सत्यमेव जयते

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

सं.: उ.क्षे.वि.स./प्रचालन/106/01/2022/11037-11078 दिनांक: 16.11.2022

विषय: उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप-समिति की 201वी बैठक के खण्ड-अ मे लिए गए निर्णयों का सार।

Subject: Gist of decisions taken in the Part-A of 201st OCC meeting of NRPC.

उत्तर क्षेत्रीय विद्युत समिति की प्रचालन समन्वय उप- समिति की 201वी बैठक दिनांक 15.11.2022 को आयोजित की गयी। उक्त बैठक की खण्ड-अ मे लिए गए निर्णयों का सार **अनुलग्नक – अ** के रूप मे संलग्न है।

201st meeting of the Operation Co-ordination Sub-Committee of NRPC was held on 15.11.2022. The Gist of the decisions taken in Part-A of this meeting is enclosed as **Annexure-A**.

16/11/22
(संतोष कुमार)
अधीक्षण अभियंता (प्रचालन)

सेवा में,

प्रचालन समन्वय उप- समिति के सभी सदस्य।

18-ए, शहीद जीतसिंह मार्ग, कटवरिया सराय, नई दिल्ली दूरभाष:011-26513265 ई-मेल: seo-nrpc@nic.in वेबसाईट: www.nrpc.gov.in
18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016 Phone: 011-26513265 e-mail: seo-nrpc@nic.in Website: www.nrpc.gov.in

अनुलग्नक – अ/
Annexure-A

Gist of decisions taken in the Part-A of 201st OCC Meeting

Agenda No. 1: Confirmation of Minutes

Minutes of 200th OCC meeting was issued on 10.11.2022.

- In regard to agenda No. 7, Uttarakhand representative requested OCC forum that following statement may kindly be inserted after para 7.76:

  "Uttarakhand SLDC representative iterated that scheme will not be feasible even Vyasi HEP does not run on continuous basis and also not available round the clock and data for study not available for one year as it has started generation in last week of April'22 and insisted to drop Dehradun as islanding scheme based on discussion with higherups and feasibility report submitted accordingly."

- With regard to Agenda No. 18 (Part B:NRLDC), BBMB requested OCC forum to modify para as mentioned below:
  "BBMB representative stated that two machines are under overhauling and other machines are available for synchronous condenser mode of operation "

  to be replaced with

  "BBMB representative stated that only two machines are available for synchronous condenser operation at Pong Power House due to overhauling of compressors." BBMB informed that any change in regard to status shall be intimated in due course.

OCC confirmed the minutes with above modifications.

Agenda No. 2.1: Supply Position (Provisional) for October 2022

Reasons submitted by states for significant deviation of actual demand from anticipated figures during the month of October 2022 are as under:

- **Delhi**

  The reason of lower peak demand and energy consumption is due to continuous rainy spells in Oct-2022 and consequently decreased in temperature.

- **Himachal Pradesh**

  The Anticipation in Energy Requirement in respect of Himachal Pradesh for the month of October, 2022 came on the lower side due to the following reasons: -

  1. Energy Requirements on Diwali, Vishwakarma Day and Bhai-Dooj came out to be very low as compared to anticipated.

  2. Also, there was a load shedding of around 2.5 MU during the month of October, 2022 owing to trippings/planned/emergency shutdowns.

- **Haryana**

The variations between actual and anticipated demand and energy consumption for the month of October-2022 is due to low agriculture demand (approx 35% less) & drastic reduction in rural domestic demand observed.

- **Punjab**

  It is intimated that actual maximum demand and actual energy requirement are less as compared to anticipated maximum demand and anticipated energy requirement respectively because of less demand of Agriculture in the state of Punjab during month of October 2022.

- **Rajasthan**

  It is intimated that actual maximum demand and actual energy requirement are less as compared to anticipated maximum demand and anticipated energy requirement respectively because agricultural load did not pick up as expected.

- **Uttar Pradesh**

  Unprecedented high intensity rainfall and certain drop in feel temperature in October 2022 in comparison to October 2021.

- **Uttarakhand**

  Due to significant rain in the month of October 2022 as compared to last year and shutdowns for pre-Diwali maintenance caused load shedding, maximum demand in the month of October 2022 was recorded lower than last year and anticipated.

Agenda No. 2.2: Power Supply Position of NCR

The Sub-Committee was informed that the NCR Planning Board (NCRPB) is closely monitoring the power supply position of National Capital Region. Monthly power supply position for NCR till the month of October 2022 was enclosed in the agenda and same was discussed in the meeting.

Significant deviation in case of Uttar Pradesh was observed.

Agenda No. 3.1: Maintenance Programme of Generating units and Transmission Lines

- The maintenance programme of generating units and transmission lines for the month of December 2022 was deliberated in the meeting on 14.11.2022.

Agenda No. 4.: Anticipated Power Supply Position in Northern Region for December 2022

- The updated anticipated Power Supply Position for December 2022 is as below:

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
CHANDIGARH	Availability	120	270	No Revision submitted
	Requirement	120	270	

State / UT	Availability / Requirement	Revised Energy (MU)	Revised Peak (MW)	Date of revision
	Surplus / Shortfall	0	0	
	% Surplus / Shortfall	0.0%	0.0%	
DELHI	Availability	3108	5450	14-Nov-22
	Requirement	2300	5450	
	Surplus / Shortfall	808	0	
	% Surplus / Shortfall	35.2%	0.0%	
HARYANA	Availability	4390	10640	14-Nov-22
	Requirement	5404	8011	
	Surplus / Shortfall	-1014	2629	
	% Surplus / Shortfall	-18.8%	32.8%	
HIMACHAL PRADESH	Availability	1114	2000	09-Nov-22
	Requirement	1104	1995	
	Surplus / Shortfall	11	5	
	% Surplus / Shortfall	1.0%	0.3%	
J&K and LADAKH	Availability	910	3270	No Revision submitted
	Requirement	1980	2980	
	Surplus / Shortfall	-1070	290	
	% Surplus / Shortfall	-54.0%	9.7%	
PUNJAB	Availability	5160	11390	14-Nov-22
	Requirement	3970	7450	
	Surplus / Shortfall	1190	3940	
	% Surplus / Shortfall	30.0%	52.9%	
RAJASTHAN	Availability	7640	18970	10-Nov-22
	Requirement	9455	16500	
	Surplus / Shortfall	-1815	2470	
	% Surplus / Shortfall	-19.2%	15.0%	
UTTAR PRADESH	Availability	9920	19500	09-Nov-22
	Requirement	9765	19500	
	Surplus / Shortfall	155	0	
	% Surplus / Shortfall	1.6%	0.0%	
UTTARAKHAND	Availability	1215	2250	07-Nov-22
	Requirement	1237	2350	
	Surplus / Shortfall	-22	-100	
	% Surplus / Shortfall	-1.8%	-4.3%	
NORTHERN REGION	Availability	33577	67200	
	Requirement	35335	58800	
	Surplus / Shortfall	-1757	8400	
	% Surplus / Shortfall	-5.0%	14.3%	

Agenda No. 5: Submission of breakup of Energy Consumption by the states

- The updated status on the submission of energy consumption breakup is presented below:

State / UT	From	To
Delhi	Apr-2018	Jul-2022
Haryana	Apr-2018	Aug-2022
Himachal Pradesh	Apr-2018	Aug-2022
Punjab	Apr-2018	Aug-2022
Rajasthan	Apr-2018	Sep-2022
Uttar Pradesh	Apr-2018	Jul-2022
Uttarakhand	Apr-2018	Jul-2022

Agenda No. 6: Follow-up of issues from various OCC Meetings - Status update

- Updated status is enclosed as ***Annexure-A.I.***
- In 195th OCC, SLDCs were requested to again to coordinate with respective Transmission utilities of states/UT's and submit details about the updated status of downstream network by State utilities from ISTS Station (***Annexure-A-I.I)*** before every OCC meeting.

Agenda No. 7. NR Islanding scheme

- In the meeting (201st OCC), NRPC representative apprised members that a meeting was held on 04.11.2022 through VC to discuss regarding islanding schemes of HP, Rajasthan and Punjab. The schemes submitted were discussed in detail and states were requested to submit revised scheme as per deliberations in the meeting. Rajasthan and HP has submitted the revised schemes.
- Further, NRPC representative informed members that a meeting was held on 11.11.2022 at NRPC conference hall to discuss regarding proposed revised Delhi islanding scheme submitted by DTL, wherein it was decided that Delhi DISCOMS may submit additional load details, if any, latest by 18.11.2022 and Delhi will submit final scheme by 25.11.2022. He highlighted that average generation of 300 MW has been agreed upon for revised Delhi islanding scheme.
- OCC members were apprised details of revised schemes submitted by HP and Rajasthan in line with discussion held in meeting dtd. 04.11.2022. Regarding UFR at identified reactor locations in islanding scheme, Rajasthan was requested to keep it as blocked until communication project is commissioned.
- Further, members were also apprised regarding scheme submitted by Punjab and corrections highlighted in the meeting held on 04.11.2022. Punjab was requested to submit revised scheme with minor corrections at the earliest for deliberation in upcoming NRPC meeting.
- Accordingly, OCC approved islanding schemes of Punjab, Rajasthan and HP. It was decided to put up these 3 schemes for approval of NRPC.

Agenda No. 8. Coal Supply Position of Thermal Plants in Northern Region

- In the meeting, NRPC representative apprised the forum about the coal stock position of generating stations in northern region during current month (till 10th November 2022).
- Average coal stock position of generating stations in northern region, having critical stock, during first ten days of November 2022 is as follows:

Station	Capacity (MW)	PLF % (prev. months)	Normative Stock Reqd. (Days)	Actual Stock (Days)
ANPARA C TPS	1200	73.25	14	1.7
GOINDWAL SAHIB TPP	540	32.09	22	0.6
KOTA TPS	1240	71.17	22	2.6
OBRA TPS	1094	61.05	22	2.3
PARICHHA TPS	1140	52.09	22	2.4
PRAYAGRAJ TPP	1980	78.01	22	1.8
ROSA TPP Ph-I	1200	64.37	22	2.5
SURATGARH TPS	1500	32.74	22	3.3
TALWANDI SABO TPP	1980	51.98	22	4.0
CHHABRA-I PH-1 TPP	500	71.31	22	1.2
CHHABRA-I PH-2 TPP	500	39.67	22	0.8
CHHABRA-II TPP	1320	59.10	22	1.1

- In the meeting, above mentioned generating stations were requested to take adequate measures.

