

1/9/40<sup>th</sup>/SCSPNR/2018 - 542-560



भारत सरकार

Government of India

विद्युत मंत्रालय

Ministry of Power

केन्द्रीय विद्युत प्राधिकरण

Central Electricity Authority

विद्युत प्रणाली योजना एवं मूल्यांकन - I प्रभाग

Power System Planning & Appraisal - I Division

-As per list enclosed-

विषय: उत्तरी क्षेत्र की विद्युत प्रणाली योजना पर स्थायी समिति की 40वीं बैठक/ उत्तरी क्षेत्र की ट्रांसमिशन पर स्थायी समिति की पहली बैठक के लिए एजेंडा

**Sub: 40<sup>th</sup> Meeting of Standing Committee on Power System Planning of Northern Region/ 1<sup>st</sup> Meeting of Northern Region Standing Committee on Transmission – AGENDA NOTE**

Sir/ Madam,

Agenda Note for 40<sup>th</sup> meeting of the Standing Committee on Power System Planning of Northern Region/ 1st Meeting of Northern Region Standing Committee on Transmission is available on CEA website: [www.cea.nic.in](http://www.cea.nic.in) at following link [http://cea.nic.in/reports/committee/scm/nr/agenda\\_note/40th.pdf](http://cea.nic.in/reports/committee/scm/nr/agenda_note/40th.pdf) (path to access – Home Page –Wing- PowerSystem-PSPA-I- Standing Committee on Power System Planning- Northern region).

Date and Venue of the meeting would be communicated shortly.

Yours faithfully,

रविन्द गुप्ता  
10/5/18

(रविंदर गुप्ता)/(Ravinder Gupta)

मुख्य अभियन्ता /Chief Engineer)

Copy to: PPS to Member (PS),

1.	Member, Secretary, NRPC, 18-A Shajeed Jeet Singh Sansanwal Marg, Katwaria Sarai, New Delhi - 110016 (Fax-011-26865206)	2.	Director (W &P) UPPTCL, Shakti Bhawan Extn,3rd floor, 14, Ashok Marg, Lucknow - 226 001 (Fax:0522-2287822)	3.	Director (Projects) PTCUL, Urja Bhawan Campus, Kanawali Road Dehradun-248001. Uttrakhand Fax-0135-276431
4.	Director (Technical), Punjab State Transmission Corporation Ltd. (PSTCL) Head Office The Mall Patiala -147001 Fax-0175-2304017	5.	Member (Power) BBMB, Sectot-19 B Madhya Marg, Chandigarh-1 60019 (Fax-01 72-2549857)	6.	Director (Operation) Delhi Transco Ltd. Shakti Sadan, Kotla Marg, New Delhi-110002 (Fax-01123234640)
7.	Director (Technical) RRVNL, Vidut Bhawan, Jaipur-302005. Fax:-0141-2740794	8.	Director (Technical) HVPNL Shakti Bhawan, Sector-6 Panchkula-134109 Fax-0172-256060640	9.	Director (Technical) HPSEB Ltd. Vidut Bhawan, Shimla -171004 Fax-0177-2813554
10.	Managing Director, HPPTCL, Barowalias, Khalini Shimla-171002 Fax-0177-2623415	11.	Chief Engineer (Operation) Ministry of Power, UT Secretariat, Sector-9 D Chandigarh -161009 Fax-0172-2637880	12.	Development Commissioner (Power), Power Department, Grid Substation Complex, Janipur, Jammu, Fax: 191-2534284
13.	Chief Engineer (Transmission) NPCIL, 9-S-30, Vikram Sarabhai Bhawan, Anushakti Nagar, Mumbai-400094 Fax-022-25993570	14.	Director (T&RE) NHPC Office Complex, Sector-33, NHPC, Faridabad-121003 (Fax-0129-2256055)	15.	Director (Projects) NTPC, NTPC Bhawan, Core 7, Scope Complex-6, Institutional Area, Lodhi Road. New Delhi (Fax-011-24361018)
16.	Director (Technical) THDC Ltd. Pragatipuram, Bypass Road, Rishikesh-249201 Fax: 0135-2431519)	17.	Director (Projects) POWERGRID Saudamini Plot no. 2, Sector - 29. Gurgaon-122 001 (Fax-0124-2571809)	18.	CEO, POSOCO B-9, Qutab Institutional Area, Katwaria Sarai New Delhi – 110010 (Fax:2682747)
19.	COO (CTU) POWERGRID, Saudamini, Plot no. 2, Sector -29, Gurgaon-122 001 (Fax-0124-2571809)				

**Agenda Note for 40<sup>th</sup> Meeting of Standing Committee on Power System Planning of Northern Region/ 1<sup>st</sup> Meeting of Northern Region Standing Committee on Transmission**

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**1.0 Confirmation of the Minutes of the 39<sup>th</sup> meeting of the Standing Committee on Power System Planning of Northern Region held on 29-30<sup>th</sup> May, 2017.**

1.1 The Minutes of **39<sup>th</sup> meeting** of the Standing Committee on Power System Planning of Northern Region (SCPSPNR) were issued vide CEA letter no. 1/9/39/2017/PSP&PA-I/783-802 dated 28<sup>th</sup> July, 2017. Subsequently, PGCIL, HVPNL, PTCUL and RRVPNL made some observations on the minutes of the meeting. Based on their observations a corrigendum to the minutes of 39<sup>th</sup> meeting of SCPSPNR was issued vide CEA's letter no. 1/9/39/PSP&A-I/2017/1462-1480 dated 28.12.2017 (copy enclosed at **Annexure-I**). No further comments have been received from the constituents.

1.2 Therefore, the minutes of the 39<sup>th</sup> meeting of SCPSPNR along with the corrigendum may please be confirmed.

**2.0 Constitution of the "Northern Region Standing Committee on Transmission" (NRSCT) for planning of Transmission System in the Region:**

2.1 MoP vide their office order NO.15/3/2017 –Trans dated 13.4.2018 has constituted the "Northern Region Standing Committee on Transmission" (NRSCT) along with its ToR (Terms of Reference) and frequency of meeting. The composition of the Committee is as given below:

Member(Power System), Central Electricity Authority (CEA)	Chairperson
Chief Operating Officer, Central Transmission Utility (POWERGRID)	Member
Director(System Operation), Power System Operation Corporation Ltd.	Member
Heads of State Transmission Utilities (STUs) of Jammu & Kashmir, Himachal Pradesh, Punjab, Haryana, Rajasthan, Delhi, Uttar Pradesh, Uttarakhand, UT of Chandigarh #	Member
Member Secretary of Northern Region Power Committee	Member
Chief Engineer(from Power System Wing), Central Electricity Authority *	Member Secretary

# STUs to coordinate with their respective Distribution Companies (DISCOMs).

\* To be nominated by the Central Electricity Authority.

2.2 Terms of Reference (ToR) of the Committee are to:

- (i) Evolve and finalize System Strengthening Schemes for removal of operational constraints and transfer of surplus power through inter-Regional corridors.
- (ii) Examine the proposals for transmission System for Access! Connectivity Applications.
- (iii) Examine the Associated Transmission System with Electricity Generators.
- (iv) Review the up-stream and down-stream network associated with Transmission schemes.
- (v) Examine and evaluate the intra-State transmission proposals.

The NRSCT shall meet at least once in three months.

2.3 This is for kind information of the members.

### **3.0 Transmission system for Ultra Mega Solar Park in Fatehgarh, distt. Jaisalmer Rajasthan**

3.1 Following transmission system associated with Ultra Mega Solar Park in Fatehgarh, Jaisalmer was agreed in the 38<sup>th</sup> meeting of SCPSNR held on 30-05-2016:

- i. Establishment of 400 kV Pooling Station at Fatehgarh (with a provision to upgrade at 765kV level)
- ii. Fatehgarh Pooling sub-station-Bhadla (PG) 765 kV D/C line (initially to be operated at 400kV)
- iii. 2 Nos. of 400kV line bays at Fatehgarh Pooling substation
- iv. 1x125 MVAR Bus reactor at 400 kV Fatehgarh Pooling station

**Note:** (i) Park Developer to construct 400 kV line from M/s AREPL solar park to Fatehgarh pooling station and provide 1x125 MVAR bus reactor at generation switchyard.

3.2 Subsequently, based on the POWERGRID's observations on MoM of 38<sup>th</sup> SCPSNR regarding 400kV line bays at Bhadla (PG) for termination of 765kV Fatehgarh PS- Bhadla (PG) D/c line (initially to be op at 400kV), CEA vide its letter dated 19.10.2016 has issued Corrigendum-II to the minutes of 38<sup>th</sup> meeting of SCPSNR, which inter-alia included the following in the note of the scheme "Transmission system for Ultra Mega Solar Park in Fatehgarh, Jaisalmer":

**Note:** (ii) POWERGRID to provide two number of line bays at Bhadla (PG)

3.3 The scheme was recommended for implementation through TBCB in the 36<sup>th</sup> meeting of Empowered Committee on Transmission held on 26-07-2016. Subsequently, CTU in 39<sup>th</sup> meeting of Standing Committee of Power System Planning of NR informed that they have received new connectivity applications for about 2100 MW from various wind/solar developers viz. M/s Suzlon and M/s Green Infra located around Fatehgarh and it was decided

that CEA would call a separate meeting to decide the scope of works for the scheme “Transmission system for Ultra Mega Solar Park in Fatehgarh, Jaisalmer” in view of new applications received by CTU for grant of connectivity at Fatehgarh and lot of implementation issues in upgradation of Fatehgarh sub-station to 765kV level.

3.4 A meeting was held on 26.7.2017 in CEA, wherein the scope of the scheme was revised to provide connectivity to these developers, and same was intimated to Empowered Committee on Transmission in its 37<sup>th</sup> meeting held on 20.9.2017. The revised scope of the scheme, interalia, included the following:

- i) Provision of 220kV level at 400kV Pooling Station at Fatehgarh
- ii) 1x500 MVA, 400/220kV Transformer at Fatehgarh PS as a part of Common Transmission system required for grant of Connectivity to the applicants (subject to the submission of Construction Bank Guarantee by the applicants in line with the CERC regulations).
- iii) Deletion of provision of charging of
  - a) Fatehgarh-Bhadla 765 kV D/c line (initially charged at 400 kV level) at 765 kV level.
  - b) Fatehgarh substation at 765 kV level from the scope of the scheme.

3.5 Subsequently, a meeting was held in CEA on 12.12.2017, wherein, CTU stated that the provision of 220kV level and 1x500 MVA, 400/220kV Transformer at Fatehgarh 400kV Pooling Station were included in the scope of the scheme, subject to the submission of Construction Bank Guarantee by the applicants. Further, CERC Connectivity Procedures are being revised as per CERC order No. 145/MP/2017 dated 29.9.2017 and connectivity to the applicants would be issued only after revision of the grant of connectivity procedure. Therefore, provision of 220kV level and 1x500 MVA, 400/220kV ICT may not be considered in the scope of works being considered for bidding. However, space provision for this ICT is to be kept in the scope. Based on the deliberations in the meeting, following was agreed;

- i) Provision of 220kV level and 1x500 MVA, 400/220kV Transformer at Fatehgarh 400kV Pooling Station not to be considered in the present RfP scope of the scheme ‘Transmission system for Ultra Mega Solar Park in Fatehgarh, Distt Jaisalmer Rajasthan’. The same has been informed by CTU vide letter dated 08/09/2017. In total space provision for 5 nos. of 400/220 kV ICTs is to be kept at Fatehgarh.
- ii) As Fatehgarh Solar park is to be commissioned by 30<sup>th</sup> September, 2019, the schedule of commissioning of the transmission scheme to be indicated as 30.9.2019 in the bidding document.
- iii) AREPL to provide details about the suitable land for the Fatehgarh substation and its tentative cost to PFCCCL within a weeks’ time

3.6 The final transmission system as per RfP of the scheme is given below:

**Name of Scheme: Transmission system for Ultra Mega Solar Park in Fatehgarh, distt. Jaisalmer, Rajasthan**

- i) Establishment of 400kV Pooling Station at Fatehgarh
- ii) Fatehgarh Pooling station-Bhadla (PG)765 kV D/C line (to be operated at 400 kV).
- iii) 2 Nos. of 400kV line bays at Fatehgarh Pooling station.
- iv) 1x125 MVAR Bus reactor at 400kV Fatehgarh Pooling station along with associated bay.
- v) Space for future 220 kV (12 nos.) line bays.
- vi) Space for future 400kV (8 nos.) line bays along with line reactors at Fatehgarh Pooling station.
- vii) Space for future 220/400kV transformers (05 nos.) along with associated transformer bays at each level.
- viii) Space for future 400kV bus reactor (2 nos.) along with associated bays.

**Note:**

- a) Park Developer to construct 400kV D/C line from M/s AREPL solar park to Fatehgarh along with 1x125 MVAR bus reactor at generation switchyard.
  - b) POWERGRID to provide 2 nos. of 400kV line bays at Bhadla (PG) for termination of 765kV Fatehgarh PS-Bhadla (PG) D/c line (to be operated at 400kV) at Bhadla end.
  - c) The Solar park developer (M/s AREPL) to provide adequate land for 400kV and 220 kV pooling station adjacent to the proposed solar park for which, transmission licensee shall coordinate with M/s AREPL including commercial aspects for transfer of land.
  - d) 220 kV line bays at Fatehgarh Pooling station for future connectivity lines shall be under the scope of respective developer
  - e) Solar park developer (M/s AREPL) to provide 2 nos. of 400kV line bays at Fatehgarh Pooling Station for termination of 400kV D/C line from AREPL solar park to 400kV Fatehgarh Pooling station.
- 3.7 The bidding process of the scheme has been completed with above scope of works and the SPV has been transferred to the successful bidder i.e. M/s Adani Transmission Limited on 14 March, 2018.

3.8 Members may please note and concur the scheme.

**4.0 Issues related to transmission system for evacuation of power for Bajoli Holi HEP (180MW) of M/s GMR Energy Ltd. in Himachal Pradesh.**

4.1 M/s GMR Energy Ltd. is constructing Bajoli Holi HEP (3x60MW) on Ravi river in Himachal Pradesh. Long Term Access was granted to M/s GMR Bajoli Holi Hydropower Pvt. Ltd. in March 2014 for 155 MW from August 2018 for 25 years through the following transmission system being implemented by HPPTCL:

- i) Bajoli Holi - Lahal Pooling Station of Himachal 220 kV D/C line with Twin Moose conductor
  - ii) Lahal Pooling Station - Chamera Pooling Station (PG) 400 kV D/c line
- 4.2 The first unit of the project is likely to be commissioned by March 2019. M/s GMR had anticipated some delay in the implementation of connectivity system to be implemented by

HPPTCL for evacuation of power from the generation project due to difficult terrain, delay in forest clearance and severe ROW problem. In view of above, GMR had proposed following temporary arrangement for evacuation of power from their project till the originally planned system is completed:

- a) Connect Plant bus to Lahal pooling station through transmission line Bajoli Holi-Lahal P.S 220 kV D/c by expediting construction of the line
  - b) Lahal P.S–Budhil HEP 220 kV D/c line (nearing completion)
  - c) Budhil HEP–Chamera-III 220 kV S/c line (existing)
  - d) Chamera-III–Chamera Pooling station through existing ISTS transmission system.
- 4.3 The matter was discussed in 39<sup>th</sup> meeting of SCSPNR held on 29-30<sup>th</sup> May, 2017, wherein it was agreed that a separate meeting would be convened by CEA involving CTU, GMR, HPPTCL and HPSEB to deliberate on the issue.
- 4.4 Accordingly, a meeting was convened in CEA on 14.7.2017 and following was agreed in the meeting:
- i) The interim arrangement for evacuation of power from Bajoli Holi HEP till completion of the planned evacuation system is as given below:
    - a) Bajoli Holi to Lahal P.S 220 kV D/C line (by HPPTCL, commissioning expected during the period July 2019 to December 2019)
    - b) Lahal P.S.–Budhil HEP 220 kV S/c line (by HPPTCL, commissioning during the period December 2017 to April 2018)
    - c) Budhil HEP–Chamera-III 220 kV S/c line (existing, dedicated line of Budhil HEP)
    - d) Chamera-III–Chamera Pooling station 220 kV D/C line (existing, ISTS line).
  - ii) M/s GMR to implement necessary SPS to reduce / trip generation at Bajoli Holi HEP to avoid overloading of 400/220 kV, 2x315 MVA ICTs at Chamera pooling station during outage of one 315 MVA ICT and overloading of Chamera III–Chamera pooling station 2200 kV D/C line during n-1 conditions.
  - iii) M/s GMR (Bajoli Holi HEP developer) needs to arrive at mutual agreement with M/s GREENCO (Budhil HEP developer) for the interim arrangement and consent for the same to be taken from Central Electricity Regulatory Commission, for the use of dedicated system of Budhil HEP.
  - iv) M/s GREENCO to furnish switchyard rating of Budhil generation switchyard and technical constraints w.r.t. quantum of power flow, if any, in the existing Budhil HEP – Chamera-III 220 kV S/c line.
  - v) Master plan for evacuation of power from generation projects in Ravi basin would be reviewed by CEA, CTU and HPPTCL.
- 4.5 Subsequently, M/s GMR Bajoli Holi Hydro Power Pvt Ltd.(GBHHPL) vide their letter dated 5.1.2018 has requested for rescheduling of commencement of LTA of 155MW from August 2018 for their generation project. The request was made due to delay in implementation of connectivity lines from Bajoli Holi plant to Chamera pooling station being implemented by HPPTCL and also due to delay in Bajoli Holi their generation project. To discuss the issue,

a meeting was held in CEA on 8.2.2017 (minutes of meeting are enclosed as **Annexure-II**) with M/s GMR Bajoli Holi, HPPTCL and CTU, wherein, it was informed that M/s GMR was granted LTA for 155MW for Bajoli Holi HEP at Chamera pooling station from August 2018. For evacuation of power from the project, only intra state system were planned up to Chamera Pooling Station. Beyond Chamera Pooling Station, the existing system was found to be sufficient for further dispersal of power and no new transmission element was planned in ISTS. As LTA was provided in the existing margins in ISTS and the generation project as well as connectivity system (under implementation by HPPTCL) are delayed, therefore, the issue needs to be discussed in ensuing meeting SCPSNR.

