



भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
उत्तर क्षेत्रीय विद्युत समिति
Northern Regional Power Committee

दिनांक 30.06.2025

विषय: उ.क्षे.वि.स. की नवीकरणीय ऊर्जा उप-समिति की 3^{री} बैठक की कार्यसूची

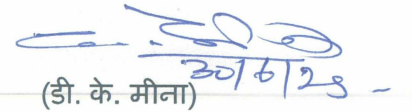
Subject: Agenda of the 3rd meeting of Renewable Energy Sub-Committee of NRPC.

उ.क्षे.वि.स. की नवीकरणीय ऊर्जा उप-समिति की 3^{री} बैठक का आयोजन **10.07.2025 (10:30 बजे से)** को एनआरपीसी सचिवालय, कांफ्रेंस हॉल, नई दिल्ली में किया जाएगा। उक्त बैठक की कार्यसूची उत्तर क्षेत्रीय विद्युत समिति की वेबसाइट <http://164.100.60.165> पर उपलब्ध है।

कृपया बैठक में उपस्थित होने की सुविधा प्रदान करें।

The 3rd Renewable Energy Sub-Committee's meeting of NRPC is scheduled to be held on **10.07.2025 (10:30 hrs. onwards)** at **NRPC Secretariat, Conference Hall, Katwaria Sarai, New Delhi**. The agenda of this meeting has been uploaded on the NRPC web-site <http://164.100.60.165>.

Kindly make it convenient to attend the meeting.


(डी. के. मीना)

अधीक्षण अभियंता (प्रचालन)

सेवा में : उ.क्षे.वि.स. की नवीकरणीय ऊर्जा उप समिति के सभी सदस्य।

To : All Members of Renewable Energy Sub-committee of NRPC

List of addressee (via mail)

List of Members of Renewable Energy Sub-committee

S. No.	Members of RE Sub-committee	Representative Email ID
1	Ministry of New and Renewable Energy	anindya.parira@nic.in;
2	National Load Despatch Center	suhasd@grid-india.in;
3	Northern Regional Load Despatch Center	somara.lakra@grid-india.in;
4	Central Transmission Utility	Kashish@powergrid.in;
5	Powergrid Corporation of India Ltd.	saroj.mishra@powergrid.in ; yashpal@powergrid.in
6	Rajasthan Rajya Vidyut Prasaran Nigam Ltd.	se.pp@rvpn.co.in;
7	Rajasthan State Load Despatch Center	se.ldrvpl@rvpn.co.in;
8	Solar Energy Corporation of India	sanjaysharma@seci.co.in; vkumar@seci.co.in;
9	National Solar Energy Federation of India	ankur.kumar@nsefi.in; ceooffice@nsefi.in;
10	Indian Wind Power Association	ceo@indianwindpower.com;
13	ABC Renewable Pvt. Ltd	dasopa@evrenenergy.com; achaturvedi@evrenenergy.com;
14	ACME Heeragarh powertech Pvt. Ltd	prachi.chauhan@acme.in; planthead.badisidd.solar@acme.in; ashutosh.singh@acme.in;
15	ACME Chittorgarh Solar Energy Pvt Ltd	sandeptak@ayanapower.com; yogesh@ayanapower.com;
16	Adani Hybrid Energy Jaisalmer One Ltd.	kailash.nagora@adani.com; sanjay.bhatt@adani.com;
17	Adani Hybrid Energy Jaisalmer Two Ltd.	
18	Adani Hybrid Energy Jaisalmer Three Ltd.	
19	Adani Hybrid Energy Jaisalmer Four Ltd.	
20	Adani Renewable Energy (RJ) limited Rawara	
21	Adani Solar Energy Jaisalmer One Pvt. Ltd. 450MW (Solar)	
22	Adani Solar Energy Four Private Limited	
23	Adani Solar Energy Jaisalmer Two Private Limited	
24	Adani Solar Energy Jaisalmer Two	

	Private Limited Project Two	
25	SB ENERGY FOUR PRIVATE LIMITED, Bhadla	
26	SB Energy Six Private Limited, Bhadla	
27	Adani Solar Enegry Jodhpur Two Limited, Rawara	
28	Adept Renewable Technologies Pvt. Ltd.	
29	Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)	
30	Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)	
31	Adani Green Energy 19 Limited	
32	Altra Xergi Pvt. Ltd.	mahendra.kumar@O2power.in;
33	AMP Energy Green Five Pvt. Ltd.	vbhattacharya@ampenergyindia.com;
34	AMP Energy Green Six Pvt. Ltd.	vbhattacharya@ampenergyindia.com;
35	Amplus Ages Private Limited	manish.tak@amplussolar.com;
36	Avaada RJHN_240MW	
37	Avaada sunce energy Pvt limited	alpesh.prajapati@avaada.com;
38	Avaada Sunrays Pvt. Ltd.	
39	Avaada Sustainable RJ Pvt. Ltd.	
40	Ayana Renewable Power Three Private Limited	Venkatraman@ayanapower.com; rajeshshukla@ayanapower.com;
41	Ayaana Renewable Power One Pvt. Ltd.	
42	Azure Power Forty One Pvt limited	sourin.nandi@azurepower.com;
43	Azure Power Forty Three Pvt. Ltd. RSS	manohar.reddy@azurepower.com;
44	Azure Maple Pvt. Ltd.	sourin.nandi@azurepower.com;
45	AZURE POWER INDIA Pvt. Ltd., Bhadla	yogesh.kumar@adani.com;
46	Azure Power Thirty Four Pvt. Ltd.	manohar.reddy@azurepower.com;
47	Clean Solar Power (Jodhpur) Pvt. Ltd.	seetaram.kumhar@herofutureenergies.com;
48	Clean Solar Power (Bhadla) Pvt. Ltd	dejendra.sharma@herofutureenergies.com; atul.tomar@herofutureenergies.com; sushant.sinha@herofutureenergies.com;
49	Eden Renewable Cite Private Limited	
50	Grian Energy private limited	mehul.sharma@amplussolar.com;
51	Mahindra Renewable Private Limited	mehar.rahmatulla@mahindra.com; patil.saurabh2@mahindra.com;
52	Mega Surya Urja Pvt. Ltd. (MSUPL)	pankaj.vaidya@seit.co.in; niraj.shah@seit.co.in;
53	AURAIYA Solar	rajivgupta@ntpc.co.in;
54	DADRI SOLAR	
55	SINGRAULI SOLAR	
56	Anta Solar	
57	Unchahar Solar	
58	NTPC Devikot Solar plant_240MW	
59	NTPC Kolayat_400kV	
60	Nedan Solar NTPC	
61	NTPC Nokhra_300MW	

62	One Volt energy Pvt. Ltd.	amarjeet.thakur@amplussolar.com;
63	ReNew Solar Energy (Jharkhand Three) Private Limited	purnendu.chaubey@renew.com; kailash.pandey@renew.com;
64	RENEW SOLAR POWER Pvt. Ltd. Bhadla	
65	ReNew Solar Urja Private Limited	
66	Renew Sun Bright Pvt. Ltd. (RSBPL)	
67	Renew Sun Waves Private Limited (RSEJ4L)	
68	Renew Surya Partap Pvt. Ltd.	
69	Renew Surya Ravi Pvt. Ltd.	
70	Renew Surya Roshni Pvt. Ltd.	
71	Renew Surya Vihan Pvt. Ltd.	
72	Renew Surya Ayaan Pvt. Ltd.	
73	RENEW SOLAR POWER Pvt. Ltd. Bikaner	
74	Rising Sun Energy-K Pvt. Ltd.	tushar.gahlot@risingsunenergy.in;
75	Serentica Renewables India 4 Private Limited	prateek.raai@serenticaglobal.com;
76	Tata Power Green Energy Ltd. (TPGEL)	vinod.kumar@tatapower.com;
77	Tata Power Renewable Energy Ltd. (TPREL)	anil.pareek@tatapower.com ; imran.khan@tatapower.com ;
78	Thar Surya Pvt. Ltd.	vivek.reddy2@enel.com; mahendra.vishnoi2@enel.com;
79	TP Surya Pvt. Ltd.	sivanarayana@tatapower.com; sagar.potdar@tatapower.com;
80	Banderwala Solar Plant TP Surya Ltd.	arun.sahoo@tatapower.com;
81	TRANSITION ENERGY SERVICES PRIVATE LIMITED	kak@evrenenergy.com;
82	Transition Green Energy Private Limited	
83	Transition Sustainable Energy Services Private Limited	

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Agenda for 3rd RE Sub-Committee meeting of NRPC

A.1. Confirmation of Minutes

A.1.1 2nd RE Sub-Committee meeting was held on 27.01.2025. Minutes of the meeting were issued vide letter dt. 01.04.2025. No comments received till now.

Decision required from Forum:

Forum may approve the minutes of 2nd RE Sub-committee meeting.

A.2. Submission of protection performance indices along with reason and corrective action taken for indices less than unity to NRPC Secretariat on monthly basis (agenda by NRPC Secretariat)

A.2.1 As per clause 15 (6) of IEGC 2023;

- Users shall submit the following protection performance indices of previous month to their respective RPC and RLDC on monthly basis for 220 kV and above (132 kV and above in NER) system, which shall be reviewed by the RPC:

a) The **Dependability Index** defined as $D = Nc / Nc + Nf$

b) The **Security Index** defined as $S = Nc / Nc + Nu$

c) The **Reliability Index** defined as $R = Nc / Nc + Ni$

where,

Nc is the number of correct operations at internal power system faults,

Nf is the number of failures to operate at internal power system faults,

Nu is the number of unwanted operations,

Ni is the number of incorrect operations and is the sum of Nf and Nu

- Each user shall also submit the reasons for performance indices less than unity of individual element wise protection system to the respective RPC and action plan for corrective measures. The action plan will be followed up regularly in the respective RPC.

A.2.2 In earlier PSC meeting, it was decided that each utility shall submit the Performance indices of previous month by 7th day of next month.

A.2.3 It has been observed that RE utilities are not submitting indices to NRPC Secretariat.

However, some of RE utilities have submitted the performance indices delayed.

- A.2.4 During the discussion of PSC meetings, it was decided that agenda may be discussed in RE Sub-Committee meeting as most of RE members do not join the Protection Sub-Committee meeting regularly.
- A.2.5 The status of submitted protection performance indices for the month of February, March & April 2025 by RE utilities is attached as **Annexure-I**.
- A.2.6 Further, format for submission of indices is attached as **Annexure-II** for reference.

Decision required from Forum:

Forum may direct all RE utilities to submit indices of previous month by 7th day of current month at mail id seo-nrpc@nic.in

A.3. Annual protection audit plan for FY 2025-26 (agenda by NRPC Secretariat)

- A.3.1 As per clause 15 of IEGC 2023;
- Annual audit plan for the next financial year shall be submitted by the users to their respective RPC by 31st October. The users shall adhere to the annual audit plan and report compliance of the same to their respective RPC.*
- A.3.2 In view of above, all utilities were requested to submit the annual protection audit plan for FY-2025-26 latest by 31st October 2024 in the 53rd PSC meeting. Thereafter, agenda is regularly followed up in monthly PSC meeting.
- A.3.3 However, most of the RE utilities have not submitted annual audit plan for FY 2025-26. The status of submitted protection audit plan for the same is attached as **Annexure-III**.
- A.3.4 Further, format for submission of audit plan is attached as **Annexure-IV** for reference.

Decision required from Forum:

Forum may direct all RE utilities to submit annual audit plan for FY 2025-26 at mail id seo-nrpc@nic.in

A.4. Third-party protection audit plan (agenda by NRPC Secretariat)

- A.3.1 As per clause 15 of IEGC 2023:

All users shall also conduct third party protection audit of each sub-station at 220 kV and above (132 kV and above in NER) once in five years or earlier as advised by the respective RPC.

A.3.2 As per clause 15 (4) of IEGC 2023;

The third-party protection audit report shall contain information sought in the format enclosed as Annexure–1 (IEGC). The protection audit reports, along with **action plan for rectification of deficiencies detected, if any, shall be submitted to the respective RPC and RLDC or SLDC, as the case may be, within a month of submission of third-party audit report.** The necessary compliance to such protection audit report shall be followed up regularly in the respective RPC.

A.3.3 However, most of the RE utilities have neither submitted the third-party audit plan nor report of audit conducted. The status of submitted the third party protection audit plan is attached as **Annexure-V.**

Decision required from Forum:

Forum may direct all RE utilities to submit third party audit plan at mail id seo-nrpc@nic.in and reports along with compliance status of audit already conducted.

A.5. Final approval of protection settings by PSC Forum for FTCs which have been provisionally allowed by NRLDC/SLDCs (agenda by NRPC Secretariat)

A.4.1 Procedure for approval of protection setting has been approved in 75th NRPC meeting as attached as **Annexure-VI**. Accordingly, FTC is allowed by RLDC/SLDCs based on protection philosophy (**Annexure-VII**). Final approval of settings to be done in monthly PSC meetings.

A.4.2 It has been observed that RE companies are not taking final approval of protection settings in PSC. The issue was discussed in 54th PSC meeting, wherein, it was decided as:

Quote

NRLDC shall give provisional protection clearance during FTC on conditional basis subject to submission of agenda in next Protection Sub-Committee meetings (not later than 2nd next PSC meeting). If utility does not put up the agenda within time, further FTC clearance would not be granted to the concerned.

Unquote

Decision required by Forum:

Utilities may be informed of above procedure and may submit agenda in PSC for compliance of IEGC.

A.6. RE generation loss events in case of fault in the vicinity of RE complex and Low Voltage Ride Through (LVRT) & High Voltage Ride Through (HVRT) non-compliance by RE Generators at interconnection point (Agenda by NRLDC)

A.6.1 Regulations pertaining to LVRT & HVRT as per CEA (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2019 are as follows.

(i). Clause B2 (3) under Part II of the Schedule for LVRT:

Quote

“The generating station connected to the grid, shall remain connected to the grid when voltage at the interconnection point on any or all phases dips up to the level depicted by the thick lines in the following curve, namely:

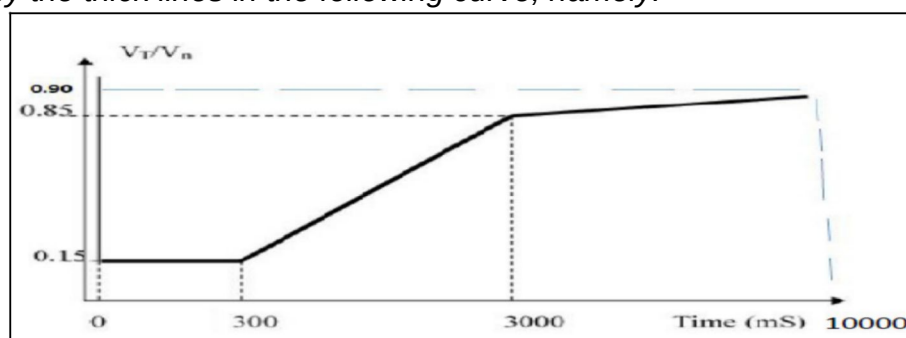


Figure 1 LVRT operating range

*Provided that during the voltage dip, the supply of **reactive power has first priority**, while the supply of active power has second priority and **the active power preferably be maintained during voltage drops**, provided, a reduction in active power within the plant's design specifications is acceptable and **active power be restored to at least 90% of the pre-fault level within 1 sec** of restoration of voltage.”*

Unquote

(ii). Clause B2(7) under Part II of Schedule for HVRT:

Quote

“The generating station connected to the grid, shall remain connected to the grid when the voltage at the interconnection point, on any or all phases (symmetrical or asymmetrical overvoltage conditions) rises above the specified values given below for specified time”.

Over voltage (pu)	Minimum time to remain connected (Seconds)
$1.30 < V$	0 Sec (Instantaneous trip)
$1.30 \geq V > 1.20$	0.2 Sec
$1.20 \geq V > 1.10$	2 Sec
$V \leq 1.10$	Continuous

Unquote

Further, CEA has issued the clarification on HVRT clause vide file no. 12/X/STD/CONN/GM/2023/438 dated 06.01.2023.

Quote

"In HVRT mode, the generating station shall provide reactive power support (absorption) proportional to the voltage rise at point of interconnection. During this phase, the quantum of reactive current absorption shall be dependent on reactive current gain in the system i.e. HVRT "K" factor. The active current and overall current shall be limited as per the transient rated current limit of the plant".

Unquote

A.6.2 Details of RE generation loss events from 01.01.2025 to 20.06.2025 and LVRT/HVRT non-compliance of RE generators:

The issue of renewable energy (RE) generation loss during faults in vicinity of RE complex and non-compliance of LVRT/HVRT requirements by RE generators at the interconnection point was thoroughly discussed in the previous meetings. The necessary action points for RE developers were outlined in the last meeting. Since 1st Jan'2025 to 20th June'2025, total 4 numbers of RE generation loss events (>1000MW) occurred in RE complex of Northern Region. Summary of these four (4) events is shown below;

Summary of RE Generation loss in NR (1st Jan'25-20th June'25):

S. No	Date & Time	Fault event	Quantum of RE generation drop	Voltage dip observed	Frequency Dip (Hz)
1	08.01.2025, 13:38 hrs	R-Y fault on 400 kV Fatehgarh-II(PG)-Fatehgarh-I (FBTL) Ckt-1	1450 MW	0.514 pu	0.14
2	18.03.2025, 10:00 hrs	R-N fault on 400 kV AGE25L-Bhadla-II (PG) line	1035 MW	0.75 pu	0.183
3	11.05.2025, 12:31 hrs	3-ph Fault on 220 kV RSDCL (PSS4)-Bhadla-II (PG) line, at the same time	2215 MW (Including	0.86 pu	0.22

		220 kV NTPC Nokhra-Bhadla-II (PG) line, STATCOM-2 (-425/+550MVAR) at 400kV Bhadla-II (PG) and 400kV Bikaner (RS)-Deedwana line tripped.	~400 MW in Rajasthan)		
4	12.06.2025, 13:34 hrs	Y-B phase to phase fault on 400 kV AKAL-JAISALMER (RS) CKT-1	1636 MW (Including ~600 MW in Rajasthan)	0.78 pu	0.18

Tripping details from RE generators for aforementioned four (4) events is yet to be received. STATCOM TFR details for 11th May'25 is also not yet received.

All the above four (4) events have been analysed in detailed based on SCADA/PMU data available at NRLDC. Based on analysis, list of LVRT/HVRT Non-compliant RE Plants, their Generation Loss quantum and details of common inverters are given below.

Table-1: List of LVRT/HVRT Non-compliant RE Plants and their Generation Loss quantum for 8th Jan'25 event: (12 nos. of RE plants found LVRT/HVRT Non-compliant on 8th Jan'25 event)

Event analysis of 08.01.2025 RE generation loss event @13:38hrs								
RE Plant Name	Pooling Station	Plant Capacity (MW)	Generation before the event (MW) (A)	Generation after the event (MW) (B)	Generation loss (MW) C = (A-B)	% Generation loss (MW) D = (C/A) *100	Inverters Make	Inverter/ WTG Model No
ACME PHALODI SOLAR POWER PVT. LTD.	Fatehgarh-I PS	300	299	7	292	98	SUNGROW	SG3300U D-20 (50 deg. Model)
ACME DEOGHAR SOLAR POWER PVT. LTD.	Fatehgarh-I PS	300	291	40	251	86	SUNGROW	SG3300U D-20 (50 deg. Model)
ACME RAISAR SOLAR POWER PVT. LTD.	Fatehgarh-I PS	300	305	162	143	47	SUNGROW	SG3300U D-20 (51 deg. Model)
ReNew Solar Urja Private Limited	Fatehgarh-II(PG)	300	293	183	110	38	SUNGROW	SG250H X-IN
							TBEA	TS208KT L-HV
Renew Surya Ravi Pvt. Ltd.	Bikaner(PG)	300	276	205	71	26	SUNGROW	SG250H X-IN
Adani Green Energy Twenty	Fatehgarh-II(PG)	500	220	165	55	25	TBEA	TS300KT L-HV-C1

Four Limited								
Avaada Sunrays Pvt. Ltd.	Bhadla-II(PG)	320	339	266	73	22	SINENG	SP-250K-INH
Clean Solar Power (Jodhpur) Pvt. Ltd.	Bhadla (PG)	250	250	200	50	20	SUNGROW	SG250HX-IN
NTPC Devikot Solar plant_240MW	Fatehgarh-II(PG)	240	226	182	44	19	TBEA	TC2500KF
ACME Chittorgarh Solar Energy Pvt Ltd	Bhadla (PG)	250	213	179	34	16	TBEA	TC3750KF
							TBEA	TC5000KF
							TBEA	TS208KTL
Adani Solar Energy Jaisalmer One Pvt. Ltd. 450MW (Solar)	Fatehgarh-II(PG)	450	434	366	68	16	SUNGROW	SG3125HV
							KEHUA	SPI3125K-B-HUD
							KEHUA	SPI3125K-B-H2
Azure Power Forty Three Pvt. Ltd.	Bikaner(PG)	600	403	360	43	11	SUNGROW	SG3125HV
							SUNGROW	SG250HX-IN
Total		3810	3549	2315	1234	35		

Table-2: List of LVRT/HVRT Non-compliant RE Plants and their Generation Loss quantum for 18th March'25 event: (12 nos. of RE plants found LVRT/HVRT Non-compliant on 18th March'25 event)

Event analysis of 18.03.2025 RE generation loss event @10:00hrs								
RE Plant Name	Pooling Station	Plant Capacity (MW))	Generation before the event (MW) (A)	Generation after the event (MW) (B)	Generation loss (MW) C = (A-B)	% Generation loss (MW) D = (C/A) *100	Inverters/ WTG Make	Inverter/ WTG Model No
NTPC Nokhra_300MW	Bhadla-II(PG)	300	261	0	261	100	TBEA	TC3125KF
							SINEN G	EP-3125-HA-UD
NTPC Devikot Solar plant_240MW	Fatehgarh-II (PG)	240	189	104	85	45	TBEA	TC2500KF
Thar Surya Pvt. Ltd.	Bikaner (PG)	300	268	192	76	28	GAMESA	GAMESA E - 2.25MVA-SB-I
Avaada Sunrays Pvt. Ltd.	Bhadla-II(PG)	320	293	214	79	27	SINEN G	SP-250K-INH

AMP Energy Green Five Pvt. Ltd.	Bhadla-II(PG)	100	103	78	25	24	FIMER	PVS980
SB ENERGY FOUR PRIVATE LIMTED, Bhadla	Bhadla (PG)	200	171	133	38	22	KEHU A	SPI3125 K-B-H
SBSR Power Cleantech Eleven Private Ltd.	Bikaner (PG)	300	264	208	56	21	KEHU A	SPI3125 K-B-H
ReNew Solar Urja Private Limited	Fatehgarh-II (PG)	300	251	199	52	21	SUNG ROW	SG250H X-IN
							TBEA	TS208KT L-HV
Avaada Sustainable RJ Pvt. Ltd.	Bikaner (PG)	300	260	207	53	20	SINEN G	EP-3125-HA-UD
Adani Hybrid Energy Jaisalmer Three Ltd.	Fatehgarh-II (PG)	300	303	260	43	14	HUAW EI	SUN2000 -185KTL-INH0
							TBEA	TS208KT L-HV
ABC Renewable Pvt. Ltd	Bhadla-II(PG)	300	272	235	37	14	TBEA	TC3125KF
AMP Energy Green Six Pvt. Ltd.	Bhadla-II(PG)	100	105	93	12	11	SUNG ROW	SG320H X
Total		3060	2740	1923	817	30		

Table-3: List of LVRT/HVRT Non-compliant RE Plants and their Generation Loss quantum for 11th May'2025 event: (21 nos. of RE plants found LVRT/HVRT Non-compliant on 11th May'2025)

Event analysis of 11.05.2025 RE generation loss event @12:31hrs								
RE Plant Name	Pooling Station	Plant Capacity (MW)	Generation before the event (MW)	Generation after the event (MW)	Generation loss (MW)	% Generation loss (MW)	Inverters/ WTG Make	Inverter/WTG Model No
			(A)	(B)	C = (A-B)	D = (C/A) *100		
*NTPC Nokhra_300MW	Bhadla-II(PG)	300	242	0	242	100	TBEA	TC3125KF
							SINEN G	EP-3125-HA-UD
NTPC Nokh Solar	Bhadla-II(PG)	245	211	0	211	100	FIMER	Fimer-PVS980-58-5000-L

Avaada Sunrays Pvt. Ltd.	Bhadla-II(PG)	320	325	54	271	83	SINE NG	SP-250K-INH
Azure Maple Pvt. Ltd.	Bhadla (PG)	300	275	83	192	70	HUA WEI	SUN2000-185KTL-INH0
NTPC Devikot Solar plant_240MW	Fatehgarh-II(PG)	240	210	124	86	41	TBEA	TC2500 KF
RENEW SOLAR POWER Pvt. Ltd. Bikaner	Bikaner (PG)	250	227	146	81	36	HUA WEI	SUN2000-185KTL-INH0
TP Surya Pvt. Ltd.	Bikaner (PG)	110	89	59	30	34	SUN GROW	SG3125HV-32
Avaada Sustainable RJ Pvt. Ltd.	Bikaner (PG)	300	295	212	83	28	SINE NG	EP-3125-HA-UD
ACME Sikar Solar Power Pvt. Ltd.	Bikaner-II	53	88	64	24	27	SUN GROW	SG4400UD-20
Clean Solar Power (Jodhpur) Pvt. Ltd.	Bhadla (PG)	250	240	175	65	27	SUN GROW	SG250 HX-IN
Mega Surya Urja Pvt. Ltd. (MSUPL)	Bhadla-II(PG)	250	247	181	66	27	SINE NG	EP3125-HA-UD
ACME RAISAR SOLAR POWER PVT. LTD.	Fatehgarh-I	300	313	233	80	26	SUN GROW	SG3300UD-20 (51 deg. Model)
AMP Energy Green Six Pvt. Ltd.	Bhadla-II(PG)	100	85	65	20	24	SUN GROW	SG320 HX
Avaada RJHN_240MW	Bikaner (PG)	240	231	177	54	23	SINE NG	EP-3125-HA-UD
							SINE NG	SP-250K-INH
Adani Hybrid Energy Jaisalmer Three Ltd.	Fatehgarh-II(PG)	300	290	237	53	18	HUA WEI	SUN2000-185KTL-INH0
							TBEA	TS208KTL-HV
ReNew Solar Urja Private Limited	Fatehgarh-II(PG)	300	289	237	52	18	SUN GROW	SG250 HX-IN

							TBEA	TS208K TL-HV
Renew Sun Waves Private Limited (RSEJ4L)	Fatehgarh-II(PG)	300	257	217	40	16	SUN GROW	SG250 HX-IN
ACME DHAULPUR SOLAR POWER PVT. LTD.	Fatehgarh-I	300	304	259	45	15	SUN GROW	SG330 OUD-20 (51 deg. Model)
Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)	Fatehgarh-II(PG)	180	180	155	25	14		
ReNew Solar Energy (Jharkhand Three) Pvt. Ltd.	Fatehgarh-II(PG)	300	260	226	34	13	HUAWEI	SUN2000-185KTL-INH0
ACME PHALODI SOLAR POWER PRIVPVT. LTD.	Fatehgarh-I	300	314	279	35	11	SUN GROW	SG330 OUD-20 (50 deg. Model)
Total		5238	4972	3183	1789	36		

*Tripping of 220kV NTPC Nokhra-Bhadla-II (PG) despite no fault in the line caused loss of evacuation path and hence generation loss of 100%, undesirable tripping of line may be reviewed.