Agenda No. 9. Format for data submission of RE generation loss events to "Technical Committee under the chairmanship of Member (GO&D), CEA" (Agenda by NRLDC)

- In the meeting, NRPC representative presented the matter to the forum and intimated forum that NRLDC vide mail dated 09.10.2022 has mentioned that in view of the recurrence of RE generation loss in Rajasthan RE complex of Northern Region and its further investigation, a Committee has been constituted by Chairperson, CEA, under the chairmanship of Member (GO&D), CEA.
- NRLDC representative mentioned that in this regard format (Annexure-A.III.a attached in 201st OCC agenda) has been circulated to all RE generators in Rajasthan region on 09.11.2022 for submission of data/information/implemented settings for the following events of RE generation loss in NR.
    a. **~3485MW on 09.07.2022 at 13:42 hrs.**
    b. **~6157MW on 11.08.2022 at 11:23 hrs.**
    c. **~3800MW on 11.09.2022 at 12:22 hrs.**
- NRLDC representative explained the above cited format to the OCC forum members.
- OCC forum noted the same.

Agenda No. 10. Proposed SPS for Grid stability through load shedding from various sub-stations in Kumaon region (Agenda by PTCUL)

- PTCUL presented to the OCC forum the proposed SPS logic for grid stability through load shedding from various sub-stations in Kumaon region.

- NRLDC representative discussed the cases by the PTCUL in the proposed SPS. PTCUL representative submitted that the scheme has also been discussed with the NRLDC.
- PTCUL representative informed forum that the Kashipur area (Kumaon) has connectivity from different areas and some of the feeders are being kept open in real-time operation and accordingly SPS has been proposed.
- CGM(I/C), NRLDC stated that PTCUL needs to make sure that SPS scheme is effective for both generation scenarios, when gas generation at shravanti and gamma infra are available and also when the gas generation is not available.
- Further, CGM (I/C) NRLDC has mentioned that it also needs to be ensured that there is no overloading in intrastate line when SPS operates. Moreover, it was requested that the lines/feeders that are normally kept open may be separately intimated to NRLDC so that the necessary changes are also incorporated in NRLDC basecase when performing simulation studies.
- OCC forum approved the above cited SPS scheme subject to compliance of above stated NRLDC observations.

Agenda No.11. Issues faced by SJVN Hydro Power stations due to increased silt, cloud burst etc. (Agenda by SJVN)

- SJVN representative presented the matter to the OCC forum.
- MS, NRPC opined that on the cited matter a separate detailed deliberation may be done among the officials of NRPC, NRLDC, SLVN & KWHP and thereafter outcome of that deliberation may be brought to the OCC forum.

Agenda No.12. Frequent trippings in 220kV Baghpat – Sambhli and 220kV Baghpat – Mandola transmission lines of UPPTCL. (Agenda by Powergrid, NR-1)

- In the meeting, NRPC representative informed OCC forum that Powergrid, NR-1 vide letter dated 07.11.2022 (copy attached as Annexure-A.VI of agenda) has intimated that frequent trippings in 220kV Baghpat – Sambhli and 220kV Baghpat – Mandola transmission lines of UPPTCL has been observed since last $2^1/_2$ years.
- Further, Powergrid NR-1 apprised forum that their team carried out the patrolling of 2200kV Baghpat-Shamli transmission line and its observations are as follows:
  - Presence of Brick kiln near the tower. Since in this line porcelain insulators are being used, therefore there is high probability of insulators getting polluted causing tripping/ auto-reclose of line.
  - Infringement of trees were observed below the line, thereby reducing the required clearance from ground.
  - Electrical clearance at Powerline crossings were found to be less, which might be one of major reason for tripping / auto-reclose of line.
  - Also, Earthwire sag was found more than the required limit.
  - Bird Nest were found at crossarm of many locations.

- In view of the above, OCC forum asked UPPCL to carry out the joint patrolling with Powergrid of both 220kV Baghpat-Shamli line and 220kV Baghpat-Mandola line and rectify the observed defects to ensure the stability and healthiness of both Grid and Baghpat GIS.

Agenda No.13. Tanda Stage#2 Unit#6 (660MW) Revival from RSD dated 22.10.2022 (Agenda by NTPC)

- In the meeting, NTPC representative presented the matter to the forum.
- UPSLDC representative intimated OCC forum that unit was revived on the request of beneficiary and subsequently sent to RSD as per the request of beneficiary.
- MS, NRPC opined that in future suitable care may be taken that upon revival of machine from RSD sufficient schedule may be given and it may not be sent to immediate RSD to avoid the wastage of precious national reserve.

Additional Agenda No.1: Proposed SPS for 400/220KV ICTs at RVPN's 400KV GSS Bhadla (Agenda by RRVPN)

- NRPC representative intimated forum that as per the discussion in 197th OCC meeting, RRVPN vide letter dated 15.11.2022 (copy enclosed as **Annexure-A.II**) have submitted simulation study of the proposed SPS for 400/220 kV ICT's at RVPN's 400kV GSS Bhadla for analysis. Schematic diagram, load details and results of load flow study are attached in Annexure-A.II.
- RRVPN representative presented the proposed SPS logic to the forum.
- NRLDC representative mentioned that they will study the abovesaid SPS logic and thereby submit its observation within one week.
- MS, NRPC intimated forum that after receiving the comments of NRLDC, a meeting would be conducted among the officials of NRPC, NRLDC and RRVPN and thereafter the proposed SPS schemes of Rajasthan would be presented in the upcoming NRPC meeting.

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Follow up issues from previous OCC meetings

Annexure-A.I

<table>
<tr><td>1</td><td>Down Stream network by State utilities from ISTS Station</td><td>Augmentation of transformation capacity in various existing substations, addition of new substations along with line bays as well as requirement of line bays by STUs for downstream network are under implementation at various locations in Northern Region. Further, 220kV bays have already been commissioned at various substations in NR. For its utilization, downstream 220kV system needs to be commissioned.</td><td>List of downstream networks is enclosed in Annexure-A.I.I.</td></tr>
<tr><td>2</td><td>Progress of installing new capacitors and repair of defective capacitors</td><td>Information regarding installation of new capacitors and repair of defective capacitors is to be submitted to NRPC Secretariat.</td><td>Data upto following months, received from various states / UTs:
◎ CHANDIGARH — Sep-2019
◎ DELHI — Aug-2022
◎ HARYANA — Aug-2022
◎ HP — Jan-2022
◎ J&K and LADAKH — Not Available
◎ PUNJAB — Jul-2022
◎ RAJASTHAN — Oct-2022
◎ UP — Oct-2022
◎ UTTARAKHAND — Oct-2022
All States/UTs are requested to update status on monthly basis.</td></tr>
<tr><td>3</td><td>Healthiness of defence mechanism: Self-certification</td><td>Report of mock exercise for healthiness of UFRs carried out by utilities themselves on quarterly basis is to be submitted to NRPC Secretariat and NRLDC. All utilities were advised to certify specifically, in the report that “All the UFRs are checked and found functional”.</td><td>Data upto following months, received from various states / UTs:
◎ CHANDIGARH — Not Available
◎ DELHI — Sep-2022
◎ HARYANA — Sep-2022
◎ HP — Oct-2022
◎ J&K and LADAKH — Not Available
◎ PUNJAB — Jun-2022
◎ RAJASTHAN — Sep-2022
◎ UP — Sep-2022
◎ UTTARAKHAND — Sep-2022
◎ BBMB — Sep-2022
All States/UTs are requested to update status for healthiness of UFRs on monthly basis for islanding schemes and on quartely basis for the rest .</td></tr>
<tr><td></td><td></td><td>In compliance of NPC decision, NR states/constituents agreed to raise the AUFR settings by 0.2 Hz in 47th TCC/49th NRPC meetings.</td><td>Status:
◎ CHANDIGARH — Not Available
◎ DELHI — Increased
◎ HARYANA — Increased
◎ HP — Increased
◎ J&K and LADAKH — Not increased</td></tr>
</table>

			◎	PUNJAB	Increased
			◎	RAJASTHAN	Increased
			◎	UP	Increased
			◎	UTTARAKHAND	Increased
			◎	BBMB	Increased
			BBMB was requested to submit the updated self certification report indicating increase of 0.2 Hz in AUFR settings, within one week. J&K and LADAKH were requested to update status for increasing settings of UFRs.		
4	Status of FGD installation vis-à-vis installation plan at identified TPS	List of FGDs to be installed in NR was finalized in the 36th TCC (special) meeting dt. 14.09.2017. All SLDCs were regularly requested since 144th OCC meeting to take up with the concerned generators where FGD was required to be installed. Further, progress of FGD installation work on monthly basis is monitored in OCC meetings.	Status of the information submission (month) from states / utilities is as under:		
			◎	HARYANA	Sep-2022
			◎	PUNJAB	Sep-2022
			◎	RAJASTHAN	Nov-2022
			◎	UP	Sep-2022
			◎	NTPC	Feb-2022
			FGD status details are enclosed as **Annexure-A.I.II**. All States/utilities are requested to update status of FGD installation progress on monthly basis.		
5	Information about variable charges of all generating units in the Region	The variable charges detail for different generating units are available on the MERIT Order Portal.	All states/UTs are requested to submit daily data on MERIT Order Portal timely.		
6	Status of Automatic Demand Management Sysytem in NR states/UT's	The status of ADMS implementation in NR, which is mandated in clause 5.4.2 (d) of IEGC by SLDC/SEB/DISCOMs is presented in the following table:	Status:		
			◎	DELHI	Fully implemented
			◎	HARYANA	Scheme not implemented
			◎	HP	Scheme not implemented
			◎	PUNJAB	Scheme not implemented
			◎	RAJASTHAN	Under implementation. Likely completion schedule is 31.12.2022.
			◎	UP	Scheme implemented by NPCIL only

7	Reactive compensation at 220 kV/ 400 kV level at 15 substations			
	State / Utility	Substation	Reactor	Status
i	POWERGRID	Kurukshetra	500 MVAr TCR	Testintg is under progress and Anticipated commissioning: Nov'22/Dec'22
ii	DTL	Peeragarhi	1x50 MVAr at 220 kV	PO awarded to M/s Kanohar Electricals Ltd. Drawings approved and under final stage inspection. GIS Bay is already available.
iii	DTL	Harsh Vihar	2x50 MVAr at 220 kV	PO awarded to M/s Kanohar Electricals Ltd. Drawings approved and under final stage inspection. GIS Bay is already available.
iv	DTL	Mundka	1x125 MVAr at 400 kV & 1x25 MVAr at 220 kV	Bay work awarded to M/s. Ethos. Bay work is expected to be completed by Dec.21. Reactor part tender is dropped and at present same is under revision.
v	DTL	Bamnauli	2x25 MVAr at 220 kV	Bay work awarded to M/s. Ethos. Bay work is expected to be completed by Dec.21. Reactor part tender is dropped and at present same is under revision.
vi	DTL	Indraprastha	2x25 MVAr at 220 kV	Bay work awarded to M/s. Ethos. Bay work is expected to be completed by Dec.21. Reactor part tender is dropped and at present same is under revision.
vii	DTL	Electric Lane	1x50 MVAr at 220 kV	Under Re-tendering due to Single Bid
viii	PUNJAB	Dhuri	1x125 MVAr at 400 kV & 1x25 MVAr at 220 kV	400kV Reactors - LOA issued on dated. 17.08.2021 and date of completion of project is 18 months from the date of LOA. 220kV Reactors - LOA issued on dated 19.07.2021 and date of completion of project is 18 months from the date of LOA.
ix	PUNJAB	Nakodar	1x25 MVAr at 220 kV	220kV Reactors - LOA issued on dated 19.07.2021 and date of completion of project is 18 months from the date of LOA.
x	PTCUL	Kashipur	1x125 MVAR at 400 kV	Price bid has been opened and is under evaluation

xi	RAJASTHAN	Akal	1x25 MVAr	1x25 MVAR Reactor at Akal has been commissioned on dated 25th July' 2022.
xii	RAJASTHAN	Bikaner	1x25 MVAr	Erection work of 1x25 MVAR Reactors at Bikaner and Suratgarh completed and testing work is pending. The same are likely to be commissioned in Aug / Sept 2022.
xiii	RAJASTHAN	Suratgarh	1x25 MVAr	Erection work of 1x25 MVAR Reactors at Bikaner and Suratgarh completed and testing work is pending. The same are likely to be commissioned in Aug / Sept 2022.
xiv	RAJASTHAN	Barmer & others	13x25 MVAr	Agreement signed on dt. 22.06.2020. Grant of Ist Instalment received on dt.19.02.21 &work order placed on dt. 7.04.2022 to M/s Kanohar Electricals Ltd.
xv	RAJASTHAN	Jodhpur	1x125 MVAr	Agreement signed on dt. 22.06.2020. Grant of Ist Instalment received on dt.19.02.21 &work order placed on dt. 7.04.2022 to M/s Kanohar Electricals Ltd.