4.6 HPPTCL may present the status of their transmission elements.

4.7 Members may deliberate.

**5.0 Connectivity of Railways’ Traction Sub Station (TSS) with ISTS Network for Ludhiana-Delhi-Sonnagar route:**

5.1 Indian Railways is planning to connect its existing TSSs between Ludhiana-Delhi-Sonnagar routes of Railways by way of construction of associated infrastructure including transmission lines and bay extension work at ISTS points at 220kV.

5.2 Railway Board vide its letter no. 2012/Elect(G)/150/1 Pt-II dated 28.12.2016 has requested for connectivity to Railways from various ISTS points for its Ludhiana-Delhi-Sonnagar route, which is presently under construction. Power requirement of Railways from the nearby proposed ISTS points is given below:

<b>CONNECTIVITY SCHEME OF TSS ALONG LUDHIANA-DELHI- SONNAGAR ROUTE</b>					
<b>S. No.</b>	<b>PGCIL GSS</b>	<b>Connectivity required at (kV)</b>	<b>Railway TSS to be supplied</b>	<b>Grid Voltage at TSS (kV)</b>	<b>Tentative load requirement (MW)</b>
1	Abdullapur	220	Jagadhari-I	220	50
2			Jagadhari-II	220	
3			Tapri	132	
4			Muzaffarnagar	132	
5	Meerut	220	Jaranda Nara	132	50
6			Hapur	132	
7			Gulaothi	132	
8			Wair	132	
9		220	Durgaoti	132	75



10	Pasauli (Sasaram)	Deoria	132
11		Chandiapur	132
12		Gadhion	132
13		Jeonathpur	132
14		Chunar	132

5.3 The issue of providing connectivity to Railways' TSS with ISTS network for Ludhiana-Delhi-Sonnagar was discussed in 39<sup>th</sup> meeting of SCSPNR held on 29-30<sup>th</sup> May, 2017, wherein, it was decided to convene a separate meeting to discuss the Connectivity of Railways' TSSs with ISTS Network at Abdullapur and Meerut (in Northern Region) and Sasaram (in Eastern Region) for Ludhiana-Delhi-Sonnagar Railway route. Accordingly, a meeting was convened on 21.7.2017 in CEA (copy enclosed as **Annexure-III**) and following decisions were taken:

- (i) Railways would utilize existing two number of 220 kV bays at Abdullapur substation (presently used for 220 kV supply to Jagadhari TSS) to meet their additional traction load requirement. The required technical upgradation of the 220 kV line (presently only two phases has been strung) would be carried out by Railways subject to fulfilment of all the existing agreements of HVPNL with Railways for this line.
- (ii) Two nos. of 220 kV (GIS) bays at Meerut 400/220 kV substation along with establishment of 220/132 kV, 2x100 MVA GIS in the premises of Meerut 400/220 kV substation was agreed for providing connectivity to Railways. The cost of above works shall be borne by Railways. Railways to implement 132kV D/c interconnection from Meerut (PG) to their 132kV substation.
- (iii) As no representative from Bihar was present in the meeting, no decision could be taken in respect of connectivity to Railways TSS at Sasaram substation.
- (iv) Indian Railways agreed to apply afresh for open access from UPPTCL instead of seeking connectivity as DISCOM's HT customer. UPPTCL agreed to consider Railways application for open access from their network.
- (v) Railways to carry out economic analysis of seeking connectivity through ISTS points considering LTA cost, RoW compensation cost etc. vis-à-vis seeking open access from STUs.

5.4 **Members may please note.**

## 6.0 **Inter connection of connectivity of Railway Traction GSS to 220 kV POWERGRID sub-station**

6.1 Railways vide their letter no. EL/TRD/NCR/PGCIL dated 25.7.2017 has intimated that Railway Board has sanctioned two 2x150 MVA 220/123 kV Grid sub-stations (GSS) at Bhogan and Fatehpur to augment traction power in Gaziabad to Allahabad section. Accordingly, Railways has proposed connectivity of their 220/132 kV GSSs at Bhogaon and Fatehpur with

Mainpuri and Fatehpur sub-stations of POWERGRID respectively at 220 kV level. Railways has requested CEA to give clearance / approval for the inter connection of POWERGRID network for the proposed Railway GSS at Bhogaon and Fatehpur.

6.2 POWERGRID may intimate the following:

- a) Availability of space for two nos. 220 kV line bays at Mainpuri (PG) and Fatehpur (PG) 400/220kV sub-stations.
- b) Existing 400/220 kV transformation capacity at Mainpuri (PG) and Fatehpur (PG).
- c) Present loading at Mainpuri (PG) and Fatehpur (PG) sub-stations.

6.3 Members may discuss.

**7.0 Conversion of Fixed line reactors in Switchable reactors at Bassi(PG), Kankroli(PG) and Zerda(GETCO) substations:**

7.1 During the 39<sup>th</sup> meeting of SCSPNR the proposal of converting the following fixed Line reactors to switchable line reactors was agreed:

Sl. No.	Name of the Line	Substation (sending end)	Reactor (MVAR )	Substation (receiving end)	Reactor (MVAR)
1	Sohawal - Ballia I	Sohawal	50	Balia	63
2	Sohawal - Ballia II	Sohawal	50	Balia	63
3	Kankroli - Zerda	Kankroli	50	Zerda	50
4	Abdullapur-Panchkula I	Abdullapur	50		--
5	Abdullapur-Panchkula II	Abdullapur	50		--
6	Bassi – Kotputli	Bassi	50		--

7.2 Subsequently, POWERGRID informed that there are space constraints at Bassi and Zerda substation for conversion of fixed line reactors to switchable line reactors at these substations. Therefore, POWERGRID has proposed to drop the proposal of conversion of Fixed line reactors in Switchable line reactors at Bassi and Zerda S/s.

7.3 In the 37<sup>th</sup> meeting of Empowered Committee on Transmission held on 20.9.2017, following scheme was agreed to be implemented through TBCB.

Sl. No.	Name of the Line	Substation (sending end)	Reactor (MVAR)	Substation (receiving end)	Reactor (MVAR)
i)	Sohawal - Ballia I	Sohawal	50	Balia	63

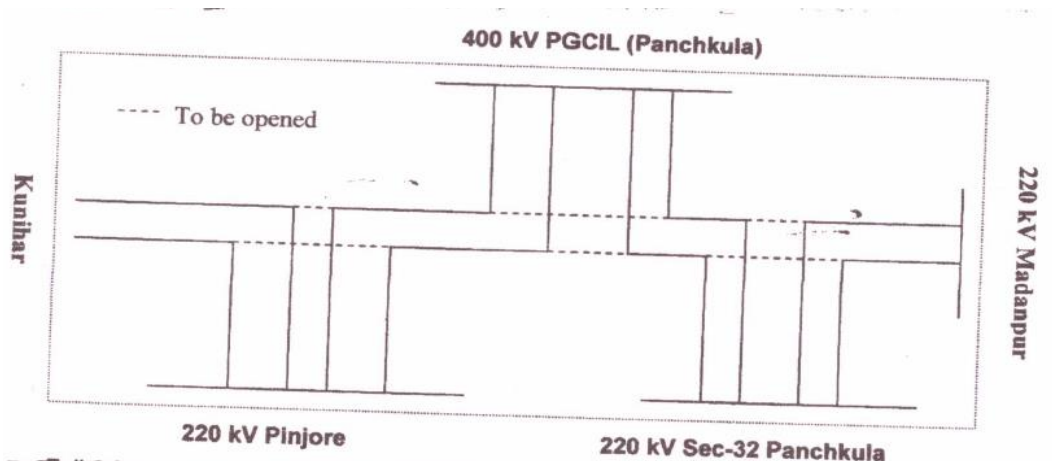
ii)	Sohawal - Ballia II	Sohawal	50	Balia	63
iii)	Abdullapur-Panchkula I	Abdullapur	50		--
iv)	Abdullapur-Panchkula II	Abdullapur	50		--
Note: Provision should be kept to use these line reactors as bus reactors in case the line is not in operation					

7.4 In the 42nd Meeting of Standing Committee on Power System Planning in Western Region (SCPSPWR) held on 17-11-2017, POWERGRID proposed to convert fixed line reactor (420 kV, 50 MVAR) at Kankroli end of Zerda–Kankroli 400kV line only into switchable line reactor. Further, Powergrid informed that as per the DOV studies, the dynamic over-voltages at both Zerda and Kankroli S/s is within limits even when the line reactor at Kankroli end is switched off. Members of SCPSPWR agreed for the scheme of conversion of fixed line reactor (420 kV, 50MVAR) at Kankroli end of Zerda–Kankroli 400kV line into switchable line reactor.

7.5 Members may like to deliberate.

**8.0 LILO of both circuits of Madanpur-Kunihar 220 kV D/c line at 220kV Pinjore (HVPNL) Substation**

8.1 HVPNL vide their letter no.CH-92/HSS-350 dated 9.10.2017 has informed that both circuits of Madanpur-Kunihar 220kV D/c line were proposed to be LILOed at three locations viz 220kV Pinjore S/s, 400/220kV Panchkula (PG) substation and 220kV Panchkula Sec-32 S/s. HVPNL had completed the LILO section at 220kV Pinjore S/s, and for connecting of this LILO section, HVPNL had requested NRLDC to provide shut down of Madanpur-Kunihar 220kV D/c line. However, NRLDC opined that 220kV Madanpur-Kunihar D/C line being an ISTS line, approval of the Standing Committee of Power System planning of Northern Region (SCPSPNR) is required for the LILO of Madanpur-Kunihar 220kV D/c line at Panchkula (PG), Pinjore and Panchkula Sec-32.



- 8.2 Based on the request from HVPNL, a meeting was held on 16.10.2017 in CEA with representatives from CTU, HVPNL, HPSEBL, HPPTCL and NRLDC, wherein following was agreed:
- (i) Proposals agreed in-principle
- HVPNL proposal of LILO of both circuits of 220kV D/C Madanpur-Kunihar line (one circuit already LILO at Baddi) at Panchkula (PG), Pinjore and Panchkula Sec-32.
  - HPSEBL proposal of LILO of 2<sup>nd</sup> circuit 220kV D/C Madanpur-Kunihar line at Baddi (HP)
- (ii) HVPNL proposal of 220kV outlets for utilization of six nos. of 220kV bays at Panchkula 400/22kV S/s:
- Panchkula(PG) – Raiwali 220kV D/c line
  - LILO of both circuits of Madanpur-Kunihar 220kV D/C line at Panchkula (PG)
- 8.3 CEA vide letter 7/G/2015-PSPA-I dated 24.10.2017 had conveyed in- principle approval for LILO of both circuits of Madanpur- Kunihar 220kV D/c line (one circuit already LILO at Baddi) at 220kV Pinjore (HVPNL) substation.
- 8.4 Subsequently, HPPTCL vide their letter no. HPPTCL/Planning/CEA\_Vol-V/2017-18/7058-59 dated 24.1.2018 has forwarded the proposal of HPSEBL for LILO of 2<sup>nd</sup> circuit 220kV D/C Madanpur-Kunihar line at Baddi (HP). HPSEBL informed that presently during winter they draw about 200-300 MW power from Baddi S/s through Madanpur-Kunihar 220kV D/C line. During high hydro generations in summer, power flows towards Madanpur. However, due to unbalanced loading, the line in not getting utilized up to its full capacity and they are also incurring high losses. Therefore, HPSEBL has requested to allow LILO of 2<sup>nd</sup> circuit 220kV D/C Madanpur-Kunihar line at Baddi(HP)
- 8.5 Members may please concur the in-principle approval for LILO of both circuits of Madanpur- Kunihar 220kV D/c line (one circuit already LILO at Baddi) at 220kV Pinjore (HVPNL) substation and the proposal of HPSEBL for LILO of 2<sup>nd</sup> circuit 220kV D/C Madanpur-Kunihar line at Baddi (HP).

## 9.0 Operational Feedback (NR Region):

S. No	Corridor	Season/ Antecedent Conditions	Description of the constraints	Remarks
1	400kV Dadri- Greater Noida	All time	High MW loading also restricting flow of Rihand-Dadri HVDC. In last quarter loading of line remained in range of 600-1400MW for most of the time. <b>Remarks:</b> As reported by UPPTCL CT/CB/Isolators of Dadri bays installed at 400kV Greater Noida S/s are designed for 2000A only, with ambient temperature at 42°C & above the current carrying capacity of above equipment goes down further.	UPPTCL to Respond

			<p>Similarly, at Dadri end the CT capacity is 2000A only &amp; at 400kV Nawada also the rating of CTs/CBs/isolators installed for Nawada Greater Noida line are of rating of 2000A only.</p> <p>Generation at Tehri and Koteshwar effects flow of 400kV Dadri-Gr. Noida. When generation at Tehri and Koteshwar is high, power flow is on the higher side from Meerut-Mandola-Dadri. Thus, when generation at Tehri &amp; Koteshwar is high, flow on Dadri-Gr. Noida increases. 400kV Gr Noida- Gr. Noida D/C has been commissioned however, loading of 400kV Dadri-Gr. Noida has not reduced. Thus, switchgear changes at Gr. Noida may be carried out so that any undue event/disturbance due to high line loadings may be avoided</p>	
4	400kV Anpara-Obra	Some times	<p>High MW loading.</p> <p>Remarks: Rihand-III (Unit#5 &amp; 6) has been shifted from NR to WR on 28th Nov 2017 by connecting through Rihand(III)-Vindhyachal PS 2xS/c lines as decided in 29<sup>th</sup> meeting of SCPSP of WR to shift it after commissioning of HVDC Champa-Kurukshetra bipole (operational since Sept 2017). This has helped in reducing line loadings in Singrauli-Anpara complex. Loading of Anpara-Obra increases in case of N-1 contingency of already heavily loaded Anpara-Sarnath 1 &amp; 2 or Anpara-Mau. Loading of this line is likely to get reduced after commissioning of already planned 765kV Anpara D – Unnao S/C line.</p>	As per PSPM Division, CEA report 765kV Anpara D – Unnao S/C line is likely to be commissioned by June 2018 , UPPTCL to Respond
7	Underlying network of following substation is not available		<p>Underlying 220kV network not available:</p> <ol style="list-style-type: none"> <li>1. Bhiwani</li> <li>2. Jind (PG)</li> <li>3. New Wanpoh (PG)</li> <li>4. Kurukshetra(PG)</li> </ol>	STUs/CTU to Respond
<b>ICT Constraints</b>				
<b>S. No</b>	<b>ICT/Constraint</b>	<b>Season/ Antecedent Conditions</b>	<b>Description of the constraints</b>	<b>Remarks</b>

