.2  11.2  11.2  11.2  11.2  12.1  -39.7  -48.3  -22.3  -33.9  12.0  -29.3  -4.9  -0.1  -2.8  23.0  -2  -0.7  -1.6  1.3  0.4  0.0  -168.6
Import/E  33  Import/E  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51  Import/E  52  53  54	Export of HVDC Export of HVDC  765 kV  400 kV  220 kV  132kV  Export of HVDC	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B'B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI GWALIOR-ORAI SATNA-ORAI CHITTORGARH-BANASKANTHA ZERDA-KANKROLI ZERDA -BHINMAL VCHAL -RIHAND RAPP-SHUJAL-PUR BHANPURA-MORAK MEHGAON-AURAIYA MALANPUR-AURAIYA GWALIOR-SAWAI MADHOPUR  WR (With SR) BHADRAWATI B/B BARSUR-L-SILERU SOLAPUR-RAICHUR WARDHA-NIZAMABAD KOLHAPUR-KUDGI	D/C D/C D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C S/C S/C S/C S/C S/C S	0 447 0 0 0 0 0 0 770 0 202 161 139 980 125 24 1 1 98 49 0	ER-NER  0 NER-NR  2503 0 1925 2582 1566 943 0 1396 893 157 404 0 396 93 140 0 25 0 WR-NR	6.7  11.2  11.2  0.0  12.1  0.0  0.0  0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1 2.8 0.0 2 0.8 1.6 0.0 0.0 217.6	6.7  11.2  11.2  11.2  11.2  11.2  11.2  11.2  12.1  -39.7  -48.3  -22.3  -33.9  12.0  -29.3  -4.9  -0.1  -2.8  23.0  -2  -0.7  -1.6  1.3  0.4  0.0  -168.6  -14.7  0.0  -20.6  -36.4  7.1
Import/E  33  Import/E  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51  Import/E  52  53  54  55  56  57	Export of HVDC Export of HVDC  765 kV  400 kV  220 kV  132kV  Export of HVDC  765 kV	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI SATNA-ORAI CHITTORGARH-BANASKANTHA ZERDA-KANKROLI ZERDA - BHINMAL VCHAL - RIHAND RAPP-SHUJALPUR BHANPURA-RANPUR BHANPURA-RANPUR BHANPURA-WANDUR MEHGAON-AURAIYA MALANPUR-AURAIYA GWALIOR-SAWAI MADHOPUR  WR (With SR) BHADRAWATI B/B BARSUR-L SILERU SOLAPUR-RAICHUR WARDHA-NIZAMABAD KOLHAPUR-KUDGI KOLHAPUR-CHIKODI	D/C D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C S/C S/C S/C S/C S/C S	0 447 0 0 0 0 0 0 770 0 202 161 139 980 125 24 1 1 98 49 0	ER-NER  0 NER-NR  2503 0 1925 2582 1566 943 0 1396 893 157 404 0 396 93 140 0 25 0 WR-NR	6.7  11.2  11.2  0.0  12.1  0.0  0.0  0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1 2.8 0.0 0.0 217.6 14.7 0.0 20.8 36.4 0.0 0.0	6.7  11.2  11.2  11.2  11.2  11.2  11.2  11.2  12.1  -39.7  -48.3  -22.3  -33.9  12.0  -29.3  -4.9  -0.1  -2.8  23.0  -2  -0.7  -1.6  1.3  0.4  0.0  -168.6  -14.7  0.0  -20.6  -36.4  7.1  0.0
Import/E  33  Import/E  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51  Import/E  52  53  54	Export of HVDC Export of HVDC  765 kV  400 kV  220 kV  132kV  Export of HVDC  765 kV	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI SATNA-ORAI CHITTORGARH-BANASKANTHA ZERDA-KANKROLI ZERDA - BHINMAL VCHAL - RIHAND RAPP-SHUJALPUR BHANPURA-RANPUR BHANPURA-RANPUR BHANPURA-WALIANIANA GWALIOR-SAWAI MADHOPUR  WR (With SR) BHANDRASH BHANDRASH BHANDRASH BHANDRASH SOLAPUR-RAICHUR WARDHA-NIZAMABAD KOLHAPUR-KUDGI KOLHAPUR-CHIKODI PONDA-AMBEWADI	D/C D/C D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C S/C S/C S/C S/C S/C S	0 447 0 0 0 0 0 0 770 0 202 161 139 980 125 24 1 1 98 49 0	ER-NER  0 NER-NR  2503 0 1925 2582 1566 943 0 1396 893 157 404 0 396 93 140 0 25 0 WR-NR	6.7  11.2  11.2  0.0  12.1  0.0  0.0  0.0	0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1 2.8 0.0 2 0.8 1.6 0.0 0.0 217.6	6.7  11.2  11.2  11.2  11.2  11.2  11.2  11.2  12.1  -39.7  -48.3  -22.3  -33.9  12.0  -29.3  -4.9  -0.1  -2.8  23.0  -2  -0.7  -1.6  1.3  0.4  0.0  -168.6  -14.7  0.0  -20.6  -36.4  7.1