Annexure-A-I.I

1. Down Stream network by State utilities from ISTS Station:

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
1	400/220kV, 3x315 MVA Samba	Commissioned: 8 Total: 8	Utilized: 6 Unutilized: 2	• Network to be planned for 2 bays.	-	PDD, J&K to update the status.
2	400/220kV, 2x315 MVA New Wanpoh	Commissioned: 6 Total: 6	Utilized: 2 Unutilized: 4	• 220 kV New Wanpoh - Alusteng D/c Line	-	PDD, J&K to update the status.
				• 220 kV New Wanpoh - Mattan D/c Line	-	PDD, J&K to update the status.
3	400/220kV, 2x315 MVA Amargarh	Commissioned: 6 Total: 6	Utilized: 6 Unutilized: 2	• 220kV D/C line from 400/220kV Kunzar - 220/33kV Sheeri	-	PDD, J&K to update the status.
4	400/220kV, 2x500 MVA Kurukshetra (GIS)	Commissioned: 8 Total: 8	Utilized: 6 Unutilized: 2	• 220kV Bhadson (Kurukshetra) – Ramana Ramani D/c line	-	HVPNL to update the status.
5	400/220 kV, 2x315 MVA Dehradun	Commissioned: 6 Total: 6	Utilized: 2 Unutilized: 4	• Network to be planned for 4 bays	-	PTCUL to update the status.
6	Shahjahanpur, 2x315 MVA 400/220 kV	Commissioned: 6 Approved/Under Implementation:1 Total: 7	Utilized: 5 Unutilized: 1 (1 bays to be utilized shortly) Approved/Under Implementation:1	• 220 kV D/C Shahajahanpur (PG) - Gola line	Feb'23	Updated in 201st OCC by UPPTCL
				• LILO of Sitapur – Shahjahanpur 220 kV SC line at Shahjahanpur (PG)	Commissioned	Energization date: 25.02.2022 updated by UPPTCL in 196th OCC
7	Hamirpur 400/220 kV Sub-station	Commissioned: 8 Total: 8	Utilized: 4 Unutilized: 4 (2 bays to be utilized shortly)	• 220 kV Hamirpur-Dehan D/c line	Commissioned	Commisioned date: 09.06.2022. Updated in 198th OCC by HPPTCL
				• Network to be planned for 4 bays	-	HPPTCL to update the status.
8	Sikar 400/220kV, 1x 315 MVA S/s	Commissioned: 8 Total: 8	Utilized: 6 Unutilized: 2	• LILO of 220 kV Sikar (220 kV GSS)-Dhod S/c line at Sikar (PG)	Commissioned	LILO of 220 kV S/C Sikar-Dhod line at 400 kV GSS PGCIL, Sikar has been charged on dt. 31.03.2022
				• Network to be planned for 2 bays.	-	Against the 3rd ICT at 400 kV GSS Sikar, only 2 bays were constructed and same has been utilized by RVPN by constructing LILO of 220 kV S/C Sikar – Dhod line as updated by RVPNL in 195th OCC
9	Bhiwani 400/220kV S/s	Commissioned: 6 Total: 6	Utilized: 0 Unutilized: 6	• 220 kV D/C line Bhiwani (PG) – Bhiwani (HVPNL) line	Dec'22	Updated in 197th OCC by HVPNL
				• 220 kV Bhiwani (PG) - Isherwal (HVPNL) D/c line.	Dec'22	Issue related to ROW as intimated in 192nd OCC.HVPNL to update the status.
				• 220 kV Bhiwani (PG) - Dadhibana (HVPNL) D/c line.	Apr'24	Issue related to ROW as intimated in 192nd OCC.HVPNL to update the status.
10	Jind 400/220kV S/s	Commissioned: 4 Approved:4 Total: 8	Utilized: 4 Unutilized: 0 Approved:4	• LILO of both circuits of 220 kV Jind HVPNL to PTPS D/C line at 400 kV substation PGCIL Khatkar (Jind) with 0.5 sq inch ACSR conductor	May'24	Updated in 197th OCC by HVPNL
11	400/220kV Tughlakabad GIS	Commissioned: 6 Under Implementation: 4 Total: 10	Utilized: 6 Unutilized: 0 Under Implementation:4	• RK Puram – Tughlakabad (UG Cable) 220kV D/c line – March 2023.	-	DTL to update the status.
				• Masjid Mor – Tughlakabad 220kV D/c line.	-	DTL to update the status.
12	400/220kV Kala Amb GIS (TBCB)	Commissioned: 6 Total: 6	Utilized: 0 Unutilized: 6	• HPPTCL has planned one no. of 220kV D/c line from Kala Amb 400/220kV S/s to 220/132kV Kala Amb S/s	Mar'23	Updated in 198th OCC by HPPTCL
				• Network to be planned for 4 bays	-	HPPTCL to update the status.

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
13	400/220kV Kadarpur Sub-station	Commissioned: 8 Total: 8	Utilized: 0 Unutilized: 8	• LILO of both circuits of 220 KV Pali - Sector 56 D/C line at Kadarpur along with augmentation of existing conductor from 220 KV Sector-56 to LILO point with 0.4 sq inch AL-59 conductor.	Mar'23	Updated in 197th OCC by HVPNL
				• LILO of both circuits of 220KV Sector 65 - Pali D/C line at Kadarpur along with augmentation of balance 0.4 sq. inch ACSR conductor of 220 kV Kadarpur - Sector 65 D/C line with 0.4sq inch AL-59 conductor	May'23	Updated in 197th OCC by HVPNL
14	400/220kV Sohna Road Sub-station	Commissioned: 8 Total: 8	Utilized: 2 Unutilized: 4	• LILO of both circuits of 220kV D/c Sector-69 - Roj Ka Meo line at 400kV Sohna Road	Jun'23	Updated in 197th OCC by HVPNL
				• LILO of both circuits of 220kV D/c Badshahpur-Sec77 line at 400kV Sohna Road	Jun'23	Updated in 197th OCC by HVPNL
15	400/220kV Prithla Sub-station	Commissioned: 8 Total: 8	Utilized: 2 Unutilized: 4 Under Implementation:2	• Prithla - Harfali 220kV D/c line with LILO of one ckt at Meerpur Kurali	Commissioned	Commisioned date: 31.12.2021. Updated in 198th OCC by HVPNL
				• LILO of both ckt of 220kV D/c Ranga Rajpur – Palwal line	-	HVPNL to update the status
				• 220kV D/C for Sector78, Faridabad	02.03.2023	Updated in 198th OCC by HVPNL
				• Prithla - Sector 89 Faridabad 220kV D/c line	31.03.2024	Under Implementation (Mar'24). Updated in 198th OCC by HVPNL
16	400/220kV Sonepat Sub-station	Commissioned: 6 Under Implementation:2 Total: 8	Utilized: 2 Unutilized: 2 Under Implementation:2	• LILO of both circuits of 220kV Samalkha - Mohana line at Sonepat	-	HVPNL to update the status.
				• Sonepat - HSIISC Rai 220kV D/c line	Mar'23	Line work is complete howere substation work is under progress. Updated in 201st OCC by HVPNL
17	400/220kV Neemrana Sub-station	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• LILO of Bhiwadi - Neemrana 220kV S/c line at Neemrana (PG)	-	Work order is finalized as updated in 201st OCC by RVPNL.. 5 months from layout finalization.
18	400/220kV Kotputli Sub-station	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• Kotputli - Pathreda 220kV D/c line	-	Bid documents under approval as updated in 195th OCC by RVPNL.
19	400/220kV Jallandhar Sub-station	Commissioned: 10 Total: 10	Utilized: 8 Unutilized: 2	• Network to be planned for 2 bays	May'24	LILO of 220 kV BBMB Jalandhar - Butari line at 400 kV PGCIL Jalandhar being planned. Work expected to be completed by May 2024. Updated in 198th OCC by PSTCL.
20	400/220kV Roorkee Sub-station	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• Roorkee (PG)-Pirankaliyar 220kV D/c line	Commissioned	Roorkee (PG)-Pirankaliyar 220kV D/c line comiisioned in 2020 as intimated by PTCUL in 197th OCC
21	400/220kV Lucknow Sub-station	Commissioned: 8 Total: 8	Utilized: 4 Unutilized: 4	• Network to be planned for 2 bays	Jan'23	• Lucknow -Kanduni, 220 kV D/C line expected energization date Jan'23 updated by UPPTCL in 201st OCC _____ • No planning for 2 no. of bays upated by UPPTCL in 196th OCC. The same has been communicated to Powergrid.
22	400/220kV Gorakhpur Sub-station	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• Network to be planned for 2 bays	Dec'22	• Gorakhpur(PG)- Maharajganj, 220 kV D/C line expected energization date Dec'22 updated by UPPCL in 196th OCC