1	765/400kV Phagi ICTs (2x1500 MVA)	December	<p>Two ICTs of 1500MVA each capacity at 765/400kV Phagi S/s. and not N-1 compliant beyond 1700MW.</p> <p>On commissioning of 765kV Phagi- Bhiwani 2nd ckt on 29/09/2016, loading at 765/400kV ICTs has reduced slightly.</p> <p>Thereafter, on commissioning 400kV Phagi-Heerapura D/C, the loading of 765/400kV ICTs at Phagi has been increased again and it would further increase after commissioning of upcoming 400kV Phagi-Ajmer D/C and generation at Chhabra Super Critical.</p> <p>Remarks: 3rd ICT of 1500MVA capacity at Phagi should be expedited as Rajasthan experiences high load in winter</p>	RRVPNL to Respond
2	400/220kV Azamgarh	All Time	<p>Azamgarh has two ICTs one of 315MVA and another of 500MVA; loading of both (total) is in range 400-600 MW which is not N-1 compliant.</p> <p>At Azamgarh N-1 non- compliance is observed throughout the year.</p> <p><b>Remarks:</b> Capacity of one ICT has been enhanced from 315MVA to 500MVA (charged on 28.4.2017) but unless capacity of other ICT is also increased or new ICT is added, N-1 non-compliance will be present.</p>	UPPTCL to respond

4	Single ICTs at following 400kV & above Nodes		<p>An incident on 15.11.2017, units 4,5,6,7 &amp; 8 (~650MW) tripped due to overloading of 400/220kV ICT (only one present) when 400kV Rajwest- Barmer was manually tripped to avail approved shutdown.</p> <ul style="list-style-type: none"> <li>· 400kV Chhabra (RRVNL)</li> <li>· 400kV Kalisindh (RRVNL);</li> </ul> <p>Out of service since 04/06/2016 on internal fault)</p> <ul style="list-style-type: none"> <li>· 400kV Bhiwani (BBMB)</li> <li>· 400kV Dehar (Space constraints; discussed in standing committee meetings)</li> </ul>	<p>The issue of single ICT at Chhabra, Kalisindh and Raj West TPS was discussed in 39<sup>th</sup> meeting of Standing Committee on Power System Planning of Northern Region (SCSPNR) held on 29-30<sup>th</sup> May 2017, wherein, it was agreed to form a Sub Committee involving the members from CEA, CTU, POSOCO, RVPNL and Rajasthan GENCOs to deliberate on the issues. 1<sup>st</sup> meeting of the sub committee was held on 2.4.2018 wherein various inputs were desired from the members of subcommittee</p>
	400/220kV Wagoora/ Srinagar & 220kV Wagoora-Ziankote D/C & 220kV Wagoora-Pampore D/C		<p>Wagoora has 4*315MVA ICTs &amp; 4 Ckts at 220kV level; 220kV Wagoora Pampore D/C, 220kV Wagoora- Zainkote D/C. All four lines are critically loaded. Wagoora is main supply point to the valley. ICTs at Wagoora are heavily loaded especially during winter months. There is high MVAr drawl at Wagoora resulting in low voltages in the valley area.</p> <p><b>Remarks:</b> 220kV Kishenpur-Ramban line was out since <b>30.7.17(revived on 25.12.2017)</b> increasing loading of Wagoora ICTs. 220 kV connectivity at 400/220 kV New Wanpoh (sub-station and 400/220 kV ICTs are ready since 2013) shall be expedited in order to diversify feed points for valley as well as reduce the loading at 400/220 kV Wagoora substation. Commissioning of new 400/220 kV Amargarh substation and underlying 220kV network would help ease the situation</p>	JKPDD to respond
3	400/220kV Jodhpur	ALL time	Jodhpur has 2*315 MVA ICTs each remaining loaded in the range of 200-280MW. N-1 non-	RRVNL to respond

			compliance was observed at Jodhpur in Q3 2017-18 (more in December).	
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**10.0 Connectivity to Luhri Hydro Electric Power Project Stage-I (210 MW) of SJVN Ltd. in Himachal Pradesh (Agenda by CTU)**

10.1 CTU has informed that earlier SJVNL had applied for connectivity of 588 MW for Luhri HEP (3\*196MW) located in HP in Dec. 2013. However, due to modifications in the capacity of the plant, it was decided to close the connectivity application. Subsequently SJVNL submitted a new connectivity application for Luhri Stage-I for 210 MW capacity. To discuss the issues regarding transmission system required for evacuation of power from Luhri HEP, a meeting was held on 10-01-2017 at CEA among CEA, CTU, SJVNL and HPPTCL/HPSEB. During this meeting, representative from SJVNL informed that the project layout was reviewed and it was decided to develop LHEP in three stages with capacity of 210 MW (St-I), 207 MW (St-II) and 363 MW (St-III). All three stages of LHEP are to be developed by SJVNL. The commissioning schedule for three stages are: Stage-I is expected by April'2023, Stage-II-by 2026 and Stage-III by 2024.

After discussions, it emerged that being the hilly terrain, there may be RoW constraints for implementation of the individual connectivity system for all three stages. Therefore, it was suggested that transmission system for Luhri HEP may be evolved in an integrated manner and one Pooling Station may be proposed for the same. Site visit for the same, if required can also be done by the officials from CEA, CTU and SJVNL.

Further, it was also agreed that the present Connectivity application for Stage-I may be taken up along with Stage-III for which SJVN may apply for Connectivity. Accordingly, the total quantum shall become more than 250 MW. Considering this transmission system for total 780 MW (all three stages) shall be taken up as integrated planning under ISTS. SJVN assured that they shall apply for Connectivity for Stage-III within three months.

The transmission system for Luhri HEP with capacity of 775 MW was discussed earlier in the 29<sup>th</sup> meeting of the Standing committee on Power System Planning of NR held on 20.1.2011 and following transmission system was agreed:

**Associated transmission for Luhri generation:**

1. LILO of Rampur-Nallagarh 400kV line at Luhri
2. Luhri-Mohali 400kV D/c (Triple Conductor)

**System Strengthening:**

1. Mohali-Malerkotla 400kv D/c
2. LILO of one circuit of Nallagarh - Patiala line at Mohali 400kV D/c
3. Establishment of 2x315 MVA 400/220kV GIS substation at Mohali

10.2 Members may discuss.

**11.0 Connectivity to M/s HMEL ( JV of HPCL- Mittal Energy Ltd) for load of 200MW at 400kV level through LILO of 400kV Talwandi Sabo – Moga - Nakodar line**



11.1 HMEL is a JV of M/s Hindustan Petroleum Corporation Ltd. and Mittal Investment Pvt Ltd. Presently, they have a crude petroleum refinery at Bathinda. For supply of power to the refinery, they have a captive plant of 165 MW and connectivity to the state grid through 220kV D/c line with a sanctioned load of 35 MW. Now, they are proposing an additional polymer unit with a total investment of Rs 22,000 Crore. For power supply to this unit, they require a continuous uninterrupted power supply without any fluctuation. The requirement of uninterrupted power supply could be met through availing the supply at 400 kV level. The nearest feed point is Talwandi Sabo TPS as well as Moga 400 kV substation. Also Talwandi Sabo –Moga – Nakodar 400 kV line is passing in vicinity to their proposed polymer plant. Therefore, they have requested for connectivity at 400 kV level through LILO of Talwandi Sabo –Moga 400 kV S/C line at 400kV substation in their premises.

11.2 PSTCL vide their letter dated 26.09.2017 requested CEA to include M/s HMEL proposal for power connection of 200MW at 400kV level through LILO of 400kV Talwandi Sabo – Moga - Nakodar line (Talwandi Sabo – Nakodar is a 400 kV D/C line with LILO of one ckt at Moga (PG) 400kV S/s). To discuss the proposal of M/s HMEL a meeting was held in CEA on 08.02.2018 with CTU, PSTCL and HMEL (copy enclosed as **Annexure- IV**), wherein following was agreed:

- i) PSTCL would provide connectivity to M/s HMEL at 400 kV level through establishment of new 400 kV substation (of PSTCL) in premises of M/s HMEL. The new 400 kV substation would be owned and operated by PSTCL.
- ii) PSTCL and HMEL would mutually discuss the scope as well as implementation modalities of new 400 kV substation.
- iii) PSTCL will finalize the scheme and the same would be included in the agenda for the next SCPSNR for ratification/ approval.

11.3 Subsequently, HMEL vide their letter dated 16.3.2018 addressed to PSTCL agreed to arrange land required for 400kV AIS to be executed in phases:

Phase 1- providing LILO of 400kV Talwandi Sabo – Moga line along with auxiliary required for Ph-1(along with 2 nos. of outgoing for HMEL) including control room, extension provisions etc

Phase-2- a) provision of land considering the space for LILO of 2<sup>nd</sup> ckt of 400kV Talwandi Sabo – Moga line

b) 2 nos. of 400/220kV ICTs for PSTCL

c) 10 nos. of 220kV transmission lines for PSTCL(future)

11.4 PSTCL may present the proposal. Members may discuss.

## **12.0 Connectivity and Long Term Access (LTA) to HPPCL 450 MW from Shongtong Karcham HEP**

12.1 In the 29<sup>th</sup> meeting of SCPSNR held on 29<sup>th</sup> December 2010, a task force was constituted with representatives from Govt. of HP, HPPCL, HPPTCL, CEA and POWERGRID to study and work out a master plan for evacuation of power from HEPs in Satluj Basin & Chandrabhaga Basin considering a number of new hydro projects planned in the upper part

of Satluj Basin and severe Right-of-Way constraints. The Task Force members visited the site in the month of September, 2011 and observed that for evacuation of power in upper part of the Satluj Basin, only one corridor is available and there are many projects like Shongtong, Jangi Thopan Powari, Khab and many other projects totaling around 3400 MW capacity. It was also observed that from Jangi PS to Wangtoo, only one line can be constructed, therefore it was planned to construct a high capacity line from Shongtong to Wangtoo, equivalent to 3000 MW capacity and with implementation of more projects, the line would be extended in backward / upward towards the Jangi and Jhangi Thopan side. This master plan was discussed in the 30<sup>th</sup> meeting of SCPSP in Northern Region held on 19<sup>th</sup> December, 2011 and agreed as a comprehensive scheme, this line was considered as part of the ISTS line and in future it would be utilized for the evacuation of power from other hydro projects in the upstream considering the physical constraints.

- 12.2 During the 36<sup>th</sup> meeting of SCPSPNR/connectivity/LTA meeting held on 13-14 July, 2015, HPPCL informed the commissioning schedule of the Shongtong generation project as Aug, 2019. In the 36<sup>th</sup> meeting of Empowered Committee on Transmission held on 26<sup>th</sup> July, 2016 the transmission system associated with Shongtong Karcham HEP with following scope of work was agreed to be implemented through Tariff Based Competitive Bidding (TBCB) route:

<b>Scope of the Transmission Scheme</b>
<p>1. Shongtong Karcham – Wangtoo 400 kV D/c Line (Quad HTLS Conductor Equivalent to about 3000MW on each ckt)</p> <p>2. 2 nos. of bays at Wangtoo</p>

*Note: Establishment of 220/400kV GIS Pooling Station at Wangtoo along with LILO of both circuits of 400 kV Karcham Wangtoo-Abdullapur D/c line at Wangtoo S/s -Implementation by STU*

- 12.3 Subsequently, MoP appointed PFCCL as Bid Process Coordinator for the scheme. Further, a meeting was held on 14.07.2017, wherein, CTU pointed out that as the generator i.e. HPPCL had applied for LTA with target region as beneficiary State, they need to take regulatory approval from CERC before implementation of the scheme and it was decided that PFCCL would transfer the SPV to the successful bidder only after consulting CEA and CTU.
- 12.4 CTU filed a petition in CERC on 11.08.2017, which, interalia, include grant of Regulatory Approval for execution of the Transmission System associated with Shongtong Karcham. CERC admitted the petition on 16.01.2018. CERC issued the order on 19.3.2018. stating:

*‘the scheme was envisaged in the year 2011 i.e. 7 years back. A considerable time has lapsed since the inception of the complete scheme and there may be changes in the commissioning schedules of projects in the Satluj Basin. Therefore, there is a need to review the scheme in the Standing Committee. In the light of this, we are not inclined to grant regulatory approval at this stage. We direct CTU to discuss the scheme in the Standing Committee Meeting of the Northern Region again in consultation with CEA and may approach Commission for regulatory approval, if required.’*

- 12.5 In a meeting held in CEA on 19.3.2018, regarding transfer of SPV "Shongtong Karcham - Wangtoo Transmission Limited" to the successful bidder, HPPCL informed that first unit of Shongtong Karcham (3x150 MW) HEP is expected to be commissioned by Sept 2021, second unit by November 2021 and third unit by January 2022. Civil and E&M works have been awarded and step up voltage of 400 kV level has been considered in the generation switchyard.
- 12.6 In the meeting PFCCL informed that they had completed the Bid Process and issued LoI to the successful bidder i.e M/s Essel Infra Projects Ltd on February 21, 2018. As per the CERC timeline, the COD for completion of project is 44 months. Even if, the SPV is transferred in March 2018 and considering the commissioning schedule of September 2021 for HEP, the time for implementation of the Transmission Project by the successful bidder would be 42 months, which is less than CERC timeline of 44 months. Therefore, the SPV needs to be transferred at the earliest to avoid any mismatch in the implementation of evaluation system of the Shongtong generation project.
- 12.7 HPPTCL may present the status of hydro generation projects in upstream of Shongtong HEP. Members may deliberate in light of the direction from CERC to discuss the scheme in SCSPS of NR again.

### **13.0 Power Evacuation of the projects in Chenab Basin and establishment of 400/132kV Substation at Kishtwar:**

- 13.1 Perspective transmission system along with its phased development for Hydro projects located in Chenab Basin in J&K was deliberated in 31<sup>st</sup> meeting of SCSPSNR held on 2.1.2013. It was agreed that the transmission plan is a conceptual plan and its updation / revision would be required based on the network topology and firm time schedule of the generation projects. It was also informed that it is necessary that the project developers apply to CTU for the connectivity and LTA, so that the above plan can be firmed up.
- 13.2 Chenab Valley Power Projects Ltd. (CVPPL), (JV of NHPC, JKSPDC and PTC) vide their letter dated 28.2.2018 has informed that they are implementing 1000 MW Pakaldul, 624 MW Kiru and 540 MW Kwar HEPs in Kishtwar district of J&K. Pakaldul project is having its investment approval from GoI and first major package of the project is awarded on 21.2.2018. Regarding Kiru HEP, both civil works and HM works packages are already evaluated and contracts can be awarded immediately after investment approval from GoI. PIB proposals are under consideration of Ministry of power for both Kiru and Kwar HEP.
- 13.3 Following transmission system was discussed in 31<sup>st</sup> meeting of SCSPSNR for evacuation of power from Kiru, Kwar and Pakal Dul HEP:
- **Kiru HEP (660 MW):**
    - 400 kV D/c (Triple HTLS Conductor –Equivalent to about 2300MW) line from Kiru HEP – Kishtwar Pooling station (High capacity common corridor-II)
    - Switchyard Capacity etc. must be able to handle about 2300MW power generated by the generation projects located in downstream of the Kiru HEP. It is proposed that the GIS switchyard equipment and XLPE cables provided may be designed for carrying 4000 Amps current.

- 400 kV, 125 MVAR Bus Reactor
  - **Kwar HEP (560 MW):**
    - LILO of one circuit of 400 kV D/c (Triple HTLS Conductor –Equivalent to about 2300MW) line from Kiru HEP – Kishtwar Pooling station
    - Switchyard Capacity etc. must be able to handle about 2300MW power generated by the generation projects located in downstream of the Kiru HEP. It is proposed that the GIS switchyard equipments and XLPE cables provided may be designed for carrying 4000 Amps current.
    - 400 kV, 125 MVAR Bus Reactor
  - **Pakaldul HEP (1000 MW):**
    - LILO of one circuit of 400 kV D/c (Triple HTLS Conductor –Equivalent to about 2300MW) line from Kiru HEP – Kishtwar Pooling station
    - Establishment of 400 kV switching station at Kishtwar (establishment of Kishtwar pooling station has also been proposed with Himachal Projects).
    - Establishment of 400/220 kV, 2x315 MVA substation near Gurdaspur/Sirhand by LILO of both circuits of 765 kV (operated at 400 kV) Kishenpur – Moga S/c lines.
    - 765 kV Kishtwar- Gurdaspur/Sirhand D/c line (to be operated at 400 kV initially)
    - Switchyard Capacity etc. must be able to handle about 2300MW power generated by the generation projects located in downstream of the Kiru HEP. It is proposed that the GIS switchyard equipment and XLPE cables provided may be designed for carrying 4000 Amps current.
    - 400 kV, 125 MVAR Bus Reactor
- 13.4 Earlier also, CVPPL had made request for establishment of 400/132kV S/s at Kishtwar to provide construction power (approx. 40MW) for Pakaldul HEP(1000MW), Kiru (624 MW) and Kwar (540 MW).
- 13.5 In the 39<sup>th</sup> meeting of SCSPNR, the issue of establishment of 400/132kV S/s at Kishtwar was raised, however, as no representative from JKPDD was present in the meeting, it was decided that issue may be taken up in the next meeting of SCSPNR.
- 13.6 As per the perspective plan discussed in previous meetings of SCSPNR, the entire generations in Chenab valley falling in J&K is proposed to be pooled at Kishtwar pooling station. It was also agreed that finalization of the perspective plan, phasing of its various transmission elements along with setting up of 400/132kV Kishtwar s/s would be taken up in coordinated manner.
- 13.7 JKSPDC / CVPPL may kindly intimate the progress of HEPs in Chenab Valley. CTU may give the details of the connectivity / LTA application received from hydro project developers.