Table-4: List of LVRT/HVRT Non-compliant RE Plants and their Generation Loss quantum for 12th June'2025 event: (11 nos. of RE plants found LVRT/HVRT Non-compliant on 12th June'2025)

Event analysis of 12.06.2025 RE generation loss event @13:34hrs								
RE Plant Name	Pooling Station	Plant Capacity (MW)	Generation before the event (MW)	Generation after the event (MW)	Generation loss (MW)	% Generation loss (MW)	Inverters/ WTG Make	Inverter/WTG Model No
			(A)	(B)	C = (A-B)	D = (C/A) *100		
Azure Maple Pvt. Ltd.	Bhadla (PG)	300	275	158	117	43	HUAWEI	SUN2000-185KTL-INH0
Avaada	Bikaner	30	293	207	86	29	SINE	EP-

Sustainable RJ Pvt. Ltd.	(PG)	0					NG	3125-HA-UD
ACME RAISAR SOLAR POWER PVT. LTD.	Fatehgarh-I	300	303	222	81	27	SUN GROW	SG330 0UD-20 (51 deg. Model)
Adani Hybrid Energy Jaisalmer Four Ltd.	Fatehgarh-I	700	654	481	173	26	HUA WEI	SUN2000-185KTL-H1
SBSR Power Cleantech Eleven Private Ltd.	Bikaner (PG)	300	265	202	63	24	KEH UA	SPI3125K-B-H
NTPC Devikot Solar plant 240MW	Fatehgarh-II(PG)	240	194	148	46	24	TBEA	TC2500 KF
Avaada Sunrays Pvt. Ltd.	Bhadla-II(PG)	320	301	244	57	19	SINE NG	SP-250K-INH
Mega Surya Urja Pvt. Ltd. (MSUPL)	Bhadla-II(PG)	250	246	202	44	18	SINE NG	EP3125-HA-UD
ACME DHAULPUR SOLAR POWER PVT. LTD.	Fatehgarh-I	300	303	256	47	16	SUN GROW	SG330 0UD-20 (51 deg. Model)
ACME Chittorgarh Solar Energy Pvt Ltd	Bhadla(PG)	250	210	178	32	15	TBEA	TC3750 KF
							TBEA	TC5000 KF
							TBEA	TS208K TL
RENEW SOLAR POWER Pvt. Ltd. Bikaner	Bikaner(PG)	250	212	186	26	12	HUA WEI	SUN2000-185KTL-INH0
Total		3510	3256	2484	772	24		

A.6.3 Comprehensively analysis of RE generation loss events occurred after 30th June'2024 i.e. events occurred from 01.07.2024 to 30.04.2025 and repetitive LVRT/HVRT non-compliant RE generators based on these events analysis:

Since 1st July'2024 to 30th April'2025, total 4 numbers of RE generation loss events (>1000MW) occurred in RE complex of Northern Region, details given below;

Summary of RE Generation loss in NR (1st July'24-30th April'25):

S. N	Date & Time	Fault event	Quantum of RE	Voltage dip	Frequency Dip
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o			generation drop	observed	(Hz)
1	12.12.2024, 12:25 hrs	B-N fault on 220 KV AzurePSS41-Bhadla (PG) line	1860 MW	0.716 PU	0.245
2	15.12.2024, 11:35 hrs	B-N fault on 220 KV AzurePSS41-Bhadla (PG) line	1066 MW	0.63 PU	0.192
3	08.01.2025, 13:38 hrs	R-Y fault on 400 KV Fatehgarh-II(PG)-Fatehgarh-I (FBTL) Ckt-1	1450 MW	0.514 PU	0.14
4	18.03.2025, 10:00 hrs	R-N fault on 400 KV AGE25L-Bhadla-II (PG) line	1035 MW	0.75	0.183

Events as mentioned in Sl.no. 1 & 2 were discussed in detailed in the 2nd RE sub-committee meeting and actions points with timeline was issued vide MoM of 2nd RE sub-committee meeting. All the four (4) events have been comprehensively analysed to identify the repetitive non-compliant RE plants. Below table shows the repetitive LVRT/HVRT Non-compliant RE plants based on the analysis of all the aforementioned four (4) events.

Table-5: List of LVRT/HVRT non-compliant RE plants in any of the 4 nos. of RE generation loss (>1000MW) events from 01.07.2024 to 30.04.2025

Sr. No.	Name of REGS	Capacity of RE GS (MW)	Name of ISTS Pooling Station where REGS is connected	Generation loss (MW)	% Generation loss (MW)	LVRT Compliant/Non-compliant w.r.t recovery of active power	Generation loss (MW)	% Generation loss (MW)	LVRT Compliant/Non-compliant w.r.t recovery of active power	Generation loss (MW)	% Generation loss (MW)	LVRT Compliant/Non-compliant w.r.t recovery of active power	Generation loss (MW)	% Generation loss (MW)	LVRT Compliant/Non-compliant w.r.t recovery of active power	Total Numbers of Events	No. of times REGS found Non-compliant	% of Non-compliance of REGS (Nos. of times non-compliant w.r.t total nos. of event occurred)
				18.03.2025, 10:00 hrs event			08.01.2025, 13:38 hrs event			15.12.2024, 11:35 hrs event			12.12.2024, 12:25 hrs event					
1	ReNew Solar Urja Private Limited	300	Fatehgarh-II(PG)	52	21	Non-compliant	110	38	Non-compliant	37	13	Non-compliant	32	11	Non-compliant	4	4	100%
2	NTPC Devikot Solar plant 240MW	240	Fatehgarh-II(PG)	85	45	Non-compliant	44	19	Non-compliant	90	40	Non-compliant	98	43	Non-compliant	4	4	100%
3	Avaada Sunrays Pvt. Ltd.	320	Bhadla-II(PG)	79	27	Non-compliant	73	22	Non-compliant	175	51	Non-compliant	167	50	Non-compliant	4	4	100%
4	Avaada Sustaina	300	Bikane	53	20	Non-compliant	11	4	Compliant	43	14	Non-compliant	62	23	Non-compliant	4	3	75%

	ble RJ Pvt. Ltd.		r(P G)			iant						iant			iant			
5	SB ENERGY FOUR PRIVATE LIMITED, Bhadla	200	Bhadla (PG)	38	22	Non-compliant	0	0	Compliant	28	14	Non-compliant	77	41	Non-compliant	4	3	75%
6	AMP Energy Green Five Pvt. Ltd.	100	Bhadla-II(P G)	25	24	Non-compliant	0	0	Compliant	30	43	Non-compliant	29	45	Non-compliant	4	3	75%
7	Renew Surya Ravi Pvt. Ltd.	300	Bikaner(P G)	12	5	Compliant	71	26	Non-compliant	25	10	Compliant	36	15	Non-compliant	4	2	50%
8	Thar Surya Pvt. Ltd.	300	Bikaner(P G)	76	28	Non-compliant	1	0	Compliant	0	0	Compliant	283	100	Non-compliant	4	2	50%
9	SBSR Power CleanTech Eleven Private Ltd.	300	Bikaner(P G)	56	21	Non-compliant	23	8	Compliant	2	1	Compliant	46	17	Non-compliant	4	2	50%
10	SB Energy Six Private Limited, Bhadla	300	Bhadla (PG)	-1	0	Compliant	4	1	Compliant	161	53	Non-compliant	73	26	Non-compliant	4	2	50%
11	ACME Chittorgarh Solar Energy Pvt Ltd	250	Bhadla (PG)	0	0	Compliant	34	16	Non-compliant	24	13	Non-compliant	0	0	Compliant	4	2	50%
12	Clean Solar Power (Jodhpur) Pvt. Ltd.	250	Bhadla (PG)	14	6	Compliant	50	20	Non-compliant	56	22	Non-compliant	8	3	Compliant	4	2	50%
13	Adani Hybrid Energy Jaisalmer Three Ltd.	300	Fatehgarh-II(P G)	43	14	Non-compliant	18	7	Compliant	0	0	Compliant	38	16	Non-compliant	4	2	50%
14	ABC Renewa	300	Bhadla-	37	14	Non-compl	0	0	Compliant	16	5	Compliant	64	21	Non-Comp	4	2	50%

	ble Pvt. Ltd		II(P G)			iant								liant				
15	NTPC Nokhra 300MW	300	Bhadla-II(P G)	261	100	Non-compliant	5	2	Compliant	22	8	Compliant	109	40	Non-compliant	4	2	50%
16	Azure Power Forty Three Pvt. Ltd.	600	Bikaner(P G)	1	5	Compliant	43	11	Non-compliant	31	5	Compliant	0	0	Compliant	4	1	25%
17	Avaada Suncenergy Pvt limited	350	Bikaner(P G)	6	2	Compliant	5	1	Compliant	31	9	Compliant	72	23	Non-compliant	4	1	25%
18	Ayana Renewable Power Three Pvt Ltd (ARPTPL)	300	Bikaner(P G)	0	0	Compliant	0	0	Compliant	1	0	Compliant	32	14	Non-compliant	4	1	25%
19	RENEW SOLAR POWER Pvt. Ltd. Bhadla	50	Bhadla (PG)	0	0	Compliant	5	10	Compliant	-1	-2	Compliant	10	20	Non-compliant	4	1	25%
20	Renew Sun Waves Private Limited (RSEJ4L)	300	Fatehgarh-II(P G)	4	2	Compliant	9	3	Compliant	3	1	Compliant	223	76	Non-compliant	4	1	25%
21	Adani Solar Energy Jaisalmer One Pvt. Ltd.	450	Fatehgarh-II(P G)	2	1	Compliant	68	16	Non-compliant	39	9	Compliant	33	7	Compliant	4	1	25%
22	Adani Green Energy Twenty Four Limited	500	Fatehgarh-II(P G)	-1	0	Compliant	55	25	Non-compliant	0	0	Compliant	-1	-2	Compliant	4	1	25%
23	ACME DEOGHAR SOLAR POWER	300	Fatehgarh-I PS	-1	0	Compliant	251	86	Non-compliant	7	3	Compliant	6	2	Compliant	4	1	25%

	PRIVATE LIMITED																	
24	ACME PHALODI SOLAR POWER PRIVATE LIMITED	300	Fatehgarh-I PS	-4	-2	Compliant	292	98	Non-compliant	3	1	Compliant	1	0	Compliant	4	1	25%
25	ACME RAISAR SOLAR POWER PRIVATE LIMITED	300	Fatehgarh-I PS	-1	0	Compliant	143	47	Non-compliant	4	2	Compliant	18	7	Compliant	4	1	25%
26	Mega Surya Urja Pvt. Ltd. (MSUPL)	250	Bhadla-II(PG)	21	10	Compliant	0	0	Compliant	57	24	Non-compliant	13	6	Compliant	4	1	25%
27	AMP Energy Green Six Pvt. Ltd.	100	Bhadla-II(PG)	12	11	Non-compliant	1	1	Compliant	2	3	Compliant	3	4	Compliant	4	1	25%

Reason of repetitive LVRT/HVRT non-compliance of RE plants as mentioned in Table no. 5 despite several follow up, and action taken status of non-compliant RE plants may be further deliberated in the forum.

A.6.4 Analysis of performance of 15 repetitive LVRT/HVRT Non-compliant RE generators in events occurred between 1st July'24 – 30th April'25 (identified as repetitive non-compliant based on event analysis of 1st Jan'24 to 30th June'24):

It has been observed that out of 15 repetitive LVRT/HVRT non-compliant RE plants (based on event analysis of 1st Jan'24 to 30th June'24) as discussed in previous meetings of RE sub-committee, few RE plants have taken corrective measures and improvement have been observed in those plants, however some plants are yet to take any corrective action despite several follow up. Performance of these 15 repetitive LVRT/HVRT non-compliant RE plants in these four (4) events occurred between 1st July'24-30th April'25 have been analysed and status of compliance in these four events along with details of actions taken is elaborated in below table (table no. 6).

Table-6: Summary of performance of 15 repetitive RE plants w.r.t LVRT/HVRT compliance (Events of RE gen. loss > 1000MW) since 01.07.2024 to 30.04.2025

Sr. No.	Name of REGS	Capacity of REGS (MW)	Name of ISTS Pooling Station where REGS is connected	Total Number of Events	No. of times REGS found non-compliant	% of Non-compliance of REGS (Nos. of times non-compliant w.r.t total nos. of event occurred)	Found Compliant in 12.12.2024 event (YES/NO)	Found Compliant in 15.12.2024 event (YES/NO)	Found Compliant in 08.01.2025 event (YES/NO)	Found Compliant in 18.03.2025 event (YES/NO)	Remarks
1	Renew	300	Fatehgarh	4	1	25%	NO	YE	YE	YE	Action taken,

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	Sun Waves Pvt. Ltd.		arh-II (PG)					S	S	S	Disable of df/dt setting in all Sungrow SG250HX-IN inverters. Upgradation of firmware with optimization of Transient Protection Logic & Wave by wave fast protection logic
2	Adani Hybrid Energy Jaisalmer Two Ltd.	300	Fatehg arh-II (PG)	4	0	0%	YES	YES	YES	YES	Action taken, Disable of df/dt setting in all Sungrow SG250HX-IN inverters. Upgradation of firmware with optimization of Transient Protection Logic & Wave by wave fast protection logic
3	ReNew Solar Urja Pvt. Ltd.	300	Fatehg arh-II (PG)	4	4	100%	NO	NO	NO	NO	No action taken Yet, still non-compliant in all the events
4	Clean Solar Power (Jodhpur) Pvt. Ltd.	250	Bhadla (PG)	4	2	50%	YES	NO	NO	YES	No action taken report submitted yet, found non-compliant 50% of the time
5	Azure Power Forty-Three Pvt. Ltd.	600	Bikane r (PG)	4	1	25%	YES	YES	NO	YES	No action taken report submitted yet, found non-compliant 25% of the time
6	Renew Surya Ravi Pvt. Ltd.	300	Bikane r (PG)	4	2	50%	NO	YES	NO	YES	No action taken report submitted yet, found non-compliant 50% of the time, same need to be implemented as implemented in Renew Sun Waves Pvt. Ltd.
7	ACME Chittorga rh Solar Energy Pvt. Ltd.	250	Bhadla (PG)	4	2	50%	YES	NO	NO	YES	No action taken report submitted yet, found non-compliant 50% of the time
8	Adani Solar Energy	450	Fatehg arh-II (PG)	4	1	25%	YES	YES	NO	YES	No action taken report submitted yet, found non-compliant

	Jaisalmer One Pvt. Ltd.										25% of the time. The issue in KEHUA inverters is yet to be resolved.
9	AMP Energy Green Five Pvt. Ltd.	100	Bhadla-II (PG)	4	3	75%	NO	NO	YES	NO	No action taken Yet, still non-compliant 75% of the time
10	AMP Energy Green Six Pvt. Ltd.	100	Bhadla-II (PG)	4	1	25%	YES	YES	YES	NO	No action taken report submitted yet, found non-compliant 25% of the time
11	Adani Hybrid Energy Jaisalmer Three Ltd.	300	Fatehgarh-II (PG)	4	2	50%	NO	YES	YES	NO	No action taken report submitted yet, found non-compliant 50% of the time.
12	ABC Renewable RJ-01 Pvt. Ltd	300	Bhadla-II (PG)	4	2	50%	NO	YES	YES	NO	No action taken report submitted yet, found non-compliant 50% of the time
13	Altra Xergi Power Pvt. Ltd.	380	Fatehgarh-III	4	0	0%	YES	YES	YES	YES	Action taken, Active islanding protection (including df/dt protection) have been disabled in all the Sungrow SG4400UD-20 Inverters
14	Avaada Sunrays Pvt. Ltd.	320	Bhadla-II (PG)	4	4	100%	NO	NO	NO	NO	No action taken Yet, still non-compliant in all the events
15	Devikot Solar plant NTPC Ltd.	240	Fatehgarh-II (PG)	4	4	100%	NO	NO	NO	NO	No action taken Yet, still non-compliant in all the events

Action taken status of LVRT/HVRT non-compliant RE plants as mentioned in Table no. 6 may be further deliberated in the forum.

A.6.5 Update on present status and submission of action taken/progress report of LVRT/HVRT Non-compliant RE generators as per the timelines committed in 2nd sub-committee meeting.

Based on the detailed deliberations in the 2nd RE sub-committee meeting, status of Action taken, further course of action and Tentative Timeline for submission of report for LVRT/HVRT non-compliant RE plants was issued vide MoM of 2nd RE sub-committee meeting.

After the issuance of MoM of 2nd RE sub-committee meeting, Only ReNew Power and Adani Green Energy Ltd. (AGEL) submitted the Root cause analyses (RCA) report

pertaining to the long pending issue of Sungrow SG250HX-IN inverter, no RCA report and progress status report received from other RE plants.

Timeline for submission of action taken/progress report as issued in Table-3 of MoM of 2nd RE sub-committee meeting have been updated based on present status (Report received/not received), and same is summarized below;

Table-7: Details of LVRT/HVRT Non-compliant RE Plants on 12th Dec'24 and 15th Dec'24 fault event, Action taken, Corrective action required / further course of action, Tentative timelines as committed in the meeting along with present status (Report received/not received)

Sl. No.	Plant Name	Action Taken	Corrective action required / further course of action	Tentative Timeline & present status
1	Renew Sun Waves Pvt. Ltd. (RSWPL)	Sungrow (OEM) brought the updation of firmware, in this update, Sungrow has disabled df/dt (ROCOF) and Anti-islanding protections of the SG250HX-IN Inverter	Again, in Dec'24 events generation loss occurred in the Plant even after the Firmware update in Nov'24, same need to be analysed in detailed and Root cause analyses report (RCA) along with changes implemented (i.e. earlier Firmware Vs New Firmware) will be shared with NRLDC/NRPC.	15.02.2025 Report Received
2	Renew Surya Ravi Pvt. Ltd. (RSRPL)	Sungrow (OEM) brought the updation of firmware, in this update, Sungrow has disabled df/dt (ROCOF) and Anti-islanding protections of the SG250HX-IN Inverter	Again, in Dec'24 events generation loss occurred in the Plant even after the Firmware update in Nov'24, same need to be analysed in detailed and Root cause analyses report (RCA) along with changes implemented (i.e. earlier Firmware Vs New Firmware) will be shared with NRLDC/NRPC.	15.02.2025 Report Received
3	AMP Energy Green Five Pvt. Ltd (AEG5L)	No one was present in the meeting to update any action taken at Plant end	AMP Energy Green Five Pvt. Ltd (AEG5L) is in the list of 15 repetitive non-complaint RE plants, issue was deliberated in 1st RE Sub-committee meeting, but no improvement observed yet. Plant needs to take the corrective measures and appraise the same to the forum accordingly.	No Report /updated status Received yet

4	NTPC Nokhra	No one was present in the meeting to update any action taken at Plant end	Plant needs to take the corrective measures and appraise the same to the forum accordingly.	No Report /updated status Received yet
5	NTPC Devikot	No one was present in the meeting to update any action taken at Plant end	NTPC Devikot is in the list of 15 repetitive non-complaint RE plants, issue was deliberated in 1st RE Sub-committee meeting, but no improvement observed yet. Plant needs to take the corrective measures and appraise the same to the forum accordingly.	No Report /updated status Received yet
6	NTPC Kolayat	No one was present in the meeting to update any action taken at Plant end	Plant needs to take the corrective measures and appraise the same to the forum accordingly.	No Report /updated status Received yet
7	Avaada Sunrays Energy Pvt. Ltd. (ASEPL)	Software of String Inverters (SINENG SP-250K-INH) in Avaada Sunce energy Pvt Ltd. have been updated by SINENG (OEM) on 15 th Dec'2024. As both the events occurred before updation of software, hence improvement can be seen in any next event.	Same is under observation after software update, in case of any fault event after 15th Dec'2024 performance will be analysed, and report will be submitted to NRLDC/NRPC. Detailed report along with reason of tripping in Avaada Plants in both the events of 12.12.2024 and 15.12.2024 will be submitted to NRLDC/NRPC.	10.02.2025 No Report Received yet
8	Avaada Sustainable RJ Pvt. Ltd.	Reason of No absorption of Reactive power in HVRT is under discussion with OEM (SINENG).	Detailed report along with reason of tripping in Avaada Plants in both the events of 12.12.2024 and 15.12.2024 will be submitted to NRLDC/NRPC.	10.02.2025 No Report Received yet
9	Avaada	Reason of No	Detailed report along with reason of	10.02.2

	Sunce energy Pvt Ltd.	absorption of Reactive power in HVRT is under discussion with OEM (SINENG).	tripping in Avaada Plants in both the events of 12.12.2024 and 15.12.2024 will be submitted to NRLDC/NRPC.	025 No Report Received yet
10	ABC Renewable (RJ-01) Pvt. Ltd.	After continuous follow up with TBEA (OEM), they have updated the Firmware & software of TBEA TC3125KF inverters two (2) times in Set'24 and Oct'24. After the Non-compliance and generation loss on 12 th Dec'24 event, issue was again taken up with TBEA and meeting was held with R&D team. Based on 12 th Dec'24 event, Firmware & software again updated for all the TBEA TC3125KF inverters on 10 th Jan'2025	Details of actions taken, Firmware & software updated and the reason of tripping on 12 th Dec'24 event will be shared with NRLDC/NRPC. Further observations after Firmware & software on 10 th Jan'25 will be share in case of any future fault event.	15.02.2025 No Report Received yet
11	SB ENERGY FOUR PVT LTD (SBE4L)	Regarding tripping in SB ENERGY FOUR PVT LTD (SBE4L), details have been shared with OEMs.	OEM is analysing the root cause, once report will come, same will be shared with NRLDC/NRPC	20.02.2025 No Report Received yet
12	SB Energy Six Pvt. Ltd. (SBE6PL)	Regarding tripping in SB Energy Six Pvt. Ltd. (SBE6PL), details have been shared with OEMs.	OEM is analysing the root cause, once report will come, same will be shared with NRLDC/NRPC	20.02.2025 No Report Received yet
1	Adani	Issue is being	Progress status report will be shared	15.02.2

3	Hybrid Energy Jaisalmer Three Ltd. (AHEJ3L)	faced in TBEA TS208KTL-HV inverters installed in the plant, same is under continuous follow up with TBEA (OEM)	with NRLDC/NRPC	025 No Report Received yet
14	Adani Solar Energy Jaisalmer Two Pvt. Ltd.	Issue is being faced in KEHUA SPI3125K-B-H inverters installed in the plant, same is under continuous follow up with KEHUA (OEM)	Progress status report will be shared with NRLDC/NRPC	15.02.2025 No Report Received yet
15	ReNew Solar Urja Pvt. Ltd. (RSUPL)	No one was present from IndiGrid in the meeting to update any action taken at Plant end.	ReNew Solar Urja Pvt. Ltd. (RSUPL) is in the list of 15 repetitive non-complaint RE plants, issue was deliberated in 1st RE Sub-committee meeting but no improvement observed yet. Plant needs to take the corrective measures and appraise the same to the forum accordingly.	No Report /updated status Received yet
16	Ayana Renewable Power Three Pvt Ltd	Details are being analysed	Report on Reason of generation loss and tripping of Inverter along with suggestive corrective action will be submitted to NRLDC/NRPC.	15.02.2025 No Report Received yet
17	ACME Chittorgarh Solar Energy Pvt Ltd.	No action taken yet, concerned person from Ayana attended the meeting was not aware of the generation loss event in ACME Chittorgarh.	ACME Chittorgarh Solar Energy Pvt Ltd. is in the list of 15 repetitive non-complaint RE plants, issue was deliberated in 1st RE Sub-committee meeting but no improvement observed yet. Plant needs to take the corrective measures and appraise the same to the forum accordingly.	20.02.2025 No Report Received yet
18	Clean Solar Power (Jodhpur) Pvt. Ltd.	No one was present from Clean Solar Power (Jodhpur) Pvt. Ltd. (Hero Futures) in the	Clean Solar Power (Jodhpur) Pvt. Ltd. is in the list of 15 repetitive non-complaint RE plants, issue was deliberated in 1st RE Sub-committee meeting but no improvement observed yet. Plant needs to take the	No Report /updated status Received

		meeting to update any action taken at Plant end.	corrective measures and appraise the same to the forum accordingly.	ed yet
19	Mega Surya Urja Pvt. Ltd. (MSUPL)	No one was present from Mega Surya Urja Pvt. Ltd. (MSUPL) in the meeting to update any action taken at Plant end.	Plant needs to take the corrective measures and appraise the same to the forum accordingly.	No Report /updated status Received yet
20	Azure Power 41 Pvt. Ltd. (AP41PL)	No one was present from Azure Power 41 Pvt. Ltd. (AP41PL) in the meeting to update any action taken at Plant end.	Plant needs to take the corrective measures and appraise the same to the forum accordingly.	No Report /updated status Received yet

A.6.6 Reason of non-submission of report despite commitment in the 2nd RE sub-committee meeting by LVRT/HVRT non-compliant RE plants as mentioned in Table no. 7 may be further deliberated in the forum.

A.6.7 Drop in RE generation is mainly due to LVRT non-compliance of RE plants during fault events (i.e. several RE plants failed to recover 90% of pre-fault active power within 1 sec). Other reasons are undesirable tripping of Inverter on various protection during fault event such as Over voltage, df/dt, Under frequency, Transient Over current or Transient Over Voltage etc despite no tripping condition as per POI voltage & frequency.

A.6.8 Despite taking up in several earlier meetings, adequate action from some RE developers to resolve the generation loss issue is yet to be implemented.

A.6.9 Only few RE developers submitted the required details for analysing the event and to find the reason of generation loss and LVRT/HVRT non-compliance at POI (Non submission of tripping details is Non-compliance of IEGC clause 37.2(c) and clause 15.3 of CEA grid standard). It is causing issues remained unresolved and persistence non-compliance.

A.6.10 Issue pertaining to validation of Plant level simulation model with actual fault event is yet to be addressed. As per FTC procedure RE plants needs to validate the Plant level simulation model within 3 months of commissioning. Simulation model

submitted at the time of connectivity/FTC are not depicting the actual plant behaviour in real-time due to various shortcomings like no modelling of various protection of Inverter or other elements which is implemented in field and causing abnormal tripping during fault event.

A.6.11 Suggestions for improvement:

1. RE plants need to keep the settings of Plant's internal elements (from 220kV or 400kV evacuating line to Inverters terminal) in coordination with Point of Interconnection (POI) as per CEA standards, to prevent tripping of any internal elements of plants (causing generation loss) when voltage and frequency at Interconnection point remains within the No-trip zone. HVRT, over voltage, over current, Transient O/V and frequency protection settings of Inverters need to be reviewed & rectified for Non-complaints RE plants.
2. RE developers should include the requirement of IEEE 2800-2200 (i.e. No ROCOF protection in Inverter) or if frequency protection or df/dt protection is there in inverters then operation of protection should be on frequency measured by averaging the frequency of 4-5 cycles window. (Same was suggested in 1st RE sub-committee meeting)
3. RE generators need to analyse the reactive power support from Inverter during HVRT in case of any tripping of Inverter in Over voltage, as several cases have been observed where plant didn't absorb reactive power despite Inverters went in HVRT and tripped on O/V.
4. Firmware of Inverters may be updated to resolve the issue of sharp reduction in active power during fault (even despite insignificant voltage dip) and to resolve the issue of any reduction in active power during HVRT (until the transient current limit of the Inverter/WTG is not hit).
5. Firmware of Inverters may be updated for adequate and prompt reactive power support (i.e. injection during LVRT, ceasing reactive power immediately after fault clearance and absorption during HVRT).
6. RE generators should also analyse the events of generation loss and non-compliance of LVRT/HVRT requirements at their end, high resolution data archiving and data logging facility at least in case of fault event should be ensured at plant end for better analysis of the events, remedial actions should be taken accordingly to resolve the issue.

A.6.12 Drop of significant quantum of RE generation affect the grid security due to large excursion in grid frequency, hence all RE plants are requested to take serious cognizance of the issue of LVRT/HVRT non-compliance of RE plants at POI and to implement necessary corrective measures to ensure LVRT/HVRT compliance at POI, further timely submission of required details for analysing the event and to find the reason of generation loss and LVRT/HVRT non-compliance at POI must be ensured by RE plants to comply with IEGC clause 37.2(c) and CEA grid standard clause 15.3.

Forum may deliberate and discuss the further course of actions.

A.7. Voltage Oscillation and Voltage spikes issue in RE complex: (Agenda by NRLDC)

A.7.1 Few instances of high-frequency, high amplitude voltage oscillations (30-50kV) occurred in the Rajasthan RE complex of the Northern Regional grid in the month of May'25.

A.7.2 All the events of oscillations occurred in the month of May'2025 have been analysed, antecedent conditions and Amplitude & Frequency of oscillation have also been studied, summary is given below Table-8.

Table-8: Antecedent conditions and Amplitude & Frequency of oscillation in NR RE complex:

Sl. No.	Oscillation event in NR RE complex		Antecedent conditions			Oscillation Details		Major Tr. Line outage
	Event date (dd/mm/yyyy)	Event Time (hh:mm:ss)	ISGS Solar Generation (MW)	Total Wind generation (MW)	Bus Voltage at 400kV Bhadla-II (PG)	Amplitude of Oscillation (kV) (Peak-to-Peak) at 400kV bus	Frequency of Oscillation (Hz)	
1	07.05.2025	10:11:22	16704	26	397	52	3.5-4 Hz	400 kV Jaisalmer (RS) - Barmer (RS) D/C line. 400 kV Barmer - Bhinmal (RS) D/C line. 400 KV BHADLA-JODHPUR (RS) line. 400 KV BHADLA-MERTA (RS) line. 400 KV Akal-Kankani (RS) line.
2	10.05.2025	10:04:20	16701	10	401	32	3.5-4 Hz	400 kV Jaisalmer (RS) - Barmer (RS) D/C line. 400 kV Barmer - Bhinmal (RS) D/C line. 400 KV Akal-Kankani (RS) line.
3	10.05.2025	10:22:20	16737	10	401	20	3.5-4 Hz	400 kV Jaisalmer (RS) - Barmer (RS) D/C line. 400 kV Barmer - Bhinmal (RS) D/C line. 400 KV Akal-Kankani (RS) line.
4	11.05.2025	10:20:22	16580	154	402	27	3.5-4 Hz	400 kV Jaisalmer (RS) - Barmer (RS) D/C line. 400 kV Barmer - Bhinmal (RS) D/C line. 400 KV Akal-Kankani (RS) line.