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
23	400/220kV Fatehpur Sub-station	Commissioned: 8 Under Implementation:2 Total: 10	Utilized: 6 Unutilized: 2 Under Implementation:2	• Network to be planned for 2 bays	-	• UPPTCL intimated that 02 no. of bays under finalization stage. In 201st OCC, UPPTCL intimated that it is finalized that Khaga s/s will be connected (tentative time 1.5 years). _____ • No planning for 2 no. of bays updated by UPPTCL in 196th OCC. The same has been communicated to Powergrid.
24	400/220kV Abdullapur Sub-station	Commissioned: 10 Under Implementation:2 Total: 12	Utilized: 10 Unutilized: 0 Under Implementation:2	• Abdullapur – Rajokheri 220kV D/c line	Oct'22	Updated in 198th OCC by HVPNL
25	400/220kV Pachkula Sub-station	Commissioned: 8 Under tender:2 Total: 10 Out of these 10 nos. 220kV Line Bays, 2 bays would be used by the lines being constructed by POWERGRID (Chandigarh-2) and balance 8 nos. bays would be used by HVPNL	Utilized: 2 Unutilized: 4 Under Implementation:2	• Panchkula – Pinjore 220kV D/c line	31.12.2022	Updated in 194th OCC by HVPNL
				• Panchkula – Sector-32 220kV D/c line	31.12.2022	Updated in 194th OCC by HVPNL
				• Panchkula – Raiwali 220kV D/c line	Commissioned	Updated in 194th OCC by HVPNL
				• Panchkula – Sadhaura 220kV D/c line: Sep'23	Sept'23	Updated in 194th OCC by HVPNL
26	400/220kV Amritsar S/s	Commissioned:7 Approved in 50th NRPC- 1 no. Total: 8	Utilized: 6 Unutilized: 1 Approved in 50th NRPC- 1 no.	• Amritsar – Patti 220kV S/c line	May'23	Route survey/tender under process. Work expected to be completed by May 2023. Updated in 198th OCC by PSTCL.
				• Amritsar – Rashiana 220kV S/c line (2 bays shall be required for above lines. However, 1 unutilized bay shall be used for Patti and requirement of one additional bay approved for Rashiana by NRPC)	May'23	Route survey/tender under process. Work expected to be completed by May 2023. Updated in 198th OCC by PSTCL.
27	400/220kV Bagpat S/s	Commissioned: 8 Total: 8	Utilized:6 Unutilized: 2	• Bagpat - Modipuram 220kV D/c line	Commissioned	Updated in 201st OCC by UPPTCL
28	400/220kV Bahardurgarh S/s	Commissioned: 4 Total: 4	Utilized:2 Unutilized: 2	• Network to be planned for 2 bays.	Mar'24 and July'24	Updated in 198th OCC by HVPNL
29	400/220kV Jaipur (South) S/s	Commissioned: 4 Total: 4	Utilized:2 Unutilized: 2	• Network to be planned for 2 bays.	-	LILO case of 220 kV Dausa – Sawai Madhopur line at 400 kV GSS Jaipur South (PG) is under WTD approval as updated by RVPNL in 195th OCC
30	400/220kV Sohawal S/s	Commissioned: 8 Total: 8	Utilized: 8	• Sohawal - Barabanki 220kV D/c line	Commissioned	Energization date: 14.04.2018 updated by UPPTCL in 196th OCC
				• Sohawal - New Tanda 220kV D/c line	Commissioned	Energization date: 28.05.2019 updated by UPPTCL in 196th OCC
				• Network to be planned for 2 bays	Commissioned	• Sohawal - Gonda 220kV S/c line (Energization date: 27.04.2020) updated by UPPTCL in 196th OCC _____ • Sohawal - Bahraich 220kV S/c line (Energization date: 15.02.2021) updated by UPPTCL in 196th OCC

Sl. No.	Substation	Downstream network bays	Status of bays	Planned 220 kV system and Implementation status	Revised Target	Remarks
31	400/220kV, Kankroli	Commissioned: 6 Total: 6	Utilized: 4 Unutilized: 2	• Network to be planned for 2 bays	-	RVPNL to update the status
32	400/220kV, Manesar	Commissioned: 8 Total: 8	Utilized: 4 Unutilized: 4	• Network to be planned for 4 bays	-	One bay 220 kV Manesar (PG)-Panchgaon ckt commissioned on 05.09.2022
33	400/220kV, Saharanpur	Commissioned: 6 Under Implementation:2 Total: 8	Utilized: 6 Unutilized: 0 Under Implementation:2	• Network to be planned for 2 bays	31.12.2022	Saharanpur(PG)-Devband D/c line expected energization date Dec'22 updated by UPPTCL in 201st OCC
34	400/220kV, Wagoora	Commissioned: 10 Total: 10	Utilized: 6 Unutilized: 4	• Network to be planned for 4 bays	-	PDD, J&K to update the status.
35	400/220kV, Ludhiana	Commissioned: 9 Total: 9	Utilized: 8 Unutilized: 1	• Network to be planned for 1 bay	Mar'23	Direct circuit from 220 kV Lalton Kalan to Dhandari Kalan to be diverted to 400 kV PGCIL Ludhiana. Work expected to be completed by March 2023.Updated in 198th OCC by PSTCL.
36	400/220kV, Chamba (Chamera Pool)	Commissioned: 3 Under tender:1 Total: 4	Utilized:3 Unutilized: 0 Under tender:1	• Stringing of 2nd ckt of Chamera Pool – Karian 220kV D/c line	-	Stringing of 2nd Circuit of Chamera Pool-Karian Tansmission line has been completed & terminal bay at 400/220 kV chamera pooling substation (PGCIL) is not ready.Updated in 198th OCC by HPPTCL
37	400/220kV, Mainpuri	Commissioned: 6 Under Implementation:2 Total: 8	Utilized: 6 Unutilized: 0 Under Implementation:2	• Network to be planned for 2 bays	-	• 02 no. of bays under finalization stage updated by UPPTCL in 196th OCC. Mainpuri S/s planned. Land is not finalized, therefore timeline not available as intimated by UPPTCL in 201st OCC.
38	400/220kV, Patiala	Commissioned: 8 Total: 8	Utilized: 6 Unutilized: 2	• Network to be planned for 2 bays	May'24	2 Nos. bays for 400 kV PGCIL Patiala - 220 kV Bhadson (D/C) line being planned. Work expected to be completed by May 2024. Updated in 198th OCC by PSTCL.

2. Establishment of new 400/220kV substations in Northern Region:

Sl. No.	Name of Substation	MVA Capacity	Expected Schedule		Downstream connectivity by States
1	400/220kV Dwarka-I GIS (8 nos. of 220kV bays)	4x 500	Mar'22		DTL to update the status
2	220/66kV Chandigarh GIS (8 nos. of 66kV bays)	2x 160	Apr'22		Chandigarh to update the status.
3	400/220kV Jauljivi GIS Out of these 8 nos. 220kV Line Bays, 4 nos. (Pithoragath-2, & Dhauliganga-2) would be used by the lines being constructed by POWERGRID and balance 4 nos. bays would be used by the lines being constructed by PTCUL.	2x315	Feb'22		• 220kV Almora-Jauljibi line • 220kV Brammah-Jauljibi line PTCUL to update the status of lines.

FGD Status

Updated status of FGD related data submission

NTPC (25.02.2022)
MEJA Stage-I (Updated by UP on 18.06.2022)
RIHAND STPS
SINGRAULI STPS
TANDA Stage-I
TANDA Stage-II
UNCHAHAR TPS
UPRVUNL (14.11.2022)
ANPARA TPS
HARDUAGANJ TPS
OBRA TPS
PARICHHA TPS

PSPCL (14.11.2022)
GGSSTP, Ropar
GH TPS (LEH.MOH.)
RRVUNL (14.11.2022)
CHHABRA SCPP
CHHABRA TPP
KALISINDH TPS
KOTA TPS
SURATGARH SCTPS
SURATGARH TPS

Updated status of FGD related data submission

Lalitpur Power Gen. Co. Ltd. (17.10.2022)
Lalitpur TPS
Lanco Anpara Power Ltd. (18.06.2022)
ANPARA-C TPS

HGPCL (14.09.2022)
PANIPAT TPS
RAJIV GANDHI TPS
YAMUNA NAGAR TPS

Adani Power Ltd. (18.02.2022)
KAWAI TPS

Rosa Power Supply Company (18.06.2022)
Rosa TPP Phase-I
Prayagraj Power Generation Company Ltd. (17.10.2022)
Prayagraj TPP
APCPL (25.02.2022)
INDIRA GANDHI STPP

Pending submissions

GVK Power Ltd.
GOINDWAL SAHIB

NTPC
DADRI (NCTPP)
Talwandi Sabo Power Ltd.
TALWANDI SABO TPP
L&T Power Development Ltd.
Nabha TPP (Rajpura TPP)

Target Dates for FGD Commissioning (Utility-wise)

Adani Power Ltd.	KAWAI TPS U#1 (Target: 31-12-2024), KAWAI TPS U#2 (Target: 31-12-2024)
APCPL	INDIRA GANDHI STPP U#1 (Target: 30-09-2022), INDIRA GANDHI STPP U#2 (Target: 30-09-2022), INDIRA GANDHI STPP U#3 (Target: 30-09-2022)
GVK Power Ltd.	GOINDWAL SAHIB U#1 (Target: 30-04-2020), GOINDWAL SAHIB U#2 (Target: 29-02-2020)
HGPCL	PANIPAT TPS U#6 (Target: 30-04-2021), PANIPAT TPS U#7 (Target: 28-02-2021), PANIPAT TPS U#8 (Target: 31-12-2020), RAJIV GANDHI TPS U#1 (Target: 30-04-2022), RAJIV GANDHI TPS U#2 (Target: 28-02-2022), YAMUNA NAGAR TPS U#1 (Target: 31-12-2021), YAMUNA NAGAR TPS U#2 (Target: 31-10-2021)

NTPC	DADRI (NCTPP) U#1 (Target: 31-12-2020), DADRI (NCTPP) U#2 (Target: 31-10-2020), DADRI (NCTPP) U#3 (Target: 31-08-2020), DADRI (NCTPP) U#4 (Target: 30-06-2020), DADRI (NCTPP) U#5 (Target: 30-06-2022), DADRI (NCTPP) U#6 (Target: 30-06-2022), RIHAND STPS U#1 (Target: 30-06-2024), RIHAND STPS U#2 (Target: 30-06-2024), RIHAND STPS U#3 (Target: 31-12-2023), RIHAND STPS U#4 (Target: 31-12-2023), RIHAND STPS U#5 (Target: 30-06-2023), RIHAND STPS U#6 (Target: 30-06-2023), SINGRAULI STPS U#1 (Target: 30-06-2024), SINGRAULI STPS U#2 (Target: 30-06-2024), SINGRAULI STPS U#3 (Target: 30-06-2024), SINGRAULI STPS U#4 (Target: 30-06-2024), SINGRAULI STPS U#5 (Target: 30-06-2024), SINGRAULI STPS U#6 (Target: 31-03-2023), SINGRAULI STPS U#7 (Target: 31-03-2023), UNCHAHAR TPS U#1 (Target: 31-12-2023), UNCHAHAR TPS U#2 (Target: 31-12-2023), UNCHAHAR TPS U#3 (Target: 30-06-2024), UNCHAHAR TPS U#4 (Target: 30-06-2024), UNCHAHAR TPS U#5 (Target: 30-06-2024), UNCHAHAR TPS U#6 (Target: 30-06-2022), MEJA Stage-I U#1 (Target: 31-12-2022), MEJA Stage-I U#2 (Target: 31-03-2023), TANDA Stage-I U#3 (Target:), TANDA Stage-I U#4 (Target:), TANDA Stage-II U#3 (Target: 31-12-2022), TANDA Stage-II U#4 (Target: 31-12-2022)