13.8 Members may deliberate.

**14.0 Intra State Green Energy Corridor-I planned for evacuation of Renewable energy addition in Rajasthan:**

14.1 The intra-state transmission system required for integration of RES generation in the state of Rajasthan was agreed in the 32<sup>nd</sup> meeting of SCPSPNR. Subsequently, RRVPNL has informed that due to inability of wind farm developers to get land for the proposed wind power projects in Banswara district and in view of new wind and solar power projects in Jaisalmer, Bikaner, Jodhpur and Barmer districts in Rajasthan, it has revised the scheme of evacuation of power from RE generation.

14.2 Further, to evacuate Solar and Wind power projects coming at Jaisalmer, Bikaner, Jodhpur and Barmer districts of Rajasthan, RRVPNL had submitted the final DPR to CEA comprising revised list of intra-state transmission schemes costing about 1018.30 Crore in the State of Rajasthan to be funded from KfW and NCEF and in-principle approval for implementation of transmission schemes costing Rs 1018.30 Cr was given to RRVPNL. Schemes costing around 522.19 crores are under implementation, The transmission schemes included one 400 kV GSS at Jaisalmer-2, five 220 kV GSS at Pokaran, Undoo, Kolayat, Chhatrail and PS-1/Bajju and five 132 kV GSS along with associate transmission lines. Subsequently, RRVPNL deferred the transmission schemes costing Rs. 486.32 Cr. due to inactivity of wind and solar park developers. In place of Rs. 486.32 Crore schemes which have been deferred, RRVPNL had proposed the alternate transmission schemes with total estimated cost of Rs. 218.80 Crore (excluding IDC). The details of alternate transmission schemes proposed by RRVPNL in lieu of the deferred projects under Green Energy Corridor Phase-I are given at **Annexure-V**.

14.3 Members may please note.

**15.0 UPPTCL's proposal for connectivity of various under construction/planned 220 kV & 132 kV substations with ISTS/other state substations:**

15.1 UPPTCL vide letter 3069/SE(TP&PSS)/CEA dated 03.04.2018 intimated that three number of 220kV substations (C.G. City, Lucknow 220/33kV S/s, Bachrawan (Raibareli) 220/132/33kV, Sikandra (Kanpur Dehat)220/132kV), two number of 132/33kV Substations (Ambala Road-II (Saharanpur), Sherkot (Bijnor)) and one number of 400/132kV S/s (Masauli (Allahabad)) have been completed / nearing completion. UPPTCL had requested "in principle" approval for the connectivity lines of these substations. UPPTCL proposal has been examined and our comments are as given below:

**1. Connectivity lines of C.G. City (Chakgajaria), Lucknow 220/33 kV S/s (3x60MVA)**

The 220kV connectivity indicated in 35<sup>th</sup> meeting of SCPSPNR is:

- Sultanpur Road (400)-Chakgajaria (Lucknow) 220 kV D/C line

As per PSPM, CEA report, Sultanpur 400/220/132kV S/s is standstill. For connectivity of the C.G. City S/s, UPPTCL has proposed LILO of Raibareli (PG)–Chinhat 220 kV S/c line

at C.G. City resulting in formation of Raibareli-C.G. City 220kV S/C line and C.G. City–Chinhat 220kV S/c line.

C.G. City, Lucknow 220/33 kV substation along with C.G. City – Chinhat 220kV S/c line is already charged by UPPTCL and request has been made for charging Raibareli- C.G. City 220kV D/C line.

## **2.Connectivity lines of Bachrawan (Raibareli) 220/132/33 kV S/s (2x160 + 2x40 MVA)**

Raibareli 400/220/132kV was approved in 37th meeting of SCSPNR. UPPTCL has planned Bachrawan (Raibareli) 220/132/33 kV S/s with its connectivity as:

- Raibareli (400)- Bachrawan (Raibareli) 220kV D/c line

As per PSPM, CEA report, the anticipated date of commissioning of Raibareli 400/220kV is March 2020. UPPTCL informed that Bachrawan (Raibareli) 220/132kV is nearing completion. For providing connectivity to Bachrawan S/s, UPPTCL has proposed the following connectivity at 220kV and 132kV :

- LILO of Amawan, Raibareli (PG) – Sarojnagar, Lucknow 220 kV line at Bachrawan (Raibareli) resulting in formation of Amawan, Raibareli (PG)- Bachrawan 220kV D/c line and Bachrawan – Sarojnagar 200kV line
- Bachrawan (220) – Bachrawan (132) 132 kV D/c line
- Bachrawan (220) – Sareni (132) 132 kV D/c line

## **3.Sikandra (Kanpur Dehat) 220/132 kV S/s (2x160 MVA)**

This substation is upgradation of existing 132/33 kV (2x40 MVA) S/s to 220 kV level. The substation is proposed to be connected at 220 kV level as follows:

- LILO of Orai (400)–Bhauti (PG) Kanpur 220 kV S/c line at Sikandra (Kanpur Dehat) resulting in formation of Orai–Sikandra 220kV S/c line and Sikandra–Bhauti (PG) 220kV S/c line.

UPPTCL informed that LILO works and substation works are almost completed. UPPTCL requested for connectivity approval of CEA for Sikandra–Bhauti (PG) 220kV line. UPPTCL also informed that Orai-Bhauti line often remains floating.

With LILO of Orai (400)–Bhauti (PG) 220 kV line at Sikandra would result in utilization of the line

## **4.Connectivity lines of Masauli (Allahabad) 400/132 kV S/s (3x200 MVA)**

The substation was earlier approved as Karelibagh 400/132 kV S/s in the 35th meeting of SCSPNR with following connectivity at 400kV level:

- LILO of one circuit of Meja TPS – Rewa Road 400 kV D/c line (Quad) at Karelibagh 400/132 kV S/s

UPPTCL has informed that due to actual land location, name of Kareligh S/s is changed as Masauli (Allahabad) 400/132 kV S/s with connectivity remaining the same as above. As the connectivity remains the same the proposal is in order.

**5.Connectivity lines of Sherkot (Bijnor) 132/33 kV S/s (2x20 MVA) & Ambala Road-II (Saharanpur) 132 kV S/s (2x40 MVA)**

UPPTCL has planned Sherkot (Bijnor) 132/33kV S/s and Ambala Road-II (Saharanpur) 132 kV S/s (2x40 MVA) with following connectivity:

- LILO of Dhampur (UP) – Kalagarh (Uttarakhand) 132 kV S/c line at Sherkot 132 kV substation of UPPTCL.
- LILO of Ambala Road-I – Bhagvanpur (Uttarakhand) 132 kV line at Ambala Road-II (Saharanpur) 132 kV substation.

Regarding connectivity of Sherkot 132/33kV S/s, a meeting was held in CEA on 4.4.2018 (copy enclosed), wherein following was agreed:

- All intra-state transmission proposals submitted by UPPTCL would be included in next SCSPNR for approval / information.
- The transmission schemes viz LILO of Dhampur – Kalagarh 132 kV S/c line at 132/33 kV Sherkot S/s and LILO of Ambala Road-I – Bhagvanpur (Uttarakhand) 132 kV line at Ambala Road-II (Saharanpur) 132 kV substation, which are inter-state in nature i.e. involving transmission network of Uttarakhand and Uttar Pradesh to be mutually discussed and agreed between UPPTCL and PTCUL. Thereafter, these schemes would be approved in SCSPNR

15.2 During the deliberations in the meeting held on 4.4.2018, it was emerged that all intra-State schemes which involve reconfiguration of ISTS elements, inter-connection with ISTS elements and all 400kV intra-state schemes planned by State needs to be specifically deliberated in the meetings of the Standing Committee on Power System planning. Also, other intra state schemes planned by the State may be intimated to Standing Committee.

15.3 CEA vide its letter No.CEA-PS-11-22(18)/1/2018-PSPA-I Division dated 8.5.2018 accorded in- principle approval for following connectivity’s of UPPTCL substations. The same is put up for formalization by the members of SCSPNR:

S.No	Substation	Connectivity
1.	C.G. City (Chakgajaria), Lucknow 220/33 kV S/s (3x60MVA)	- LILO of Raibareli (PG) – Chinhat 220 kV S/c line at C.G. City - Sultanpur Road (400)-Chakgajaria (Lucknow) 220 kV D/C line

2.	Bachrawan (Raibareli) 220/132/33 kV S/s (2x160 + 2x40 MVA)	- LILO of Amawan, Raibareli (PG)–Sarojninagar, Lucknow 220 kV S/c line at Bachrawan (Raibareli) - Bachrawan (220)–Bachrawan (132) 132 kV D/c line - Bachrawan (220)–Sareni (132) 132 kV D/c line
3.	Sikandra (Kanpur Dehat) 220/132 kV S/s (2x160 MVA)	- LILO of Orai (400)–Bhauti (PG) Kanpur 220 kV S/c line at Sikandra (Kanpur Dehat).
4.	Masauli (Allahabad) 400/132 kV S/s (3x200 MVA)	- LILO of one circuit of Meja TPS–Rewa Road 400 kV D/c line (Quad) at Masauli 400/132 kV S/s

15.4 Members may like to deliberate.

### 16.0 Modification in approved evacuation network of 2x660MW Jawaharpur Thermal Power Plant.

16.1 The transmission system for evacuation of power from Jawaharpur TPS (2x660 MW) was agreed in the 38<sup>th</sup> meeting of SCSPNR held on 30.5.2016. UPPTCL vide their letter dated 16.9.2017 has informed that due to availability of land for Firozabad 400kV S/S at a location other than envisaged earlier and likely availability of network following modifications are suggested in the agreed transmission system:

S. No.	Agreed Transmission System	Modifications suggested by UPPTCL
1.	<b>2x660 MW Jawaharpur (Etah) TPS (2021-22):</b>	
i)	Evacuation at 765 kV with G.T. 21/765 kV	no change
ii)	LILO of Mainpuri–Greater Noida 765 kV S/C line at Jawaharpur TPS - 30 km	no change
iii)	765/400 kV, 2x1500 MVA ICT at Jawaharpur TPS	no change
iv)	400/220 kV 2x500 MVA ICT at Jawaharpur TPS	no change
v)	Jawaharpur TPS–Firozabad 400 kV D/C line – 80 km	Jawaharpur TPS–Firozabad 400 kV D/C (Quad) line – 80 km
vi)	Firozabad–Agra South 400 kV D/C– 40 km	LILO of one circuit of Fahtehabad (Agra 765 kV)- Agra South 400kV D/C line at Firozabad - 20km



vii)	Etah–Jawaharpur TPS 220 kV D/C – 20 km & Jawaharpur TPS – Sirsaganj 220 kV D/C – 40 km	LILO of Mainpuri–Sikandrarao 220kV existing S/c line at Jawaharpur TPS -15km (for startup power also)
viii)	330 MVAR, 765 kV Bus Reactor at Jawaharpur TPS	No change
2.	<b>Firozabad 400/220/132 kV 2x500, 2x160 MVA substation</b>	
i)	Firozabad – Jawaharpur TPS 400 kV D/C line – 80 km	Jawaharpur TPS–Firozabad 400 kV D/C (Quad) line – 80 km
ii)	Firozabad (400 kV) – Agra South 400 kV D/C line – 50 km	LILO of one circuit of Fahtehabad (Agra 765 kV)- Agra South 400kV D/C line at Firozabad -20km
iii)	Firozabad (400 kV) – Tundla 220 kV D/C line	No change
iv)	Firozabad (400kV) – Firozabad 220 kV D/C line	LILO of Firozabad(220) –Agra (765-PGCIL) 220kV S/c line at Firozabad(400)-20km
v)		Firozabad(400)- Narkhi 132kV D/c line -30km
vi)		LILo of Etmadpur – Brhan 132kV S/c line at Firozabad (400)-35km

16.2 Studies results for the above modified system is given at **Annexure-VII**. Members may deliberate.

**17.0 Agenda for issues related to Rihand, Anpara, Singrauli Generation project:**

**(i) Capacity enhancement of Rihand- Dadri HVDC from 1500MW to 2500MW**

**(ii) High short circuit levels in Rihand Singrauli, Anpara generation complexes**

**(iii) High Loading on Singrauli-Anpara line 400kV**

**(iv) NTPC proposal regarding connectivity from ISTS for Singrauli STPP St-III (2x660 MW)**

17.1 The proposal of capacity enhancement of Rihand-Dadri HVDC from 1500MW to 2500MW was discussed in 36th, 37th and 38th meetings of SCSPNR held on 13-07-2015, 20-01-2016 and 30-05-2016 respectively. The proposal was agreed in principle during 36th and 37th SCSPNR. However, as per the minutes of 38th meeting of SCSPNR, additional studies were required to be carried out.

17.2 Studies were carried out by PGCIL and were presented in the 39th meeting of SCSPNR held on 29-30<sup>th</sup> May, 2017 and after deliberations, it was agreed that the studies may be reviewed considering following:

- a) Rihand-III –Vindhyachal link (1000 MW)
- b) Relieve the overloading of Singrauli-Anpara 400 kV line
- c) To reduce the high short circuit level in Singrauli –Anpara complex.

17.3 In view of above, studies were carried out considering the following generation in and around the complex:

S.No.	Generation	Capacity(MW)	Dispatch(MW)	Voltage level (kV)
1	Singrauli	2000 (200x5 +500x2 )	1700	400
2	Obra 4	1000 (200x5 )	900	400
3	Obra 2	288 ( 94+94+50+50)	155	220
4	Anpara C	1200 ( 600x2 )	1080	765
5	Anpara D	1000 ( 500x2 )	900	765
6	Anpara A&B	1630 ( 210x3 + 500x2 )	1380	400
7	Rihand I&II	2000 ( 500x4 )	1800	400
8	Rihand -III	1000 ( 500x2 )	900	400
9	Obra C	1320 ( 660x2 )	960	765
	<b>Total</b>	<b>11438</b>	<b>9775</b>	

17.4 Following Cases were studied and study results are enclosed as **Annexure-VIII**:

Case-1: With Rihand -III connected in Northern Region (Exhibit-I &II- with and without Anpara-Singrauli 400kV line)

Case-2: With Rihand -III connected in Western region (Exhibit-III &IV - with and without Anpara-Singrauli 400kV line)

Three phase fault current in Case-1 and Case-II are as follows:

Bus Name	Voltage level	Case-I		Case-II	
		With Anpara-Singrauli 400kV line	Without Anpara-Singrauli 400kV line	With Anpara-Singrauli 400kV line	Without Anpara-Singrauli 400kV line
<b>Three phase fault current in kA</b>					
ANPARA A&B	400	51.2	38	50.3	38.0
ANPARA-D	400	45.1	34.9	44.7	34.9
ANPARAC	400	49.9	37.5	49.3	37.4

OBRA	400	23.0	21.8	22.9	21.8
RIHAND-G	400	33.6	28.9	29	24.4
VINDHYBT	400	39.7	27.6	38.1	25.8
RIHND-III	400	33.6	28.9	35.8	35.8
FATEH-PG	400	50.1	49.8	50.0	49.8
SINGRL4	400	44.8	29.9	42.7	27.8
VINDH-IV,V	400	31.2	31.2	33.7	33.8
VIN-POOL	400	37.2	37.2	41	41.4

- 17.5 Capacity enhancement of Rihand - Dadri HVDC from 1500MW to 2500MW, in the 39<sup>th</sup> meeting of SCSPNR, it was deliberated that the loading some of the transmission lines in Singrauli / Rihand / Anpara / Obra complex get critically loaded under contingencies without augmentation of the bipole capacity. However, from the above studies, it was observed that the overloading of some of the lines in the complex is due to the loop flow and with opening of Singrauli- Anapara 400kV line, the flows on the lines gets reduced. Also, the 3 phase fault current also reduces drastically with opening of Singrauli- Anapara 400kV line.
- 17.6 Further, studies were carried out with outage of one pole of Rihand –Dadri HVDC link considering the Case-II (With Rihand -III connected in Western region) without Singrauli – Anapara 400kV Line and no overloading was observed in the generation complex. Study results are given at Exhibit-V.
- 17.7 NTPC vide their letter no NTPC/CON/Singrauli-III/2 dated 22.3.2018 has informed that they have planned construction of 2x660MW Singrauli –III STPP within the existing Singrauli STPP complex. The tendering process for EPC package for the main plant is in advance stage and NIT has already been issued. NTPC also informed that UP has agreed to take entire power from the project and UPPTCL intends to draw their share of power from ISTS network
- 17.8 To evacuate the power from 2x660MW Singrauli –III STPP, following transmission system is proposed:
- I. Singrauli-III – Vindhyachal IV, V 400kV D/c line
  - II. Singrauli-III – Rihand-III 400kV D/c line
- The load flow studies considering the above system is enclosed as Exhibit- VI &VII (with and without Anpara-Singrauli 400kV line)
- .
- 17.9 As per the studies, no overloading was observed. However, transformer loading at Vidhyachal Pool 2x1500 MVA, 765/400kv S/s was of the order of 2x 1100 MW and under n-1 condition, it becomes around 1600MW. Study results are given at Exhibit-V.
- The fault current after considering Singrauli –III generation is given below:

Bus Name	Voltage level	With Singrauli line	Anpara-400kV	Without Anpara-Singrauli 400kV line
		<b>Fault Current in kA</b>		
ANPARA A&B	400	50.5		38.0
ANPARA-D	400	44.7		34.9
ANPARAC	400	49.3		37.4
OBRA	400	22.9		21.8
RIHAND-G	400	29		24.4
VINDHYBT	400	38.1		25.8
RIHND-III	400	36.8		36.8
FATEH-PG	400	50.0		49.8
SINGRL4	400	42.7		27.8
VINDH-IV,V	400	35.3		35.3
VIN-POOL	400	41.6		41.6
SINGRAULI-III	400	31.5		31.5

17.10 From the above, following is concluded:

(i) Singrauli and Anpara Generations are connected presently strongly with the grid and to reduce overloading of Singrauli- Anpara 400kV line, the line needs to be kept in normal open condition, which also reduces to short circuit level in the generation complex

(ii) For evacuation of power power from 2x660MW Singrauli –III STPP, following transmission system is proposed:

I. Singrauli-III – Vindhyachal IV, V 400kV D/c line

II. Singrauli-III – Rihand-III 400kV D/c line

(iii) Capacity enhancement of Rihand- Dadri HVDC from 1500MW to 2500MW is not required in the present scenario.