5	13.05 .2025	14:34: 48	17412	1670	402	30	3.5-4 Hz	400 kV Jaisalmer (RS) - Barmer (RS) D/C line. 400 kV Barmer - Bhinmal (RS) D/C line.
6	14.05 .2025	10:21: 00	17728	1456	398	35	3.5-4 Hz	400 kV Jaisalmer (RS) - Barmer (RS) D/C line. 400 kV Barmer - Bhinmal (RS) D/C line.
7	17.05 .2025	10:21: 08	17843	1667	399	26	3.5-4 Hz	400 kV Jaisalmer (RS) - Barmer (RS) D/C line. 400 kV Barmer - Bhinmal (RS) D/C line.

A.7.3 High-frequency, low-amplitude voltage oscillations (mainly from RE plants side) escalated into high-frequency, high-amplitude voltage oscillations when the STATCOM at Fatehgarh-II & Bhadla-II remained in Auto mode (VCM or QCM) under low SCR scenario and voltage at 400kV bus of RE pooling S/s fell below 400kV. To mitigate this, STATCOM at Fatehgarh-II (PG)/Bhadla-II(PG) were put in manual mode (Fixed-Q) for short duration only when oscillation occurred.

A.7.4 Issue of voltage oscillations and translation of high-frequency, low-amplitude voltage oscillations into high-frequency, high-amplitude voltage oscillations when STATCOM remains in Voltage control mode (Auto mode-VCM) were discussed in detailed in previous RE sub-committee meetings.

A.7.5 It was observed that high-frequency, high-amplitude voltage oscillations and voltage dip/fluctuation considerably reduced after charging of 765kV Bhadla-II-Sikar-II D/C line on 17.12.2024. After 17.12.2024, STATCOMs in RE pocket were mostly being operated in Auto mode only, also SCR of Fatehgarh-II & Bhadla-II system were improved slightly.

A.7.6 However, with further addition of new RE capacity in the complex, SCR again depleted. ~ 3500-4000 MW capacity have been integrated in last 6 months without commissioning of any evacuating Transmission system. This shows serious lag in the commissioning of evacuating Transmission system w.r.t the commissioning of RE capacity in the complex.

A.7.7 With the rise in solar generation without commissioning of its associated transmission system, the SCR has declined and causing oscillation when ISTS connected RE generation exceeds 18.5 GW in the complex. Therefore, it is crucial to take proactive measures to identify the root-cause of High-frequency, low-amplitude oscillations originating from RE plants and translation of high-frequency, low-amplitude voltage oscillations into high-frequency, high-amplitude voltage oscillations in case of Low SCR (Weak grid connectivity/low system strength) when STATCOMs remains in Auto mode (VCM or QCM).

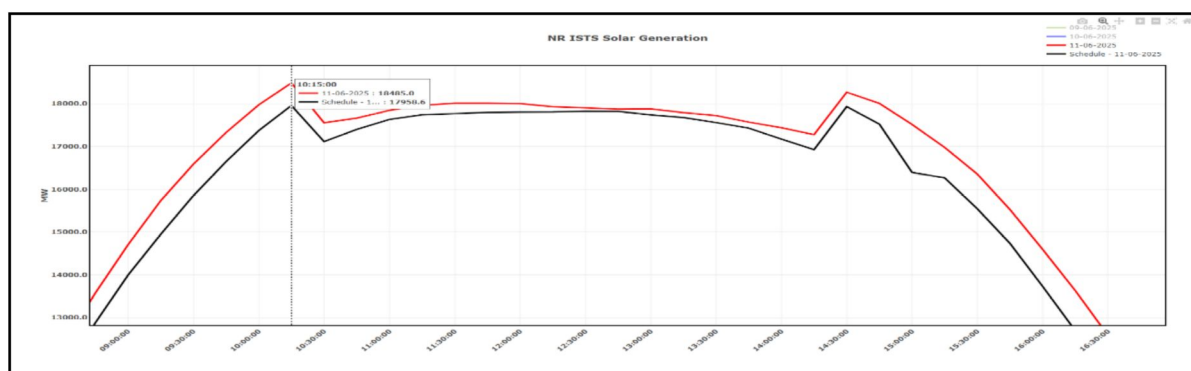
A.7.8 Commissioning of RE evacuating lines planned for evacuation of Phase-II & Phase-III generation needs to be expedited as nearly entire generation of Phase-II has already been commissioned and ~2000 MW of Phase-III generation has been commissioned but few Transmission elements of Ph-II is yet to get commissioned and not a single transmission element of Phase-III is commissioned yet. Delay is commissioning of Associated transmission system causing Weak grid

connectivity/low system strength because of penetration of additional RE generation of Phase-III in existing system.

A.7.9 A detailed deliberation was made in 2nd RE sub-committee meeting regarding issue of STATCOM, SIEMENS (OEM) was also present in the meeting. As per the MoM of 2nd RE sub-committee issued dated 01.04.2025 "After detailed deliberation it was decided to constitute a Committee under SE(O) comprising members from NRLDC/NLDC, PGCIL, CTUIL, Rajasthan SLDC and SIEMENS (OEM) to look into the issue of STATCOM operation in view of the oscillations observed in Northern Region. The Committee shall go through the detailed technical analysis of the events, shall carry meetings among members for better technical deliberations & arriving some conclusion and Committee may submit report within one month suggesting some corrective actions and specifications for future STATCOM". Committee is requested to expeditiously conduct the meeting for addressing the STATCOM issue.

A.7.10 As per point no. 7.15 of the MoM of 2nd RE sub-committee issued dated 01.04.2025 "MS NRPC requested all 15 RE plants (as identified having reactive power in phase with the oscillating voltage in system) to submit the report/reason of in-phase oscillation occurred on 28th Dec'24 by 15.02.2025". No RE plant submitted the report/reason of in-phase oscillation with system voltage.

A.7.11 Oscillatory behaviour has been observed at boundary points around 10:30 Hrs and 14:30 Hrs, coinciding with instances of over-injection by RE generators beyond their scheduled limits. This over-generation undermines the intent of curtailment measures and increases system vulnerability, especially when the pocket is already weak due to multiple line outages and low SCR. All RE plants are strictly advised to adhere to scheduled generation and avoid over-injection during these critical hours. Detailed analysis is enclosed as **Annexure-VIII**. Below plot of NR ISTS connected solar generation shows the over-injection by RE generators around 10:30 Hrs and 14:30 Hrs boundary points.



A.7.12 NRLDC Instruction should be strictly adhere in case of any oscillations or contingency in the grid.

A.7.13 RE generators should promptly provide the reactive power support in case of NRLDC instruction and should maintain their bus voltage ~225 kV in general to avoid any low voltage issue in the complex.

A.7.14 High resolution data archiving and data logging facility should be ensured by RE

developers. In case of any oscillation, data should be analysed by RE generators and same should be shared with NRLDC for further detailed analysis.

- A.7.15 All RE developers are requested to share updates or findings from their respective investigations regarding voltage oscillations with the forum, actions taken status from RE plants side may be updated to forum. Solar/Wind association i.e. NSEFI & IWPA may carry out a comprehensive study to identify the root-cause of High-frequency, low-amplitude oscillations originating from RE plants in Rajasthan RE complex.

Forum may discuss the further course of actions and may deliberate on the issue of Voltage oscillation in RE complex.

A.8. Power Quality measurement and Harmonic distortion analysis for all RE generating stations in line with Central Electricity Authority (Technical Standards for Connectivity to the Grid) Regulations

- A.8.1. As stipulated in Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2013, Part-II, clause B1, Sub-clause (1), (2), (3) & (4) about requirements with respect to Harmonics, Direct Current (DC) Injection and Flicker are as follows;

B1. Requirements with respect to Harmonics, Direct Current (DC) Injection and Flicker

- 1) *Harmonic current injections from a generating station shall not exceed the limits specified in Institute of Electrical and Electronics Engineers (IEEE) Standard 519.*
- 2) *The Generating station shall not inject DC current greater than 0.5 % of the full rated output at the interconnection point.*
- 3) *The generating station shall not introduce flicker beyond the limits specified in IEC 61000. Provided that the standards for flicker will come into effect from 1st April 2014.*
- 4) *Measurement of harmonic content, DC injection and flicker shall be done **at least once in a year** in presence of the **parties concerned** and the indicative date for the same shall be mentioned in the connection agreement.*
- 5) *Provided that in addition to annual measurement, if distribution licensee or transmission licensee or the generating company, as the case may be, desires to measure harmonic content or DC-injection or flicker, it shall inform the other party in writing and the measurement shall be carried out **within 5 working days**.*

- A.8.2. List of RE plants commissioned full capacity before 31st March'2024 and not performed power quality filed testing yet is enclosed as **Annexure-IX**. These RE plants are requested to conduct the Power Quality measurement, Harmonic analysis, DC injection and Flicker test at earliest **in presence of the concerned parties**, as they are already in violation of the compliance of aforementioned clause B1(4) (Commissioned full capacity 1 year ago as on 31st March'24).

- A.8.3. There are **50 RE plants** whose **full capacity commissioned before 31st March'24**,

out of 50 RE plant only 22 RE plants has submitted the Power quality filed test report.

- A.8.4. Therefore, it is requested to perform Power Quality measurement, Harmonic analysis test and Flicker test at Field in the presence of concerned parties as per CEA regulation as mentioned above and submit the Test report for Power Quality measurement, Harmonic analysis, DC injection and Flicker test showing the %THD and distortion Individual Harmonic distortion at Point of Interconnection for Voltage and Current, DC injection and Flicker at POI.

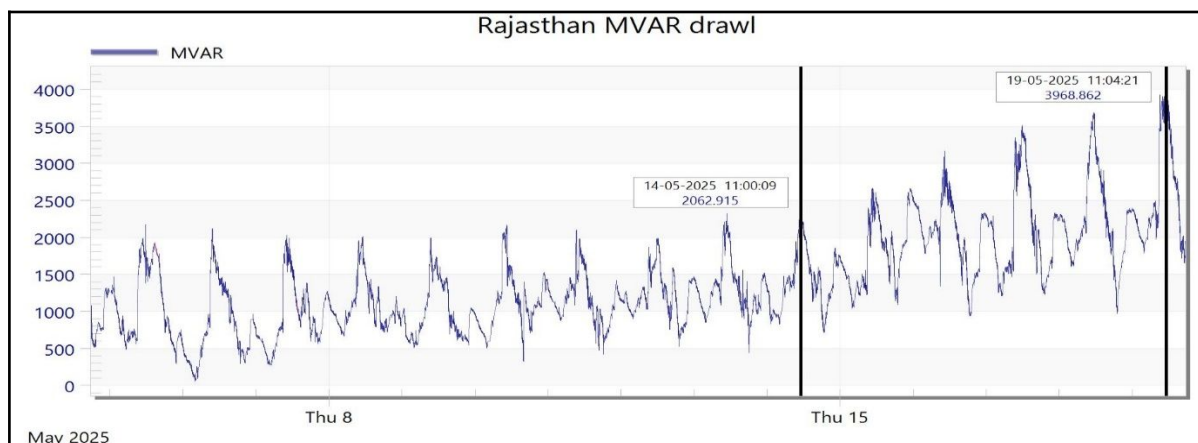
Forum may decide on the following

- i. Timeline to close these pending compliances related to Power Quality Norms.***
- ii. List of RE plants those have submitted affidavit during Connectivity/FTC approval for installation filter bank by 30.06.2025 is enclosed as Annexure-X, As the Deadline for installation of Filter bank as per MoM of "Meeting for discussing commissioning of RE plants pending compliance of connectivity Regulations" held under the Chairmanship of the Secretary (Power) on 18.02.2025 and MoM issued vide F.No.48-15/2/2024-NRE is 30th June'2025, all RE plants as mentioned in Annexure-X are requested to give update to the forum.***

A.9. Huge MVar drawl by RVPN network: (Agenda by NRLDC)

A.9.1 It has been noted that the Rajasthan state control area has been drawing a significant amount of reactive power (MVar) from the grid. This has led to very poor power factors at many 400/220kV stations in Rajasthan, causing severe low-voltage issues. The issue has been repeatedly highlighted through NRLDC letters and discussions in various OCC and NRPC forums, and in the last 1st and 2nd RE subcommittee meetings of NRPC as well.

A.9.2 High drawl by the Rajasthan control area leads to increased dependency on STATCOM and other ISGS RE plants, as they attempt to compensate by increasing MVar to maintain voltage stability. However, this pushes them towards saturation, limiting their ability to provide adequate support during sudden voltage drops due to faults. Moreover, low voltage conditions causes voltage oscillations in the RE pocket.



A.9.3 It is imperative that Rajasthan SLDC take immediate and focused action to address this critical issue.

A.9.4 Rajasthan SLDC is requested to provide update on followings;

- i. Status of installation of already approved Capacitor bank in Rajasthan Intra-state system. SLDC Rajasthan informed in last meeting that order for 500MVar capacitor bank (100 nos. of 5MVar) had already been placed, commissioning is expected to start from July'2025 and installation shall be completed by Nov'2025. *Rajasthan SLDC may give update on this.*
- ii. Status of approval of planned STATCOM. SLDC Rajasthan informed in last meeting that Rajasthan Electricity Regulatory Commission (RERC) is yet to approve the investment plan for ± 300 MVar STATCOM at 400kV Bhadla(RS) and at 765kV Jaiselmer S/s. *Rajasthan SLDC may give update on this.*
- iii. Clear roadmap outlining the measures to be undertaken for effective mitigation of low voltage and reactive drawl issue of Rajasthan system.
- iv. Status on Installation of Power Plant controller (PPC) in Old Solar/Wind plant of Intra-state. As these plants don't have PPC, in case of any Wind generation ramping it causes direct reactive power (MVar) drawl from the grid, plants are reliant on the grid causing uncontrolled reactive power at POI level and sever low voltage issue at Grid S/S.

Forum may deliberate further.

A.10. Status of RE evacuation Phase-II transmission system: (Agenda by NRLDC)

A.10.1 Commissioning of Planned Phase-II transmission system (which is yet to be commissioned) for RE generation evacuation from Rajasthan RE complex is essential not only for RE generation evacuation but also for improving the RE pocket's system strength making system more stable and less vulnerable to fluctuations and also for reliving the constraint of N-1 non-compliance of 765kV Jhatikara, 765kV Bhiwani and 765kV Moga S/s ICTs loading. Phase-II transmission system needs to be expedited as commissioning of planned Phase-II generation is almost completed, also ~2000MW of phase-III generation is commissioned.

A.10.2 Creation of 765kV Narela S/s, commissioning of 765kV Khetri-Narela D/C line, LILO of 765kV Meerut-Bhiwani at 765kV Narela S/s and commissioning of 2 nos. of

400kV Narela-Maharanibagh D/C lines needs to be expedited. It would relieve the constraint of 765/400kV Jhatikara ICTs loading, as it would divert some quantum of RE power flow from Khetri---Jhatikara path to Khetri---Narela path.

A.10.3 However, due to 765kV Khetri-Narela D/C line, loading on 765kV Bikaner-Khetri D/C line would increase further which is already highly loaded.

A.10.4 Therefore, to relieve the constraint of 765kV Bikaner-Khetri D/C line loading, with commissioning of Phase-III planned generation, commissioning of 765kV Bhadla-II-Sikar-II D/C line (2nd), 765kV Sikar-II-Khetri D/C line and 765kV Sikar-II-Narela D/C line is most important.

A.10.5 PGCIL is requested to provide an update on the status and the expected timeline of commissioning for following elements;

- i. 765kV Bhadla-II(PG)-Sikar-II D/C (2nd) (i.e. Ckt-3 & Ckt-4). (Phase-II)
- ii. Creation of 765kV Narela S/s and 765/400kV, 2*1500MVA ICTs at 765kV Narela S/s. (Phase-II)
- iii. 765kV Khetri-Narela D/C line. (Phase-II)
- iv. LILO of 765kV Meerut-Bhiwani at 765kV Narela S/s. (Phase-II)
- v. 2 nos. of 400kV Narela-Maharanibagh D/C lines. (Phase-II)
- vi. 765kV Sikar-II-Khetri D/C line. (Phase-III)
- vii. 765kV Sikar-II-Narela D/C line. (Phase-III)
- viii. 765kV Fatehgarh-III-Bewar-Dausa system. (Phase-III)

A.10.6 As per the Minutes of 2nd RE sub-committee meeting, all the Transmission elements mentioned in sl. no. (i) to (v) were expected by June'25 but not a single element commissioned yet, resulted bottle necking of RE power in the complex.

A.10.7 As on 20.06.2025. ~2.5 GW of RE power have been restricted during solar peak hrs. i.e. 10:30hrs to 14:30hrs to ensure the Grid Security and Reliability, evacuation of the restricted RE power can be facilitated with commissioning of above-mentioned Transmission elements.

Forum may discuss the present status and actual timeline of the above-mentioned Transmission elements.

A.11. Refurbishment of 400kV Bhadla(Rs)-Bikaner(Rs) D/C(Agenda by NRLDC)

A.11.1 For assessment of inter control-area transfer capability and related simulation studies, thermal ratings of transmission lines as per CEA's Manual on Transmission Planning Criteria 2023 are being adopted, considering anticipated ambient temperatures as the basis for safe operating limits.

A.11.2 However, in the case of the 400kV Bhadla(RS)–Bikaner(RS) D/C line, the rating of terminal equipment is significantly lower than the thermal capacity of the line itself. This mismatch is resulting in under-utilization of the transmission corridor and is emerging as a **critical bottleneck in renewable energy evacuation from the**

Western Rajasthan RE complex—leading to curtailment of renewable power.
Immediate resolution is essential to ensure optimal RE integration and evacuation.

Rajasthan SLDC is requested to provide update regarding the same.

A.12. Night mode operation of RE-Plants(Agenda by NRLDC)

A.12.1As per **clause 39 (11) of IEGC 2023** “All the Inverter Based Resources (IBRs) covering wind, solar and energy storage shall ensure that they have the necessary capability, as per CEA Connectivity Standards, all the time including non-operating hours and night hours for solar. The active power consumed by these devices for purpose of providing reactive power support, when operating under synchronous condenser/night-mode, shall not be charged under deviations and shall be treated as transmission losses in the ISTS.”

A.12.2In accordance with this regulation, all Renewable Energy (RE) plants are advised to ensure that their inverters are capable to both injecting and absorbing reactive power during night mode operation. Utilizing inverters in night mode to manage voltage levels is crucial to prevent line opening under high voltage conditions during night hours and to reduce delays in charging transmission lines during morning hours when solar is ramping.

A.12.3Such operations are expected to be carried out in the near future, and the preparedness of the plant in this regard is essential.

All RE developers are requested to kindly update and confirm the readiness of their plants for night mode operation capability.

A.13. Protection related issues in multiple elements tripping, detailed analysis of the events and status of remedial measures: (Agenda by NRLDC)

A.13.1 The list of major RE tripping events occurred during **January-May 2025** is attached as **Annexure-XI**.

A.13.2 RE plants are requested to review the above-mentioned grid events, prepare detailed analysis report and present the event details during 03rd RE sub-committee meeting. Necessary actions also need to be taken to ensure the compliance of LVRT/HVRT during any grid events and to avoid undesirable tripping.

Members may like to discuss.

A.14. Status of submission of DR/EL and tripping report for the month of January 2025-May 2025(Agenda by NRLDC)

A.14.1The status of receipt of DR/EL and tripping report of utilities for the month of **January 2025-May 2025** is given below;

Status of submission of FIR/DR/EL/Tripping Report on NR Tripping Portal															
Time Period: 1st January 2025 - 31st January 2025															
S. No.	Utility	Total No. of tripping	First Information Report (Not Received)		Disturbance Recorder (Not Received)	Disturbance Recorder (NA) as informed by utility	Disturbance Recorder (Not Received)	Event Logger (Not Received)	Event Logger (NA) as informed by utility	Event Logger (Not Received)	Tripping Report (Not Received)	Tripping Report (NA) as informed by utility	Tripping Report (Not Received)	Remark	
			Value	%	Value		%	Value		%	Value		%		
1	ABC RENEWABLE_RJ01	1	1	100	1	0	100	1	0	100	1	0	100	DR, EL & Tripping report not submitted	
2	AHEJ2L	1	1	100	1	0	100	1	0	100	1	0	100		
3	AHEJ4L	2	2	100	2	0	100	2	0	100	2	0	100		
4	AMP Energy Green Private Limited	2	2	100	2	0	100	2	0	100	2	0	100		
5	AREPRL	1	1	100	1	0	100	1	0	100	1	0	100		
6	BANDERWALA_TPSL	1	1	100	1	0	100	1	0	100	1	0	100		
7	FBTL	1	0	0	0	0	0	0	0	0	0	0	0	Details received	
8	GRIAN ENERGY PRIVATE LIMITED	1	1	100	1	0	100	1	0	100	1	0	100	DR, EL & Tripping report not submitted	
9	RENEW SURYA VIHAAN PRIVATE LIMITED	2	2	100	2	0	100	2	0	100	2	0	100		
10	RENEW SURYARAVI (RSRPL)	1	1	100	1	0	100	1	0	100	1	0	100		
11	RSDCL	2	2	100	2	0	100	2	0	100	2	0	100		
Total in NR Region		15	14	93	14	0	93	14	0	93	14	0	93		

A.14.2 As per IEGC clause 37.2 (c), Disturbance Recorder (DR), station Event Logger (EL), Data Acquisition System (DAS) shall be submitted within 24 hrs of the event and as per IEGC clause 37.2 (e), the user shall submit a detailed report in the case of grid disturbance or grid incidence within one (1) week of the occurrence of event to RLDC and RPC.

A.14.3 However, it is evident from the submitted data that reporting status is not satisfactory and needs improvement. Non submission of DR/EL & tripping details further affect the grid event analysis.

A.14.4 Members may please note and advise the concerned for timely submission of the information.

A.14.5 RE plants are requested to upload DR/EL of all the tripping incidents on Web Based Tripping Monitoring System “http://103.7.128.184/Account/Login.aspx” within 24 hours of the events as per IEGC clause 37.2(c) and clause 15.3 of CEA grid standard.

A.14.6 Apart from prints of DR outputs, the corresponding COMTRADE files (.cfg/.dat) may please also be submitted in tripping portal / through email.

Members may like to discuss.

A.15. Intimation and approval of NRPC during any revision of protection setting at site: (Agenda by NRLDC)

A.15.1 During analysis of some of the grid events, protection settings different from what was approved during FTC was found at some of the RE stations. Due to this, undesired tripping events have also been observed.

A.15.2 As per **IEGC clause 14.2**,
“All users connected to the grid shall:

कार्यसूची: उ.क्षे.वि.स.की नवीकरणीय ऊर्जा उप-समिति की 3^{री} बैठक

- a) *furnish the protection settings implemented for each element to respective RPC in a format as prescribed by the concerned RPC;*
- b) *obtain approval of the concerned RPC for (i) any revision in settings, and (ii) implementation of new protection system;*
- c) *intimate to the concerned RPC about the changes implemented in protection system or protection settings within a fortnight of such changes;*
- d) *ensure correct and appropriate settings of protection as specified by the concerned RPC.*
- e) *ensure proper coordinated protection settings."*

A.15.3 In view of above, RE plants are requested to take the final approval of protection settings from NRPC Protection sub-committee (PSC) forum for the Protection settings which were provisionally approved by NRLDC during FTC activity. Any changes in the protection settings should be done only after prior approval through NRPC Protection sub-committee (PSC). Implemented settings in the plants should be PSC approved.

Members may like to discuss.

A.16. Compliance regarding Rated Capacity demonstration and Performing Frequency response test. (Agenda by NRLDC)

A.16.1 In accordance with clause 22 and 24 of CERC IEGC Regulations, 2023

Quote

22. TRIAL RUN OF GENERATING UNIT

- a) *Successful trial run of a solar inverter unit(s) covered under sub-clause (a) of this clause shall mean the flow of power and communication signal for not less than four (4) hours on a cumulative basis between sunrise and sunset in a single day with the requisite metering system, power plant controller, telemetry and protection system in service. The generating company shall record the output of the unit(s) during the trial run and shall corroborate its performance with the temperature and solar irradiation recorded at site during the day and plant design parameters*

Provided that:

- i. *the output below the corroborated performance level with the solar irradiation of the day shall call for a repeat of the trial run.*
- ii. *if it is not possible to demonstrate the rated capacity of the plant due to insufficient solar irradiation, COD may be declared subject to the condition that the same shall be demonstrated immediately when sufficient solar irradiation is available after COD, within one year from the date of COD.*

24. DOCUMENTS AND TESTS PRIOR TO DECLARATION OF COMMERCIAL OPERATION

- a) *The generating company shall submit a certificate confirming compliance with CEA Technical Standards for Connectivity in accordance with sub-clause (a) of clause (4) of Regulation 26 of these regulations.*
- b) *Type test report for Fault Ride through Test (LVRT and HVRT) for units commissioned after the specified date as per CEA Technical Standards for Connectivity mandating LVRT and HVRT capability shall be submitted.*
- c) *The following tests shall be performed at the point of interconnection:*
 - i. *Frequency response of machines as per the CEA Technical Standards for Connectivity.*
 - ii. *Reactive power capability as per OEM rating at the available irradiance or the wind energy, as the case may be.*

Provided that the generating company may submit offline simulation studies for the specified tests, in case testing is not feasible before COD, subject to the condition that tests shall be performed within a period of one year from the date of achieving COD.

Unquote

A.16.2 As per the above-mentioned clause, RE plants are requested to demonstrate the rated capacity (with 0.95Lead – Lag PF) and perform the frequency response test.

A.16.3 Renew Surya Pratap Private Limited, Renew Surya Vihaan Private Limited, Renew Surya Aayan Private Limited, Renew Surya Roshni Private Limited has yet not perform frequency response test and 1yr from COD is passed. Kindly perform the test at the earliest.

A.16.4 RE plants Serentica Renewables India 4 Private Limited, Serentica Renewables India 5 Private Limited, Phalodi Solar Plant, Ayana Renewable Power Three Private Limited and Ayana Renewable Power Three Private Limited are nearby to complete its 1 yr since COD. Kindly plan the test and perform within 1 yr from COD.

RE plants are requested to demonstrate the rated capacity with 0.95Lead – Lag PF and perform the frequency response test within 1 year of COD to avoid any de-rating.

A.17. Protection against electromagnetic interference(Agenda by NRLDC)

A.17.1 As per Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023.

Quote

80. Protection against electromagnetic interference. – The owner of every electric supply line of voltage level 11 kV or above shall obtain the clearance of Power Telecommunication Co-ordination Committee to ensure the safety of the personnel and telecommunication line as per the requirement of section 160 of the Act.

Unquote

A.17.2 In this regard, Grid-India has already communicated to CEA vide its letter (Ref. No. GRID-INDIA/NLDC/FTC/2025) dated 04th June'2025, same is enclosed as **Annexure-XII**.

All RE plants are required to take PTCC clearance of all 11kV and above line.

A.18. Injection of infirm power in the grid(Agenda by NRLDC)

A.18.1 In accordance with **clause 19(7) of CERC IEGC Regulations, 2023**

Quote

"The onus of proving that the interchange of infirm power from the unit(s) of the generating station is for the purpose of pre-commissioning activities, testing and commissioning, shall rest with the generating station, and the concerned RLDC shall seek such information on each occasion of the interchange of power before COD. For this, the generating station shall furnish to the concerned RLDC relevant details, such as those relating to the specific commissioning activity, testing, and full load testing, its duration and the intended period of interchange. The generating station shall submit a tentative plan for the quantum and time of injection of infirm power on day ahead basis to the respective RLDC."

Unquote

A.18.2 As per the above-mentioned clause, quantum and time of injection of infirm power needs to be submitted by the plant on day-ahead basis. However, it is observed that the data pertaining to infirm power injection is not being shared/submitted by some of the plants on day ahead basis.

A.18.3 It is requested to comply the same in line with the above indicated regulation and submit the data on OMS portal in consultation with NRLDC FTC team for all future infirm power injection for the purpose of commissioning activities.

A.19. Constraints in evacuation of RE power in Western Rajasthan: Procedure for issuance of Deemed T-GNA/ Standing Clearance to RE plants(Agenda by NRLDC)

A.19.1 As per the provision of clause 22.4(a) of CERC (Connectivity and General Network Access to the inter-State Transmission System) Regulations, 2022 stating:

Quote

.....

"Provided also that where such GNA is yet to become effective, such entity shall be eligible to get its power scheduled partly or fully of the quantum of Connectivity sought for, subject to availability of transmission system by treating such access as deemed T-GNA and shall not be required to pay T-GNA charges."

Unquote

A.19.2 In view of the above-mentioned clause, deemed T-GNA are being given to RE plants whose connectivity is yet to become effective. Deemed T-GNA is issued on the basis of available margin after consideration of margin allocated to RE plants whose connectivity is effective.