L&T Power Development Ltd (Nabha)	Nabha TPP (Rajpura TPP) U#1 (Target: 30-04-2021), Nabha TPP (Rajpura TPP) U#2 (Target: 28-02-2021)
Lalitpur Power Gen. Company Ltd.	LALITPUR TPS U#1 (Target: 31-12-2026), LALITPUR TPS U#2 (Target: 30-09-2026), LALITPUR TPS U#3 (Target: 30-06-2026)
Lanco Anpara Power Ltd.	ANPARA C TPS U#1 (Target: 31-12-2023), ANPARA C TPS U#2 (Target: 31-12-2023)
Prayagraj Power Generation Company Ltd.	PRAYAGRAJ TPP U#1 (Target: 31-12-2024), PRAYAGRAJ TPP U#2 (Target: 31-12-2024), PRAYAGRAJ TPP U#3 (Target: 31-12-2024)
PSPCL	GH TPS (LEH.MOH.) U#1 (Target: 31-12-2024), GH TPS (LEH.MOH.) U#2 (Target: 31-12-2024), GH TPS (LEH.MOH.) U#3 (Target: 31-12-2024), GH TPS (LEH.MOH.) U#4 (Target: 31-12-2024), GGSSTP, Ropar U#3 (Target: 31-03-2022), GGSSTP, Ropar U#4 (Target: 31-05-2022), GGSSTP, Ropar U#5 (Target: 31-07-2022), GGSSTP, Ropar U#6 (Target: 30-09-2022)

Rosa Power Supply Company	ROSA TPP Ph-I U#1 (Target: 31-12-2026), ROSA TPP Ph-I U#2 (Target: 31-12-2026), ROSA TPP Ph-I U#3 (Target: 31-12-2026), ROSA TPP Ph-I U#4 (Target: 31-12-2026)
RRVUNL	KOTA TPS U#5 (Target: 31-08-2022), KOTA TPS U#6 (Target: 31-08-2022), KOTA TPS U#7 (Target: 31-08-2022), SURATGARH TPS U#1 (Target: 31-12-2026), SURATGARH TPS U#2 (Target: 31-12-2026), SURATGARH TPS U#3 (Target: 31-12-2026), SURATGARH TPS U#4 (Target: 31-12-2026), SURATGARH TPS U#5 (Target: 31-12-2026), SURATGARH TPS U#6 (Target: 31-12-2026), SURATGARH SCTPS U#7 (Target: 28-02-2025), SURATGARH SCTPS U#8 (Target: 28-02-2025), CHHABRA TPP U#1 (Target: 31-12-2026), CHHABRA TPP U#2 (Target: 31-12-2026), CHHABRA TPP U#3 (Target: 31-12-2026), CHHABRA TPP U#4 (Target: 31-12-2026), CHHABRA SCPP U#5 (Target: 28-02-2025), CHHABRA SCPP U#6 (Target: 28-02-2025), KALISINDH TPS U#1 (Target: 28-02-2025), KALISINDH TPS U#2 (Target: 28-02-2025)
Talwandi Sabo Power Ltd.	TALWANDI SABO TPP U#1 (Target: 28-02-2021), TALWANDI SABO TPP U#2 (Target: 31-12-2020), TALWANDI SABO TPP U#3 (Target: 31-10-2020)
UPRVUNL	ANPARA TPS U#1 (Target: 31-12-2023), ANPARA TPS U#2 (Target: 31-12-2023), ANPARA TPS U#3 (Target: 31-12-2023), ANPARA TPS U#4 (Target: 31-12-2023), ANPARA TPS U#5 (Target: 31-12-2023), ANPARA TPS U#6 (Target: 31-12-2023), ANPARA TPS U#7 (Target: 31-12-2023), HARDUAGANJ TPS U#8 (Target: 31-12-2024), HARDUAGANJ TPS U#9 (Target: 31-12-2024), OBRA TPS U#9 (Target: 31-12-2024), OBRA TPS U#10 (Target: 31-12-2024), OBRA TPS U#11 (Target: 31-12-2024), OBRA TPS U#12 (Target: 31-12-2024), OBRA TPS U#13 (Target: 31-12-2024), PARICHHA TPS U#3 (Target: 30-04-2022), PARICHHA TPS U#4 (Target: 31-12-2024), PARICHHA TPS U#5 (Target: 31-12-2024), PARICHHA TPS U#6 (Target: 31-12-2024)

RAJASTHAN RAJYA VIDYUT PRASARAN NIGAM LIMITED.
[Corporate Identity Number (CIN):U40109RJ2000SGC016485]
(Regd. Office: Vidyut Bhawan, Jan Path, Jyoti Nagar, Jaipur - 302 005)
OFFICE OF THE SUPERINTENDING ENGINEER (PROJECT & PLANNING)
+91-141-2740623, Fax:+91-141-2740794;
e-mail: se.pp@rvpn.co.in; website:www.rvpn.co.in
RVPN
An ISO 9001:2000 Certified Company

No. RVPN/SE(P&P)/XEN-2(P&P)/AE-2/ F. /D 1211 Jaipur, Dt. 15/09/2022

To
The General Manager (NRLDC)
Power System Operation Corporation Ltd. (POSOCO)
18-A, Shaheed Jeet Singh Sansanwal Marg, Katwaria Sarai
New Delhi-110016.

Sub:- Proposed SPS for 400/220 kV ICTs at RVPN's 400 KV GSS Bhadla.
Ref: MOM 197th OCC Meeting held on dated 22.07.2022

On the above captioned subject, it was decided in the 197th OCC Meeting held on dated 22.07.2022 that RVPN to share the studies/simulation study of the proposed SPS for 400/220 kV ICTs at RVPN's 400 kV GSS Bhadla for further analysis. RVPN has carried out the load flow study for proposed SPS. Kindly find attached modified justification note for proposed SPS for 400/220 KV ICTs at RVPN's 400 KV GSS Bhadla alongwith schematic diagram, load details and results of load flow study for consideration and approval.

Encl: As above

(K.K. Meena)
Chief Engineer (PP&D)
RVPNL, Jaipur.

Copy to the following for information and necessary action please-

1. The Member Sceratry (NRPC), 18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016
2. The Chief Engineer (LD/T&C/MPT&S), RVPN, Jaipur/Jodhpur/Jodhpur.
3. The Chief Engineer, Power System Planning & Appraisal-I Division, CEA, Sewa Bhawan, RK Puram-I, New Delhi-110066
4. The Superintending Engineer (Operation), NRPC, 18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016.

Encl: As above

Chief Engineer (PP&D)
RVPNL, Jaipur

Proposed SPS for 2x315 MVA, 400/220 kV ICTs at 400 kV GSS Bhadla

1. Details of Installed ICTs and Transmission Lines

- There are 3x500MVA, 400/220 kV ICTs at 400 kV GSS Bhadla. Mainly these ICTs are used to stepped up the RE power to evacuate through 400 kV lines to Jodhpur, Merta and Bikaner. Load sharing on all the ICTs is almost equal and each ICT is loaded near to rated capacity of 500 MVA.
- Power map of transmission system at 400 kV GSS Bhadla is shown in Figure 1.

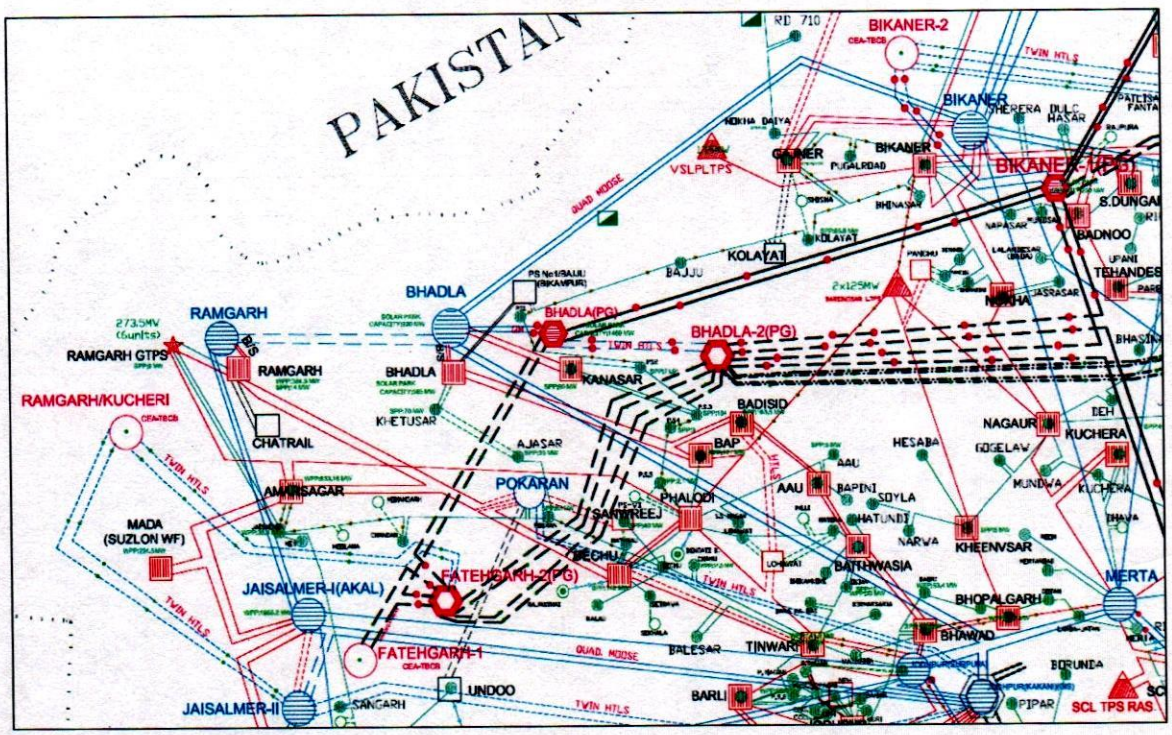


Fig. 1 Power map of Bhadla region

2. Load Details on ICTs and Transmission Lines Associated with 400 kV GSS Bhadla

- Peak Loads recorded on the 400/220 kV ICTs and 220 kV lines associated with 400 kV GSS Bhadla are detailed below in Table 1. RE power injected by the lines to 220 kV Bus of 400 kV GSS Bhadla is also mentioned in the Table 1.