Import/E  33  Import/E  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51  Import/E  52  53  54  55  56  57  58	Export of HVDC Export of HVDC  765 kV  400 kV  220 kV  132kV  Export of HVDC  765 kV	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI SATNA-ORAI CHITTORGARH-BANASKANTHA ZERDA-KANKROLI ZERDA - BHINMAL VCHAL - RIHAND RAPP-SHUJALPUR BHANPURA-RANPUR BHANPURA-RANPUR BHANPURA-WANDUR MEHGAON-AURAIYA MALANPUR-AURAIYA GWALIOR-SAWAI MADHOPUR  WR (With SR) BHADRAWATI B/B BARSUR-L SILERU SOLAPUR-RAICHUR WARDHA-NIZAMABAD KOLHAPUR-KUDGI KOLHAPUR-CHIKODI	D/C D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C S/C S/C S/C D/C S/C S/C S/C S/C S/C S/C S/C S/C S/C S	0 447 0 0 0 0 0 0 770 0 202 161 139 980 125 24 1 98 49 0	ER-NER  0 NER-NR  2503 0 1925 2582 1566 943 0 1396 893 157 404 0 396 93 140 0 255 0 WR-NR  620 0 1881 2196 25 0 0	6.7  11.2  11.2  0.0  12.1  0.0  0.0  0.0	0.0 0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1 2.8 0.0 2 0.8 1.6 0.0 0.0 217.6 14.7 0.0 20.8 36.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	6.7  11.2  11.2  11.2  11.2  11.2  11.2  11.2  11.2  11.2  12.1  -39.7  -48.3  -22.3  -33.9  12.0  -29.3  -4.9  -0.1  -2.8  23.0  -2  -0.7  -1.6  1.3  0.4  0.0  -168.6  -14.7  0.0  -20.6  -36.4  7.1  0.0  0.0
Import/E  33  Import/E  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51  Import/E  52  53  54  55  56  57  58	Export of HVDC Export of HVDC  765 kV  400 kV  220 kV  132kV  Export of HVDC  765 kV	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI SATNA-ORAI CHITTORGARH-BANASKANTHA ZERDA-KANKROLI ZERDA -BHINMAL VCHAL -RIHAND RAPP-SHUJALPUR BHANPURA-RANPUR BHANPURA-MORAK MEHGAON-AURAIYA MALANPUR-AURAIYA GWALIOR-SAWAI MADHOPUR  WR (With SR) BHADRAWATI B/B BARSUR-L.SILERU SOLAPUR-RAICHUR WARDHA-NIZAMABAD KOLHAPUR-CHIKODI PONDA-AMBEWADI XELDEM-AMBEWADI	D/C D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C S/C S/C S/C S/C S/C S	0 447 0 0 0 0 0 0 770 0 202 161 139 980 125 24 1 98 49 0	ER-NER  0 NER-NR  2503 0 1925 2582 1566 943 0 1396 893 157 404 0 396 93 140 0 255 0 WR-NR  620 0 1881 2196 225 0 0 81 WR-SR	6.7  11.2  11.2  0.0  12.1  0.0  0.0  0.0	0.0 0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1 2.8 0.0 2 0.8 1.6 0.0 0.0 217.6 14.7 0.0 20.8 36.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	6.7  11.2  11.2  11.2  11.2  11.2  11.2  11.2  11.2  11.2  11.2  12.1  139.7  148.3  12.0  12.0  12.0  12.0  12.0  13.0  14.9  10.1  1.3  10.4  10.0  168.6  11.7  10.0  10.0  10.0  10.0  10.0  11.3
Import/E  33  Import/E  34  35  36  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51  Import/E  52  53  54  55  56  57  58	Export of HVDC Export of HVDC  765 kV  400 kV  220 kV  132kV  Export of HVDC  765 kV	NER (With NR) BISWANATH CHARIALI-AGRA  WR (With NR) CHAMPA-KURUKSHETRA VCHAL B/B APL-MHG GWALIOR-AGRA PHAGI-GWALIOR JABALPUR-ORAI SATNA-ORAI CHITTORGARH-BANASKANTHA ZERDA-KANKROLI ZERDA -BHINMAL VCHAL -RIHAND RAPP-SHUJALPUR BHANPURA-RANPUR BHANPURA-MORAK MEHGAON-AURAIYA MALANPUR-AURAIYA GWALIOR-SAWAI MADHOPUR  WR (With SR) BHADRAWATI B/B BARSUR-L.SILERU SOLAPUR-RAICHUR WARDHA-NIZAMABAD KOLHAPUR-CHIKODI PONDA-AMBEWADI XELDEM-AMBEWADI	D/C D/C D/C D/C D/C D/C D/C D/C S/C S/C S/C S/C S/C S/C S/C S/C S/C S	0 447 0 0 0 0 0 0 770 0 202 161 139 980 125 24 1 98 49 0	ER-NER  0 NER-NR  2503 0 1925 2582 1566 943 0 1396 893 157 404 0 396 93 140 0 255 0 WR-NR  620 0 1881 2196 225 0 0 81 WR-SR	6.7  11.2  11.2  0.0  12.1  0.0  0.0  0.0	0.0 0.0 0.0 0.0 32.2 0.0 39.7 48.3 22.3 33.9 0.0 29.3 4.9 0.1 2.8 0.0 2 0.8 1.6 0.0 0.0 217.6 14.7 0.0 20.8 36.4 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	6.7  11.2  11.2  11.2  11.2  11.2  11.2  11.2  11.2  11.2  11.2  12.1  13.9.7  12.0  12.0  12.0  12.0  13.0  14.9  10.1