Members may like to deliberate.

**18.0 UPPTCL Proposal for establishment of transmission system to evacuate and disperse 4000 MW power from RE plants under Green Energy Corridor (GEC-II) in Bundelkhand region of Uttar Pradesh**

- 18.1 UPPTCL has submitted the detailed project report (DPR) of the transmission system plan to evacuate and disperse 4000 MW power from renewable energy (Solar) plants under Green Energy Corridor – II (GEC-II) in Bundelkhand region of Uttar Pradesh vide their letter no. 2902/TP&PSS/Solar Energy dated 07.02.2018.
- 18.2 UPNEDA which is the nodal agency to develop the solar parks in Uttar Pradesh, planned to develop 4000 MW of grid connected solar power projects in the Bundelkhand region. District wise solar capacity planned by UPNEDA is as follows:

S. No.	Name of the District	Anticipated Capacity (MW)
1	Jalaun	600
2	Hamirpur	450
3	Lalitpur	1200
4	Mahoba	650
5	Jhansi	1000
6	Banda	100
	<b>Total</b>	<b>4000</b>

- 18.3 To evacuate this power, UPPTCL has planned to establish 27 nos. of substation with interconnecting lines of different voltage level. The details of the substations as follows:

S. No.	District	Name of Substation	Capacity (MVA)
(A)	<b>765/400/220/132 kV Substations</b>		
1	Jhansi	Gurusarai	2x1500 + 2x500 + 2x160
2	Lalitpur	Jakhora	2x1500 + 2x500 + 2x160
(B)	<b>400/220/132 kV Substations</b>		
1	Jalaun	Maheba	2x500 + 2x160
2	Hamirpur	Sarila	2x500 + 2x160
3	Mahoba	Charkhari	2x500 + 2x160
4	Farrukhabad	Farrukhabad	2x500 + 2x160
5	Fatehpur	Fatehpur	2x500 + 2x160
(C)	<b>220/132/33 kV Substations</b>		
1	Jalaun	Rampura	2x160 + 2x40
2	Jalaun	Talbahat	2x160 + 2x40
3	Lalitpur	Birdha	2x160 + 2x40
4	Lalitpur	Maddeora	2x160 + 2x40
5	Jalaun	Dakor	2x160 + 2x40
6	Mahoba	Panwari	2x160 + 2x40
7	Jhansi	Bamaur	2x160 + 2x40
8	Jhansi	Bangra	2x160 + 2x40
9	Mahoba	Kabrai	2x160 + 2x40
10	Jhansi	Baragaon	2x160 + 2x40
11	Mahoba	Jaitpur	2x160 + 2x40
(D)	<b>132/33 kV Substations</b>		
1	Jalaun	Kadaura	2x40

2	Jalaun	Kuthond	2x40
3	Hamirpur	Kurara	2x40
4	Hamirpur	Gohand	2x40
5	Jhansi	Moth	2x40
6	Banda	Barokh Khurd	2x40
7	Hamirpur	Muskara	2x40
8	Lalitpur	Mehrauni	2x40
9	Lalitpur	Bar	2x40

Interconnecting lines planned by UPPTCL under GEC-II are as follows:

**765 kV lines:**

- i. 765 kV Gurusarai (Jhansi) – Mainpuri S/c line
- ii. 765 kV Jakhora (Lalitpur) – Gurusarai (Jhansi) S/c line
- iii. 765 kV Jakhora (Lalitpur) – Lalitpur S/c line
- iv. 765 kV Jakhora (Lalitpur) – Orai(PG) S/c line

**400 kV lines:**

- i. 400 kV Maheba (Jalaun) – Orai(400) S/c line
- ii. 400 kV Sarila (Hamirpur) – Maheba (Jalaun) S/c line
- iii. 400 kV Sarila (Hamirpur) – Banda S/c line
- iv. 400 kV Charkhari (Mahoba) – Sarila (Hamirpur) S/c line
- v. 400 kV Charkhari (Mahoba) – Gurusarai (Jhansi) S/c line
- vi. 400 kV Maheba (Jalaun) – Farrukhabad D/c line
- vii. 400 kV Farrukhabad – Badaun S/c line
- viii. 400 kV Fatehpur(400) – Sarila (Hamirpur) S/c line
- ix. 400 kV Fatehpur(400) – Charkhari (Mahoba) S/c line
- x. 400 kV Fatehpur(400) – Fatehpur(PG) D/c line

**220 kV lines:**

- i. 220 kV Rampura-Sikandra(220) S/c line
- ii. 220 kV Talbahat(Lalitpur)-Babina(Jhansi) D/c line
- iii. 220 kV Birdha(Lalitpur)-Lalitpur(220) S/c line
- iv. 220 kV Maddeora (Lalitpur)-Lalitpur(220) S/c line
- v. 220 kV Dakor-Maheba(400) D/c line
- vi. 220 kV Panwari(Mahoba)-Sarila(Hamirpur) D/c line
- vii. 220 kV Bamaur(Jhansi)-Gurusarai(Jhansi) D/c line
- viii. 220 kV Bangra(Jhansi)-Gurusarai(Jhansi) D/c line
- ix. 220 kV Kabrai(Mahoba)-Charkhari(Mahoba) D/c line
- x. 220 kV Farrukhabad(400)-Neebkarori D/c line
- xi. 220 kV Farrukhabad(400)-Etah(220) D/c line
- xii. 220 kV Fatehpur(400)-Malwa(Fatehpur) D/c line
- xiii. 220 kV Baragaon(Jhansi)-Gurusarai(Jhansi) D/c line

- xiv. 220 kV Jaitpur(Mahoba)-Charkhari(Mahoba) D/c line
- xv. 220 kV Talbahat(Lalitpur)-Jakhora(Lalitpur) D/c line
- xvi. 220 kV Rampura(Jalaun)-Maheba(Jalaun) S/c line

**132 kV lines:**

- i. 132 kV Kadaura-Hamirpur (Patara) S/c line
  - ii. 132 kV Kuthond(Jalaun)-Madhogarh S/c line
  - iii. 132 kV Kurara(Hamirpur)-Bharua Sumerpur S/c line
  - iv. 132 kV Gohand(Hamirpur)-Bharua Sumerpur S/c line
  - v. 132 kV Moth(New) Jhansi-Moth existing(Jhansi) S/c line
  - vi. 132 kV Barokh Khurd(Banda)-Banda(400) S/c line
  - vii. 132 kV Muskara(Hamirpur)-Sarila(Hamirpur) D/c line
  - viii. 132 kV Mehrauni(Lalitpur)-Jakhora(Lalitpur) D/c line
  - ix. 132 kV Bar(Lalitpur)-Jakhora(Lalitpur) D/c line
- 18.4 UPPTCL has carried out the studies considering the above transmission elements i.e. 2 nos. of 765 kV, 5 nos. of 400 kV, 11 nos. 220 kV & 10 nos. of 132 kV substations with inter connecting lines. The proposal of UPPTCL along with the studies was discussed in the meetings held at CEA on 13.03.2018 & 27.03.2018, wherein, CEA proposed the following changes:
- (a) It was also pointed out that UPPTCL has carried out the studies considering load of about 34000 MW of Uttar Pradesh for 2021-22 case, which is quite higher than the 19<sup>th</sup> EPS projections i.e. about 24000 MW.
  - (b) CEA proposed to plan only 1 no. of 765 kV substation instead of 2 nos, which may be connected with Lalitpur TPS and Mainpuri via Orai(PG).
- 18.5 Therefore, it was decided that UPPTCL will review the transmission system and carry out revised studies.
- 18.6 UPPTCL may present the revised transmission system with the studies. Member may like to deliberate.
- 19.0 Augmentation of 400/220kV, 2x240 MVA to 2x315 MVA Obra TPS and 1x315+1x500 MVA to 2x500 MVA at Moradabad:**
- 19.1 UPPTCL vide their letter dated 13.4.2018 informed that in order to remove N-1 constraints at 400/220kV Moradabad S/s and 400/220kV Obra S/s raised by NRLDC and NRPC, UPPTCL has planned augmentation of 400/220kV, 2x240 MVA to 2x315 MVA Obra TPS and 1x315+1x500 MVA to 2x500 MVA at Moradabad and implementing the same.
- 19.2 Members may like to note.
- 20.0 HVPNL proposal for creation of 400kV Nain Substation near Madlauda area (district Panipat)**
- 20.1 HVPNL vide their letter dated 19.4.2017 has submitted the following proposal regarding creation of 2x500MVA 400/220kV+2x160 MVA, 220/132kV Nain Substation near

Madlauda area by LILO of both circuits of 400kV Kurukshetra HVDC (PGCIL) – Jind (PGCIL) D/c line:

- i) Establishment of 2x500MVA 400/220kV+2x160 MVA, 220/132kV Nain Substation near Madlauda
- ii) LILO of both circuits of 400kV Kurukshetra HVDC(PGCIL) – Jind Khatkhar (PGCIL) D/c line at Nain
- iii) Establishment of 2x100 MVA, 220/33kV Sawaha S/s
- iv) Establishment of 2x100 MVA, 220/33kV Jattal S/s
- v) LILO of both circuits of 220kV Jind-PTPS (5-8) D/c line at Sawaha s/s
- vi) LILO of both circuits of 220kV Sawaha-PTPS(5-8) D/c line at Nain
- vii) LILO of both circuits of 220kV PTPS(1-4) -Sewah(BBMB) D/c line at Jattal S/s
- viii) Establishment of 2x20/25 MVA, 132/33kV S/s at Ballah
- ix) Nain –Ballah 132kV D/c line
- x) Nain –Madlauda 132kV D/c line
- xi) Nain -Urlana132kV D/c line
- xii) LILO of Mundlana-Israna 132kV D/c line at Nain S/s

20.2 Subsequently, HVPNL vide their letter dated 1.9.2017 has proposed LILO of both circuits of 220kV Jind (HVPNL)-Safidon D/c line at Khatkhar Jind (PG).

20.3 System studies were carried out considering the above proposal, which are enclosed at **Annexure-IX**.

20.4 Members may like to deliberate.

**21.0 Any other agenda item –with the permission of chair.**



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**Corrigendum to Minutes of 39<sup>th</sup> Meeting of  
Standing Committee on Power System Planning in Northern Region (SCSPNR)  
held on 29-30<sup>th</sup> May, 2017 at NRPC, Katwaria Sarai, New Delhi**

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The minutes of **39<sup>th</sup> meeting** of the Standing Committee on Power System Planning of Northern Region were issued vide 1/9/38/2016/PSP&PA-I/783-802 dated 28<sup>th</sup> July, 2017. RRVPNL, PTCUL, POWERGRID, HVPNL and PSTCL had given observations on the minutes. Following corrigendum is issued based on the observations/Comments received from RRVPNL, PTCUL, POWERGRID, HVPNL and PSTCL:

1. RRVPNL vide their letter RVPN/SE(P&P)/XEN-2(P&P)/AE-2/F/D825 dated 7.9.2017 has given observations on item no.27 and 37 of the minutes of 39<sup>th</sup> Meeting of SCSPNR held on 29-30<sup>th</sup> May,2017

**Corrigendum-I #1:**

**27.0 Reactive Power Compensation Requirement Studies in Northern Region and High voltage at Kurukshetra**

In the minutes of 39<sup>th</sup> meeting of SCSPNR following has been mentioned under Item No. 27.7:

.....However, RRVPNL mentioned that they would take up implementation of 220 kV reactors at Akal and Suratgarh in first phase. The second reactor as proposed at Bikaner and Barmer would be considered in the second phase. They would apply for PSDF funding for installation of these reactors.

The above sentences of the minutes under Item No. 27.7 are replaced as:

*.....However, RRVPNL mentioned that they would take up implementation of one 220 kV reactor each at Akal, Suratgarh, Bikaner and Barmer (already approved & under process) in first phase. The second reactor as proposed at Bikaner and Suratgarh would be considered in the second phase. They would apply for PSDF funding for installation of these reactors.*

**Corrigendum-I# 2**

In the minutes of 39<sup>th</sup> meeting of SCSPNR following has been mentioned under Item No. 37.3:

37.3 POWERGRID stated that they would try to complete the 400kV bays at Bhinmal (May 2018) and Sikar(October 2018) in the matching time frame on best effort basis.

The above para of the minutes is replaced as:

*37.3 POWERGRID stated that they would try to complete the 400kV bays at Bhinmal (May 2018) and Sikar(October 2017) in the matching time frame on best effort basis.*

2. PTCUL vide their letter no 1596/Dir.(Projects)/PTCUL/CEA dated 17-08-2017 had given observations

regarding Item no: Para 24.7(ii) and 43.3(ii) of the minutes of 39<sup>th</sup> meeting of SCSPNR:

### **Corrigendum-I# 3**

In the minutes of 39<sup>th</sup> meeting of SCSPNR following has been mentioned under Para 24.7(ii) and 43.3(ii):

Srinagar (HEP)–Srinagar (PTCUL) 400kV D/c is neither required for affecting the connectivity of any project in Alaknanda basin nor for evacuation of power, hence should not be included under UITP.

Item no: 24.7(ii) and 43.3(ii) of the minute of the meeting of 39<sup>th</sup> SCSPNR may be read as:

*In view of delay in implementation of the envisaged projects in Alaknanda basin, Srinagar (HEP)–Srinagar (PTCUL) 400kV D/c line along with Srinagar 400/220kV Substation (part of UITP Scheme) at present is facilitating Uttarakhand to draw their share of free power from Vishnuprayag and Srinagar HEP.*

3. POWERGRID vide their letter C/CTU/N/02 dated 31.8.2017 has given observations on the item no 26 &27 of the minutes of 39<sup>th</sup> Meeting of SCSPNR held on 29-30<sup>th</sup> May,2017:

### **Corrigendum-I# 4**

In the minutes of 39<sup>th</sup> meeting of SCSPNR following has been mentioned under Item no 26.11(ii)

(ii) Combination of AIS and GIS (mainly GIS ducts) shall be used for implementation as per the site conditions. Further, in the bypass arrangement, wherever possible, provision may be kept to bring back the system to original configuration, in case of contingency or system requirement.

Item no. 26.11(ii) of the minutes is modified as follows:

*(ii) Combination of AIS and GIS (mainly GIS ducts) shall be used and shifting/reorientation works inside substations may be carried out to accommodate the splitting/bypass arrangements for implementation as per the site conditions. Further, in the bypass arrangement, where ever possible, provision may be kept to bring back the system to original configuration, in case of contingency or system requirement.*

### **Corrigendum-I# 5**

Under item no. 27, installation of 2x25 MVAR bus reactors at 220kV level was agreed at 400/220kV Maharani Bagh S/s alongwith the reactive compensation at other substations. It was also agreed that these reactors shall be provided by the owner of the substation. Since 220kV bus of 400/220kV Maharani Bagh S/s is operated and controlled by DTL, therefore 2x25 MVAR bus reactors at 220kV of bus are to be installed by DTL.