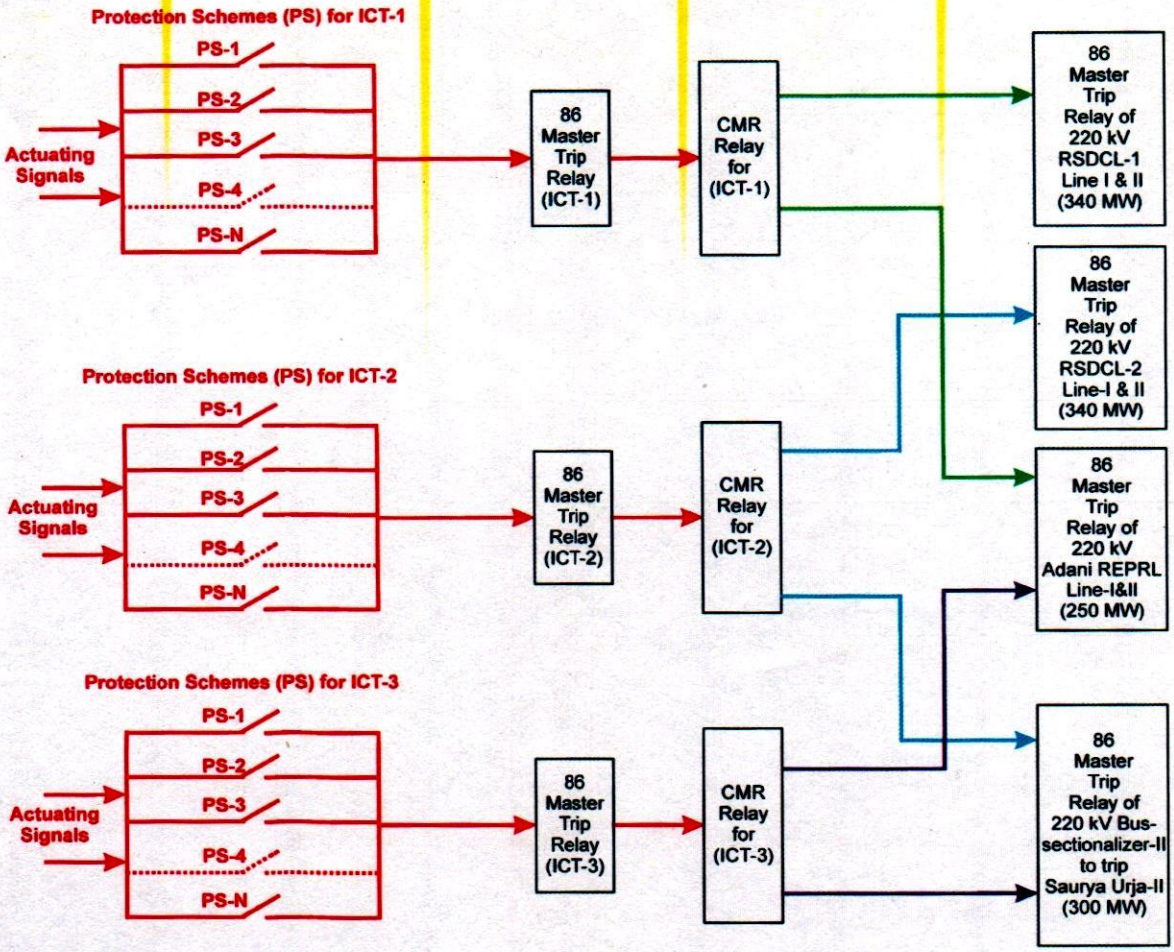
Table 1: Load Details on ICTs and Transmission Lines Associated with 400 kV GSS Bhadla

S. No.	Name of 220 kV line/ILTs	Peak Load (MW)	RE Generation
1	500 MVA, 400/220 kV ICT-I	494	
2	500 MVA, 400/220 kV ICT-II	490	
3	500 MVA, 400/220 kV ICT-III	491	
4	400 kV Bhadla-Bikaner Ckt-I Line	598	
5	400 kV Bhadla-Bikaner Ckt-II Line	710	

6	400 kV Bhadla-Ramgarh Ckt-I Line	520	
7	400 kV Bhadla-Ramgarh Ckt-II Line	520	
8	400 kV Bhadla-Merta Line	406	
9	400 kV Bhadla-Jodhpur (Surpura) Line	600	
10	400 kV Bhadla (RVPN)-Bhadla(PGCIL) Ckt-I Line	562	
11	400 kV Bhadla (RVPN)-Bhadla(PGCIL) Ckt-II Line	548	
12	220 kV Bhadla-Kanasar Ckt-I Line	134	190 MW
13	220 kV Bhadla-Kanasar Ckt-II Line	134	
14	220 kV Bus Sectionalizer-II to evacuate power of Saurya Urja-II (300 MW)	-	300 MW
15	220 kV Bhadla-RSDCL-1 Ckt-I Line	153	340 MW
16	220 kV Bhadla-RSDCL-1 Ckt-II Line	152	
17	220 kV Bhadla-RSDCL-2 Ckt-I Line	154	340 MW
18	220 kV Bhadla-RSDCL-2 Ckt-II Line	156	
19	220 kV Bhadla-Adani REPRL Ckt-I Line	132	250 MW
20	220 kV Bhadla- Adani REPRL Ckt-II Line	131	

3. Proposed SPS for ICTs at 400 kV GSS Bhadla

- After detailed analysis of above loading conditions, RE power injection & grid interconnection issues, following lines are considered for tripping as soon as any one of the 3x500 MVA, 400/220 kV ICTs is tripped on fault/protection:-
  - 220 kV Bhadla-RSDCL-1 Ckt-I Line
  - 220 kV Bhadla-RSDCL-1 Ckt-II Line
  - 220 kV Bhadla-RSDCL-2 Ckt-I Line
  - 220 kV Bhadla-RSDCL-2 Ckt-II Line
  - 220 kV Bhadla- Adani REPRL Ckt-I Line
  - 220 kV Bhadla- Adani REPRL Ckt-II Line
  - 220 kV Bus Sectionalizer-II used to evacuate 300 MW RE power of Saurya Urja-II
- Tripping command for the 220 kV lines and 220 kV Bus Sectionalizer-II used to inject RE power on the 220 kV bus of 400 kV GSS Bhadla is to be taken from the 86 relay installed on 220 kV side of all the 3x500 MVA, 400/220 kV ICTs which will be utilized to trip the above 220 kV lines and/or 220 kV Bus Sectionalizer-II when any one ICT trips on fault/protection.
- Schematic diagram for tripping of 220 kV lines included in SPS for 3x500 MVA, 400/220 kV ICTs at 400 kV GSS Bhadla is shown below in Figure 2.



SCHEMATIC DIAGRAM OF PROPOSED SPS FOR 3X500 MVA 400/220 KV ICTs AT 400 KV GSS BHADLA

Fig. 2 Schematic diagram of proposed logics for SPS of 3x500 MVA, 400/220 kV ICTs at 400 kV GSS Bhadla

- To facilitate the RE generators for evacuation of RE powers of all generators in proportionate quantum, the tripped lines may be re-connected after curtailing the RE generation from all generators in such a quantum to maintain loadings on the healthy 400/220 kV ICTs within permissible limits.

4. Validation of Proposed SPS for ICTs at 400 kV GSS Bhadla Using Load Flow Studies

- Load flow study is carried out for the condition corresponding to FY 2022-2023 for total system load of 16012 MW (recorded on 28.06.2022) considering the RE generation mentioned in the Table 2 at injection point with the RVPN network. The voltage level and injection point for RE generators are also mentioned in the Table 2.

Table 2 Details of RE Generators and Injection Point

S. No.	Name of RE Generator	Quantum of RE Power	Voltage Level of Grid Injection Point/Location	RE evacuation arrangement

1	RSDCL-1	340 MW	220 kV (400 kV GSS Bhadla)	220 kV D/C RSDCL-Bhadla line integrated to 220 kV bus of 400 kV GSS of Bhadla
2	RSDCL-2	340 MW	220 kV (400 kV GSS Bhadla)	220 kV D/C RSDCL-Bhadla line integrated to 220 kV bus of 400 kV GSS of Bhadla
3	Adani REPRL	250 MW	220 kV (400 kV GSS Bhadla)	220 kV D/C RSDCL-Bhadla line integrated to 220 kV bus of 400 kV GSS of Bhadla
4	Saurya Urja-II	300 MW	220 kV (400 kV GSS Bhadla)	220 kV D/C Saurya Urja-II-Bhadla line integrated to 220 kV bus of 400 kV GSS of Bhadla using bus coupler between the 220 kV GSS and 400 kV GSS
5	220 kV GSS Kanasar	190 MW	220 kV (400 kV GSS Bhadla)	220 kV D/C Kanasar-Bhadla line integrated to 220 kV bus of 400 kV GSS of Bhadla
6	Saurya Urja-I	200 MW	220 kV (220 kV GSS Bhadla)	220 kV D/C Saurya Urja-I-Bhadla line integrated to 220 kV bus of 220 kV GSS of Bhadla
7	Injection on 33 kV voltage level by 6 nos. generators	65 MW	33 kV (220 kV GSS Bhadla)	Power is injected on 33 kV voltage level in the yard of 220 kV GSS Bhadla
8	132 kV GSS Khetusar	70 MW	132 kV (220 kV GSS Bhadla)	Power is injected on 132 kV voltage level in the yard of 220 kV GSS Bhadla

- Load flow study is carried out for the following case studies:-

Case-1: Base Case (Power flow plot is placed at Exhibit-1). Power flow plot with outage of one ICT is placed at Exhibit-1A.

Case-2: Outage of 500 MVA, 400/220 kV ICT-1 and tripping of following lines (Power flow plot is placed at Exhibit-2)

- 220 kV D/C Bhadla-RSDCL-1 line
- 220 kV D/C Bhadla-Adani REPRL line

Case-3: Outage of 500 MVA, 400/220 kV ICT-2 and tripping of following lines (Power flow plot is placed at Exhibit-3)

- 220 kV D/C Bhadla-RSDCL-2 line
- 220 kV Bus Coupler between 400 kV GSS Bhadla and 220 kV GSS Bhadla for outage of 300 MW generation of Saurya Urja-II

Case-4: Outage of 500 MVA, 400/220 kV ICT-3 and tripping of following lines (Power flow plot is placed at Exhibit-4)

- 220 kV D/C Bhadla-Adani REPRL line

- 220 kV Bus Coupler between 400 kV GSS Bhadla and 220 kV GSS Bhadla for outage of 300 MW generation of Saurya Urja-II

- Power flow on the ICTs and transmission lines associated with the 220 kV and 400 kV transmission lines associated with 400 kV GSS Bhadla are Tabulated in Table 3:-