A.19.3 In view of ISTS connected RE generation in Rajasthan area getting commissioned ahead of the commissioning of their associated transmission system, evacuation constraints are being observed.

A.19.4 Henceforth following process is being adopted for issuance of NOC:

- i. Deemed T-GNA shall be issued on bimonthly basis (i.e. twice a month).
- ii. All the applications received till 24:00 Hrs of 25th of the current month (say M) shall be processed together and margin shall be allocated on pro-rata basis for 1st to 15th day of M+1 month. Applications received after this period shall be processed on first come first served basis. NOCs shall be issued by 27th of the current month.
- iii. All the applications received till 24:00 Hrs of 10th of the M+1 month shall be processed together and margin shall be allocated on pro-rata basis for the latter half of the month i.e. 16th day to end of the month. Applications received after this period shall be processed on first come first served basis. NOCs shall be issued by 12th day of the month.

Hence, all RE plants are requested to apply for Deemed T-GNA/ NOC on bimonthly basis as per the timeline mentioned in the procedure.

A.20. Reliable Telemetry from RE Plants(Agenda by NRLDC)

A.20.1 Reliability and accuracy of SCADA data and its associated communication system is essential for monitoring and coordinating operations of a large electricity grid. It helps in visualization and management of the critical grid element failure/grid incident in real time and minimizes the possibility of any untoward incidences/disturbances. NRLDC has been regularly pursuing all for ensuring availability of real-time data.

1. List of stations having issues is as given below:

Poolin g Station	Station Name	PRESSURE (980–1020)	AMBIENT TEMPERAT URE (0–55)	WIND SPEED (0–25)	WIND DIRECTI ON (0– 360)	RELATIVE HUMIDITY (0–100)
FTHGR 1	ADANI WIND PARK WSS 3	Data is Out of Range	Data is updating with good quality, and it is within the range.	Data is updating with good quality, and it is within the range.	Data is updating with good quality, and it is within the range.	Data is updating with good quality, and it is within the range.
FTHGR 1	ADANI WIND PARK	Data is constant from 00:00 to	Data is constant from 00:00	Data is constant from	Data is constant from	Data is constant from 00:00 to

	WSS 4	23:45 with good quality	to 23:45 with good quality	00:00 to 23:45 with good quality	00:00 to 23:45 with good quality	23:45 with good quality
FTHGR 2	ADANI HYBRID	Data is Out of Range	Data is updating with good quality, and it is within the range.	Data is updating with good quality, and it is within the range.	Data is updating with good quality, and it is within the range.	Data is updating with good quality, and it is within the range.
FTHGR 2	ADANI HYBRID -2	Data is Out of Range	Data is updating with good quality, and it is within the range.	Data is updating with good quality, and it is within the range.	Data is updating with good quality, and it is within the range.	Data is updating with good quality, and it is within the range.
FTHGR 2	ADANI HYBRID -3	Data is Out of Range	Data is updating with good quality, and it is within the range.	Data is updating with good quality, and it is within the range.	Data is updating with good quality, and it is within the range.	Data is updating with good quality, and it is within the range.
FTHGR 2	ADANI JAISALMER WIND	Data is Out of Range	Bad Quality Data from 16:00 to 16:00	Bad Quality Data from 16:00 to 16:00	Bad Quality Data from 16:00 to 16:00	Bad Quality Data from 16:00 to 16:00

2. Plants and their Gateway Issues:

Sl. No	Plant Name	Gateway Issue
1	Altra Xergi	Both Gateway are Out
2	Devikot	Both Gateway are Out
3	ABC SOLAR	Both Gateway are Out
4	RSDCL PPS4	Both Gateway are Out
4	MSUPL	Both Gateway are Out
5	NTPC Nokhra	Gateway UP but data having issues (Either bad quality data or wrong data)
6	Renew Sunwave	
7	Ayana 3	
8	Azure 43 RSS	
9	Azure 43 PSS	

A.20.2 In the aforementioned plant, the following gateways are permanently down, and the issue remains unresolved despite regular follow-ups.

3. List of Stations for which PMU data is not reporting since long is given below:

4. TS1PL	Thar Surya	Waiting for configuration-Since 01/04/2025
MSUPL_IP	Mega Saurya Urja	Waiting for configuration-Since 13/06/2025
AGE25_IP IP001/002/003	Adani Green Energy	Waiting for configuration-Since 24/05/2025
NRSVPL_IP	Rene Surya Vihaan	Waiting for configuration-Since 18/05/2025

A.20.3 In view of the above mentioned issues all concerned are requested to please take corrective action on priority.

All concerned are requested to please update timelines for rectification.

A.21. Requirement of Firewall at Sub-station end: (Agenda by NRLDC)

A.21.1 The Guidelines on “Interfacing Requirements” focus on the general data acquisition systems for RTUs, SAS Gateway computers, communications and AMI metering systems required for reliable, secure and economic operations of the control centre(s) was issued by CERC in Jan 2024.

A.21.2 Clause 6 of the interface guidelines is as given below:

Quote

“The communication service provider while providing the interfaces for the data exchange between the Control Centres, between the user station and the Control Centre must comply with CERT-In, NCIIPC (National Critical Information Infrastructure Protection Centre) guidelines for the interface being provided to the end user in accordance with CEA (Technical Standards for Communication System in Power System Operations) Regulations, 2020. Necessary firewall/router as per requirement shall be provided by the respective users while connecting the remote equipment with the Control Centre network. Direct connectivity with the operational network be avoided while connecting the remote station and shall be through firewall with necessary VLAN configuration.”

Unquote

A.21.3 As per above guidelines it is essential that firewall shall be installed at Sub-station end. All new sub-stations are being connected through firewall only and same has been incorporated in connection agreement also. However, firewalls are not available at many plants as tabulated below. In this regard all RE Generators are requested to please take up for installation for necessary firewalls.

A.21.4 Issue was also discussed in 1st RE Meeting but still there is no progress in this regard.

FATEHGARH 1	ADANI SOLAR PSS1
	ADANI SOLAR PSS2
	ADANI WIND PSS1
	ADANI WIND PSS2
	NIDAN
FATEHGARH-2	EDEN SOLAR
	Adani Hybrid1
	Adani Hybrid2
	Adani Hybrid3
	ASERJ1 SOLAR
	WIND
BIKANER 765	RENEW BIKANER 250
	SBSR 300 MW
Bhadla	ADANI BHADLA
	AZURE MAPPLE
	CSP JODHPUR
	Saurya Urja
	ESSEL
Bhadla 2	AVADA 320

All concerned are requested to please update timelines for installation of firewalls at the earliest.

A.22. Over-injection than NOC/IC: (Agenda by NRLDC)

A.22.1 Based on the available system margin for RE evacuation from Rajasthan RE complex, RE plants are being allowed to schedule generation even when the associated systems are not yet commissioned. However, it has been observed that some Renewable energy (RE) plants are injecting power beyond the approved NOC/IC limits during peak solar generation periods.

A.22.2 Despite repeated follow-ups, these plants are not complying with the instructions. On several occasions, this over-injection has led to emergency situations in the system. While some compliance is observed temporarily after follow-ups, it is often not sustained, and in some cases, there is no compliance at all.

List of NR ISTS connected RE plants found over injecting based on 09-Mar-2025 to 09-Apr-2025 data:

Sl. No.	Name of the RE Developers	Name of the RE plants	Maximum Injection	Installed Capacity (MW)
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			(MW)	
1	ABC Renewable (RJ-01)	ABCREPL*	319	300
2	ACME	ACME Raisar,	326	300
		ACME Dhaulpur,	325	300
		ACME Deogarh,	327	300
		ACME Phalodi,	329	300
		ACME Heergarh	322	300
3	Adani	ARERJL,	210	200
		ASE4PL,	52.5	50
		ASEJ2L,	52.5	50
		ASERJ2PL,	170	150
		SBE6PL,	335	300
		AHEJOL,	425	390
		AHEJ2L,	330	300
		AHEJ3L,	325	300
		ASEJOPL,	470	450
		AGE24L*,	558	500
		ASERJ2PL_FTG2,	196	180
		ASERJ2PL_P1,	159	150
		ASERJ2PL_P2,	159	150
		AHEJ4L,	159	150
		AGE25L*	887	700
			548	500
4	Amp Energy	AEG4PL*,	111	100
		AEGFPL*,	112	100
		AEGSPL*	116.5	100
5	Avaada	Avaada RJHN,	258	240
		Avaada Sunce,	383	350
		Avaada Sustainable		

		Avaada Sunrays	330	300
			330	320
6	Ayana	Ayana, Ayana3*	305 331	300 300
7	Azure	APTFL, Azure Mapple*, Azure43	137 308 623	130 276 600
8	CSP	CSP(Saurya Urja)	305	300
9	Eden	Eden	309	300
10	Enel	Thar Surya1	314	300
11	Mahindra	MSUPL	264	250
12	NTPC	Nidan	307	296
13	O2 Power	AXPPL	409	380
14	Prerak	ARTPL*, TGEPL*, TSESPL*	138 120 60	110 100 50
15	Renew	Renew(Adani), RSWPL, RSPPL, RSAPL	53 307 206 313	50 300 300 300
16	Rising Sun	RSEKPL	211	190
17	Sterlite	RSUPL	307	300
18	Tata power	TPGEL Bikaner	243	225

(*) Restriction during peak solar hours for the RE plants for which ATS is yet to get commissioned.

A.23. Delayed Response for TRAS-Down and TRAS requirement from RE generators: (Agenda by NRLDC)

A.23.1 Due to low demand resulting from inclement weather conditions and the likelihood of high system frequency, TRAS down in renewable energy (RE) has been

implemented on the WBES portal after backing down thermal generation to their technical minimum. The concerned RE plants were informed well in advance, and revised schedules were issued significantly prior to the delivery period.

A.23.2 However, it has been observed that the some RE plants are not adhering to the revised schedules following the TRAS down. In real-time operations, inconsistent and delayed responses from the plants have been noted. Furthermore, when sudden TRAS down instructions are issued, the plants often fail to respond promptly. This results in the need for repeated telephonic communication to align actual generation with the scheduled values.

A.23.3 List shown below for the RE plants which do not promptly complied the implemented schedule on 25.05.2025 as follows:

Sl. No.	Plant Name	Pooling Station
1	CSP Jodhpur	Bhadla (PG)
2	SBE6PL	Bhadla (PG)
3	MSRPL	Bhadla (PG)
4	Azure41	Bhadla (PG)
5	Avaada Sunce	Bikaner (PG)
6	Avaada Sustainable	Bikaner (PG)
7	Ayana	Bikaner (PG)
8	RSRPL	Bikaner (PG)
9	RSPPL	Bikaner (PG)
10	TS1PL	Bikaner (PG)
11	Ayana3	Bikaner (PG)
12	Azure43	Bikaner (PG)
13	ACME Heergarh	Bhadla-II (PG)
14	Avaada Sunrays	Bhadla-II (PG)
15	Nokhra	Bhadla-II (PG)
16	MSUPL	Bhadla-II (PG)
17	Kolayat	Bhadla-II (PG)
18	SGEL	Bikaner-II
19	NTPC Nidan	Fatehgarh-I

20	RSUPL	Fatehgarh-II (PG)
21	AHEJ2L	Fatehgarh-II (PG)
22	AHEJ3L	Fatehgarh-II (PG)

A.23.4 Despatch under TRAS DOWN, as per the emergency provisions of the Ancillary Services Regulations, has been initiated for regional entity solar RE generating stations with an installed capacity of 250 MW or more. This measure is part of real-time actions taken to maintain system frequency within the IEGC band during periods of low demand. NLDC/RLDCs have informed the concerned RE generators about the TRAS DOWN in advance.

A.23.5 In the event of receiving a TRAS Down instruction, generators are requested to continuously monitor their injection schedules in real-time through the Web-Based Energy Scheduling (WBES) software [<https://newwb.es.gridindia.in/login>], until the required updates/modifications are incorporated into the REMC portal.

Members may deliberate further.

A.24. PPC not installed in 250 MW Adani Bhadla Solar Park: (Agenda by NRLDC)

A.24.1 200MW solar Azure plant is connected at 250MW Adani pooling station along with 50MW Renew solar plant. Adani pooling station is further connected to Bhadla (PG) through 220kV Adani Bhadla-Bhadla (PG) D/C line. Therefore, PPC should be installed in the park to individually control the active and reactive power of 200MW Azure and 50MW Renew Solar plants being evacuated through 220kV Adani Bhadla-Bhadla (PG) D/C line.

A.24.2 PPC is yet to be installed in 200MW Azure Power and at Central Park level, 50 MW Renew is having PPC at its 33kV level. Due to unavailability of PPC, Adani Bhadla Solar Park is unable to provide the desired reactive power support whenever required. Most of the time these two plants are absorbing MVARs and not complying NRLDC instruction in real-time for reactive power support. It is a non-compliance of clause B2(1) of CEA technical standards for grid connectivity.

A.24.3 Representative from Adani Green Energy Ltd. (AGEL) confirmed in last meeting that PPC shall be installed by 31st March'2025 in 200MW Azure Plant.

AGEL may update the status of Installation of PPC to the forum.

A.25. In-adequate/Delayed MVAR response by the plants: (Agenda by NRLDC)

A.25.1 It is observed that the many of the times RE plants are not complying with the Fix-Q injection code given during peak solar generation hours. It is causing low voltages in the system, few of the examples observed in real-time are as follows:

Sl. N o.	Name of the RE Plant/Park	Code for Fix MVAR injection 10:30-14:30hrs	Maximum support received (MVar)	Date of observation followed by mail-communication
1	TPREL(Bhadla)	80	40	05.06.2025
2	SBE6PL(Bhadla)	80	22	05.06.2025
3	Mahoba(Bhadla)	80	42	05.06.2025
4	Avaada Pooling(Bikaner)	200	120	22.05.2025
5	Azure43(Bikaner)	180	160	22.05.2025

A.26. Frequently changing of manpower/ mail ids/ communication over mobile no. (other than VOIP): (Agenda by NRLDC)

A.26.1A Number of point of mobile contacts are observed while received communication from RE plants regarding scheduling, forecasting and real-time operation, SCADA or protection. It is more difficult where the QCA is not there.

A.26.2The concern person is also changing frequently and sometimes it is observed that the concern person is not at the plant and he ask for some time to communicate at the plants' control room.

A.26.3There is observed delay in action for the communication from NRLDC control room to RE plants.

A.26.4Plants are also preferring over mobile communication the VOIP during real-time operation.

A.26.5This is for further deliberation with this forum, the plants should opt to incorporate in the QCA. Further if it is suitable to provide their communication addresses at some new portal/existing portal.

A.27. Frequency Response from the RE plants: (Agenda by NRLDC)

A.27.1Frequency response from wind generating stations, generating stations using inverters, wind - solar photo voltaic hybrid systems as per CEA (Technical

Standards for Connectivity to the Grid) (Amendment) Regulations, 2019 Clause B2(4) is quoted below

Quote

The generating stations with installed capacity of more than 10 MW connected at voltage level of 33 kV and above –

-
- (i) ***shall have governors or frequency controllers of the units at a droop of 3 to 6% and a dead band not exceeding ± 0.03 Hz:***
Provided that for frequency deviations in excess of 0.3 Hz, the Generating Station shall have the facility to provide an immediate (within 1 second) real power primary frequency response of at least 10% of the maximum Alternating Current active power capacity;
- (ii) *shall have the operating range of the frequency response and regulation system from 10% to 100% of the maximum Alternating Current active power capacity, corresponding to solar insolation or wind speed, as the case may be;*
- (iii) *shall be equipped with the facility for controlling the rate of change of power output at a rate not more than $\pm 10\%$ per minute.*

Unquote

A.27.2 All RE developers are requested to ensure the compliance of CEA standards for frequency response. Further, all RE developers are requested to share the present implemented settings & control philosophy for frequency control as per CEA standards.

Members may deliberate further.

A.28. Access to WBES: (Agenda by NRLDC)

A.28.1 To ensure WBES access is restricted to authorized users, access has been permitted only through the static IP addresses provided by them. All RE generators are hereby informed that WBES will be accessible solely through the whitelisted static IPs submitted by the users.

A.28.2 Therefore, it is requested to kindly provide the static/physical IP in the format mentioned below at the earliest, if not already shared.

SL no	Beneficiary Name	Physical IPs for WBES access	Physical IPs for data fetching from API	Mobile number (One number only) for OTP Authentication for WBES access	Email id (one id only) for OTP Authentication for WBES access

1					
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A.28.3 It may also be kindly noted that we are in the process of implementing OTP based login to WBES. Hence, all the users are hereby requested to provide the details such as mobile number and email address if not already shared.

Status of performance indices report of Feb 2025 (Last date of submission 07.03.2025)						
S. No.	Member Utility	Received Status (Yes/No)	Vide mail dated	Remarks	Indices less than 1 (Yes/No)	Reason submitted and corrective action taken
1	ABC Renewable Pvt. Ltd					
2	ACME Heeragarh powertech Pvt. Ltd					
3	ACME Chittorgarh Solar Energy Pvt Ltd					
4	Adani Hybrid Energy Jaisalmer One Ltd.	yes	22.04.2025		No	NA
5	Adani Hybrid Energy Jaisalmer Two Ltd.	yes	22.04.2025		No	NA
6	Adani Hybrid Energy Jaisalmer Three Ltd.	yes	22.04.2025		No	NA
7	Adani Hybrid Energy Jaisalmer Four Ltd.	yes	22.04.2025		No	NA
8	Adani Renewable Energy (RJ) limited Rawara	yes	22.04.2025		No	NA
9	Adani Solar Energy Jaisalmer One Pvt. Ltd. _450MW (Solar)	yes	22.04.2025		No	NA
10	Adani Solar Enegry Four Private Limited	yes	22.04.2025		No	NA
11	Adani Hybrid Energy Jaisalmer Four Ltd. (AEML 2-350)	yes	22.04.2025		No	NA
12	Adani Solar Energy Jaisalmer Two Private Limited Project Two	yes	22.04.2025		No	NA
13	SB Energy Six Private Limited, Bhadla	yes	22.04.2025		No	NA
14	Adani Solar Enegry Jodhpur Two Limited, Rawara	yes	22.04.2025		No	NA
15	Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)	yes	22.04.2025		No	NA
16	Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)	yes	22.04.2025		No	NA
17	Adani Green Energy 24 Limited (Bhimsar)	yes	22.04.2025		No	NA
18	Adani Green Twenty-Five Limited (Badisid)	yes	22.04.2025		No	NA
19	Altra Xergi Pvt. Ltd.	yes	23.04.2025		No	NA
20	AMP Energy Green Five Pvt. Ltd.					
21	AMP Energy Green Six Pvt. Ltd.					
22	Amplus Ages Private Limited	Yes	04.04.2025		No	NA
23	Avaada RJHN 240MW	yes	07.03.2025		No	NA
24	Avaada sunce energy Pvt limited	yes	07.03.2025		No	NA
25	Avaada Sunrays Pvt. Ltd.	yes	07.03.2025		No	NA
26	Avaada Sustainable RJ Pvt. Ltd.	yes	07.03.2025		No	NA
27	Ayana Renewable Power Three Private Limited					
28	Ayaana Renewable Power One Pvt. Ltd.					
29	Azure Power Forty One Pvt limited					
30	Azure Power Forty Three Pvt. Ltd. _RSS					
31	Azure Maple Pvt. Ltd.					
32	AZURE POWER INDIA Pvt. Ltd., Bhadla					
33	Azure Power Thirty Four Pvt. Ltd.					
34	Clean Solar Power (Jodhpur) Pvt. Ltd.					
35	Clean Solar Power (Bhadla) Pvt. Ltd					
36	Eden Renewable Cite Private Limited					
37	Grian Energy private limited	Yes	04.04.2025		No	NA
38	Mahindra Renewable Private Limited					
39	Mega Surya Urja Pvt. Ltd. (MSUPL)					
40	AURAIYA Solar					
41	DADRI SOLAR					
42	SINGRAULI SOLAR					
43	Anta Solar					
44	Unchahar Solar					
45	NTPC Devikot Solar plant _240MW					
46	NTPC Kolayat _400kV					
47	Nedan Solar NTPC					
48	SKB NTPC					
49	NTPC Nokhra _300MW					
50	One Volt energy Pvt. Ltd.	Yes	04.04.2025		No	NA
51	ReNew Solar Energy (Jharkhand Three) Private Limited	YES	26.03.2025		No	NA
52	RENEW SOLAR POWER Pvt. Ltd. Bhadla	YES	26.03.2025		No	NA
53	ReNew Solar Urja Private Limited	YES	26.03.2025		No	NA
54	Renew Sun Bright Pvt. Ltd. (RSBPL)	YES	26.03.2025		No	NA
55	Renew Sun Waves Private Limited (RSEJ4L)	YES	26.03.2025		No	NA

56	Renew Surya Partap Pvt. Ltd.	YES	26.03.2025		No	NA
57	Renew Surya Ravi Pvt. Ltd.	YES	26.03.2025		No	NA
58	Renew Surya Roshni Pvt. Ltd.	YES	26.03.2025		No	NA
59	Renew Surya Vihan Pvt. Ltd.	YES	26.03.2025		No	NA
60	Renew Surya Ayaan Pvt. Ltd.	YES	26.03.2025		No	NA
61	Renew Solar Photovoltaic Pvt Ltd					
62	RENEW SOLAR POWER Pvt. Ltd. Bikaner					
63	Rising Sun Energy-K Pvt. Ltd.					
64	Serentica Renewables India 4 Private Limited					
65	Tata Power Green Energy Ltd. (TPGEL)	Yes	04.03.2025		No	NA
66	Tata Power Renewable Energy Ltd. (TPREL)	Yes	04.03.2025		No	NA
67	Thar Surya Pvt. Ltd.					
68	TP Surya Pvt. Ltd.					
69	Banderwala Solar Plant TP Surya Ltd.	Yes	04.03.2025		No	NA
70	TRANSITION ENERGY SERVICES PRIVATE LIMITED					
71	Transition Green Energy Private Limited					
72	Transition Sustainable Energy Services Private Limited					

Status of performance indices report of March 2025 (Last date of submission 07.04.2025)							
S. No.	Member Utility		Received Status (Yes/No)	Vide mail dated	Remarks	Indices less than 1 (Yes/No)	Reason submitted and corrective action taken
1	ABC Renewable Pvt. Ltd						
2	ACME Heeragarh powertech Pvt. Ltd						
3	ACME Chittorgarh Solar Energy Pvt Ltd						
4	Adani Hybrid Energy Jaisalmer One Ltd.		yes	22.04.2025		No	NA
5	Adani Hybrid Energy Jaisalmer Two Ltd.		yes	22.04.2025		No	NA
6	Adani Hybrid Energy Jaisalmer Three Ltd.		yes	22.04.2025		No	NA
7	Adani Hybrid Energy Jaisalmer Four Ltd.		yes	22.04.2025		No	NA
8	Adani Renewable Energy (RJ) limited Rawara		yes	22.04.2025		No	NA
9	Adani Solar Energy Jaisalmer One Pvt. Ltd. _450MW (Solar)		yes	22.04.2025		No	NA
10	Adani Solar Enegrty Four Private Limited		yes	22.04.2025		No	NA
11	Adani Hybrid Energy Jaisalmer Four Ltd. (AEML 2-350)		yes	22.04.2025		No	NA
12	Adani Solar Energy Jaisalmer Two Private Limited Project Two		yes	22.04.2025		No	NA
13	SB Energy Six Private Limited, Bhadla		yes	22.04.2025		No	NA
14	Adani Solar Enegrty Jodhpur Two Limited, Rawara		yes	22.04.2025		No	NA
15	Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)		yes	22.04.2025		No	NA
16	Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)		yes	22.04.2025		No	NA
17	Adani Green Energy 24 Limited (Bhimsar)		yes	22.04.2025		No	NA
18	Adani Green Twenty-Five Limited (Badisid)		yes	22.04.2025		No	NA
19	Altra Xergi Pvt. Ltd.		yes	23.04.2025		No	NA
20	AMP Energy Green Five Pvt. Ltd.						
21	AMP Energy Green Six Pvt. Ltd.						
22	Amplus Ages Private Limited	AmPlus Solar	Yes	04.04.2025		No	NA
23	Avaada RJHN _240MW	Avaada	Yes	07.04.2025		No	NA
24	Avaada sunce energy Pvt limited		Yes	07.04.2025		No	NA
25	Avaada Sunrays Pvt. Ltd.		Yes	07.04.2025		No	NA
26	Avaada Sustainable RJ Pvt. Ltd.		Yes	07.04.2025		No	NA
27	Ayana Renewable Power Three Private Limited						
28	Ayaana Renewable Power One Pvt. Ltd.						
29	Azure Power Forty One Pvt limited						
30	Azure Power Forty Three Pvt. Ltd._RSS						
31	Azure Maple Pvt. Ltd.						
32	AZURE POWER INDIA Pvt. Ltd., Bhadla						
33	Azure Power Thirty Four Pvt. Ltd.						
34	Clean Solar Power (Jodhpur) Pvt. Ltd.						
35	Clean Solar Power (Bhadla) Pvt. Ltd						
36	Eden Renewable Cite Private Limited						
37	Grian Energy private limited	AmPlus Solar	Yes	04.04.2025		No	NA
38	Mahindra Renewable Private Limited						
39	Mega Surya Urja Pvt. Ltd. (MSUPL)						
40	AURAIYA Solar						
41	DADRI SOLAR						
42	SINGRAULI SOLAR						
43	Anta Solar						
44	Unchahar Solar						
45	NTPC Devikot Solar plant _240MW						
46	NTPC Kolayat _400KV						
47	Nedan Solar NTPC						
48	SKB NTPC						
49	NTPC Nokhra _300MW						
50	One Volt energy Pvt. Ltd.	AmPlus Solar	Yes	04.04.2025		No	NA
51	ReNew Solar Energy (Jharkhand Three) Private Limited	RENEW	Yes	08.04.2025		No	NA
52	RENEW SOLAR POWER Pvt. Ltd. Bhadla		Yes	08.04.2025		No	NA
53	ReNew Solar Urja Private Limited						
54	Renew Sun Bright Pvt. Ltd. (RSBPL)		Yes	08.04.2025		No	NA
55	Renew Sun Waves Private Limited (RSEJ4L)						
56	Renew Surya Partap Pvt. Ltd.		Yes	08.04.2025		No	NA
57	Renew Surya Ravi Pvt. Ltd.		Yes	08.04.2025		Yes	yes
58	Renew Surya Roshni Pvt. Ltd.		Yes	08.04.2025		No	NA
59	Renew Surya Vihan Pvt. Ltd.		Yes	08.04.2025		No	NA
60	Renew Surya Ayaan Pvt. Ltd.		Yes	08.04.2025		No	NA
61	Renew Solar Photovoltaic Pvt Ltd		Yes	08.04.2025		No	NA
62	RENEW SOLAR POWER Pvt. Ltd. Bikaner						
63	Rising Sun Energy-K Pvt. Ltd.						
64	Serentica Renewables India 4 Private Limited						
65	Tata Power Green Energy Ltd. (TPGEL)		Yes	02.04.2025		No	NA
66	Tata Power Renewable Energy Ltd. (TPREL)		Yes	02.04.2025		No	NA
67	Thar Surya Pvt. Ltd.						