4. HVPNL vide their letter no, Ch-10/HSS-152/Vol-19 dated 30.8.2017 has given the observations on SI no. 2 of Item no:20 'Operational feedback' and Item no. 26 'Study to limit high Short Circuit level of various Substations in NR (Phase 2):

**Corrigendum-I#6**

In the minutes of 39<sup>th</sup> meeting of SCPSPNR following has been mentioned under SI no. 2 of Item no:20 'Operational feedback':

<b>S. No</b>	<b>Corridor</b>	<b>Season/ Antecedent Conditions</b>	<b>Constraints</b>	<b>Deliberations in the 39<sup>th</sup> meeting of SCPSPNR</b>
2	400kV Mahendragarh- Dhanonda D/C	All time	Remarks: High Loading was observed during to less/outage of generation at CLP Jhajjar (35% of time, generation was under outage & 30% of time under less generation.	The line is a 5 km quad line, but the switchgears at both the ends are of 2000A, therefore, upgradation of switchgear should be taken up by HVPNL. HVPNL was requested to carry out the upgradation works at the earliest. HVPNL informed that the average load of about 700 MW (each ckt) is continuously running on the said line. However, agreed for carrying out the equipment upgradation at both the sub-stations.

The above item of the minutes is modified as follows:

<b>S. No</b>	<b>Corridor</b>	<b>Season/ Antecedent Conditions</b>	<b>Constraints</b>	<b>Deliberations in the 39<sup>th</sup> meeting of SCPSPNR</b>
2	400kV Mahendragarh- Dhanonda D/C	All time	Remarks: High Loading was observed during to less/outage of generation at CLP Jhajjar (35% of time, generation was under outage & 30% of time under less generation.	The line is a 5 km quad line, but the switchgears at both the ends are of 2000A, therefore, upgradation of switchgear should be taken up by HVPNL. HVPNL was requested to carry out the upgradation works at the earliest. HVPNL informed that the average load of about 700 MW (each ckt) is continuously running on the said line. However, HVPNL agreed for carrying out the equipment upgradation at Dhanonda sub-station and the funding for the same may be got explored from PSDF.

**Corrigendum-I#7**

In the minutes of 39<sup>th</sup> meeting of SCSPNR following has been mentioned at Para no. 26.11(b) (ii)  
12ohm Series Line reactors in Mohindergarh–Dhanonda 400kV D/c line Ckt I & II at Dhanonda end  
(To be implemented by HVPNL / POWERGRID)

Para no. 26.11(b) (ii) of the minutes is modified as follows:

*(ii) 12ohm Series Line reactors in Mohindergarh–Dhanonda 400kV D/c line Ckt I & II at Mohindergarh end (To be implemented under ISTS)*

5. PSTCL vide their letter dated 17.11.2017 has given the observation on item no 27.10 of the minutes of 39<sup>th</sup> meeting that the additional 125 MVAR bus reactor is not required at 400kV Nakodar in view of existing 80MVAR bus reactor at this substation and only 1no. of 220kV 25 MVAR bus reactor persists for this substation.

**Corrigendum-I#8**

*Installation of 125 MVAR bus reactor at 400kV Nakodar(Punjab) is deleted from Sl.No 8 of table for 400kV Bus reactor mentioned under item no 27.14(b) of the minutes of 39<sup>th</sup> meeting of SCSPNR.*

**Minutes of Meeting held on 8.2.2018 regarding rescheduling of LTA for 155 MW of power from Bajoli Holi HEP (180 MW)**

M/s GMR Bajoli Holi Hydro Power Pvt Ltd.(GBHHPL) vide their letter dated 5.1.2018 has requested for rescheduling of commencement of LTA of 155MW from August 2018 for their generation project. This request has been made due to delay in implementation of connectivity lines from Bajoli Holi plant to Chamera pooling station being implemented by HPPTCL and also due to delay in Bajoli Holi their generation project. To discuss the issue, a meeting was held in CEA on 8.2.2017 with M/s GMR Bajoli Holi, HPPTCL and CTU. List of participants is enclosed at Annexure-1.

1. M/s GBHHPL informed that they have been granted LTA of 155MW from August 2018 beyond Chamera pooling station (ISTS as injection point). The following transmission system was to be implemented by HPPTCL for providing connectivity upto the ISTS point:
  - iii) 220 kV high capacity (Twin Moose conductor) line from Bajoli Holi to Lahal Pooling Station.
  - iv) 400 kV D/c line from to Chamera Pooling Station (PG)
  - v) Establishment of 2x315 MVA, 400/220kV Lahal Pooling Station (GIS)

For implementation of the transmission system required for connectivity of their plant to ISTS point, they have signed Transmission Agreement with HPPTCL with the commissioning schedule of connectivity system as 31.7.2017. However, there is delay in construction of above STU network, therefore, commencement of LTA from August 2018 would not be feasible and the same may be rescheduled.

2. Regarding the status of transmission elements being implemented by HPPTCL, HPPTCL informed that the commissioning schedules for Bajoli Holi - Lahal Pooling Station 220kV D/c line and Lahal Pooling Station- Chamera Pooling Station (PG) 400 kV D/c line are October 2019 and December 2019 respectively. Lahal Pooling station is likely to be commissioned by April 2019.
3. CTU stated that M/s GMR was granted LTA for 155MW for Bajoli Holi HEP at Chamera pooling station from August 2018. For evacuation of power from the project, only intra state system were planned upto Chamera Pooling Station. Beyond Chamera Pooling Station, the existing system was found to be sufficient for further dispersal of power and no new transmission element was planned in ISTS.As LTA was provided in the existing margins in ISTS and the generation project as well as connectivity system (under implementation by HPPTCL) are delayed, therefore, the issue needs to be discussed in SCPSNR.
4. M/s GMR stated that they have signed the PPA with Delhi International Airport (P) Ltd (DIAL) with its commencement date as April 2019. The first unit is likely to be commissioned by March 2019, however, for evacuation of power the transmission system(under implementation by HPPTCL) would not be available as per the schedule intimated by HPPTCL. Therefore, commencement of LTA is not possible from August 2018, as well as, from April 2019.

5. CEA stated that as per the Transmission agreement signed between GMR and HPPTCL, in the event of delay in commissioning of the transmission system from its schedule, HPPTCL shall pay transmission charges to Bajoli Holi proportionate to its capacity ready for connection provided further that HPPTCL fails to make alternate arrangement for dispatch of power.

CEA further stated that earlier on request received from M/s GMR regarding the proposal of interim arrangement, a meeting was held on 14.7.2017 in CEA with CTU, HPPTCL, GREENKO and GMR, wherein following was decided:

- vi) The interim arrangement for evacuation of power from Bajoli-Holi HEP till completion of the planned evacuation system is:
    - e) Bajoli Holi to Lahal P.S 220 kV D/C line ( HPPTCL), commissioning expected during the period July 2019 to December 2019
    - f) Lahal P.S – Budhil HEP 220 kV S/c line ( HPPTCL), commissioning during the period December 2017 to April 2018
    - g) Budhil HEP – Chamera-III 220 kV S/c line (existing, dedicated line of Budhil HEP)
    - h) Chamera-III – Chamera Pooling station 220 kV D/C line (existing, ISTS line).
  - vii) M/s GMR to implement necessary SPS to reduce/ trip generation at Bajoli Holi HEP to avoid overloading of 400/220 kV, 2X315 MVA ICTs at Chamera pooling station during outage of one 315 MVA ICT and overloading of Chamera III – Chamera pooling station 220 kV D/C line during n-1 conditions.
  - viii) M/s GMR (Bajoli Holi HEP developer) needs to arrive at mutual agreement with M/s GREENKO (Budhil HEP developer) for the interim arrangement and consent for the same to be taken from Central Electricity Regulatory Commission, for the use of dedicated system of Budhil HEP.
  - ix) M/s GREENKO to furnish switchyard rating of Budhil generation switchyard and technical constraints w.r.t quantum of power flow, if any, in the existing Budhil HEP – Chamera-III 220 kV S/c line.
  - x) Master plan for evacuation of power from generation projects in Ravi basin would be reviewed by CEA, CTU and HPPTCL.
6. HPPTCL stated that Bajoli Holi -Lahal P.S 220 kV D/C line and Lahal P.S – Budhil HEP 220kV S/c (on D/C tower) line are likely to be completed by October 2019 and May 2018 respectively. Therefore, power from the Bajoli Holi project could partially be evacuated through the above proposed interim arrangement.
7. CTU stated that before finalization of above interim arrangement, the same needs to be discussed with POSOCO and NHPC. Also, mutual agreement between M/s GMR (Bajoli Holi HEP developer) with M/s GREENKO (Budhil HEP developer) is required and consent for the same is to be taken from Central Electricity Regulatory Commission, for the use of dedicated system of Budhil HEP as deliberated earlier in the meeting held on 14.7.2017. CTU also informed that Budhil HEP- Lahal Pooling Station 220kV S/c line has not been agreed in any Standing

Committee meeting till date. It was further stated that with the proposed interim arrangement, the constraints in evacuation of power through transformers at 400/220kV Chamera Pooling Station needs to be studied. CTU also informed that LTA cannot be operationalized till the time Lahal-Chamera Pooling Station 400kV D/c is materialized.

8. The matter was deliberated and following was agreed:

- i) CEA to convene a meeting with CTU, POSOCO, GMR, HPPTCL, NHPC and GREENKO to discuss interim arrangement for evacuation of power from Bajoli Holi HEP.
- ii) The issue of M/s GMR Bajoli Holi Hydro Power Pvt Ltd. regarding commencement of LTA would be discussed in next meeting of SCPSNR
- iii) HPPTCL to expedite the commissioning of the transmission elements viz Bajoli Holi - Lahal Pooling Station 220kV D/c line, Lahal Pooling station and Lahal Pooling Station-Chamera Pooling Station (PG) 400 kV D/c line to minimize the delay in availability of connectivity system of M/s GBHHPL.

The meeting ended with thanks to chair.

**Annexure-I**

**List of Participants of the Meeting held at CEA on 8.2.2018 regarding rescheduling of LTA for 155 MW of power from Bajoli Holi HEP (180 MW)**

Sl. No.	Name Shri/Smt	Designation
<b>I. CEA</b>		
1.	Ravinder Gupta	- Chief Engineer, (PSPA-I)
2.	Awdhesh Kumar Yadav	- Director (PSPA-I)
3.	Manjari Chaturvedi	- Deputy Director
<b>II. POWERGRID</b>		
4.	Mukesh Khanna	- AGM
5.	Rashmi Pant Joshi	- Manager
<b>III. HPPTCL</b>		
6.	Kaushalesh Kapoor	- GM (C&D)
7.	Sandeep Sharma	- DGM (Plg.)
<b>IV GMR</b>		
8.	S. Balaji	- Head-Strategic Plng
9.	G. Muralidhar Gupta	- AGM
10.	G. Saraswat	- AVP Trans.
11.	Ajay Kr. Nathani	- Head Trans.

**Minutes of Meeting held at CEA on 21.07.2017 regarding Connectivity of Railways' Traction Sub Station (TSS) with ISTS Network at Abdullapur, Meerut and Sasaram for Ludhiana-Delhi-Somnagar route.**

List of participants is attached as **Annexure-I**.

1. Member (PS) welcomed the participants. He stated that in line with the decision of the 39<sup>th</sup> meeting of Standing Committee on Power System Planning in Northern Region, this meeting has been convened to discuss the Connectivity of Railways' TSSs with ISTS Network at Abdullapur & Meerut (in Northern region) and Sasaram (in Eastern Region) for Ludhiana-Delhi-Somnagar Railway route.
2. UPPTCL stated that before taking up the individual cases for discussion, the financial viability of the Railways' proposal of getting connected with ISTS needs to be discussed and same was also deliberated in the previous meeting of Standing Committee of NR. The switchover/withdrawal from STU network to ISTS has to be gradual, so that STU gets adequate time to plan utilization of their network. In Uttar Pradesh, they had received a number of applications from Railways as DISCOM's HT customer for drawing power from the State network. If all these loads are sanctioned, corresponding augmentation in the Transmission network of UP would also be required to meet the additional load. If Railways takes ISTS connectivity and switches its load from state network to ISTS network, then the network / augmentation in UP network for catering to Railways' load would become idle / underutilized. Therefore, Railways' needs to first decide, either to continue as DISCOM's HT consumer or get connected to ISTS directly. Due to this uncertainty, they were not in a position to take any decision on the load applications submitted by Railways.
3. Indian Railways clarified that they have to meet their traction load requirements, which can be catered either through state network or through open access by getting connectivity with ISTS network. Till the establishment of connectivity with the ISTS network, they would continue to apply as DISCOM's HT consumer of the respective state for meeting their traction load requirements. Further, since Indian Railways is not getting NoC for Open Access from STU's, they had been seeking connectivity as DISCOM's HT customer.
4. CEA clarified that in the recently held Standing Committee meeting of NR on 29<sup>th</sup>-30<sup>th</sup> May 2017, two cases of connectivity to Railways were discussed. First case was connectivity of Railways' TSS with ISTS Network for Delhi – Bharuch route wherein, it was agreed that Railways would once again look into the cost economics of connectivity to ISTS points as number of the States had already granted / were in the process of granting no objection certificate for open access to Railways from their network and would share the same with CEA. The second case was Connectivity of Railways' TSS with ISTS Network for Ludhiana-Delhi-Sonnagar route. This meeting has been called to discuss the ISTS connectivity of Railways at Meerut, Abdullapur and Sasaram ISTS substations for the Ludhiana-Delhi-Sonnagar route. The connectivity sought by Indian Railways with ISTS Network at Abdullapur, Meerut and Sasaram needs to be viewed in isolation as no STU network exists in parallel from these ISTS points. As far as the overall plan of Railway for getting connectivity is concerned, Railways needs to rework their cost economics in view of the state's willingness to provide open access to Railway. It was stated that in case UP agrees to provide open access to Railways through their intra state transmission system, then the augmentation in intra state Transmission network of UP would be required for providing open access to Railways in their network.



5. After that connectivity to Railways at Meerut and Abdullapur was discussed.

**220 kV Connectivity at Meerut 400/220 kV substation:**

POWERGRID informed that space at Meerut 400/220 kV S/s is available for implementation of only one no. of 220 kV bay (AIS) or 2 nos. of 220kV GIS bays. It was also informed that space is available in the substation for creation of 220/132 kV, 2x100 MVA GIS at Meerut sub-station and Railways can draw power through 132 kV D/c line.

CEA suggested that instead of creating 220/132 kV GIS at Meerut sub-station, 220 kV S/c line emanating from Meerut sub-station can be constructed as deposit work for Indian Railways. Further Indian Railways can construct 220/132 kV sub-station on its own and can draw power at 132 kV level.

POWERGRID stated that due to severe RoW constraints, some portion of the line needs to be implemented as cable and laying of 132 kV line would be economical instead of 220 kV line. Therefore, creation of 220/132 kV GIS at Meerut sub-station and drawl of power through 132 kV D/c line would be economical to Railways. The 132kV D/c feeder would be a combination of overhead line and cable.

Railways agreed to the proposal of creation of 220/132 kV GIS at Meerut sub-station for further supply of power their traction sub-stations and the cost for the works would be borne by Railways.

**220 kV Connectivity at Abdullapur 400/220 kV substation:**

POWERGRID informed that at Abdullapur 400/220 kV substation Railways is drawing power through two no. of 220 kV bays for their Jagadhari TSS. HVPNL confirmed that the line is being exclusively used by Railways and is drawing 10-15 MW power at present.

CEA stated that instead of getting additional 220 kV connectivity at Abdullapur, the connectivity already provided at Abdullapur may be utilized by Railways for feeding their additional traction load. HVPNL agreed with proposal and stated the they have no objection for carrying out the necessary technical upgradation of the 220 kV line ( presently only two phases has been strung) by railway to meet their traction load requirements subject to fulfilment of all the existing commercial agreement of HVPNL with Railways for this line.

6. After detailed deliberations, the following decisions were taken:

- d) Railways would utilize existing two number of 220 kV bays at Abdullapur substation (presently used for 220 kV supply to Jagadhari TSS) to meet their additional traction load requirement. The required technical upgradation of the 220 kV line (presently only two phases has been strung) would be carried out by Railways subject to fulfilment of all the existing agreements of HVPNL with Railways for this line.
- e) Two nos. of 220 kV (GIS) bays at Meerut 400/220 kV substation along with establishment of 220/132 kV, 2x100 MVA GIS in the premises of Meerut 400/220 kV substation was agreed for providing connectivity to Railways. The cost of above works shall be borne by Railways. Railways to implement 132kV D/c interconnection from Meerut (PG) to their 132kV substation.