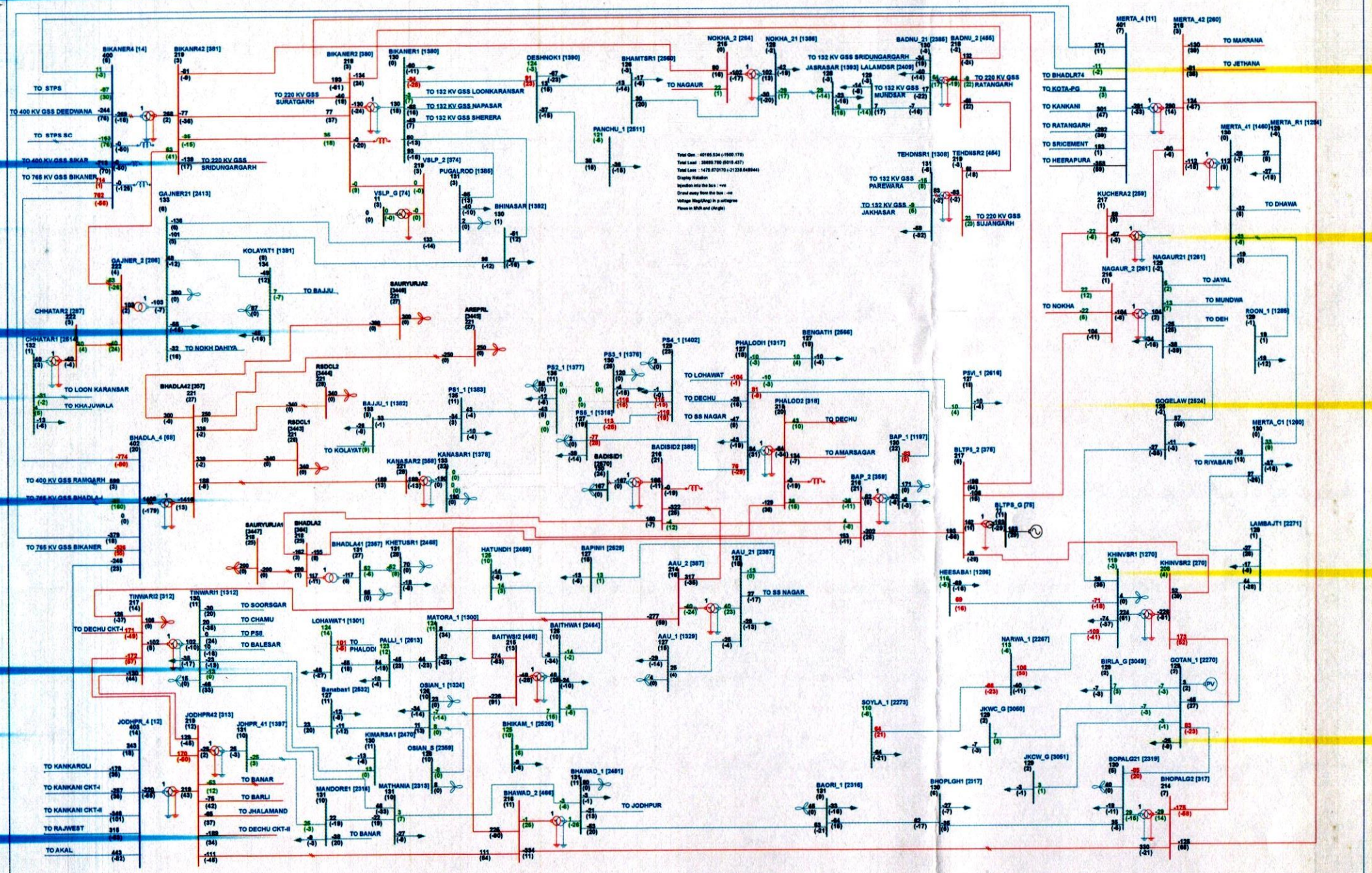
Table 3 Power Flow on the ICTs and Transformers

S. No.	Name of ICT/Line	Power Flow (MW)				
		Base Case (Case-1)		Case-2	Case-3	Case-4
		(Exhibit-1)	(Exhibit-1A)	(Exhibit-2)	(Exhibit-3)	(Exhibit-4)
1	3x500 MVA, 400/220 kV ICTs	-1408	NA	NA	NA	NA
1	2x500 MVA, 400/220 kV ICTs	NA	**-1403**	-823	-774	-862
2	400 kV S/C Bhadla-Bikaner (RVPN) line	774	772	710	704	714
3	400 kV S/C Bhadla-Bikaner (PGCIL) line	526	525	476	471	479
4	400 kV S/C Bhadla-Jodhpur line	245	244	208	205	211
5	400 kV S/C Bhadla-Merta line	379	378	348	345	350
6	400 kV S/C Bhadla-Ramgarh line	-599	-598	-656	-661	-652
7	400 kV S/C Bhadla (RVPN)-Bhadla (PGCIL) line	83	82	-262	-291	-239
8	220 kV D/C Bhadla-RSDCL1 line	-339	-339	NIL	-339	-339
9	220 kV D/C Bhadla-RSDCL2 line	-339	-339	**-339**	NIL	-339
10	220 kV D/C Bhadla-Adani line	-250	-250	NIL	-250	NIL
11	220 kV D/C Bhadla-Saurya Urja-II line (Bus coupler)	-300	-300	-300	NIL	NIL
12	220 kV D/C Bhadla (220 kV GSS)-Saurya Urja-I line	-200	-200	-200	-200	-200
13	220 kV D/C Bhadla (220 kV GSS)-Bap line	155	155	155	155	155
14	220 kV D/C Bhadla (220 kV GSS)-Badisid line	162	162	162	162	162

- Detailed analysis of the power flow on the transmission elements associated with the 400 kV GSS Bhadla and 220 kV GSS Bhadla mentioned in Table 3 indicates that loading on all the healthy ICTs is within permissible limits. However, with reduced RE generation loading on the healthy ICTs vary from 77.4% to 82.3%. These ICTs can be utilized up to full capacity by allowing the generation from the tripped RE generators on reduced capacity.

5. Conclusion

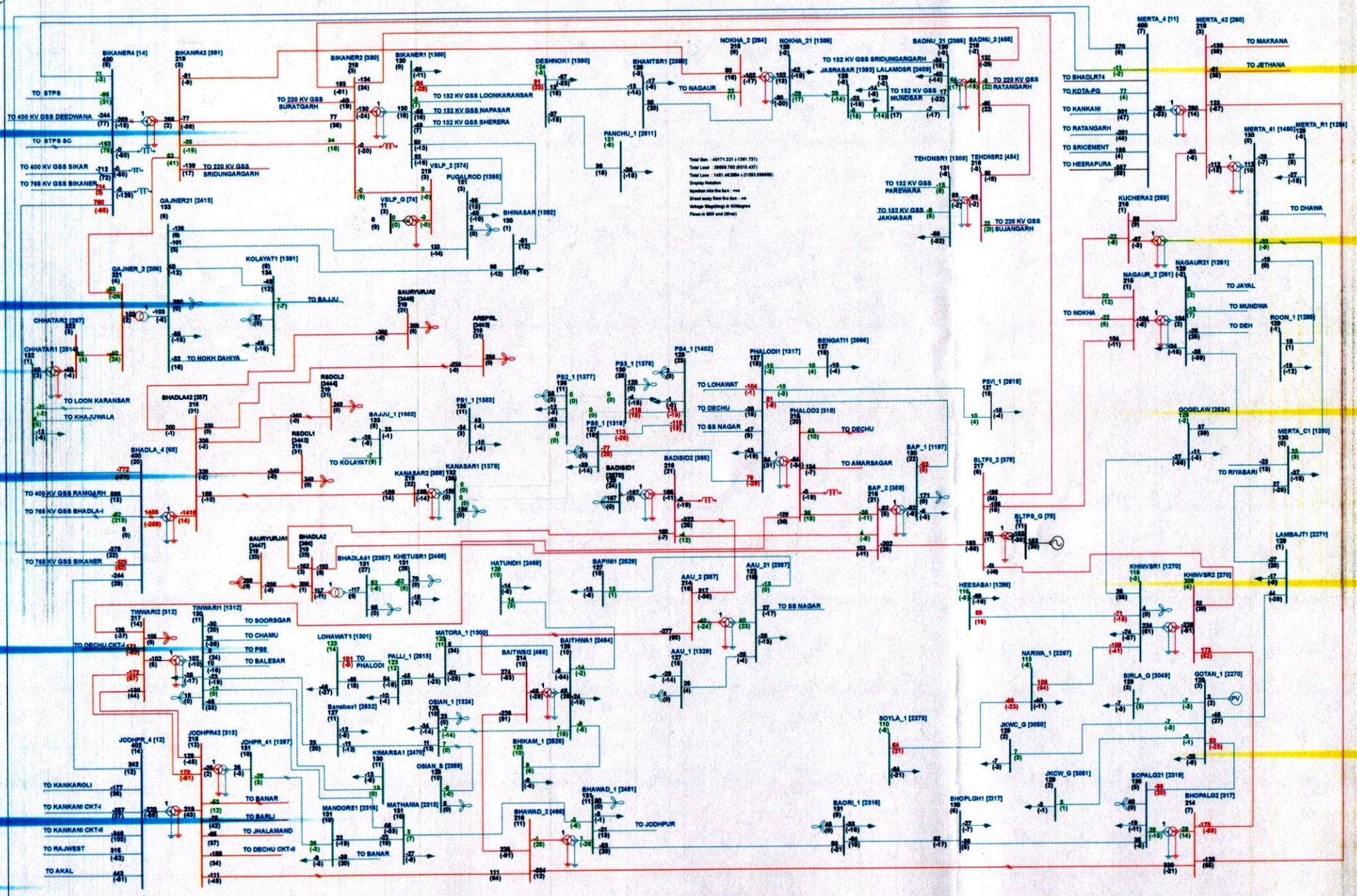
Based on the results of load flow study, SPS logics included in the section 3 and explained in Fig. 2 are found feasible.