68	TP Surya Pvt. Ltd.						
69	Banderwala Solar Plant TP Surya Ltd.		Yes	02.04.2025		No	NA
70	TRANSITION ENERGY SERVICES PRIVATE LIMITED						
71	Transition Green Energy Private Limited						
72	Transition Sustainable Energy Services Private Limited						

Status of performance indices report of April 2025 (Last date of submission 07.05.2025)						
S. No.	Member Utility	Received Status (Yes/No)	Vide mail dated	Remarks	Indices less than 1 (Yes/No)	Reason submitted and corrective action taken
1	ABC Renewable Pvt. Ltd					
2	ACME Heeragarh powertech Pvt. Ltd					
3	ACME Chittorgarh Solar Energy Pvt Ltd					
4	Adani Hybrid Energy Jaisalmer One Ltd.					
5	Adani Hybrid Energy Jaisalmer Two Ltd.					
6	Adani Hybrid Energy Jaisalmer Three Ltd.					
7	Adani Hybrid Energy Jaisalmer Four Ltd.					
8	Adani Renewable Energy (RJ) limited Rawara					
9	Adani Solar Energy Jaisalmer One Pvt. Ltd. _450MW (Solar)					
10	Adani Solar Enegry Four Private Limited					
11	Adani Hybrid Energy Jaisalmer Four Ltd. (AEML 2-350)					
12	Adani Solar Energy Jaisalmer Two Private Limited Project Two					
13	SB Energy Six Private Limited, Bhadla					
14	Adani Solar Enegry Jodhpur Two Limited, Rawara					
15	Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)					
16	Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)					
17	Adani Green Energy 24 Limited (Bhimsar)					
18	Adani Green Twenty-Five Limited (Badisid)					
19	Altra Xergi Pvt. Ltd.	Yes	06.05.2025		No	NA
20	AMP Energy Green Five Pvt. Ltd.					
21	AMP Energy Green Six Pvt. Ltd.					
22	Amplus Ages Private Limited	Yes	08.05.2025		No	NA
23	Avaada RJHN _240MW	Yes	20.05.2025		No	NA
24	Avaada sunce energy Pvt limited	Yes	20.05.2025		No	NA
25	Avaada Sunrays Pvt. Ltd.	Yes	20.05.2025		No	NA
26	Avaada Sustainable RJ Pvt. Ltd.	Yes	20.05.2025		No	NA
27	Ayana Renewable Power Three Private Limited					
28	Ayaana Renewable Power One Pvt. Ltd.					
29	Azure Power Forty One Pvt limited					
30	Azure Power Forty Three Pvt. Ltd. _RSS					
31	Azure Maple Pvt. Ltd.					
32	AZURE POWER INDIA Pvt. Ltd., Bhadla					
33	Azure Power Thirty Four Pvt. Ltd.					
34	Clean Solar Power (Jodhpur) Pvt. Ltd.					
35	Clean Solar Power (Bhadla) Pvt. Ltd					
36	Eden Renewable Cite Private Limited					
37	Grian Energy private limited	Yes	08.05.2025		No	NA
38	Mahindra Renewable Private Limited					
39	Mega Surya Urja Pvt. Ltd. (MSUPL)					
40	AURAIYA Solar					
41	DADRI SOLAR					
42	SINGRAULI SOLAR					
43	Anta Solar					
44	Unchahar Solar					
45	NTPC Devikot Solar plant _240MW	Yes	26.05.2025		No	NA
46	NTPC Kolayat _400kV					
47	Nedan Solar NTPC					
48	SKB NTPC	Yes	26.05.2025		No	NA
49	NTPC Nokhra _300MW					
50	One Volt energy Pvt. Ltd.	Yes	08.05.2025		No	NA
51	ReNew Solar Urja Private Limited	Yes	21.05.2025		No	NA
52	ReNew Solar Energy (Jharkhand Three) Private Limited					
53	RENEW SOLAR POWER Pvt. Ltd. Bhadla					
54	Renew Sun Bright Pvt. Ltd. (RSBPL)					
55	Renew Sun Waves Private Limited (RSEJ4L)					
56	Renew Surya Partap Pvt. Ltd.					
57	Renew Surya Ravi Pvt. Ltd.					
58	Renew Surya Roshni Pvt. Ltd.					

59	Renew Surya Vihan Pvt. Ltd.					
60	Renew Surya Ayaan Pvt. Ltd.					
61	Renew Solar Photovoltaic Pvt Ltd					
62	RENEW SOLAR POWER Pvt. Ltd. Bikaner					
63	Rising Sun Energy-K Pvt. Ltd.					
64	Serentica Renewables India 4 Private Limited					
65	Tata Power Green Energy Ltd. (TPGEL)	Yes	05.05.2025		No	NA
66	Tata Power Renewable Energy Ltd. (TPREL)	Yes	05.05.2025		No	NA
67	Banderwala Solar Plant TP Surya Ltd.	Yes	05.05.2025		No	NA
68	Thar Surya Pvt. Ltd.					
69	TP Surya Pvt. Ltd.					
70	TRANSITION ENERGY SERVICES PRIVATE LIMITED					
71	Transition Green Energy Private Limited					
72	Transition Sustainable Energy Services Private Limited					

Format No.-PI-01
Reporting of performance indices for protection system
(for elements connected at 220 kV and above)

Name of Utility:

Month:

S.N.	Sub-station	Unit (SPS/Line/ICT/GT/ etc)	Nc	Nf	Nu	Ni	Dependability Index (D)	Security Index (S)	Reliability Index (R)

Justification for less than one index may be attached separately.

Nc is the number of correct operations at internal power system faults

Nf is the number of failures to operate at internal power system faults

Nu is the number of unwanted operations

Ni is the number of incorrect operations and is the sum of Nf and Nu

Status of Internal Protection Audit Plan for FY 2025 -26							
S. No.	NRPC Member	Status	Schedule submitted as per utility	Present Status Completed (yes/no)	Report Submission Date by audit party	Discussion held in PSC meeting number	Compliance status
1	ABC Renewable Pvt. Ltd						
2	ACME Heeragarh powertech Pvt. Ltd	Received	Jun-25				
3	ACME Pholidi	Received	Jun-25				
4	ACME Deagarh	Received	Jun-25				
5	ACME Raisar	Received	Jun-25				
6	ACME Dhoulpar	Received	Jun-25				
7	ACME Chittorgarh Solar Energy Pvt Ltd						
8	Adani Hybrid Energy Jaisalmer One Ltd.	Received	Jul-25				
9	Adani Hybrid Energy Jaisalmer Two Ltd.	Received	Jul-25				
10	Adani Hybrid Energy Jaisalmer Three Ltd.	Received	Aug-25				
11	Adani Hybrid Energy Jaisalmer Four Ltd.	Received	Aug-25				
12	Adani Renewable Energy (RJ) limited Rawara	Received	Sep-25				
13	Adani Solar Energy Jaisalmer One Pvt. Ltd. 450MW (Solar)	Received	Oct-25				
14	Adani Solar Energy Four Private Limited	Received	Sep-25				
15	Adani Hybrid Energy Jaisalmer Four Ltd. (AEML 2-350)	Received	Sep-25				
16	Adani Solar Energy Jaisalmer Two Private Limited Project Two	Received	Oct-25				
17	SB Energy Six Private Limited, Bhadla	Received	Oct-25				
18	Adani Solar Energy Jodhpur Two Limited, Rawara	Received	Sep-25				
19	Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)	Received	Nov-25				
20	Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)	Received	Nov-25				
21	Adani Green Energy 24 Limited (Bhimsar)	Received	Nov-25				
22	Adani Green Twenty-Five Limited (Badisid)	Received	Dec-25				
23	Altra Xergi Pvt. Ltd.						
24	AMP Energy Green Five Pvt. Ltd.						
25	AMP Energy Green Six Pvt. Ltd.						
26	Amplus Ages Private Limited						
27	Avaada RJHN 240MW						
28	Avaada sunce energy Pvt limited						
29	Avaada Sunrays Pvt. Ltd.						
30	Avaada Sustainable RJ Pvt. Ltd.						
31	Ayana Renewable Power Three Private Limited						
32	Ayaana Renewable Power One Pvt. Ltd.						
33	Azure Power Forty One Pvt limited						
34	Azure Power Forty Three Pvt. Ltd. RSS						
35	Azure Maple Pvt. Ltd.						
36	AZURE POWER INDIA Pvt. Ltd., Bhadla						
37	Azure Power Thirty Four Pvt. Ltd.						
38	Clean Solar Power (Jodhpur) Pvt. Ltd.						
39	Clean Solar Power (Bhadla) Pvt. Ltd						
40	Eden Renewable Cite Private Limited						
41	Grian Energy private limited						
42	Mahindra Renewable Private Limited						
43	Mega Surya Urja Pvt. Ltd. (MSUPL)						
44	AURAIYA Solar						
45	DADRI SOLAR						
46	SINGRAULI SOLAR						
47	Anta Solar						
48	Unchahar Solar						
49	NTPC Devikot Solar plant 240MW						
50	NTPC Kolayat 400kV						
51	Nedan Solar NTPC						
52	NTPC Nokhra 300MW						
53	One Volt energy Pvt. Ltd.						
54	ReNew Solar Energy (Jharkhand Three) Private Limited						
55	RENEW SOLAR POWER Pvt. Ltd. Bhadla						
56	ReNew Solar Urja Private Limited						
57	Renew Sun Bright Pvt. Ltd. (RSBPL)						
58	Renew Sun Waves Private Limited (RSEJ4L)						
59	Renew Surya Partap Pvt. Ltd.						
60	Renew Surya Ravi Pvt. Ltd.						
61	Renew Surya Roshni Pvt. Ltd.						
62	Renew Surya Vihan Pvt. Ltd.						
63	Renew Surya Ayaan Pvt. Ltd.						
64	Renew Solar Photovoltaic Pvt Ltd						
65	RENEW SOLAR POWER Pvt. Ltd. Bikaner						
66	Rising Sun Energy-K Pvt. Ltd.						
67	Serentica Renewables India 4 Private Limited						
68	Tata Power Green Energy Ltd. (TPGEL) (225MW)	Received	30-1-2026				
69	Tata Power Renewable Energy Ltd. (TPREL) (300MW)	Received	28-1-2026				
70	Thar Surya Pvt. Ltd.						
71	TP Surya Ltd., Noorsar (110MW)	Received	30-1-2026				
72	Bandarwala Solar Plant TP Surya Ltd. (300MW)	Received	28-02-2026				
73	TRANSITION ENERGY SERVICES PRIVATE LIMITED						
74	Transition Green Energy Private Limited						
75	Transition Sustainable Energy Services Private Limited						

Format

Internal Protection Audit Calendar

(for elements connected at 220 kV and above)

FY 2023-24

Name of Utility:.....

S.N.	Name of Sub-station	Voltage level	Next Internal Audit schedule	Last Audit conducted (Month/Year)
1				
2				

Status of 3rd Party Protection Audit Plan							
S. No.	NRPC Member	Status	Schedule submitted as per utility	Present Status Completed (yes/no)	Report Submission Date by audit party	Discussion held in PSC meeting number	Compliance status
1	ABC Renewable Pvt. Ltd						
2	ACME Heeragarh powertech Pvt. Ltd						
3	ACME Pholidi						
4	ACME Deogarh						
5	ACME Raisalr						
6	ACME Dhoulgar						
7	ACME Chittorgarh Solar Energy Pvt Ltd						
8	Adani Hybrid Energy Jaisalmer One Ltd.						
9	Adani Hybrid Energy Jaisalmer Two Ltd.						
10	Adani Hybrid Energy Jaisalmer Three Ltd.						
11	Adani Hybrid Energy Jaisalmer Four Ltd.						
12	Adani Renewable Energy (RJ) limited Rawara						
13	Adani Solar Energy Jaisalmer One Pvt. Ltd. 450MW (Solar)						
14	Adani Solar Energy Four Private Limited						
15	Adani Hybrid Energy Jaisalmer Four Ltd. (AEML 2-350)						
16	Adani Solar Energy Jaisalmer Two Private Limited Protect Two						
17	SB Energy Six Private Limited, Bhadia						
18	Adani Solar Energy Jodhpur Two. Limited, Rawara						
19	Adani Solar Energy RJ Two Pvt. Ltd. (Devkot)						
20	Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)						
21	Adani Green Energy 24 Limited (Bhimsar)						
22	Adani Green Twenty-Five Limited (Badisid)						
23	Altra Xera Pvt. Ltd.	Conducted		Completed	03.02.2025-04.02.2025	60	
24	AMP Energy Green Five Pvt. Ltd.						
25	AMP Energy Green Six Pvt. Ltd.						
26	Amplus Aqes Private Limited						
27	Avaada RJHN 240MW						
28	Avaada sunce energy Pvt limited						
29	Avaada Sunrays Pvt. Ltd.						
30	Avaada Sustainable RJ Pvt. Ltd.						
31	Ayana Renewable Power Three Private Limited	Conducted		18.05.2025		61	
32	Ayaana Renewable Power One Pvt. Ltd.	Conducted		09.03.2025		59	
33	Azure Power Forty One Pvt limited						
34	Azure Power Forty Three Pvt. Ltd. RSS						
35	Azure Maple Pvt. Ltd.						
36	AZURE POWER INDIA Pvt. Ltd., Bhadia						
37	Azure Power Thirty Four Pvt. Ltd.						
38	Clean Solar Power (Jodhpur) Pvt. Ltd.						
39	Clean Solar Power (Bhadia) Pvt. Ltd.						
40	Eden Renewable Cite Private Limited						
41	Grian Energy private limited						
42	Mahindra Renewable Private Limited						
43	Maxa Surya Urja Pvt. Ltd. (MSUPL)						
44	ALURAIYA Solar						
45	DADRI SOLAR						
46	SINGRAULI SOLAR						
47	Anta Solar						
48	Unchahar Solar						
49	NTPC Devkot Solar plant 240MW						
50	NTPC Kolayat 400kV						
51	Nedan Solar NTPC						
52	NTPC Nokhra 300MW						
53	One Volt energy Pvt. Ltd.						
54	ReNew Solar Energy (Jharkhand Three) Private Limited						
55	RENEW SOLAR POWER Pvt. Ltd. Bhadia						
56	ReNew Solar Urja Private Limited						
57	Renew Sun Bright Pvt. Ltd. (RSBPL)						
58	Renew Sun Waves Private Limited (RSEJAL)						
59	Renew Surya Partap Pvt. Ltd.						
60	Renew Surya Ravi Pvt. Ltd.						
61	Renew Surya Roshni Pvt. Ltd.						
62	Renew Surya Vihan Pvt. Ltd.						
63	Renew Surya Ayaan Pvt. Ltd.						
64	Renew Solar Photovoltaic Pvt Ltd						
65	RENEW SOLAR POWER Pvt. Ltd. Bikaner						
66	Rising Sun Energy-K Pvt. Ltd.						
67	Serentica Renewables India 4 Private Limited						
68	Tata Power Green Energy Ltd. (TPGEL) (225MW)	Received	31-03-2027				
69	Tata Power Renewable Energy Ltd. (TPREL) (300MW)	Received	31-03-2027				
70	Thar Surya Pvt. Ltd.						
71	TP Surya Ltd., Noorsar (110MW)	Received	31-03-2027				
72	Bandarwala Solar Plant TP Surya Ltd. (300MW)	Received	31-03-2027				
73	TRANSITION ENERGY SERVICES PRIVATE LIMITED						
74	Transition Green Energy Private Limited						
75	Transition Sustainable Energy Services Private Limited						



उत्तरक्षेत्रीय विद्युत समिति
NORTHERN REGIONAL POWER COMMITTEE

**Procedure for Approval of Protection
Settings in Northern Region**

(In reference to regulation 14 of IEGC 2023)

Version: 1.0

(Approved in 75th NRPC meeting held on 28.08.2024)

August, 2024

A. Procedure in case of new element charging

1. ISTS users shall submit the protection settings to NRPC and NRLDC for every new element to be commissioned one month in advance through mail.
In case of intrastate elements, users shall submit the protection settings to NRPC and concerned SLDC for every new element to be commissioned one month in advance through mail.
2. NRLDC based on the above information and the First Time Charging (FTC) request by user through Outage Management System (OMS) portal of NRLDC, shall allow integration of new element in the system as per NRLDC FTC procedure with the prevailing practice to avoid any delay in charging of the new element. The settings shall be treated as provisional arrangement till approval in PSC (Protection Sub-Committee).
In case of intrastate elements, SLDC shall allow integration of new element in the system. This shall be treated as provisional arrangement till approval in PSC.
3. NRLDC/SLDCs may ask any other relevant data/information from concerned utilities during scrutiny of settings.
4. Users will be responsible for any revision in settings of the existing element required due to charging of new element. The settings shall be treated as provisional arrangement.
5. The concerned utility shall put up the agenda for getting final approval in next PSC.
6. NR PSC will review and approve the final settings based on the inputs submitted by the utility. In case of any change required in final protection settings of the new element than the provisional one, as decided by the committee, the same shall be implemented within 7 days by the concerned utility.
7. Utility shall intimate to NRPC Secretariat and NRLDC/SLDC (as applicable) within fortnight after implementation of settings for record in regional protection settings database.

B. Procedure in case of revision of settings of any existing element (without any changes in network configuration):

1. Any change in the existing protection settings shall be carried out only after prior approval from PSC Forum of NRPC.
2. The concerned utility (both ISTS and intrastate) shall put up an agenda regarding any changes required in existing protection settings due to integration of new element in the existing system or otherwise, in PSC.
3. Utility shall intimate to NRLDC/SLDC (as applicable) and NRPC about the changes implemented in protection system or protection settings within 15 days of such changes.



उत्तर क्षेत्रीय विद्युत समिति

NORTHERN REGIONAL POWER COMMITTEE



Protection Philosophy of Northern Region

(Developed in compliance of IEGC 2023)

Version: 3.0

(Approved in 53rd PSC meeting held on 22.10.2024)

October 2024

Contents

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1. Transmission line & Cable

S.N.	Protection Setting/ Protocol	Mandated Setting for transmission lines
1	Protection Scheme	220kV and above: Independent Main-I and Main-II protection (of different make OR different type/different algorithm) of non-switched numerical type is to be provided with carrier aided scheme. 132kV and below: One non-switched distance protection scheme and, directional over current and earth fault relays, should be provided as back up.
2	Distance Protection Zone-1	Reach: 80% of the protected line; 110% of the protected line (In case of radial lines) TimeSetting: Instantaneous.
3	Distance Protection Zone-2	Reach: Single Circuit Line: 120% of length of principle line section. Double circuit line: 150% coverage of line to take care of underreaching due to mutual coupling effect. Time setting: i. 0.35 second (considering LBB time of 200mSec, CB open time of 60ms, resetting time of 30ms and safety margin of 60ms) ii. 0.5-0.6 second (For a long line followed by a short line)

4	Distance Protection Zone-3	Reach: Zone-3 should overreach the remote terminal of the longest adjacent line by an acceptable margin (typically 20% of highest impedance seen) for all fault conditions. Time Setting: 800-1000 msec If zone-3 reach transcends to other voltage level, time may be taken upto 1.5 sec.
5	Distance Protection Zone- 4	The Zone-4 reverse reach must adequately cover expected levels of apparent bus bar fault resistance. Time may be coordinated accordingly. Where Bus Bar protection is not available, time setting: 160 msec.
6	Power Swing Blocking	Block tripping in all zones, all lines. Out of Step tripping to be applied on all inter-regional tie lines. Deblock time delay = 2s
7	Protection for broken conductor	Negative Sequence current to Positive Sequence current ratio more than 0.2 (i.e. $I_2/I_1 \geq 0.2$) Alarm Time delay: 3-20 sec. Tripping may be considered for radial lines to protect single phasing of transformers.
8	Switch on to fault (SOTF)	Switch on to fault (SOTF) function to be provided in distance relay to take care of line energization on fault.
9	VT fuse fail detection function	VT fuse fail detection function shall be correctly set to block the distance function operation on VT fuse failure.
10	Carrier Protection	To be applied on all 220kV and above lines with the only exception of radial feeders.

11	Back up Protection	1. On 220kV and above lines with 2 Main Protections: • Back up Earth Fault protections alone to be provided. • No Over current protection to be applied. 2. At 132kV and below lines with only one Main protection: • Back up protection by IDMT O/C and E/F to be applied.
12	Auto Reclosing with dead time.	AR shall be enabled for 220 kV and above lines for single pole trip and re-closing. Dead time = 1.0s. Reclaim time = 25.0s Auto-recloser shall be blocked for following: - faults in cables/composite - Breaker Fail Relay - Line Reactor Protections - O/V Protection - Received Direct Transfer trip signals - Busbar Protection - Zone 2/3 of Distance Protection - Circuit Breaker Problems. CB Pole discrepancy relay time:1.5 sec; for tiebreaker: 2.5 sec

13	Line Differential	For cables and composite lines, line differential protection with built in distance back up shall be applied as Main-I protection and distance relay as Main-II protection. For very short line (less than 10 km), line differential protection with distance protection as backup (built- in Main relay or standalone) shall be provided mandatorily as Main-I and Main-II. Differential protection may be done using dark fiber (preferably), or using bandwidth.
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14	Over Voltage Protection	FOR 765kV LINES/CABLE: Low set stage (Stage-I): 106% - 109% (typically 108%) with a time delay of 5 seconds. High set stage (Stage-II): 140% - 150% with a time delay of 100 milliseconds. 400kV LINES/CABLE: Low set stage (Stage-I): 110% - 112% (typically 110%) with a time delay of 5 seconds. High set stage (Stage-II): 140% - 150% with a time delay of 100 milliseconds. FOR 220 KV LINES: High set stage: 140% - 150% with a timedelay of 100 milliseconds. (OPTIONAL) FOR 220 KV CABLE/COMPOSITE: Low set stage (Stage-I): 110% - 112% (typically 110%) with a time delay of 5 seconds. High set stage (Stage-II): 140% - 150% with a time delay of 100 milliseconds. Drop-off to pick-up ratio of overvoltage relay: better than 97% Grading: Voltage as well as time grading may be done for multi circuit lines/cable.
15	Resistive reach setting to prevent load point encroachment	Following criteria may be considered for deciding load point encroachment: Maximum load current (I_{max}) may be considered as 1.5 times the thermal rating of the line or 1.5 times the associated bay equipment current

		rating (the minimum of the bay equipment individual rating) whichever is lower. (Caution: The rating considered is approximately 15minutes rating of the transmission facility). • Minimum voltage (V_{min}) to be considered as 0.85pu (85%).
16	Direct Inter-trip	To be sent on operation of following: - Overvoltage Protection - LBB Protection - Busbar Protection - Reactor Protection - Manual Trip (400 kV and above) - Cable Fault (in composite lines)
17	Permissive Inter-trip	To be sent on operation of Distance Protection

2. Series Compensated lines

1	Lines with Series and other compensations in the vicinity of Substation	- Zone-1:FSC end: 60% of the protected line. Time: Instantaneous; Remoted end: 60% of the protected line with 100ms-time delay. POR Communication scheme logic is modified such that relay trips instantaneously in Zone-1 on carrier receive. - Zone-2: 120 % of uncompensated line impedance for single circuit line. For Double circuit line, settings may be decided on basis of dynamic study in view of zero sequence mutual coupling. - Phase locked voltage memory is used to cope with the voltage inversion. Alternatively, an intentional time delay may be applied to overcome directionality problems related to voltage inversion. - over-voltage stage-I setting for series compensated double circuit lines may be kept higher at 113%.
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3. Busbar protection

1	Busbar protection	To be applied on all 220kV and above sub stations with the only exception of 220kV radial fed bus bars.
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4. Local Breaker Back-up

1	Local Breaker Backup (LBB)	For 220 kV and above level substations as well as generating stations switchyards, LBB shall be provided for each circuit breaker. LBB Current sensor $I > 20\% I_n$ LBB time delay = 200ms In case of variation in CT ratio, setting may be done accordingly.
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5. Power Transformer

5.1 Differential Protection

1	Id min (sensitivity) i.e. multiple of trans. HV side rated current	Default: 0.2 pu Or If tap range is -X% to +Y%, then (X+Y)% may be kept as setting.
2	First Slope	0 - 10%. In case of differential relay with only two slopes, this slope is considered as zero.
3	Second Slope	20% to 40%
4	Third Slope	60% to 80%
5	Unrestrained operation level	Unrestrained differential current $\leq 1/(\%$ impedance at nominal tap)
6	Max. ratio of 2nd harm. to fundamental harm dif. curr. in %	I_2/I_1 Ratio = 10 - 15%
7	Max. ratio of 5th harm. to fundamental harm dif. curr. in %	I_5/I_1 Ratio = 25%
8	Second and fifth harmonics restrain feature	Enabled
9	Cross block feature	Enabled

5.2 Restricted earth fault (REF) protection

1	Pick up current (IREF)	10 – 15 % of Full load current (IFL).
2	Stabilizing resistor (RSTAB)	stabilizing resistor (RSTAB) is obtained by dividing stabilizing voltage (VSTAB) by pick-up current. Stabilizing voltage $VSTAB = IF \times (R_{CT} + 2RL)$ $RSTAB = (VSTAB / IREF) \times k$ Where: IF = Maximum through fault current, RCT = CT resistance, RL = CT circuit lead resistance, k = Multiplying factor (1-1.5)

5.3 Over Current Protection

1	Scheme	To be implemented on both sides of ICT
2	Low set Directional	Pick up: 110-150% of full load current Characteristics: IDMT Co-ordination: to be coordinated with distance relay zone 3 settings of outgoing feeders.
3	High Set Non-Directional	Pick Up: 100-110% of the through fault level of the transformer Characteristics: DT; 0 to 50 msec For IV side of 220 kV transformer only Pick Up: 70-100% of the through fault level of the transformer Characteristics: DT; 100 to 150 msec

5.4 Earth Fault Protection

1	Scheme	To be implemented on both sides of ICT
2	Low set Directional	Pickup: 20-80% of rated full load current Characteristics: IDMT Co-ordination: to be coordinated with earth fault relay setting of outgoing feeders.
3	High Set Non-Directional	Pick Up: 100-110% of the through fault level of the transformer Characteristics: DT; 0 to 50 msec For IV side of 220 kV transformer only Pick Up: 70-100% of the through fault level of the transformer Characteristics: DT; 100 to 150 msec

5.5 Overexcitation protection:

In case of non-availability capability curve by OEM, Shall be provided on both HV and LV sides as below:

U/F %	Time set (s)
110	9000
118	90
126	49.5
134	18
142	4
150	1

***Over excitation setting curve should be as per capability curve provided by OEM. The setting should be well below capability curve and continuous operating limit. However, it must be ensured that Over excitation setting provided by OEM are not be over-sensitive.

6. Shunt Reactor protection

6.1 Differential Protection

1	Id min (sensitivity)	Default: 0.2 pu
2	First Slope	0 - 10%. In case of differential relay with only two slopes, this slope is considered as zero.
3	Second Slope	20% to 40%
4	Third Slope	60% to 80%
5	Unrestrained operation level	2 pu
6	Max. ratio of 2nd harm. to fundamental harm dif. curr. in %	I2/I1Ratio = 15%
7	Max. ratio of 5th harm. to fundamental harm dif. curr. in %	I5/I1Ratio = 25%
8	Second and fifth harmonics restrain feature	Enabled
9	Cross block feature	Enabled

6.2 Impedance/ Zone protection

1	Setting	60% of reactor impedance
2	Time setting	1.2 sec

6.3 Phase overcurrent

1	DT	setting of 6-10 times rated current with a time delay of 0.1s
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Voltage Oscillation in Northern Region RE complex in May'2025

All the events of oscillations occurred in the month of May'2025 have been analysed, antecedent conditions and Amplitude & Frequency of oscillation have also been studied, summary is given below **Table-1**.

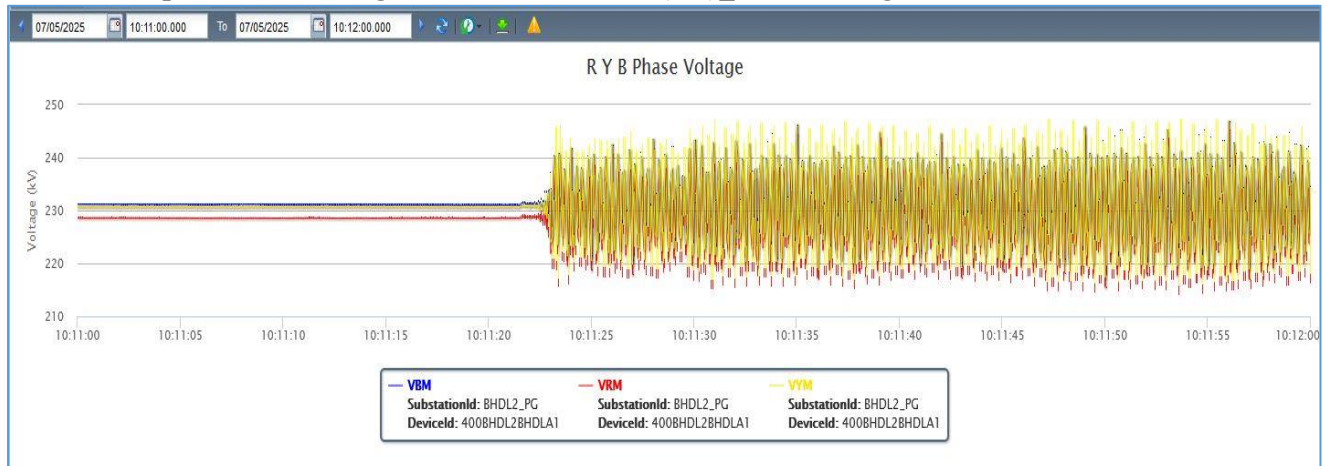
Sl. No.	Oscillation event in NR RE complex		Antecedent conditions			Oscillation Details		Major Tr. Line outage
	Event date (dd/mm/yyyy)	Event Time (hh:mm:ss)	ISGS Solar Generation (MW)	Total Wind generation (MW)	Bus Voltage at 400kV Bhadla-II (PG)	Amplitude of Oscillation (kV) (Peak-to-Peak) at 400kV bus	Frequency of Oscillation (Hz)	
1	07.05.2025	10:11:22	16704	26	397	52	3.5-4 Hz	400 kV Jaisalmer (RS) -Barmer (RS) D/C line. 400 kV Barmer - Bhinmal (RS) D/C line. 400 KV BHADLA-JODHPUR (RS) line. 400 KV BHADLA-MERTA (RS) line. 400 KV Akal-Kankani (RS) line.
2	10.05.2025	10:04:20	16701	10	401	32	3.5-4 Hz	400 kV Jaisalmer (RS) -Barmer (RS) D/C line. 400 kV Barmer - Bhinmal (RS) D/C line. 400 KV Akal-Kankani (RS) line.
3	10.05.2025	10:22:20	16737	10	401	20	3.5-4 Hz	400 kV Jaisalmer (RS) -Barmer (RS) D/C line. 400 kV Barmer - Bhinmal (RS) D/C line. 400 KV Akal-Kankani (RS) line.
4	11.05.2025	10:20:22	16580	154	402	27	3.5-4 Hz	400 kV Jaisalmer (RS) -Barmer (RS) D/C line. 400 kV Barmer - Bhinmal (RS) D/C line. 400 KV Akal-Kankani (RS) line.
5	13.05.2025	14:34:48	17412	1670	402	30	3.5-4 Hz	400 kV Jaisalmer (RS) -Barmer (RS) D/C line. 400 kV Barmer - Bhinmal (RS) D/C line.
6	14.05.2025	10:21:00	17728	1456	398	35	3.5-4 Hz	400 kV Jaisalmer (RS) -Barmer (RS) D/C line. 400 kV Barmer - Bhinmal (RS) D/C line.
7	17.05.2025	10:21:08	17843	1667	399	26	3.5-4 Hz	400 kV Jaisalmer (RS) -Barmer (RS) D/C line. 400 kV Barmer - Bhinmal (RS) D/C line.