- f) As no representative from Bihar was present in the meeting, no decision could be taken in respect of connectivity to Railways TSS at Sasaram substation.
- g) Indian Railways agreed to apply afresh for open access from UPPTCL instead of seeking connectivity as DISCOM's HT customer. UPPTCL agreed to consider Railways application for open access from their network.
- h) Railways to carry out economic analysis of seeking connectivity through ISTS points considering LTA cost, RoW compensation cost etc. vis-à-vis seeking open access from STUs.

The meeting ended with thanks to chair.

**Minutes of Meeting held on 8.2.2018 to discuss the issue regarding supply of 200 MW power to Petrochemical Plant of M/s HMEL.**

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PSTCL vide their letter dated 26.09.2017 has requested CEA to include M/s HMEL( HPCL- Mittal Energy Ltd) proposal for power connection of 200MW at 400kV level through LILO of 400kV Talwandi Sabo – Moga - Nakodar line (Talwandi Sabo – Nakodar is a 400 kV D/C line with LILO of one ckt at Moga(PG) 400kV S/s). To discuss the proposal of M/s HMEL a meeting was held in CEA on 08.02.2018 with CTU, PSTCL and HMEL. The list of participants is enclosed at Annexure-1.

M/s HMEL representative stated that HMEL is a JV of M/s Hindustan Petroleum Corporation Ltd. and Mittal Investment Pvt LTd. Presently, they have a crude petroleum refinery at Bathinda. For supply of power to the refinery, they have a captive plant of 165 MW and connectivity to the state grid through 220kV D/c line with a sanctioned load of 35 MW. Now, they are proposing an additional polymer unit with a total investment of Rs 22000 Crore. For power supply to this unit, they require a continuous uninterrupted power supply without any fluctuation. The requirement of uninterrupted power supply could be met through availing the supply at 400 kV level. The nearest feed point is Talwandi Sabo TPS as well as Moga 400 kV substation. Also Talwandi Sabo –Moga – Nakodar 400 kV line is passing in vicinity to their proposed polymer plant, therefore they have requested for connectivity at 400 kV level through LILO of Talwandi Sabo –Moga 400 kV S/C line at 400kV substation in their premises.

CEA/ CTU stated that the proposal of HMEL establishes direct connectivity of an Industrial consumer with the 400 kV intra state / interstate grid, which cannot be agreed.

CEA suggested that the desired connectivity to HMEL at 400 kV level may be given by PSTCL from their existing 400 kV substation or from a new 400 kV substation in the vicinity of proposed HMEL polymer plant. The new substation would provide connectivity to HMEL as well as help PSTCL in feeding additional loads in that area.

CTU stated that Talwandi Sabo – Nakodar is a 400 kV D/C line with LILO of one ckt at Moga(PG). If LILO of Talwandi Sabo –Nakodar 400 kV S/C line is done at HMEL 400 kV substation, then it would be a part of intrastate system, which can be finalized by PSTCL and the same can be put for information of the SCPSNR. However, if LILO of Talwandi Sabo –Moga 400 kV S/C line is done at HMEL 400 kV substation then ISTS point (Moga) is also involved and the scheme would require ratification by SCPSNR (Standing Committee on Power System Planning in Northern Region).

PSTCL stated that their transmission system augmentation for the next 3 years had already been freezed and there was no proposal for creation of a new 400 kV substation in vicinity of HMEL polymer plant. PSTCL further stated that LILO of second circuit of Talwandi Sabo – Nakodar 400 kV D/C line was also proposed at Moga.

CEA suggested that the establishment of a new 400 kV substation could be taken up in phases which would initially provide connectivity to HMEL and later on for feeding loads in that area. The implementation modalities as well as the detailed scope for establishment of 400 kV substation needs to be mutually deliberated amongst HMEL and PSTCL. The new 400 kV substation should be owned and operated by PSTCL.

M/s HMEL stated that they would extend all possible help to PSTCL in implementation of the new 400 kV substation in their premises that would take care of its connectivity needs as well as future requirements of PSTCL.

After further deliberations, the following was agreed:

- iv) PSTCL would provide connectivity to M/s HMEL at 400 kV level by establishment of new 400 kV substation (of PSTCL) in premises of M/s HMEL. The new 400 kV substation should be owned and operated by PSTCL.
- v) PSTCL and HMEL would mutually discuss the scope as well as implementation modalities of new 400 kV substation.
- vi) PSTCL will finalise the scheme and the same would be included in the agenda for the next SCSPNR for ratification/ approval.

Meeting ended with thanks to the chair

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**Annexure-I**

**List of Participants to the meeting held on 8.2.2018 to discuss the issue regarding supply of 200 MW power to Petrochemical Plant of M/s HMEL.**

**CEA**

<b>Sl.</b>	<b>Name (Shri/Smt)</b>	<b>Designation</b>
1.	Ravinder.Gupta	C.E.
2.	A.K. Yadav	Director
3.	Manjari Chaturvedi	Deputy Director

**POWERGRID**

4.	Mukesh Khanna	GM (CTU-Plg.)
5.	Rashmi Pant Joshi	Manager (CTU-Plg.)

**PSTCL**

6.	Shashi Prabha	Dir. Technical
7.	A.K. Kapur	EIC/TS

**HMEL**

8.	K.K. Singla	CE
9.	Saurabh Kapoor	AGM-Project
10.	Gurminder Singh	Manager

**The updated Schemes under Intra State Green Energy Corridor-I planned for evacuation of Renewable energy addition in Rajasthan is as follows:**

**(i) under implementation:**

S.No.	Name of the Scheme	Route Length (in km)	Estimated Cost (excluding IDC) (in Rs. Lacs)	Estimated Cost (including IDC) (in Rs. Lacs)
1	400/220 kV, 2x500 MVA GSS at Jaisalmer-2 alongwith 1x125 MVAR, 400 kV Bus Type Reactor	—	15030.74	19379.76
2	400 kV D/C Jaisalmer (2)-Barmer line (Twin Moose)	130	10469	13498.12
3	400 kV D/C Barmer-Bhimnal(PGCIL) line (Twin Moose)	140	11204	13902.43
4	400 kV Terminal Bay Equipment at 400/220 kV GSS Barmer (for termination of 400 kV D/C Jaisalmer (2) - Barmer line at Barmer end)	—	2807.02	3619.21
			<b>39510.76</b>	<b>50399.52</b>

**(ii) Scheme in lieu of deferred transmission elements:**

S.no	Name of proposed transmission scheme	Estimated Cost (excluding IDC) in lakhs
<b>A.</b>	<b>Augmentation at various EHV substations</b>	
(i)	Augmentation at 400 kV GSS Akal (+ 3X500 MVA & (-) 3X315 MVA, 400/220 kV)	4617.75
(ii)	Augmentation at 220 kV GSS Bhadla (+ 40/50 MVA (-) 20/25 MVA, 132/33 kV)	180.73
(iii)	Additional 1X160 MVA transformer at 220/132 kV GSS Kanasar with HV& LV bays	729.63
<b>B</b>	<b>220 kV GSS Chhatargarh along with associated lines.</b>	
(i)	220/132 kV, 160 MVA GSS at Chhatargarh (Upgradation)	2691.95
(ii)	100 km 220 kV D/c line from 220 kV GSS Gajner to proposed 220 kV GSS Chhatargarh	4830.00

(iii)	77 km 132 kV D/c line from proposed 220 kV GSS Chhatargarh to existing 132 kV GSS Loonkarnsar	2280.20
<b>C</b>	<b>New sub-transmission system for evacuation of power from new solar and wind power plants in Western Rajasthan</b>	
(i)	75 km 220 kV D/c Akal-Jaisalmer 2 line	3599.00
(ii)	2 nos. 220 kV feeder bays at 400 kV GSS Jaisalmer-2	147.60
(iii)	LILO of one circuit of 400 kV D/c Akal-Jodhpur (new) line at 400 kV GSS Jaisalmer-2 (appx. 10 km)	2117.40
(iv)	1 no. 400 kV Quad Moose feeder bay at 400 kV GSS Jaisalmer-2 with additional hardware for conversion of one 400 kV twin moose bay to quad moose bay	685.90
	<b>Grand Total</b>	<b>21880.19</b>

**Minutes of meeting held on 4.4.2018 in CEA regarding proposals from UP Power Transmission Corporation Limited (UPPTCL)**

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List of participants is enclosed at Annexure-I.

Member (Power System), CEA welcomed the participants to the meeting and requested Chief Engineer (PSPA-I) to brief the issue.

Chief Engineer (PSPA-I) stated that UPPTCL vide their letter dated 20.3.2018 and 21.3.2018 has requested to accord approval for LILO of Dhampur (UP)–Kalagarh (Uttarakhand) 132 kV S/c inter-state line at 132/33 kV Sherkot (UP) S/s and LILO of Basti – Gorakhpur (PG) 220 kV S/c at 220/132 kV Bansi S/s respectively.

UPPTCL stated that they have completed the works of 132/33kV Sherkot S/s and they want to interconnect the substation by LILO of Dhampur (UP) – Kalagarh (Uttarakhand) 132 kV S/c line. As Dhampur (UP)–Kalagarh (Uttarakhand) 132 kV S/c line is inter-state in nature, therefore for establishment connectivity to Sherkot (UP) s/s through the LILO, approval has been sought.

PTCUL stated that UPPTCL needs to submit detailed studies for the proposal and they can comment on the UP proposal only after examination of the studies.

UPPTCL stated Dhampur (UP) S/s is also fed from Nehtaur (220/132 kV) S/s of UPPTCL and with the proposed LILO connectivity, there would only be redistribution of the power flow, as Sherkot's load at present is met at 33 kV voltage level. UPPTCL further stated that the power flow on Dhampur–Kalagarh 132 kV S/c line is bidirectional. In times of increased hydro generation in Uttarakhand, UP imports power through this line, while in lean hydro season UP exports power to Uttarakhand through this line.

CEA observed that from Kalagarh HEP (3x66 MW), there are four 132 kV outlets, two towards UP and two towards Uttarakhand. Prima facie, there may not be any significant difference in power flow with LILO of Dhampur – Kalagarh 132 kV S/c line at 132/33 kV Sherkot S/s. After establishment of 132 kV S/S at Sherkot, the loads of Sherkot, which is presently met at 33 kV from Dhampur, would be directly fed from Sherkot 132/33 kV S/S.

POSOCO stated that metering point on inter-state line would get shifted from Dhampur to Sherkot after establishment of LILO connectivity at Sherkot. POSOCO further stated that LILO of Basti–Gorakhpur (PG) 220 kV S/c at 220/132 kV Bansi S/s was permitted, however, the LILO at Basti has not been approved in meeting of the Standing Committee on Power System Planning.

UPPTCL stated that apart from two proposals, which has been discussed in the present meeting, some more intra state transmission schemes of UP, including LILO of Ambala Road-I – Bhagvanpur (Uttarakhand) 132 kV line at Ambala Road-II (Saharanpur) 132 kV substation, are under implementation, which are expected to be completed shortly. Approval from SCSPNR would be required for these transmission schemes.

CEA stated that all intra-State transmission schemes, which involve reconfiguration of ISTS elements, inter-connection with ISTS elements and all 400kV intra-state schemes planned by state needs to be specifically deliberated in the meetings of the Standing Committee on Power System planning. Also, other intra state schemes planned by the State may be intimated to Standing Committee.

After deliberations, following was agreed:

- a) All intra-state transmission proposals submitted by UPPTCL would be included in next SCSPNR for approval /information.
- b) The transmission schemes viz LILO of Dhampur – Kalagarh 132 kV S/c line at 132/33 kV Sherkot S/s and LILO of Ambala Road-I – Bhagvanpur (Uttarakhand) 132 kV line at Ambala Road-II (Saharanpur) 132 kV substation, which are inter-state in nature i.e. involving transmission network of Uttarakhand and Uttar Pradesh to be mutually discussed and agreed between UPPTCL and PTCUL. Thereafter, these schemes would be approved in SCSPNR.

Meeting ended with thanks to chair.

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**Annexure-I**

**List OF Participants of the meeting held on 4.4.2018 in CEA regarding proposals from UP Power Transmission Corporation Limited (UPPTCL)**

**CEA**

<b>Sl.</b>	<b>Name (Shri/Smt)</b>	<b>Designation</b>
1.	P.S. Mhaske	Member (Power System)
2.	Ravinder.Gupta	C.E.
3.	Awdhesh Kr Yadav	Director
4.	Manjari Chaturvedi	Deputy Director
5.	Vikas Sachan	Assistant Director
6.	Jitesh Srivas	Assistant Director

**CTU**

7.	Dr. Subir Sen	COO(CTU Plg.)
8.	Mukesh Khanna	GM (CTU-Plg.)
9.	Rashmi Pant Joshi	Manager (CTU-Plg.)

**POSO**

10.	D.K. Jain	G.M.
11.	R.K. Porwal	DGM
12.	Kamaldeep	Dy. Mgr.

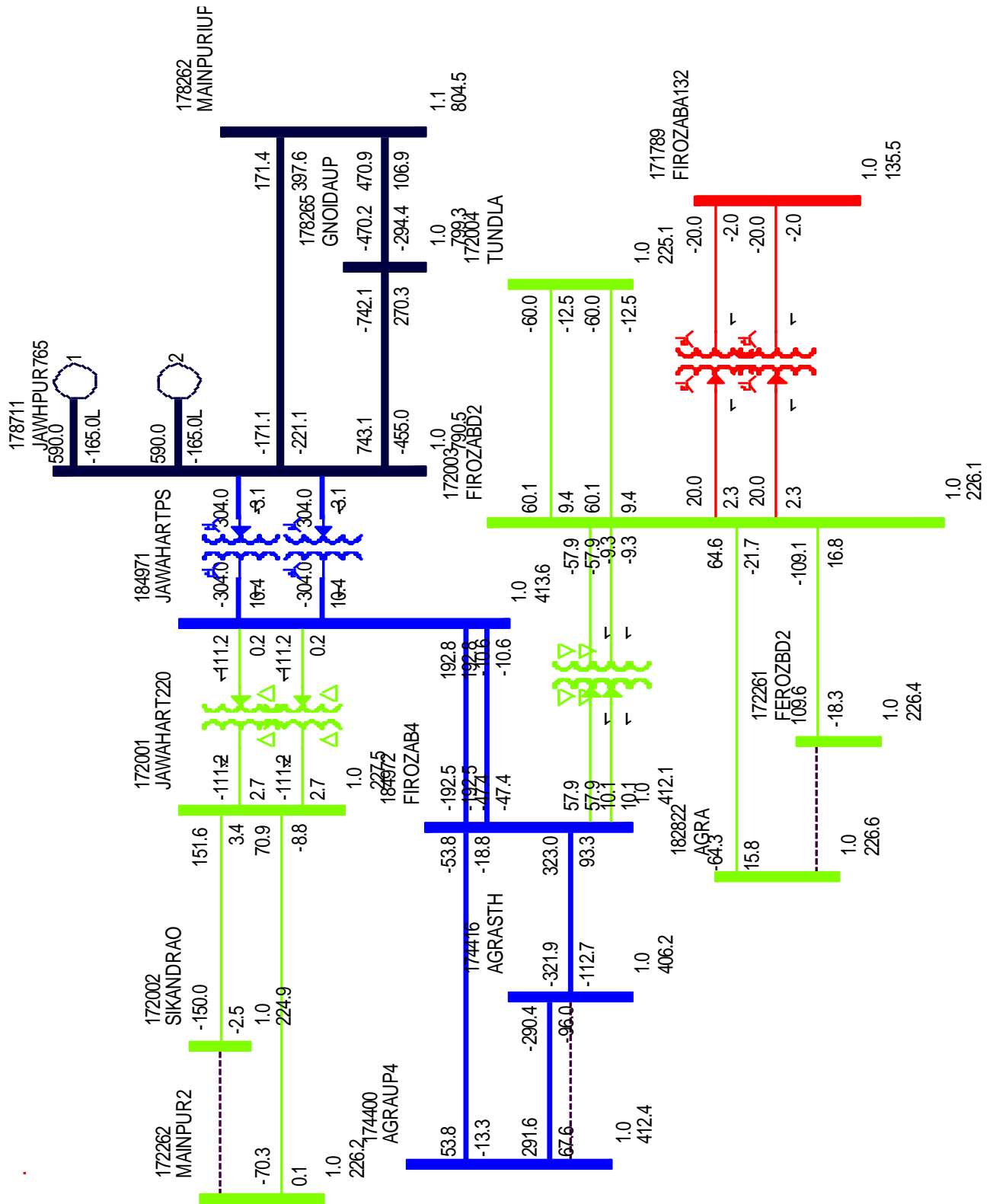
**PTCUL**

13.	Sanjaya Mittal	Director (Projects)
14.	Ajay Kumar Agarwal	CE
15.	Deep Sah	CE
16.	Sachin Rawat	S.E.
17.	S.P. Arya	S.E.
18.	Himanshu Baliyan	E.E.