BASE CASE: LOAD FLOW STUDY FOR CONDITION CORRESPONDING TO THE FY 2022-2023 FOR TOTAL SYSTEM LOAD OF 16012 MW

SPS STUDY-400 KV GSS BHADLA

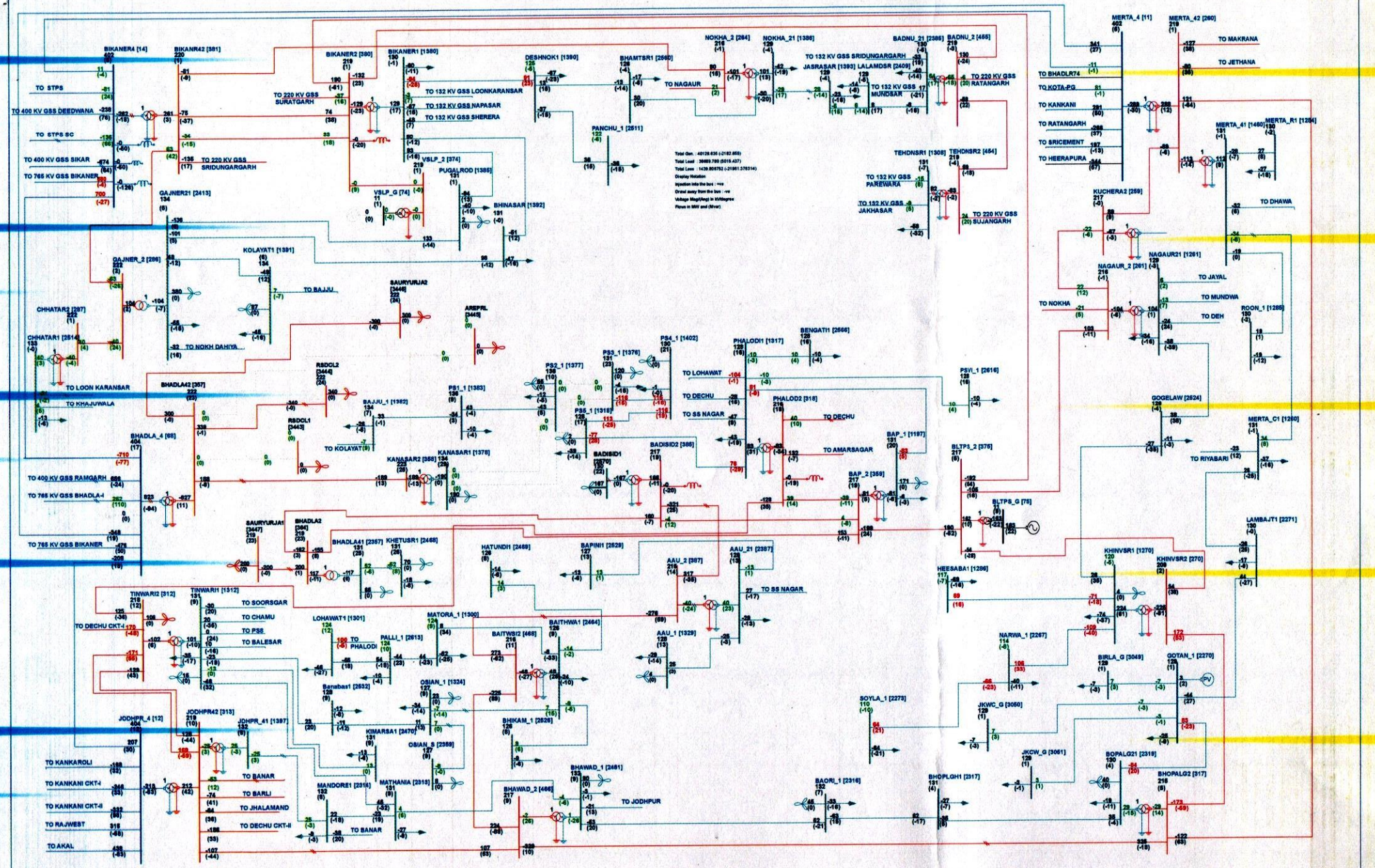
EXHIBIT-1



BASE CASE: LOAD FLOW STUDY FOR CONDITION CORRESPONDING TO THE FY 2022-2023 FOR TOTAL SYSTEM LOAD OF 16012 MW (OUTAGE OF ONE ICT)

SPS STUDY-400 KV GSS BHADLA

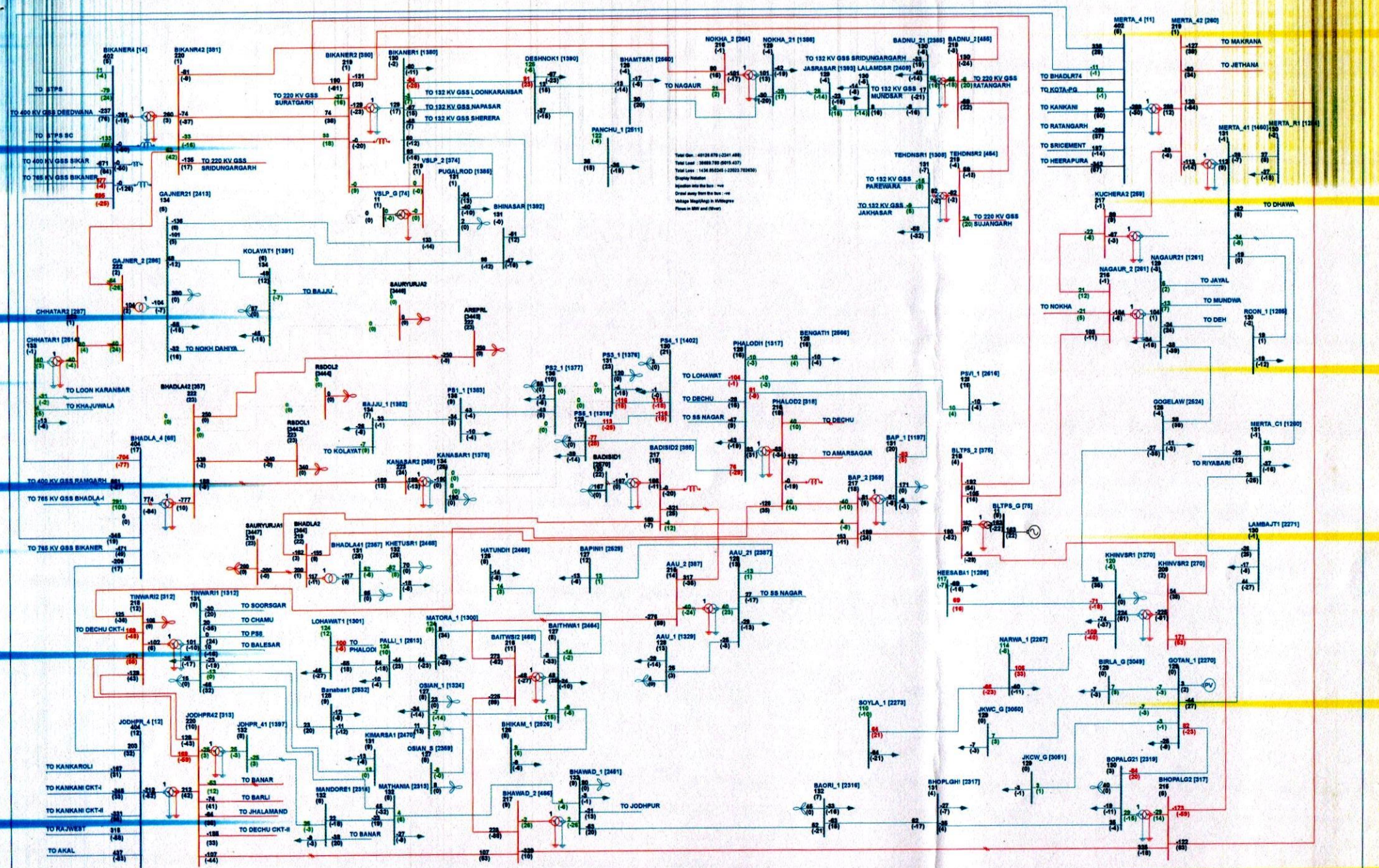
EXHIBIT-1 A



CASE-2: OUTAGE OF ONE ICT AND TRIPPING OF POWER PLANTS OF RSDCL1 AND ADANI REPRL

SPS STUDY-400 KV GSS BHADLA

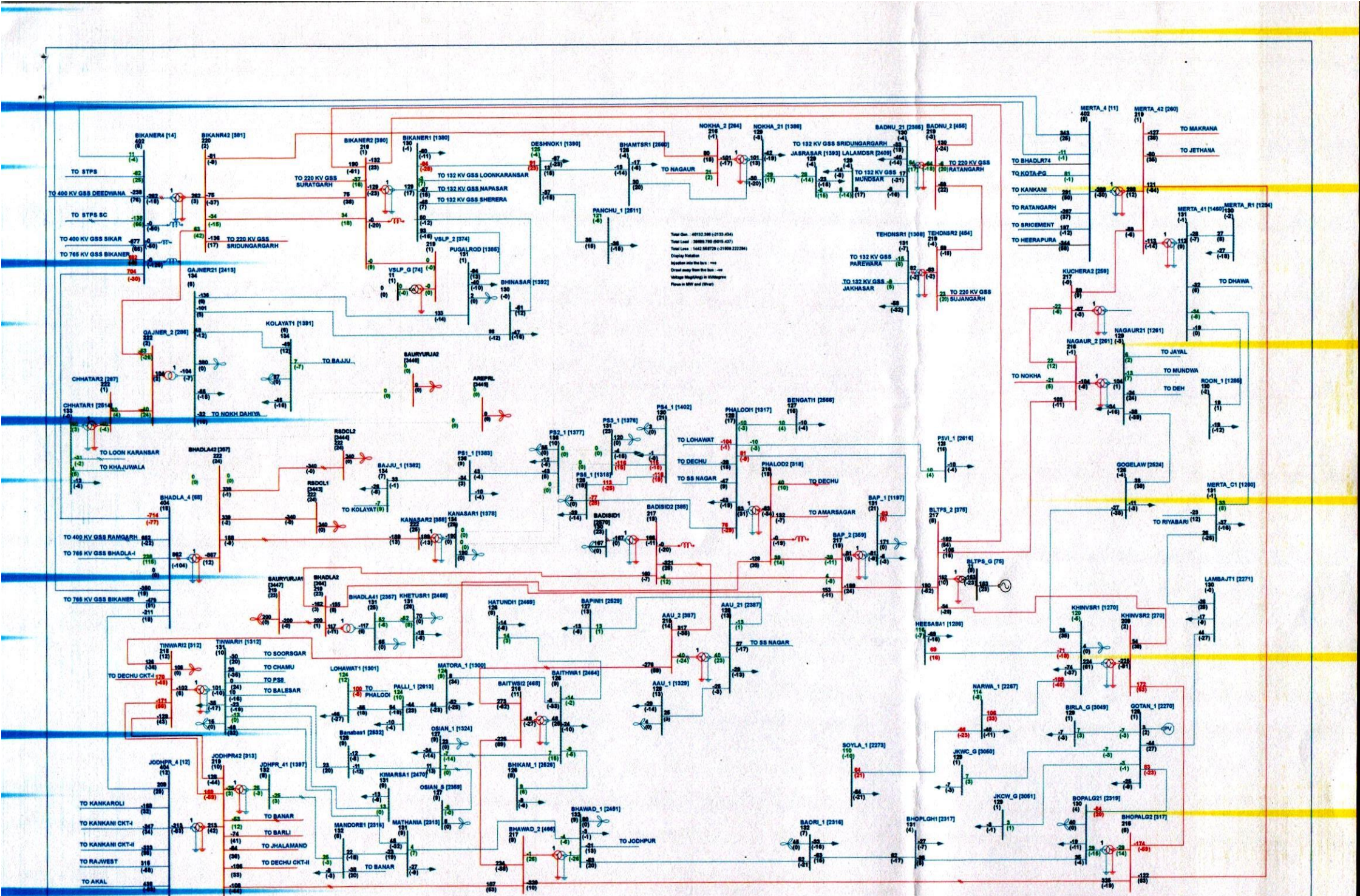
EXHIBIT-2



CASE-3: OUTAGE OF ONE ICT AND TRIPPING OF POWER PLANTS OF RSDCL2 AND SAURYA URJA-II(BUS COUPLER)

SPS STUDY-400 KV GSS BHADLA

EXHIBIT-3



CASE-4: OUTAGE OF ONE ICT AND TRIPPING OF POWER PLANTS OF RSDCL2 AND SAURYA URJA-II(BUS COUPLER)

SPS STUDY-400 KV GSS BHADLA

EXHIBIT-4