Details of all the above-mentioned events, Voltage plot at 400kV Bhadla-II (PG) bus along with ISTS connected Solar generation and Total Wind generation is given below;

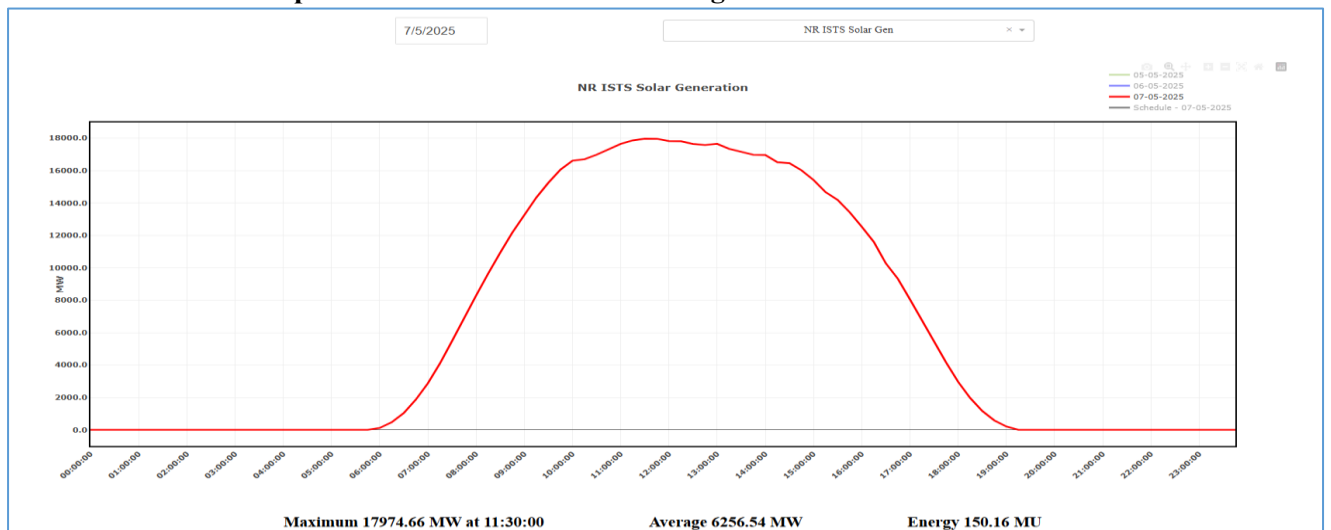
On 07.05.2025

On 07.05.2025, Oscillation occurred at 10:11:22hrs, Peak-Peak Amplitude of Oscillation was 52kV and frequency was 3.5 Hz. 7 nos. of Rajasthan Intra-state line were out as mentioned in Table-1, Rajasthan Total Intra-state RE was restricted to 5000 MW, Over-injection was observed in Rajasthan Intra-state RE generation.

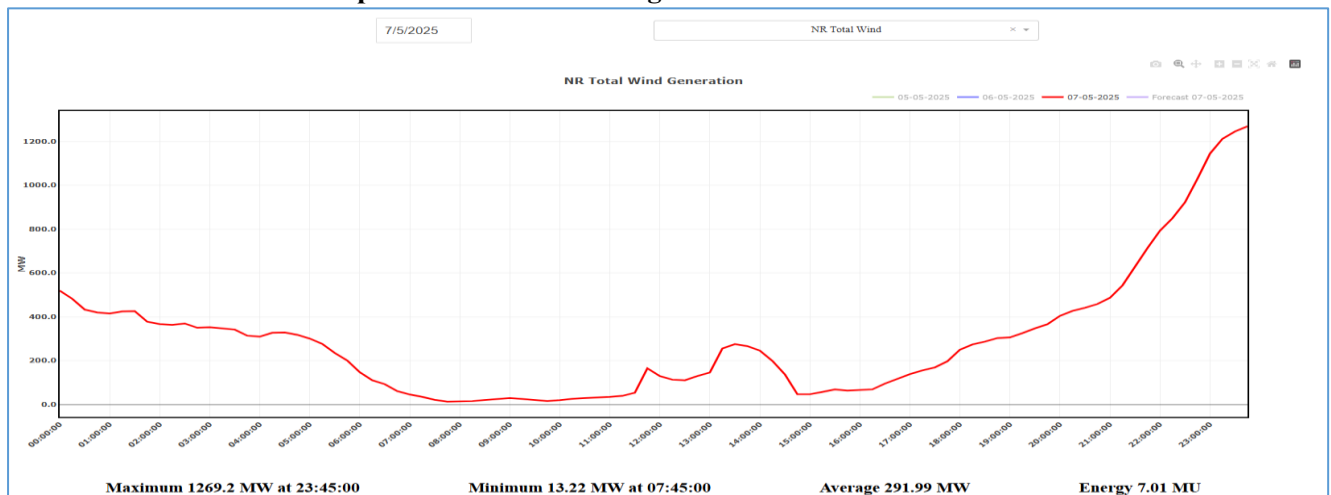
PMU plot of Bus Voltage at 400kV Bhadla-II (PG)_07.05.2025 @10:11:00-10:12:00



SCADA plot of NR ISTS connected Solar generation for 07.05.2025



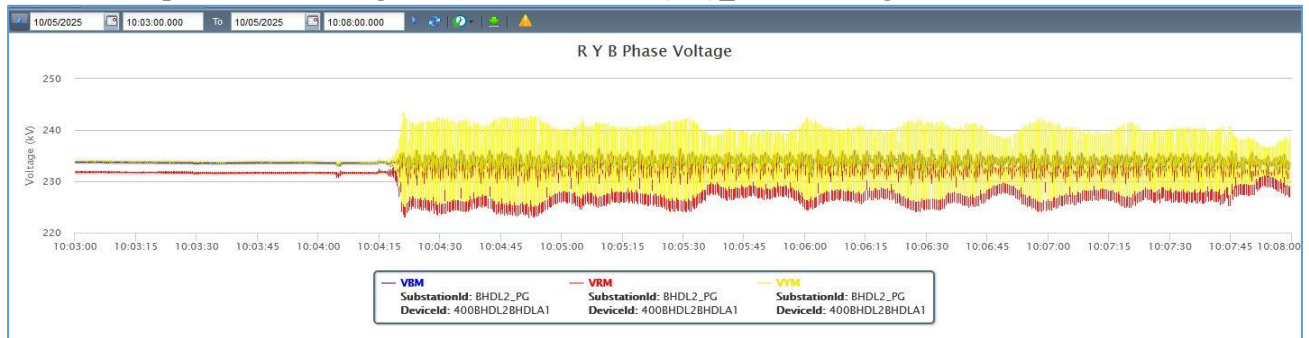
SCADA plot of NR Total Wind generation for 07.05.2025



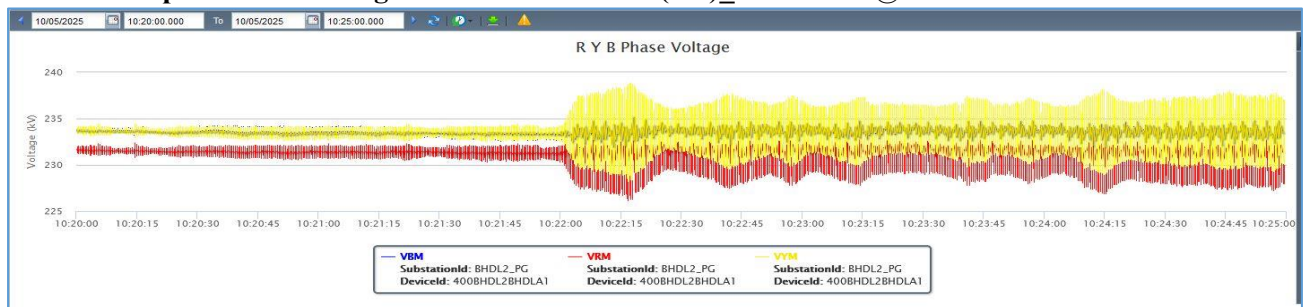
On 10.05.2025

On 10.05.2025, O Oscillation occurred at 10:04:20hrs and 10:22:20hrs, Peak-Peak Amplitude of Oscillation was 32kV and 20kV respectively and frequency was 3.5 Hz. 5 nos. of Rajasthan Intra-state line were out as mentioned in Table-1, Rajasthan Total Intra-state RE was restricted to 5600 MW, Over-injection was observed in Rajasthan Intra-state RE generation.

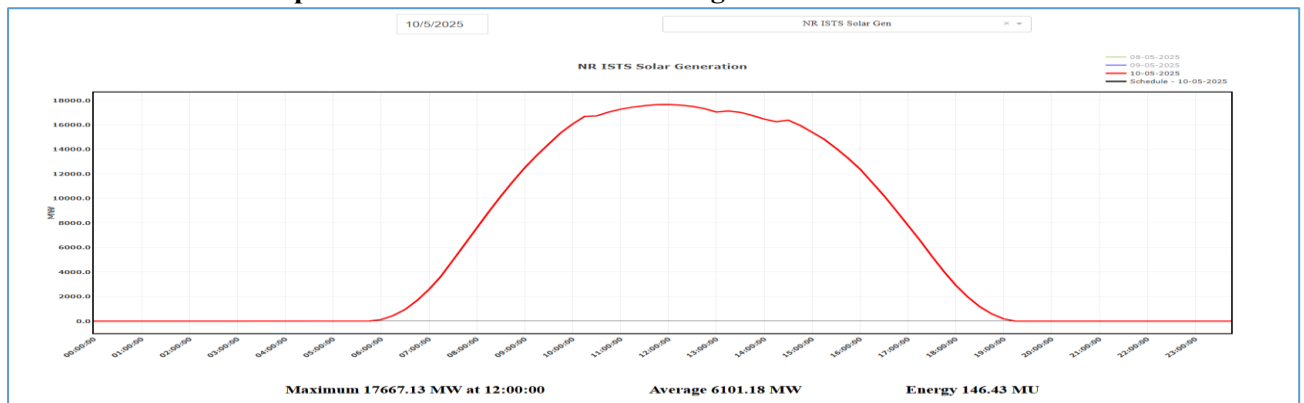
PMU plot of Bus Voltage at 400kV Bhadla-II (PG)_10.05.2025 @10:03:00-10:08:00



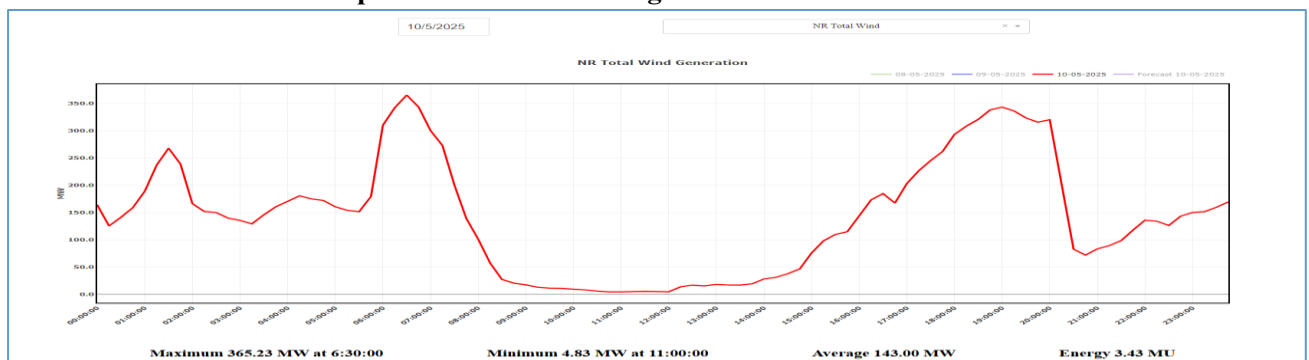
PMU plot of Bus Voltage at 400kV Bhadla-II (PG)_10.05.2025 @10:20:00-10:25:00



SCADA plot of NR ISTS connected Solar generation for 10.05.2025



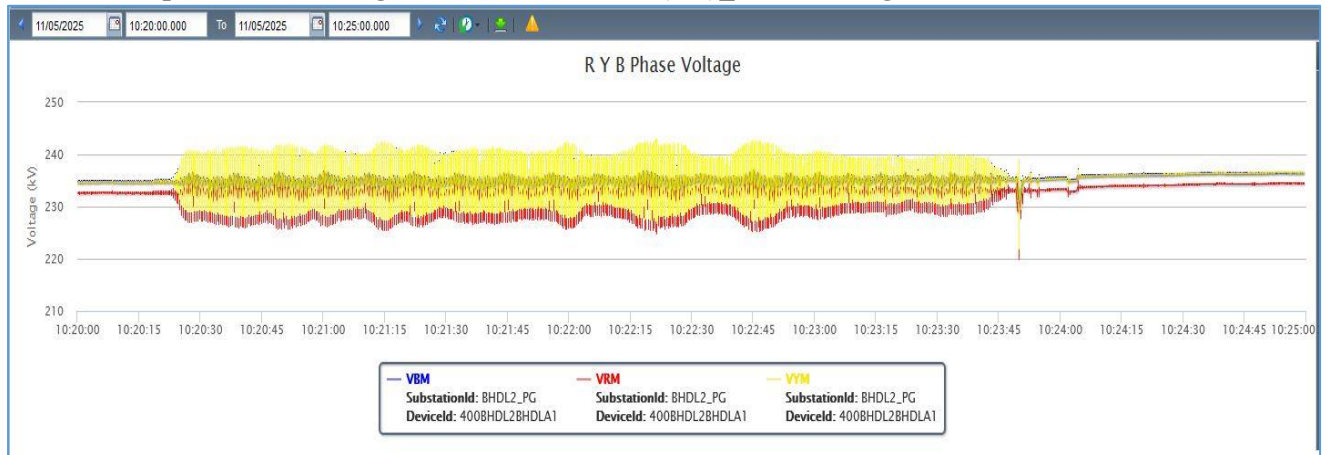
SCADA plot of NR Total Wind generation for 10.05.2025



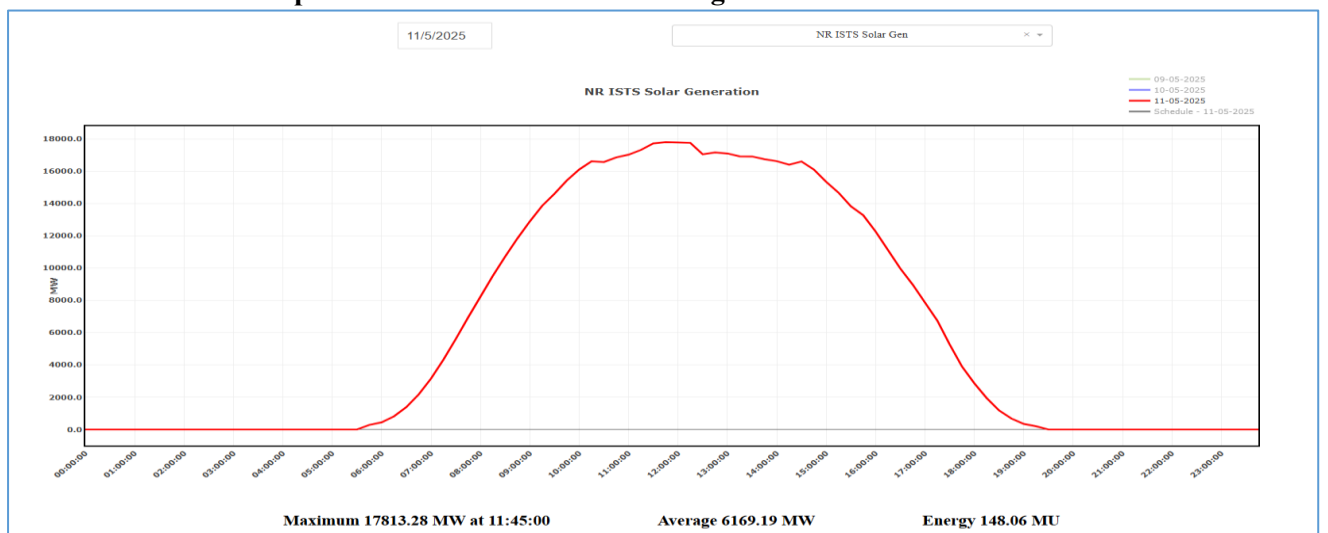
On 11.05.2025

On 11.05.2025, Oscillation occurred at 10:20:22hrs, Peak-Peak Amplitude of Oscillation was 27kV and frequency was 3.5 Hz. 5 nos. of Rajasthan Intra-state line were out as mentioned in Table-1, Rajasthan Total Intra-state RE was restricted to 5600 MW, Over-injection was observed in Rajasthan Intra-state RE generation.

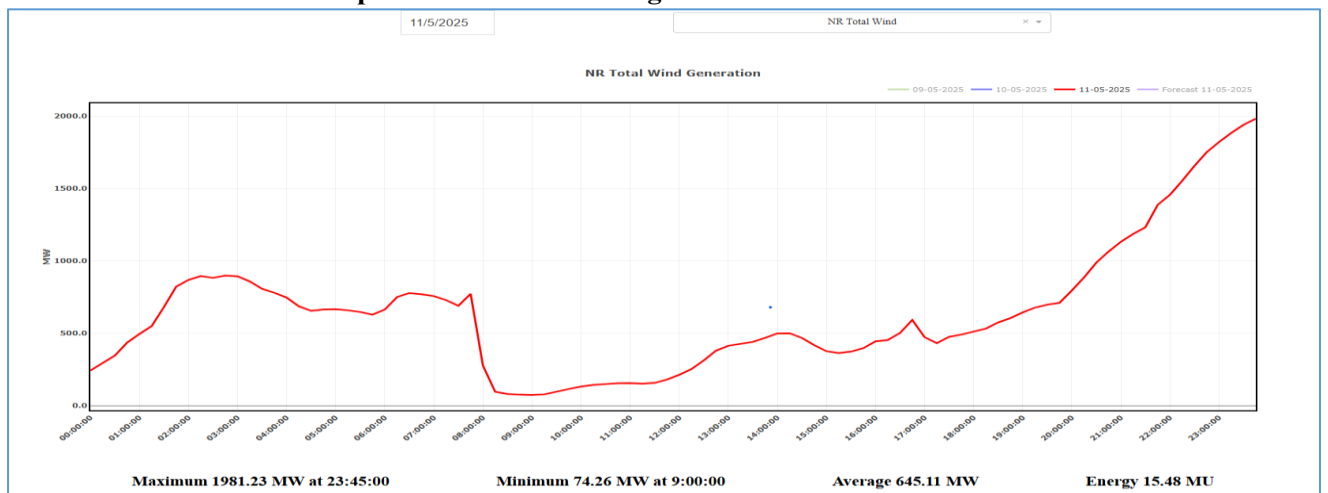
PMU plot of Bus Voltage at 400kV Bhadla-II (PG)_11.05.2025 @10:20:00-10:25:00



SCADA plot of NR ISTS connected Solar generation for 11.05.2025



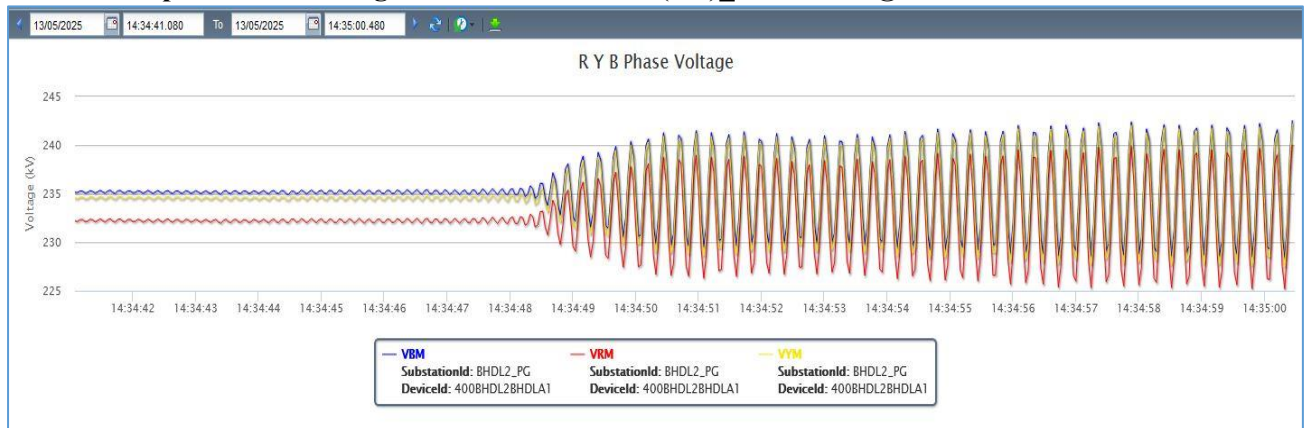
SCADA plot of NR Total Wind generation for 10.05.2025



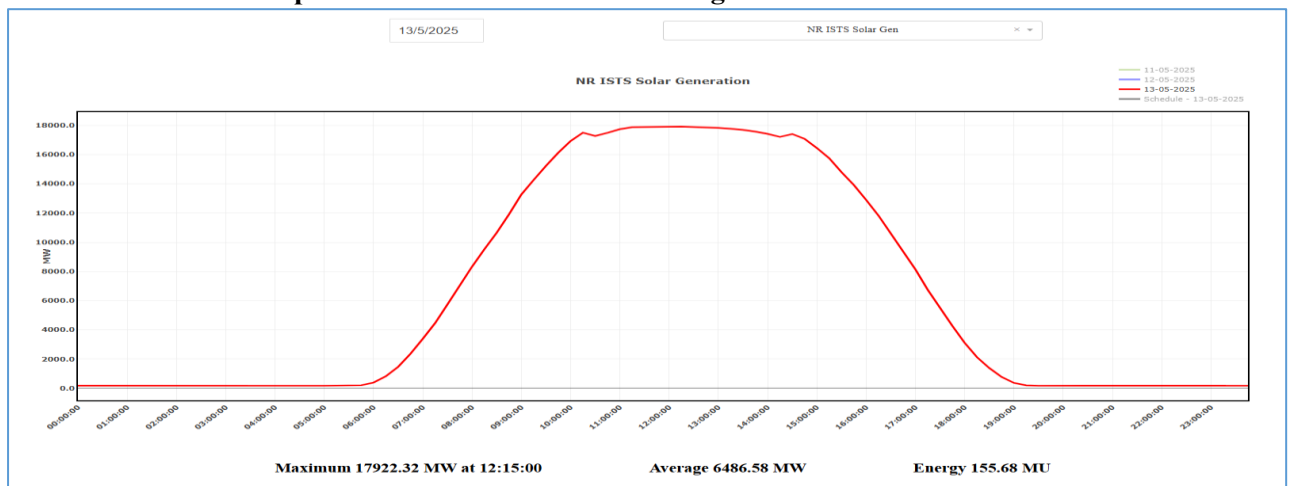
On 13.05.2025

On 13.05.2025, Oscillation occurred at 14:34:48hrs, Peak-Peak Amplitude of Oscillation was 30kV, and frequency was 3.5 Hz. 4 nos. of Rajasthan Intra-state line were out as mentioned in Table-1, Rajasthan Total Intra-state RE was restricted to 6000 MW, Rajasthan Wind generation was on higher side, ~1700MW, significant MVar drawl was there by Rajasthan Intra-state Wind plants. Voltage at 400kV Bhadla-II (PG) bus was >400kV (~402kV) but oscillation occurred.

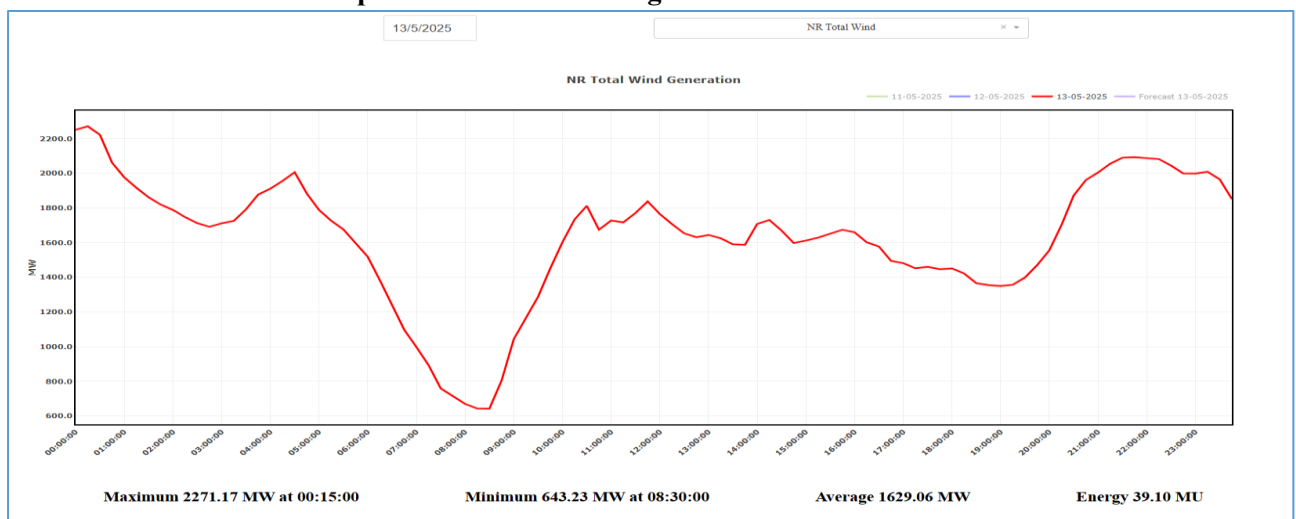
PMU plot of Bus Voltage at 400kV Bhadla-II (PG)_13.05.2025 @14:34:40-14:35:00



SCADA plot of NR ISTS connected Solar generation for 11.05.2025



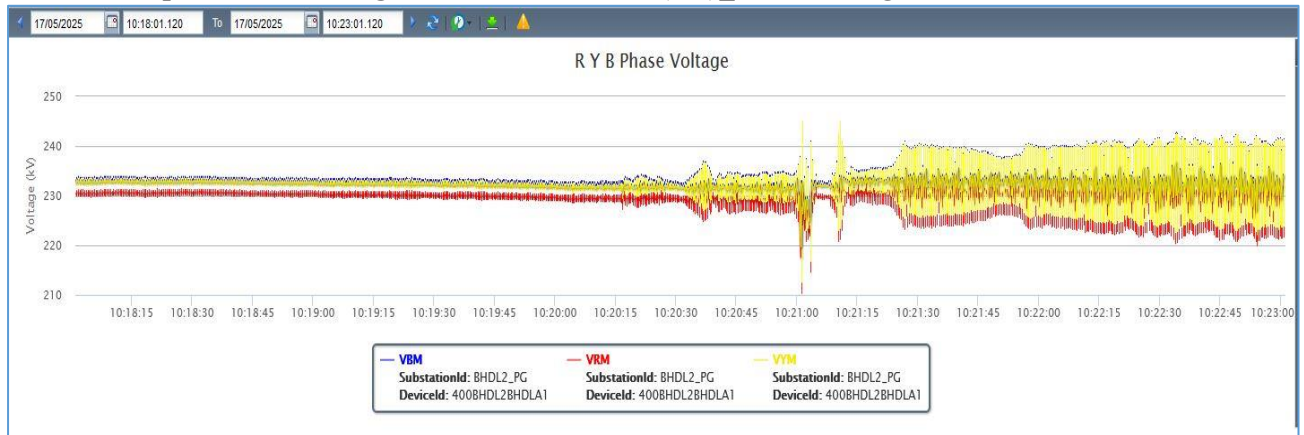
SCADA plot of NR Total Wind generation for 10.05.2025



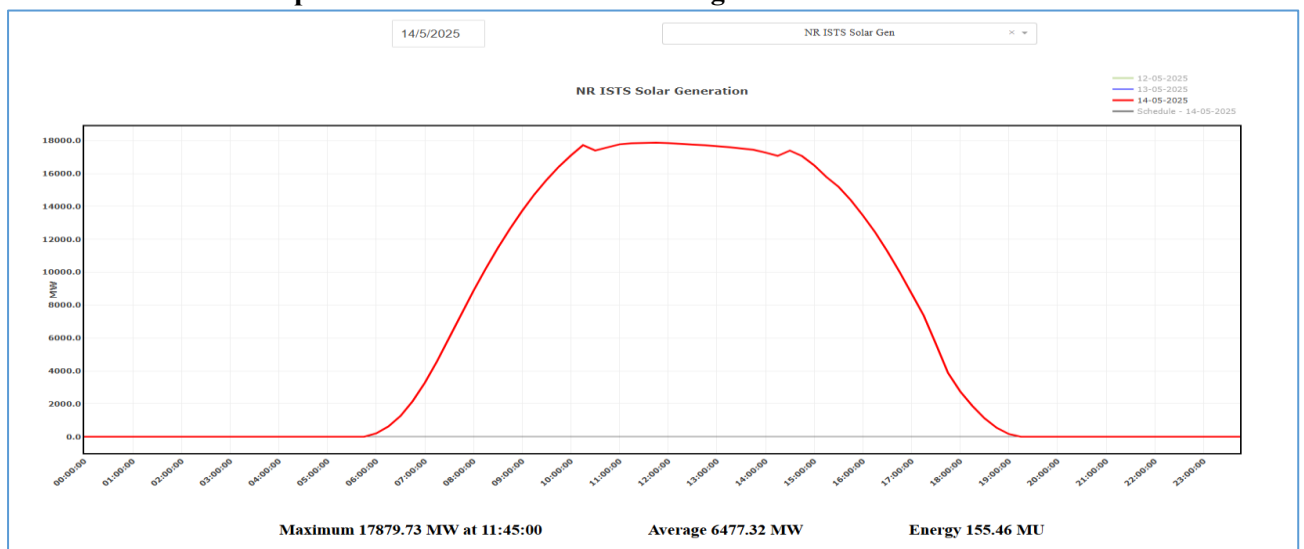
On 14.05.2025

On 14.05.2025, Oscillation occurred at 10:21:00hrs, Peak-Peak Amplitude of Oscillation was 35kV and frequency was 3.5 Hz. 4 nos. of Rajasthan Intra-state line were out as mentioned in Table-1, Rajasthan Total Intra-state RE was restricted to 6000 MW, Over-injection was observed in Rajasthan Intra-state RE generation.

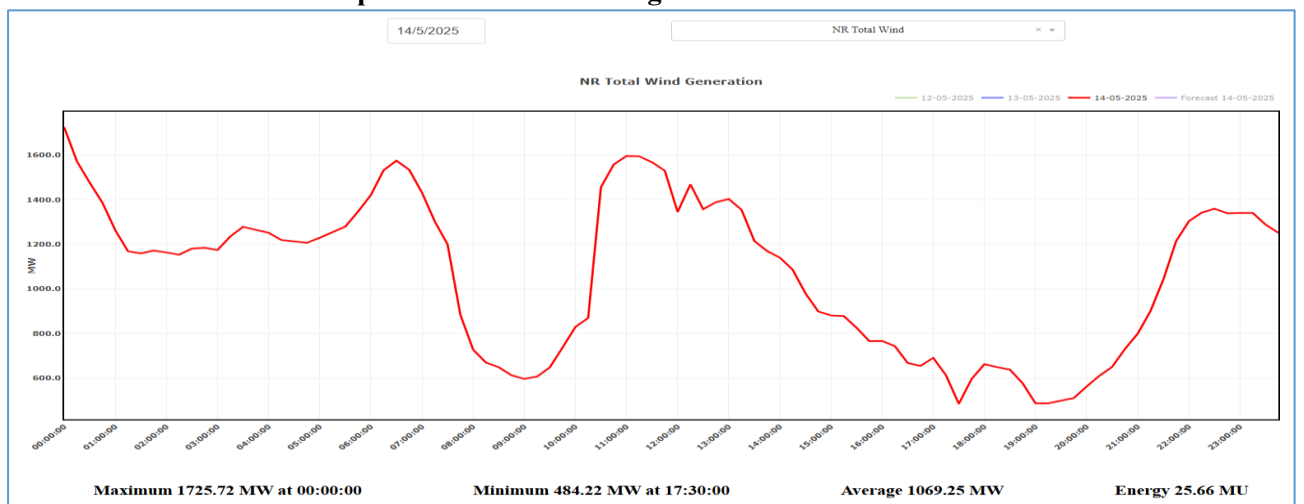
PMU plot of Bus Voltage at 400kV Bhadla-II (PG)_14.05.2025 @10:18:00-10:23:00



SCADA plot of NR ISTS connected Solar generation for 14.05.2025



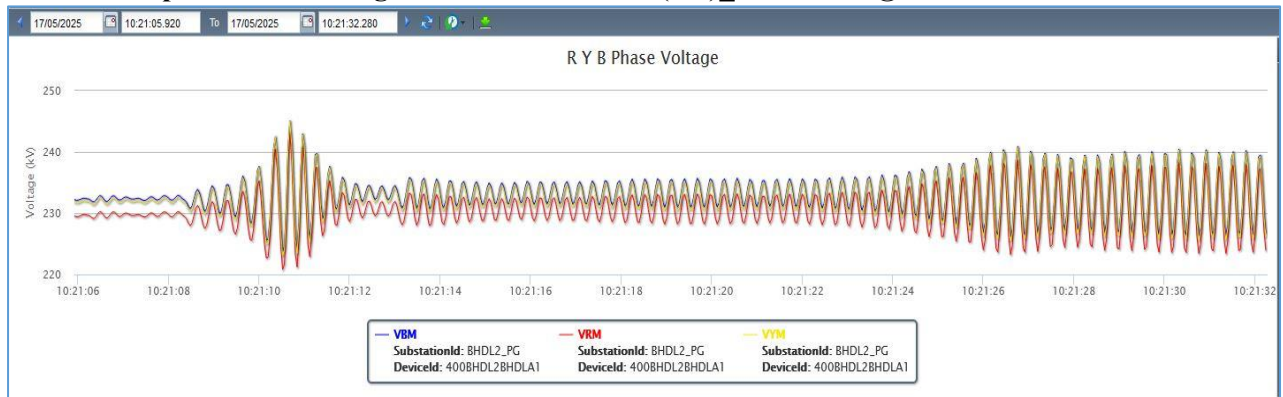
SCADA plot of NR Total Wind generation for 14.05.2025



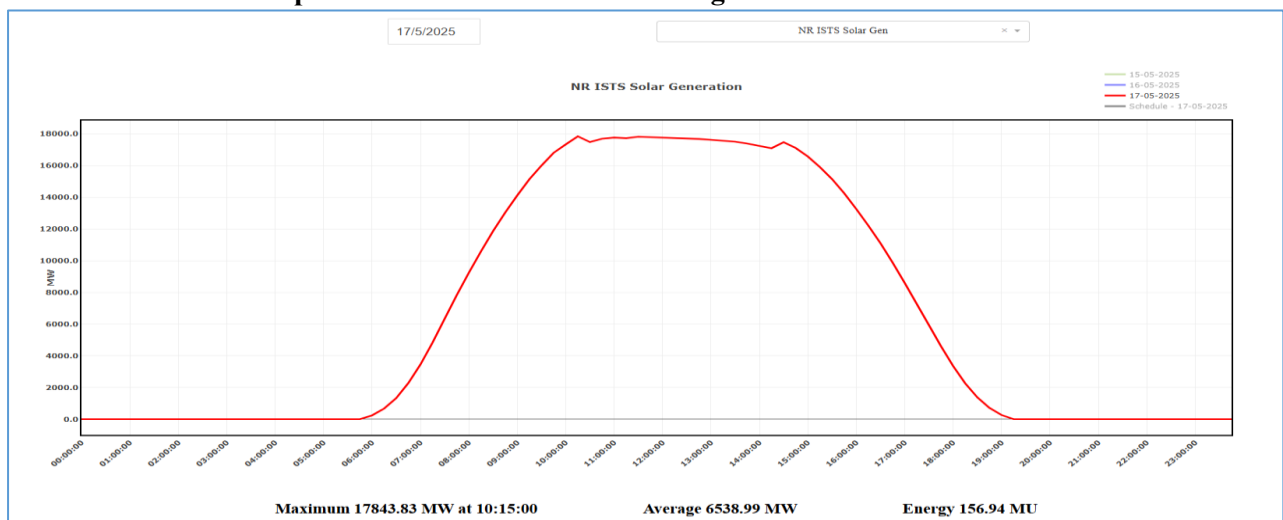
On 17.05.2025

On 17.05.2025, Oscillation occurred at 10:21:08hrs, Peak-Peak Amplitude of Oscillation was 26kV, and frequency was 3.5 Hz. 4 nos. of Rajasthan Intra-state line were out as mentioned in Table-1, Rajasthan Total Intra-state RE was restricted to 6000 MW, Over-injection was observed in Rajasthan Intra-state RE generation. Rajasthan Wind generation was on higher side, ~1700MW, significant MVar drawl was there by Rajasthan Intra-state Wind plants.

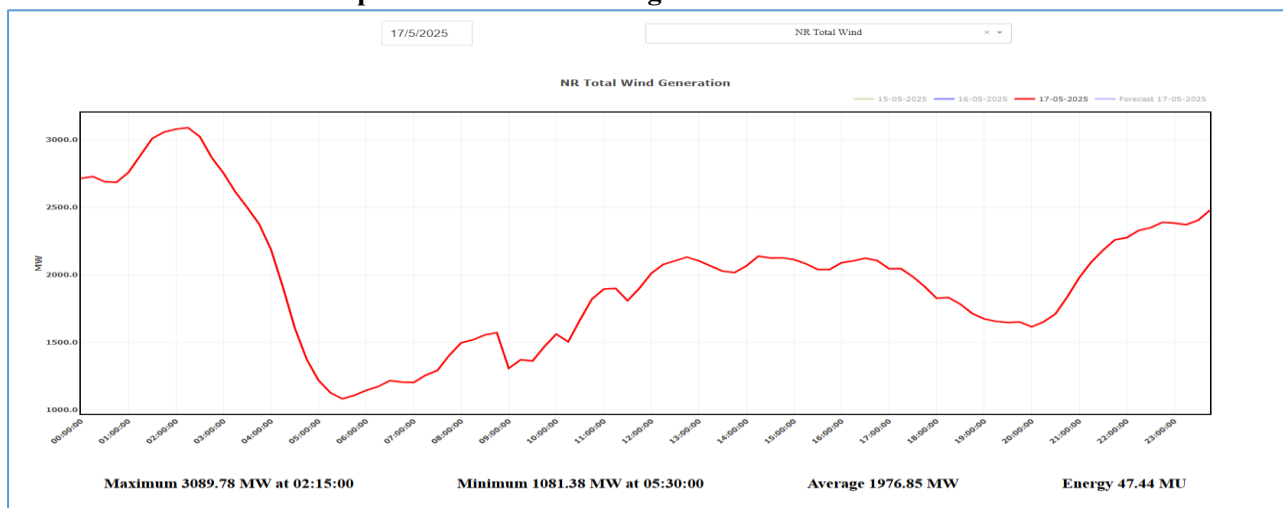
PMU plot of Bus Voltage at 400kV Bhadla-II (PG)_17.05.2025 @10:21:06-10:21:32



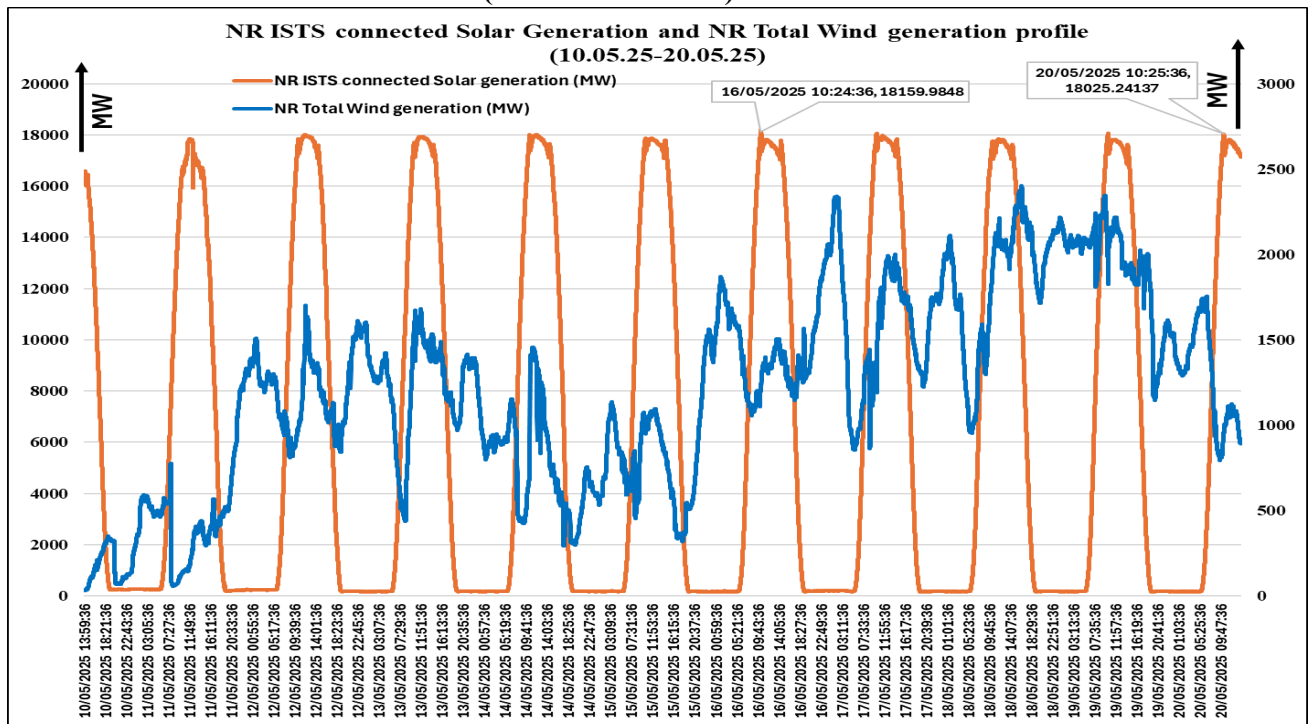
SCADA plot of NR ISTS connected Solar generation for 14.05.2025



SCADA plot of NR Total Wind generation for 17.05.2025



NR ISTS connected Solar Generation and NR Total Wind generation profile (10.05.25 20.05.25)



Observations and Inference:

- 1) In May'2025, 7 nos. of Oscillation events occurred. Out of 7, 6 nos. of Oscillation events occurred b/w 10:00-10:30hrs and 1 no. of Oscillation event occurred b/w 14:30-15:00hrs.
- 2) It has been observed that despite negligible total Wind generation (<200MW) on 07.05.25, 10.05.25 and 11.05.25, Oscillations were observed. In 4 Instances of oscillation from 07.05.25-11.05.25, Voltage at 400kV bus was >400kV in 3 instances. Major factor of oscillation was observed as the Low SCR of the RE complex due to Outage of Multiple lines.
- 3) Maximum amplitude of oscillation in May'25 was observed on 07.05.25 having amplitude of oscillation (Peak-to-Peak) at 400kV Bhadla-II (PG) bus was 52kV (~90kV in 765kV bus). Oscillation died out only after taking STATCOMs in Manual Fixed-Q mode.
- 4) 7 nos. of Rajasthan Intra-state line were out on 07.05.2025 as mentioned in Table-1. Out of 7 nos., 2 nos. of line (400 KV BHADLA-JODHPUR (RS) line & 400 KV BHADLA-MERTA (RS) line) revived on 09.05.2025.
- 5) Oscillation of comparatively lesser amplitude having amplitude of oscillation (Peak-to-Peak) at 400kV Bhadla-II (PG) bus was 30kV (~60kV in 765kV bus) were observed in 3 instances from 10.05.25 to 11.05.25. On 11.05.25, 5 nos. of Rajasthan Intra-state line were out as mentioned in Table-1, 1 line i.e. 400 KV Akal-Kankani (RS) line revived on 12.05.2025.
- 6) On 13.05.25, 14.05.25 and 17.05.25 events of oscillation, Wind generation was on higher side (~1500-1700MW) coinciding with Solar ramping at the time of oscillation.

List of RE plants commissioned before 31st March'24 but not performed power quality filed testing

Sl. No.	Name of the plant	Capacity (MW)	Pooling station	Last capacity commissioned "Date (dd/mm/yyyy)"	Power quality field test report submitted	Last performed power quality filed testing	Remarks/violation observed
1	RENEW SOLAR POWER Pvt. Ltd. Bhadla	50	Bhadla (PG)	05-05-2019	NO		
2	AZURE POWER INDIA Pvt. Ltd., Bhadla	200	Bhadla (PG)	05-05-2019	NO		
3	SB ENERGY FOUR PRIVATE LIMITED, Bhadla	200	Bhadla (PG)	17-05-2019	NO		
4	Adani Renewable Energy (RJ) limited Rawara	200	Bhadla (PG)	23-08-2019	YES	14.07.2024	No Violation
5	Azure Power Thirty-Four Pvt. Ltd.	130	Bhadla (PG)	09-09-2019	NO		
6	RENEW SOLAR POWER Pvt. Ltd. Bikaner	250	Bikaner	28-10-2019	NO		
7	ACME Chittorgarh Solar Energy Pvt Ltd	250	Bhadla (PG)	03-01-2020	YES	30.08.2024	1. Total Demand Distortion (TDD) For short Time (10 minute) values 95th percentile: Out of Limit Individual 2. Current Distortion for short time (10 minute) value 99th percentile: 5th Harmonic is out of Limit 3. Individual Current Distortion for short time (10 minute) value 95th percentile: 5th, 7th Harmonics are Out of Limit
8	Clean Solar Power (Bhadla) Pvt. Ltd	300	Bhadla (PG)	29-02-2020	NO		
9	Adani Solar Energy Four Private Limited	50	Bhadla (PG)	19-04-2020	NO		
10	Adani Solar Energy Jodhpur Two Limited, Rawara	50	Bhadla (PG)	13-09-2020	NO		
11	Azure Power Forty-Three Pvt. Ltd._RSS	300	Bikaner	10-02-2021	NO		
12	SB Energy Six Private Limited, Bhadla	300	Bhadla (PG)	18-06-2021	NO		
13	Eden Renewable Cite Private Limited	300	Fatehgarh-II(PG)	14-08-2021	YES	24.07.2024	Individual Voltage Distortion For short time (10 minutes) value 95th percentile: 5th Harmonic is Out of Limit Long Term Flickers (plt) at 220 kV interconnecting point are Out of limit

14	Mahindra Renewable Private Limited	250	Bhadla (PG)	20-08-2021	NO		
15	Tata Power Renewable Energy Ltd. (TPREL)	300	Bhadla (PG)	24-08-2021	NO		
16	Renew Sun Waves Private Limited	300	Fatehgarh-II(PG)	08-10-2021	NO		
17	Renew Sun Bright (RSEJ4L)	300	Fatehgarh-II(PG)	18-11-2021	NO		
18	ReNew Solar Energy (Jharkhand Three) Private Limited	300	Fatehgarh-II(PG)	11-12-2021	NO		
19	ReNew Solar Urja Private Limited	300	Fatehgarh-II(PG)	20-12-2021	NO		
20	Azure Power Forty-Three Pvt. Ltd._PSS	300	Bikaner	01-01-2022	NO		
21	Ayaana Renewable Power One Pvt. Ltd.	300	Bikaner	02-01-2022	YES	25.02.2025	Flicker Measurement Long term Flicker (Plt) measurement values 95th percentile - All Phase values are Exceeding the Limits Short term Flicker (Pst) measurement values 99th percentile - All Phase values are Exceeding the Limits Long term Flicker (Plt) measurement values 99th percentile - All Phase values are Exceeding the Limits
22	Azure Power Forty-One Pvt limited	300	Bhadla (PG)	09-03-2022	NO		
23	Avaada Sunce energy Pvt limited	350	Bikaner	08-04-2022	YES	30.11.2024	No Violation
24	Clean Solar Power (Jodhpur) Pvt. Ltd.	250	Bhadla (PG)	23-04-2022	NO		
25	Avaada Sustainable RJ Pvt. Ltd.	300	Bikaner	12-05-2022	YES	30.11.2024	No Violation
26	Avaada RJHN_240MW	240	Bikaner	12-05-2022	YES	30.11.2024	No Violation
27	ACME Heergarh Powertech Pvt. Ltd	300	Bhadla-II(PG)	25-05-2022	YES	26.07.2024	No Violation
28	Adani Hybrid Energy Jaisalmer One Ltd.	390	Fatehgarh-II(PG)	27-05-2022	YES	02.07.2024	No Violation

29	ABC Renewable Pvt. Ltd	300	Bhadla-II(PG)	05-06-2022	YES	23.05.2023 (Exceeded 1 year)	1. Long term Flicker (Plt) measurement values 95th percentile-All phase values are Exceeding Limits 2. Long term Flicker (Plt) measurement values 99th percentile-R & B phase values are Exceeding Limits 3. Individual Current Harmonic distortion measurement for short time (10 Minute) values 99th percentile - All values are within limits. 4. Individual Current Harmonic distortion measurement for short time (10 Minute) values 95th percentile - All values are within limits, Except,5th, & 7th Harmonics 5. DC Current Injection, Percentage of Full Load rated current at POI - All phase values are Exceeding Limits
30	Mega Surya Urja Pvt. Ltd. (MSUPL)	250	Bhadla-II(PG)	25-06-2022	NO		
31	Tata Power Green Energy Ltd. (TPGEL)	225	Bikaner	02-08-2022	YES	14.07.2024	No Violation
32	Nedan Solar NTPC	296	Fatehgarh-I	05-08-2022	YES	04.06.2024 (Exceeded 1 year)	No Violation
33	Adani Hybrid Energy Jaisalmer Two Ltd.	300	Fatehgarh-II(PG)	29-09-2022	YES	05.06.2024 (Exceeded 1 year)	No Violation
34	Adani Hybrid Energy Jaisalmer Three Ltd.	300	Fatehgarh-II(PG)	29-09-2022	YES	05.06.2024 (Exceeded 1 year)	No Violation
35	Adani Hybrid Energy Jaisalmer Four Ltd.	700	Fatehgarh-I	07-10-2022	YES	27.05.2024 (Exceeded 1 year)	No Violation
36	Adani Solar Energy Jaisalmer One Pvt. Ltd.	450	Fatehgarh-II(PG)	23-10-2022	YES	04.08.2024	No Violation

37	Thar Surya Pvt. Ltd.	300	Bikaner	26-11-2022	YES	14.04.2024 (Exceeded 1 year)	Flicker Measurement 1 Short term percentile Flicker (Pst) measurement values 95th - All Phase values are exceeding the Limits 2 Long term percentile Flicker (Plt) measurement values 95th - All Phase values are exceeding the Limits 3 Short term percentile Flicker (Pst) measurement values 99th - All Phase values are exceeding the Limits 4 Long term percentile Flicker (Plt) measurement values 99th - All Phase values are exceeding the Limits For Current Circuit PQ Parameter Measurement Individual Current Harmonic distortion measurement for very short time (3second) values 99th percentile - All Values are Within Limits Expect 25th Harmonic R&Y phase on 4th day during Night Individual Current Harmonic distortion measurement for short time (10 Minute) values 99th percentile - All Values are Within Limits Expect 25th Harmonic R&Y phase Individual Current Harmonic distortion measurement for short time (10 Minute) values 95th percentile - All Values are Within Limits Expect 2nd Harmonics DC Current Injection - All the values are exceeding the limit
38	Avaada Sunrays Pvt. Ltd.	320	Bhadla-II(PG)	14-12-2022	NO		
39	NTPC Devikot Solar plant_240MW	240	Fatehgarh-II(PG)	15-12-2022	NO		
40	Azure Maple Pvt. Ltd.	300	Bhadla (PG)	30-03-2023	NO		
41	Renew Surya Ravi Pvt. Ltd.	300	Bikaner	31-03-2023	NO		
42	Tata Power Green Energy Ltd. (TPGEL)	110	Bikaner	29-05-2023	YES	14.07.2024	No Violation
43	NTPC Nokhra_300MW	300	Bhadla-II(PG)	30-06-2023	NO		
44	ADANI SOLAR ENERGY JAISALMER TWO PVT. LTD. (SBSR)	300	Bikaner	07-10-2023	YES	14.07.2024	No Violation
45	Grian Energy Private Limited	100	Bikaner-II	06-02-2024	YES	24.08.2024	No Violation
46	Amplus Ages Private Limited	100	Bhadla-II(PG)	08-02-2024	YES	10.09.2024	No Violation

47	ALTRA XERGI POWER PRIVATE LIMITED	380	Fatehgarh-III(PG)	09-02-2024	YES	24.07.2024	Total Harmonic Distortion in Voltage circuit (THD) for short time (10 minute) values 95th percentile - All values are within limits, Except Y Phase Individual Voltage Harmonic distortion measurement for very short time (3 second) values 99th percentile (7 days) - All values are within limits Except 5th (Y Phase) Harmonic Individual Voltage Harmonic distortion measurement for short time (10 Minutes) values 95th percentile - All values are within limits, Except 5th Harmonic. Long term Flicker (Plt) measurement values 95th percentile - All Phase values are exceeding the Limits Short term Flicker (Pst) measurement values 99th percentile - All Phase values are exceeding the Limits Long term Flicker (Plt) measurement values 99th percentile - All Phase values are exceeding the Limits
48	Adept Renewable Technologies Private Limited	110	Bikaner-II	03-03-2024	NO		
49	Transition Energy Services Private Limited	69	Bikaner-II	06-03-2024	NO		
50	TPSL 200MW TPTCL Banderwala	200	Bikaner-II	31-03-2024	NO		

Undertaking regarding installation of Filter (Deadline-30.06.2025)

Sl No.	RE Plant Name	Pooling Station	Connectivity approved quantum (MW)	Present I/C (MW)	Present Status
1	Ayana Renewable Power Three Pvt Ltd (ARPTPL)	Bikaner (PG)	300	300	Pending
2	Adani Solar Energy RJ Two Pvt. Ltd. (Phalodi)	Bhadla (PG)	150	150	Installed
3	Adani Solar Energy RJ Two Pvt. Ltd. (Devikot)	Fatehgarh-II (PG)	180	180	Installed
4	Adani Green Energy Twenty Four Ltd.		500	500	Installed
5	Rising Sun Energy-K Pvt. Ltd.	Bhadla-II (PG)	190	190	Installed
6	AMP Energy Green Six Pvt. Ltd.		100	100	Installed
7	AMP Energy Green Five Pvt. Ltd.		100	100	Installed
8	Adani Green Energy Twenty Five Ltd.		500	500	Installed
9	AMP Energy Green Four Pvt. Ltd.		100	100	Installed
10	Nokh Solar Power Plant NTPC Limited(NSPPNL)		735	490	Pending
11	Eden Renewable Alma Private Limited		300	100	Pending
12	Amplus Grian One Volt Pvt. Ltd.	Bikaner-II (PBTSL)	300	300	Installed
13	Serentica Renewables India Four Private Limited (SRIPL4)		180	168	Installed
	Serentica Renewables India Five Private Limited (SRIPL5)		220	176	

14	Juniper Green Cosmic Pvt. Ltd.		100	100	Installed
15	ACME Sikar Solar Private Limited		300	300	Pending
16	Khidrat Renewable Energy Private Limited		300	300	Apply Filter bank for FTC (In process)
17	Renew Surya Vihan Pvt. Ltd.	Fatehgarh-III	300	300	Pending
18	Renew Surya Ayaan Pvt. Ltd.		300	300	Pending
19	Renew Surya Roshni Pvt. Ltd.		380	380	Pending
20	XL Xergi Power Private Limited		400	400	Apply Filter bank for FTC (In process)
21	Neemba Solar Plant Renew Surya Vihaan Pvt Ltd		200	200	Pending
22	Renew Surya Jyoti Private Limited		210	210	Pending
23	ACME Deogarh Solar Power Pvt. Ltd.	Fatehgarh-I	300	300	Apply Filter bank for FTC (In process)
24	ACME Phalodi Solar Power Pvt. Ltd.		300	300	Apply Filter bank for FTC (In process)
25	ACME Raiser Solar Power Pvt. Ltd.		300	300	Apply Filter bank for FTC (In process)
26	ACME Dhaulpur Solar Power Pvt. Ltd.		300	300	Apply Filter bank for FTC (In process)
27	NTPC Anta Solar Plant	NTPC Anta	90	90	Pending
	Sub Total		7635	7134	

Out of **27** RE Plants in the list, **11** RE plants have installed the Filter bank, **6** are under process (applied FTC of filter bank) and **10** RE plants have not installed the filter bank (not even applied for FTC of filter bank).

RE Grid Event summary for January-May 2025

S.No.	Category of Grid Incident/ Disturbance (Grid-I to Grid-V)	Name of Elements (Tripped/Manually opened)	Affected Area	Owner/ Agency	Outage		Revival		Duration (h:mm)	Event (As reported)	Loss of generation / loss of load during the Grid Disturbance		Antecedent Generation/Load in the Regional Grid		Fault Clearance time (in ms)	Remarks
					Date	Time	Date	Time			Generation Loss(MW)	Load Loss (MW)	Antecedent Generation (MW)	Antecedent Load (MW)		
1	GD-1	1) 220 KV Bhadla_2 (PG)-RSDCL(PSS4)_SL_BHD2_PG (RSDCL) Ckt 2) 220 KV Nokhra_SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt 3) 220/33 KV 100 MVA ICT 1 at Nokhra_SL_BHD2 (NTPC) 4) 220/33 KV 100 MVA ICT 2 at Nokhra_SL_BHD2 (NTPC) 5) 220/33 KV 100 MVA ICT 3 at Nokhra_SL_BHD2 (NTPC)	Rajasthan	PGCIL, RSDCL, NTPC	15-Jan-25	13:13	15-Jan-25	14:36	01:23	i)Generation of 220kV Nokhra (IP) and 220kV RSDCL-4(IP) stations evacuate through 220 KV Nokhra_SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt and 220 KV Bhadla_2 (PG)-RSDCL(PSS4)_SL_BHD2_PG (RSDCL) Ckt respectively. ii)During antecedent condition, 220kV Nokhra (IP) and 220kV RSDCL-4(IP) were generating approx. 295 MW and 178 MW respectively (as per PMU). iii)As reported, at 13:13hrs, 220 KV Bhadla_2 (PG)-RSDCL(PSS4)_SL_BHD2_PG (RSDCL) Ckt tripped on R-N phase to earth fault with fault distance of 1.3km and fault current of 23.4kA from Bhadla2(PG) end. During inspection it was found that jumper snapped out at tower location no. 8. iv)During the same time, 220 KV Nokhra_SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt along with 220/33 KV 100 MVA ICT 1, 2 and 3 at Nokhra_SL_BHD2 (NTPC) also tripped. Line tripped from Nokhra(NTPC) end only (exact reason of tripping and nature of protection operated yet to be shared). v)Due to tripping of 220 KV Nokhra_SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt and 220 KV Bhadla_2 (PG)-RSDCL(PSS4)_SL_BHD2_PG (RSDCL) Ckt, 220kV Nokhra (IP) and 220kV RSDCL-4(IP) S/s lost their connectivity from grid and blackout occurred at 220kV Nokhra (IP) and 220kV RSDCL-4(IP) S/s. vi)As per PMU at 220kV Nokhra(NTPC), R-N phase to earth fault (voltage dipped upto 0.269 p.u.) is observed with fault clearing time of 80ms. vii)As per PMU, solar generation loss of approx. 295 MW at Nokhra(IP) and 178 MW at RSDCL-4(IP) were observed.	473	0	52585	57053	80	Detailed analysis of the event and remedial action taken details need to be shared by Nokhra(IP) & RSDCL(PSS4(IP))
2	GD-1	i) 400 KV Bikaner(PG)-AzurePSS43 SL_BKN_PG(Azure) (Azure) Ckt ii) 400 KV AzurePSS43 SL_BKN_PG-AzurePSS43 SL_BKN_PG (Azure) Ckt iii) 400/33 KV 150 MVA ICT 1 at AzurePSS43 SL_BKN_PG(Azure) iv) 400/33 KV 150 MVA ICT 2 at AzurePSS43 SL_BKN_PG(Azure) v) 400/33 KV 150 MVA ICT 3 at AzurePSS43 SL_BKN_PG(Azure) vi) 400/33 KV 150 MVA ICT 4 at AzurePSS43 SL_BKN_PG(Azure) vii) 400/33 KV 150 MVA ICT 5 at AzurePSS43 SL_BKN_PG(Azure)	Rajasthan	Azure43(IP) & PGCIL	23-Feb-25	18:05	23-Feb-25	23:18	05:13	i)Generation of 400kV Azure43(IP) (both PSS and RS) evacuates through 400 KV Bikaner(PG)-AzurePSS43 SL_BKN_PG(Azure) (Azure) Ckt. ii)During antecedent condition, Azure43(IP) was generating approx. 29 MW (as per PMU). iii)As reported, at 18:05hrs, 400 KV Bikaner(PG)-AzurePSS43 SL_BKN_PG(Azure) (Azure) Ckt tripped due to DT received at Bikaner(PG) end. (Exact reason yet to be shared) iv)During the same time, 400 KV AzurePSS43 SL_BKN_PG-AzurePSS43 SL_BKN_PG (Azure) Ckt, 400/33 KV 150 MVA ICT 1, 2 & 3 at AzurePSS43 SL_BKN_PG(Azure) and 400/33 KV 150 MVA ICT 1 & 2 at AzurePSS43 SL_BKN_PG(Azure) also tripped due to loss of evacuation path (Exact reason and nature of protection operated yet to be shared). This led to complete blackout of 400kV Azure43(IP) S/s. v)As per PMU at Bikaner(PG), no fault was observed in the system. vi)As per PMU at Azure43(IP), solar generation loss of approx. 29 MW is observed.	29	0	42623	49032	NA	Detailed analysis of the event and remedial action taken details need to be shared by Azure43(IP)
3	GD-1	1) 400/220 KV 500 MVA ICT 6 AT BHADLA_2 (PG) 2) 220 KV NOKHRA_SL_BHD2 (NTPC)-BHADLA_2 (PG) (NOKHRA) Ckt-1 3) 400 KV AGE25L SL_BHD2_PG-Bhadla_2 (PG) (AGE25L) Ckt-1	Rajasthan	Adani Green, PGCIL and NTPC	18-Mar-25	10:00	18-Mar-25	10:34	00:34	i)Generation of 220kV Nokhra (IP) and 400kV AGE25L stations evacuate through 220 KV Nokhra_SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt and 400 KV AGE25L SL_BHD2_PG-Bhadla_2 (PG) (AGE25L) Ckt-1 respectively. ii)During antecedent condition, 220kV Nokhra (IP) and 400kV AGE25L were generating approx. 262 MW and 488 MW respectively (as per PMU). iii)As reported, at 09:59:40hrs V-phase CT of 405-52 bay at AGE25L RE station failed and it triggered Transformer Differential protection of main CB 404-52 and Tie CB 405-52 opened on bus-Bar Zone-1 protection. iv)As per PMU at 400kV Bhadla2(PG), V-N fault cleared in 240msec followed by permanent R-N fault is observed & fault clearing time of 80ms. v)At the same time, 400/220kV 500MVA ICT-6 at Bhadla2(PG) and 220 KV NOKHRA_SL_BHD2 (NTPC)-BHADLA_2 (PG) (NTPC_NOKHRA) Ckt-1 also tripped. The reason for the same is yet to be received. vi)As per PMU, solar generation loss of approx. 487 MW at AGE25L(IP) and 262 MW at Nokhra(IP) were observed. vii)As per SCADA, total Generation loss of 1035MW was observed in NR region.	1035	0	58902	56730	240	Detailed analysis of the event and remedial action taken details need to be shared by Nokhra(IP) & AGE25L(IP)
4	GD-1	i)220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) Ckt-1 ii)220/33kV 130 MVA ICT1 at Azure 34	Rajasthan	PGCIL & Azure	31-Mar-25	13:43	31-Mar-25	14:19	00:36	i)Generation of 220kV Azure Maple(IP) station evacuates through 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1 which was generating approx. 290 MW (as per PMU). Similarly, 220kV Azure 34(IP) station evacuates through 220 KV BHADLA(PG)-AZURE POWER 34 SOLAR(APTFL) (APTFL) Ckt-1 which was generating 132MW (as per PMU). ii)As reported, at 13:43hrs, 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1 tripped on R-N phase to earth fault due to differential protection operation on account of tree fell on the line. At the same time 130 MVA 220/33kV ICT at 220kV Azure 34 also tripped on account of differential relay protection (exact reason yet to be shared) iii)Due to tripping of 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1 and 130 MVA 220/33kV ICT1 at Azure34, Azure Maple(IP) and Azure 34 S/s lost its connectivity from grid and blackout occurred at 220kV Azure Maple(IP) and 220kV Azure 34(IP) S/s. iv)As per PMU at Bhadla(PG), R-N phase to earth fault (voltage dipped upto 0.95 p.u.) is observed with fault clearing time of 160ms. After the fault clearance voltage increased upto 1.04 p.u. v)As per PMU at Bada(PG), a sharp drop in frequency is observed from 49.90 Hz to 49.82 Hz and frequency recovered to 49.91 Hz within 1 min. vi)As per SCADA, dip in NR total solar generation of approx. 802 MW is observed. vii)As per SCADA, solar generation loss of approx. 280MW at Azure Maple, 132MW at Azure34, 115MW at TPREL and 115MW at AHEJAL RE stations were observed. Drop in generation of TPREL and AHEJAL is suspected due to LVFT non-compliance. Details is yet to be received from RE stations. viii)As per DR (Bhadl end) of 220 KV Bhadla(PG)-Azure Maple PSS SL_BHD_PG (APMPL) (APMPL) Ckt-1, R-N phase to earth fault ("7.3kA) with unsuccessful A/R operation is observed. 3-ph A/R was observed instead of 1-ph-A/R.	802	0	54433	43433	160	Detailed analysis of the event and remedial action taken details need to be shared by Azure Maple(IP) & Azure34(IP). Reason of drop in RE generation need to be shared by TPREL(IP) and AHEJAL(IP).
5	GD-1	1) 400 KV AYANA1 SL_BKN_PG (ARP1PL)-ARP3PL_SL_BK_PG (AYANA_RP3PL) Ckt 2) 400kV SVIN Solar-Bikaner2(PG) ckt	Rajasthan	Ayana_RP3PL(AR P3PL), PGCIL, SGEI	2-Apr-25	14:45	2-Apr-25	16:22	01:37	i)Generation of 400/33 KV Ayana_RP3PL(AR P3PL)(IP) station evacuates through 400kV ARP1PL-RP3PL line at 765/400/220kV Bikaner(PG) pooling station and of 400/33kV SVIN solar RE station through 400kV SVIN Solar-Bikaner(PG) line at 400/220kV Bikaner2(PG) Pooling station. ii)During antecedent condition, ARP3PL and SVIN solar were generating "288MW and "198MW respectively. iii)As reported, at 14:40hrs, 400 KV AYANA1 SL_BKN_PG (ARP1PL)-ARP3PL_SL_BK_PG (AYANA_RP3PL) Ckt tripped on R-N phase to earth fault. iv)At the same time, 400kV SVIN Solar-Bikaner2(PG) Ckt also tripped from SVIN Solar end on operation of directional earth fault protection operation at SVIN Solar end. v)Due to tripping of both the lines, complete solar generation of ARP3PL and SVIN Solar got affected due to loss of evacuation path. vi)As reported by SVIN solar, Directional E/F pick up setting at SVIN solar was sensitive and same has been revised from 0.1pu to 0.2 pu (CT ratio 2000/1). vii)As per PMU phase voltage & current plot of 400kV Ayana(ARP1PL)-Bikaner line (ARP3PL end), R-N phase to earth fault with no A/R operation is observed. viii)As per SCADA, drop in total NR solar generation of "1060MW is observed. RE plants i.e., ARP3PL (carrying "298MW) and SVIN solar (carrying "198MW) tripped during the event.	1060	0	53641	45158	120	Detailed analysis of the event and remedial action taken details need to be shared by Ayana(IP) & SVIN Solar(IP)
6	GD-1	1) 220/33 KV 160 MVA ICT 1 at Thar Surya1 SL_BKN_PG (TS1PL)	Rajasthan	Thar Surya1 (IP)	7-Apr-25	10:02	7-Apr-25	11:44	01:42	i)Generation of 220/33 KV Thar Surya1 (IP) station evacuates via 220 KV Bikaner(PG)-Thar Surya1(IP) Ckt through 220/33 KV 160 MVA ICT 1 & 2 at Thar Surya1 SL_BKN_PG (TS1PL). During antecedent condition, 220/33 KV 160 MVA ICT 2 at Thar Surya1 SL_BKN_PG (TS1PL) was already out (tripped at 14:27 hrs on 06.04.2025 due to pressure release valve operated). 220 KV Thar Surya1 (IP) was generating approx. 155 MW (as per PMU). ii)As reported, at 10:02hrs, 220/33 KV 160 MVA ICT 1 at Thar Surya1 SL_BKN_PG (TS1PL) tripped due to heavy sparking on LV side bay 309 (exact nature, location and reason of fault yet to be received). iii)Due to tripping of 220/33 KV 160 MVA ICT 1 at Thar Surya1 SL_BKN_PG (TS1PL), 220 KV Thar Surya1 (IP) S/s lost its connectivity from grid and blackout occurred at 220 KV Thar Surya1 (IP) S/s. iv)As per PMU, solar generation loss of approx. 155 MW was observed at 220 KV Thar Surya1 (IP).	155	0	55428	53839	240	Detailed analysis of the event and remedial action taken details need to be shared by Thar Surya1(IP)
7	GI-2	i)220KV Jaisalmer- NTPC Solar ckt ii)400/220 KV 500 MVA ICT 3 at Jaisalmer(RS) iii)400/220 KV 500 MVA ICT 4 at Jaisalmer(RS) iv)220kV Jaisalmer-ACME ckt v)220kV Jaisalmer-Green Infra ckt vi)220kV Jaisalmer-Alkal Ckt vii)400/220 KV 500 MVA ICT 1 at Jaisalmer(RS) viii)400 KV Alkal-Jaisalmer (RS) Ckt-1	Rajasthan	RVNL, ACME & NTPC	5-May-25	11:53	5-May-25	12:53	01:00	i)400/220kV Jaisalmer(RS) has one and half breaker bus scheme at 400kV level and double main and transfer bus scheme at 220kV level. ii)400/220kV 500MVA ICT-3 & 4 and 220kV line to NTPC solar, ACME solar, Infra Green Solar and Alkal-I were connected at 220kV Bus-2. 400/220kV ICT-1,2&5 and 220kV lines to Alkal-II, Green Power solar, Renew Power solar and O2 Power solar were connected at 220kV Bus-1. iii)As reported, at 11:53 hrs, R-N fault occurred on 220kV NTPC_Solar -Jaisalmer line due to snapping of tripped at Jaisalmer end. The fault was converted into a bus fault leading to operation of bus bar of 220kV bus-2. iv)At the elements connected at 220kV bus-2 i.e., 400/220kV 500MVA ICT-3 & 4 and 220kV line to NTPC solar, ACME solar, Infra Green Solar and Alkal-I were tripped on bus bar protection operation. v)At the same time, 400/220kV 500MVA ICT-1 also tripped from both HV & LV side and 400kV Alkal-Jaisalmer line tripped from Alkal end only. As reported, line tripped on R-N fault in 2-2 from Alkal end. vi)As per PMU at Fatehgarh3(PG), R-N phase to earth fault converted into R-Y fault with delayed clearance of "800msec is observed. vii)As per SCADA relay of Jaisalmer S/s, power flow in all the remaining ICTs (ICT-2 & 5) and other 220kV feeders also became zero. (reason of the same yet to be received.) viii)As per SCADA, total drop in NR solar generation of "1050MW is observed out of which "890MW solar generation drop observed in Rajasthan solar.	1050	0	53092	52225	800	Detailed analysis of the event and remedial action taken details need to be shared by SDC Rajasthan in coordination with RE plants connected to Rajasthan control area.
8	GD-1	i)220 KV BHADLA_2 (PG)-RSDCL(PSS2)_SL_BHD2_PG (RSDCL) Ckt-1 ii)220 KV NOKHRA_SL_BHD2 (NTPC)-BHADLA_2 (PG) (NTPC_NOKHRA) Ckt-1 iii)400 KV BIKANER(RS)-DEEDWANA(MTS) (RS) Ckt-1 iv)STATCOM NO 2(425+550MVAR) AT 400 KV BHADLA_2 (PG)	Rajasthan	RSDCL, PGCIL and RVNL	11-May-25	12:31	11-May-25	13:17	00:46	i)Generation of 220kV Nokhra (IP) and 220kV RSDCL-2(IP) stations evacuate through 220 KV Nokhra_SL_BHD2 (NTPC)-Bhadla_2 (PG) (NTPC_NOKHRA) Ckt and 220 KV BHADLA_2 (PG)-RSDCL(PSS2)_SL_BHD2_PG (RSDCL) Ckt-1, 220 KV NOKHRA_SL_BHD2 (NTPC)-RSDCL-1 & 220 KV RSDCL(PSS2)_SL_BHD2_PG (RSDCL)-RSDCL3 (IP) Ckt respectively. ii)During antecedent condition, 220kV Nokhra (IP) and 220kV RSDCL-2(IP) were generating approx. 242 MW and 218 MW respectively (as per PMU). iii)As reported, at 12:31hrs, 220 KV Bhadla_2 (PG)-RSDCL (PSS2)_SL_BHD2_PG (RSDCL) Ckt tripped (Tripping details awaited) iv)During the same time, 220 KV NOKHRA_SL_BHD2 (NTPC)-BHADLA_2 (PG) (NTPC_NOKHRA) Ckt-1 along with STATCOM NO 2(425+550MVAR) AT 400 KV BHADLA_2 (PG) also tripped. v)After 400kV BIKANER(RS)-DEEDWANA(MTS) (RS) Ckt-1 also tripped. The tripping details for the said line is still awaited. vi)At the same time, 400 KV BIKANER(RS)-DEEDWANA(MTS) (RS) Ckt-1 also tripped. The tripping details for the said line is still awaited. vii)As per PMU at 400kV, 3 phase fault (voltage dipped upto 0.87 p.u.) is observed with fault clearing time of 80ms. viii)As per PMU, solar generation loss of approx. 143 MW at Awada, and 242 MW at Nokhra(IP) were observed. ix)As per PMU at Azure Maple, fluctuation in power generation was also observed.	2215	0	60137	59672	80	Detailed analysis of the event and remedial action taken details need to be shared by Nokhra(IP) & RSDCL(PSS2(IP)). Reason of drop in RE generation need to be shared by Awada(IP) and Azure Maple(IP).



ग्रिड कंट्रोलर ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
GRID CONTROLLER OF INDIA LIMITED
(A Government of India Enterprise)



[formerly Power System Operation Corporation Limited (POSOCO)]
राष्ट्रीय भार प्रेषण केन्द्र / **National Load Despatch Centre**

कार्यालय : बी-9, प्रथम एवं द्वितीय तल, कुतुब इंस्टीट्यूशनल एरिया, कटवारिया सराय, नई दिल्ली - 110016
Office : 1st and 2nd Floor, B-9, Qutab Institutional Area, Katwaria Sarai, New Delhi -110016
CIN : U40105DL2009GOI188682, Website : www.grid-india.in, E-mail : gridindiacc@grid-india.in, Tel.: 011- 42785855

Ref: GRID-INDIA/NLDC/FTC/2025

Date: 04th Jun 2025

To,

Chief Engineer, PCD Division, CEA Sewa Bhawan, R.K. Puram, Sector-1, New Delhi-110066	Chief Engineer, CEI Division, CEA Sewa Bhawan, R.K. Puram, Sector-1, New Delhi-110066
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Sub: Regarding the issue of Power and Telecommunication Coordination Committee (PTCC) clearance for underground power cables of voltage level 11 kV and above at First Time Charging (FTC) stage, raised by Renewable Energy (RE) Developers.

Madam/Sir,

The RE developers have raised certain concerns regarding the relevance of PTCC clearance for underground power cables at 33 kV within the RE plant boundary, in a meeting held on 30th May 2025 under the chairmanship of Secretary, MNRE. The points raised by Wind Independent Power Producers Association (WIPPA) during the meeting is attached at **Annexure-I**. The RE developers have stated that the Project commissioning is getting delay due to long approval process from DoT, Railways, MoD & CEA.

It is understood that Power Communication Development (PCD) Division of CEA is taking up the matter for waiving off Induced Voltage (IV) calculations on underground cables of 33 kV and below during central level PTCC meetings. The relevant sections of MOM for 111th CLPTCC meeting is enclosed as **Annexure-II**.

At present, the PTCC clearance is being sought by RLDCs from RE plants for 33 kV feeders (underground power cables) to confirm compliance with CEA (Measures relating to Safety and Electric Supply) Regulations, 2023. However, considering the issue raised by RE Developers, it is requested to kindly examine the matter and issue appropriate directions/ clarifications regarding requirement of PTCC clearance for 33 kV underground power cables within/outside the plant boundary of RE projects.

Yours faithfully,

S Usha

Executive Director, NLDC

Encl: As above

Copy to:

- Member (Power System), CEA
- Member (GO&D), CEA
- Executive Director, NRLDC/WRLDC/SRLDC/ERLDC/NERLDC, GRID-INDIA
- Director (System Operation & Market Operation), GRID-INDIA
- Chairman and Managing Director, GRID-INDIA

RLDCs are seeking PTCC approval for underground 33 kV cables within plant boundary

Regarding PTCC approval.


NRLDC New Element Charging <nrlcdcftc@grid-india.in>

To
○ Ayush Bhargava; ○ Tushar Gahlot; ○ Paras Kumar; ○ Suraj Kakkar; ○ 400MW XI Energy Power Private; ○ Birku Singh; ○ Shubham Vats; ○ Vineet Singh; ○ nkamal@ampin.energy; ○ Imran Usmani; ○ Amitanand Jha; ○ Harish Kumar; ○ mehul.sharma@amplussolar.com; +39 others

Cc
○ Somara Lakra (सोमारा लाकरा); ○ Sunil Kumar Aharwal (सुनील कुमार अहरवाल); ○ Kamaldeep Singh (कमलदीप सिंह); ○ cepcd.cea@gov.in

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Sir/ma'am,

As per Central Electricity Authority (Measures relating to Safety and Electric Supply) Regulations, 2023

Quote

80. Protection against electromagnetic interference. – The owner of every electric supply line of voltage level 11 kV or above shall obtain the clearance of Power Telecommunication Co-ordination Committee to ensure the safety of the personnel and telecommunication line as per the requirement of section 160 of the Act.

Unquote

Kindly provide the PTCC approval of 33kV feeders as per CEA regulation quoted above.

- Huge network of 33kV underground cables laid inside solar plant premises for large scale utility projects (multiple feeders)
- Uncertain of multiple cable route layout & exact coordinates at the beginning of the project to start/get the approval process
- Project commissioning delay due to long approval process from DoT, Railways, MoD & CEA
- PTCC approval non relevance for 33kV cables laid inside plant premises as the land is acquired by developer and will be cleared from all over ground or under ground structures before starting the construction
- PTCC approval relevant only for overhead or underground lines being laid/constructed in non-acquired lands where clearance is taken only for right of way to construct/lay the 33kV lines

I/22455/2022(1)



भारत सरकार

Government of India

विद्युत मंत्रालय

Ministry of Power

केन्द्रीय विद्युत प्राधिकरण

Central Electricity Authority

विद्युत संचार विकास प्रभाग

Power Communication Development Division

No. CEA/PCD/111th CLPTCC/

Date: 08.07.2022

All Members Central PTCC
(As per attached list)

Subject: - 111th Central Level Power and Telecommunication Coordination Committee (CLPTCC) Meeting - Regarding

The minutes of the 111th Central Level Power and Telecommunication Coordination Committee (CLPTCC) meeting held on 28th June, 2022 is enclosed herewith for kind information and necessary actions by all concerned. The minutes of the meeting are also available at <https://cea.nic.in/ptcc/?lang=en>.

The next CLPTCC meeting is to be organized by BSNL. Therefore, BSNL is requested to take necessary action in this regard.

Encl.: as above.

Sd/-

Director &
Secretary, CLPTCC

Copy for kind information to:

1. Member (Power System), CEA.
2. Chief Engineer, PCD Division, CEA.
3. Chief General Manager, Inspection and QA Circle, BSNL.

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development of V.2 of the portal which expected to be ready in 2 months i.e. by the end of August, 2022 and all issues in the existing portal will addressed in V.2.

Chief Engineer (PCD) requested BSNL to explore possibilities of interfacing PTCC portal with NSWS and take up the matter with DoT for interfacing of PTCC portal with NSWS.

Member (PS), CEA emphasized the importance of NSWS and suggested that CEA and BSNL should deliberate and decide for inclusion of PTCC portal into NSWS.

CE (PCD), CEA and CGM, BSNL agreed with the suggestion of Member (PS), CEA.

It was decided that:

- (1) Members will furnish their comments on shared flowcharts for PTCC process through email within three weeks from the date of issuance of the minutes of meeting.
- (2) BSNL will prepare flowcharts for lines below 220 kV in the same line as prepared by CEA and share with CEA within three weeks from the date of issuance of the minutes of meeting.
- (3) CEA and BSNL will deliberate with Invest India regarding interfacing of PTCC portal with NSWS along with the launch of V.2 of the PTCC portal.

[Action: CEA, BSNL & Other Members]

B.2. PTCC approval for power Cables

Background: The proposal for waiving off IV calculation of 33 kV and below UG cables was raised by Tata Power in 106th CLPTCC meeting. A brief summary of the proceedings is given in **Appendix**.

In 110th CLPTCC Meeting, it was decided that CEA will send a formal proposal to Defense and Railway regarding waiving off of IV calculations for their telecom circuits in case of 33 kV and below UG power cables. In case there are further reservations, a separate meeting between Defense, Railway, CEA and BSNL will be convened to deliberate on the matter.

Follow-up action/status: A letter was written to Tata Power by CEA ***[Annexure-B.2(1)]*** to submit a detailed study regarding induction effects on telecom cables under SLG fault in UG power cables.

Tata Power has informed that they along with DTU are carrying out studies on this matter and the final theoretical and experimental results will be shared with CEA in due time ***[Annexure-B.2(2)]***.

Deliberation & Decision: On receipt of study report from Tata Power, the formal proposal will be deliberated with the Defense and Railway.

[Action: CEA]

PTCC Approval for Underground Power Cables

The proposal for waiving off of IV calculation of 33 kV and below UG cables was raised by Tata Power in 106th CLPTCC meeting.

In the 107th CLPTCC meeting, it was proposed to waive-off Induced Voltage (IV) calculations on telecom circuits due to underground power cables of voltage level 33 kV and below due to low induction caused by them. It was decided that power utilities would submit PTCC proposal along with self-certification to telecom authorities and in case of no-objection from telecom authorities within a month, power utilities could charge the power cable. Accordingly, BSNL circulated guidelines vide letter dated 13.03.2019.

In 108th CLPTCC meeting, CEA suggested changes in the guidelines and it was decided that BSNL would issue the revised guidelines. Further, representative from Railway did not agree to waive-off IV calculations for Railway telecom circuits due to safety consideration. Inputs from Defense could not be recorded due to non-representation.

Revised guidelines prepared by BSNL were taken up for discussion in 109th CLPTCC meeting and it was observed that the same were still not aligned with changes suggested by CEA. Thus, it was agreed in 109th CLPTCC meeting that CEA would prepare the guidelines for self-certification of PTCC cases for underground power cable of voltage level 33 kV and below.

In the 110th CLPTCC meeting, CEA informed that while preparing the guidelines, it had following observations:

- a) The number of UG power cables of voltage level upto 33 kV being laid is high and the time taken for laying of these cables is comparatively less. Therefore, their PTCC clearance process needs to be completed expeditiously.
- b) The induction due to such power cables will be less due to double screening effect of power cable and telecom cable as well as due to low value of SLG fault current.
- c) Waiving off IV calculation for BSNL telecom cables alone cannot cut down the time taken in PTCC clearance.

Chairman, CLPTCC briefed the Defense and Railway representatives that in 33 kV and below power cables, the protection against IV would be not be required due to the following reasons:

- Lower fault current
- Lesser chances of SLG fault
- Double screening effect
- Better insulation
- Shorter length of such cables
- Absence of auto-reclosing feature

Considering above and GoI resolution for Ease of Doing Business (EoDB), CEA urged Railway and Defense to reconsider waiving off IV calculations on their respective circuits in this case. If Railway and Defense agree to this proposition, CEA will issue guidelines regarding PTCC clearance of UG power cables of voltage level upto 33 kV on self-certification basis.

Defense representative replied that the matter will be taken up with the higher authorities. Railway representative requested that a formal proposal may be sent to the Railway Board in this regard. The matter would then be taken up with Signaling Division of Railways.