**UPPTCL**

19.	Suman Guchh	Director (Comm)
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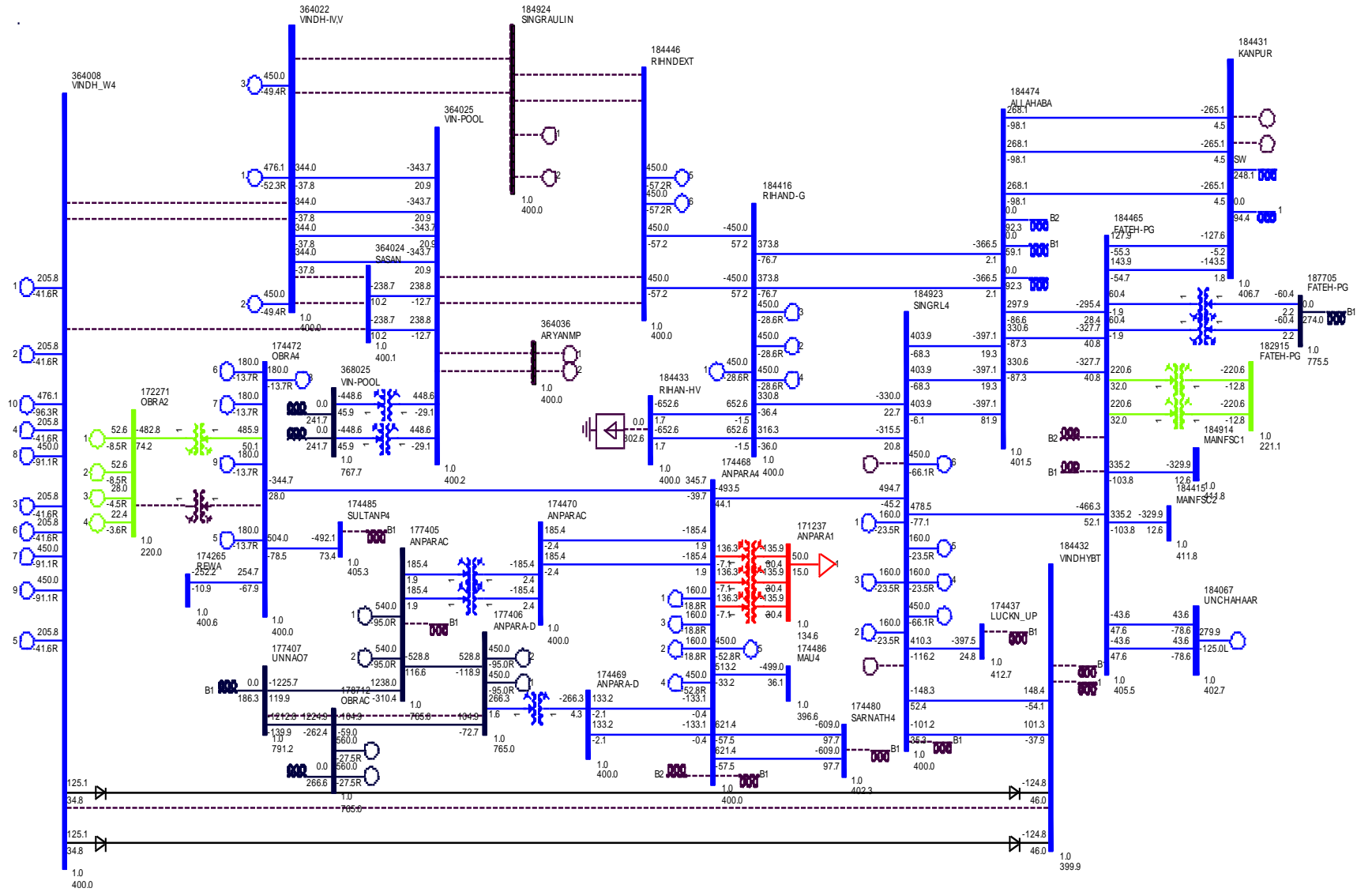


## Annexure-VIII

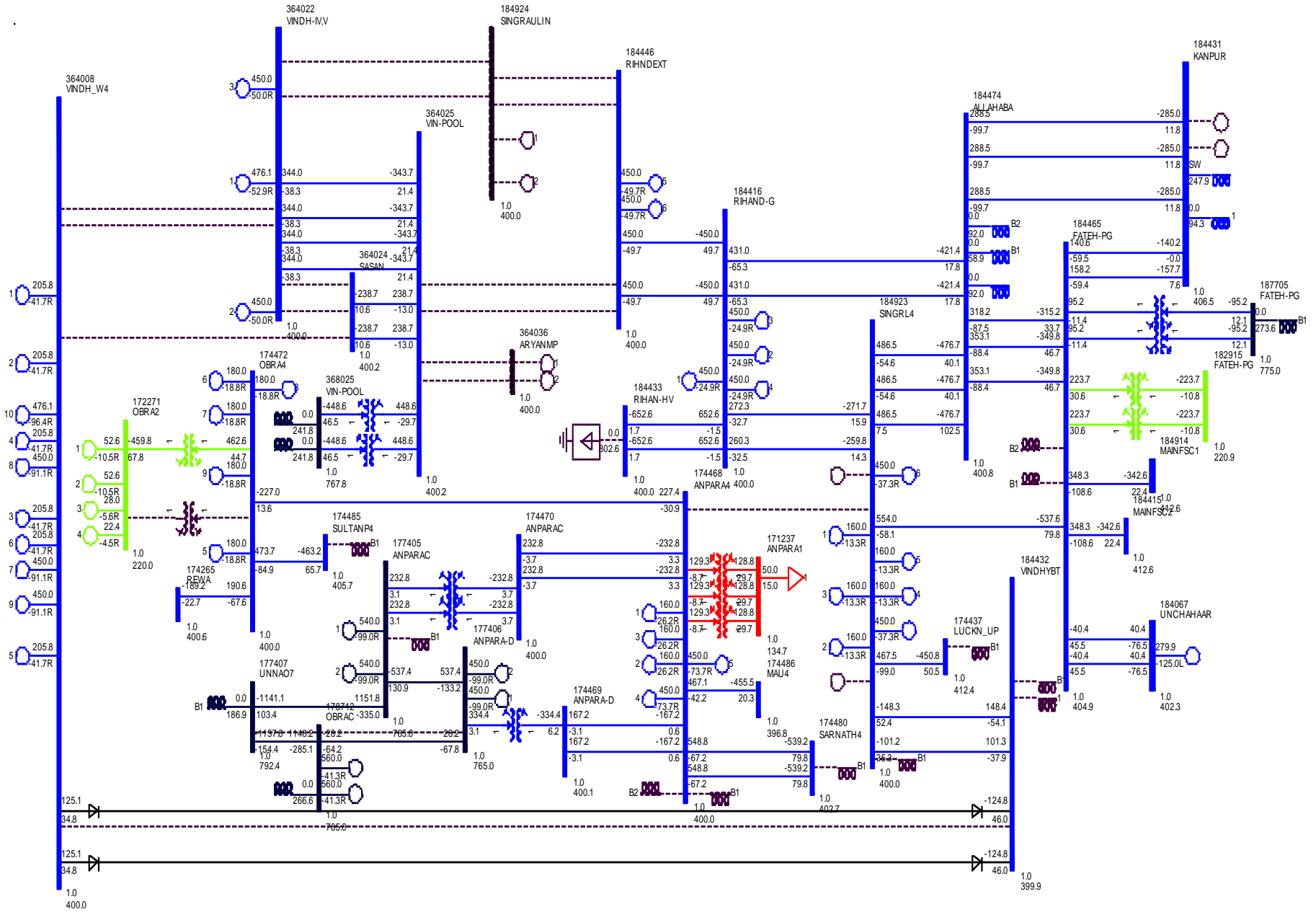
### Agenda for issues related to Rihand, Anpara, Singrauli Generation project:

<b>Exhibit-I</b>	With Rihand-III in NR and Singrauli –Anapara 400kV Line closed
<b>Exhibit-II</b>	With Rihand-III in NR and without Singrauli –Anapara 400kV Line
<b>Exhibit-III</b>	With Rihand-III in WR and with Singrauli –Anapara 400kV Line closed
<b>Exhibit-IV</b>	With Rihand-III in WR and without Singrauli –Anapara 400kV Line
<b>Exhibit-V</b>	With Rihand-III in WR ,Without Singrauli –Anapara 400kV Line, outage of one pole of Rihand –Dadri HVDC link
<b>Exhibit-VI</b>	Singrauli-III generation , without Anpara-Singrauli 400kV line
<b>Exhibit-VII</b>	Singrauli-III generation , with Anpara-Singrauli 400kV line

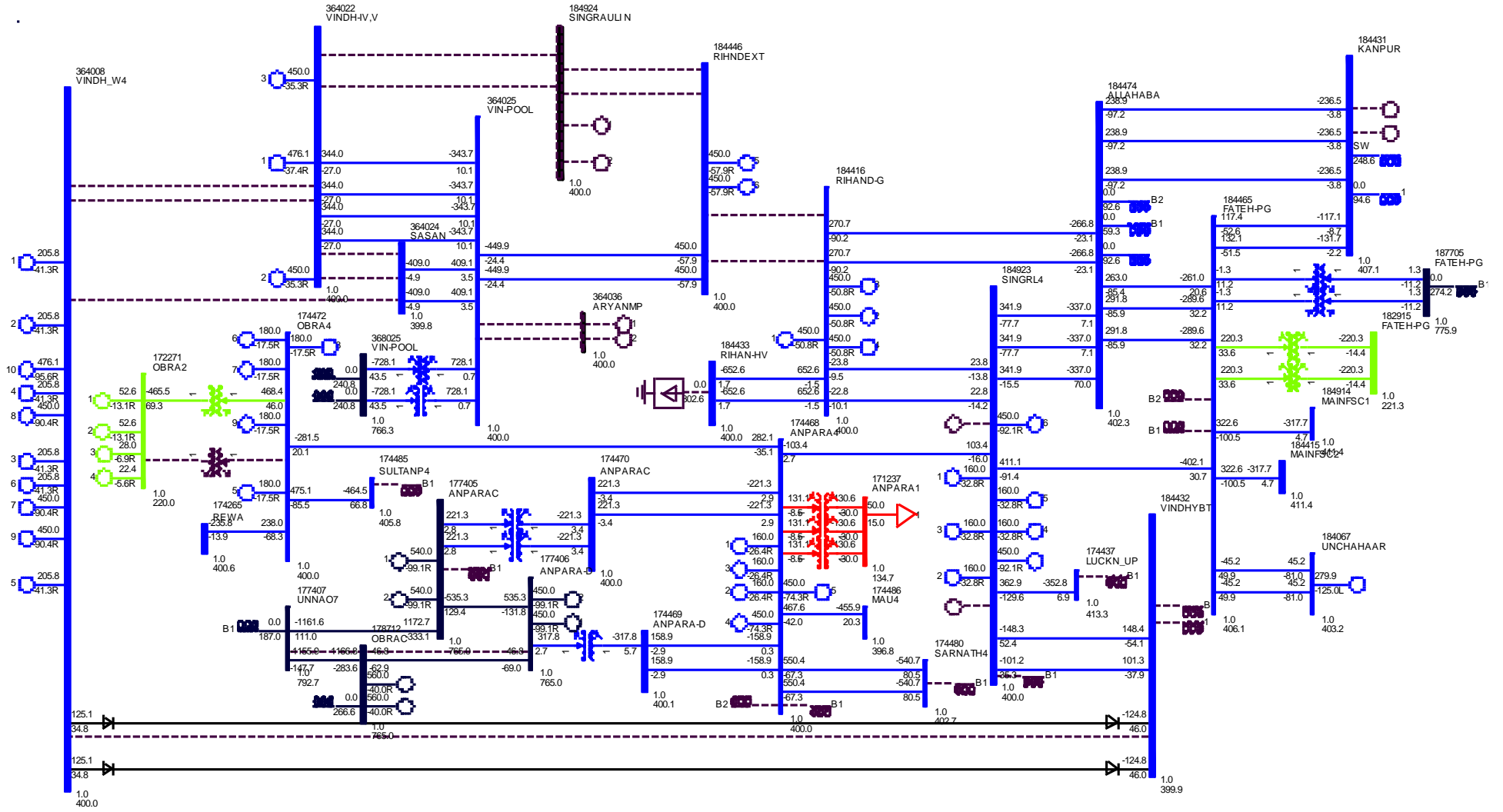
With Rihand-III in NR and Singrauli –Anapara 400kV Line closed



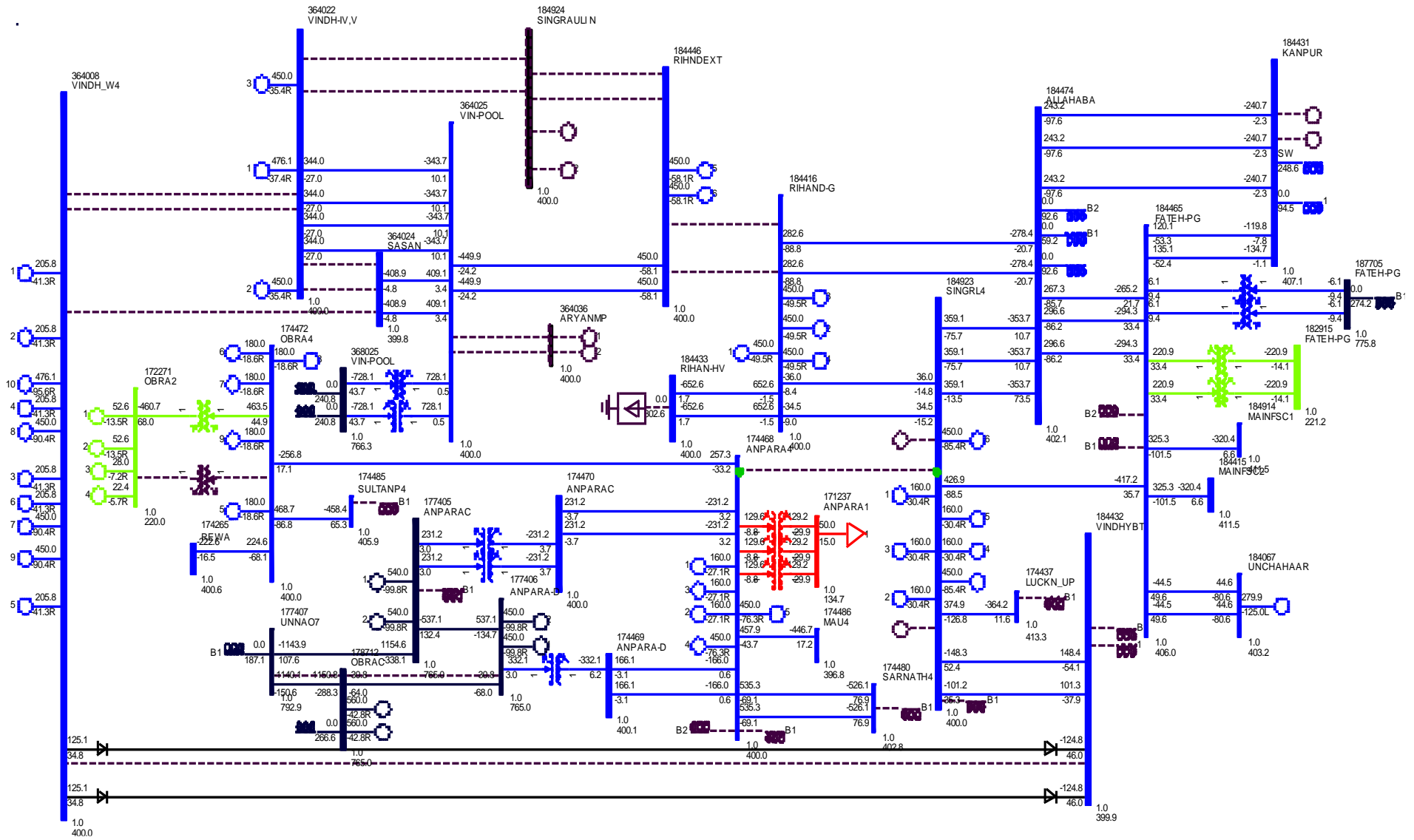
With Rihand-III in NR and without Singrauli –Anapara 400kV Line



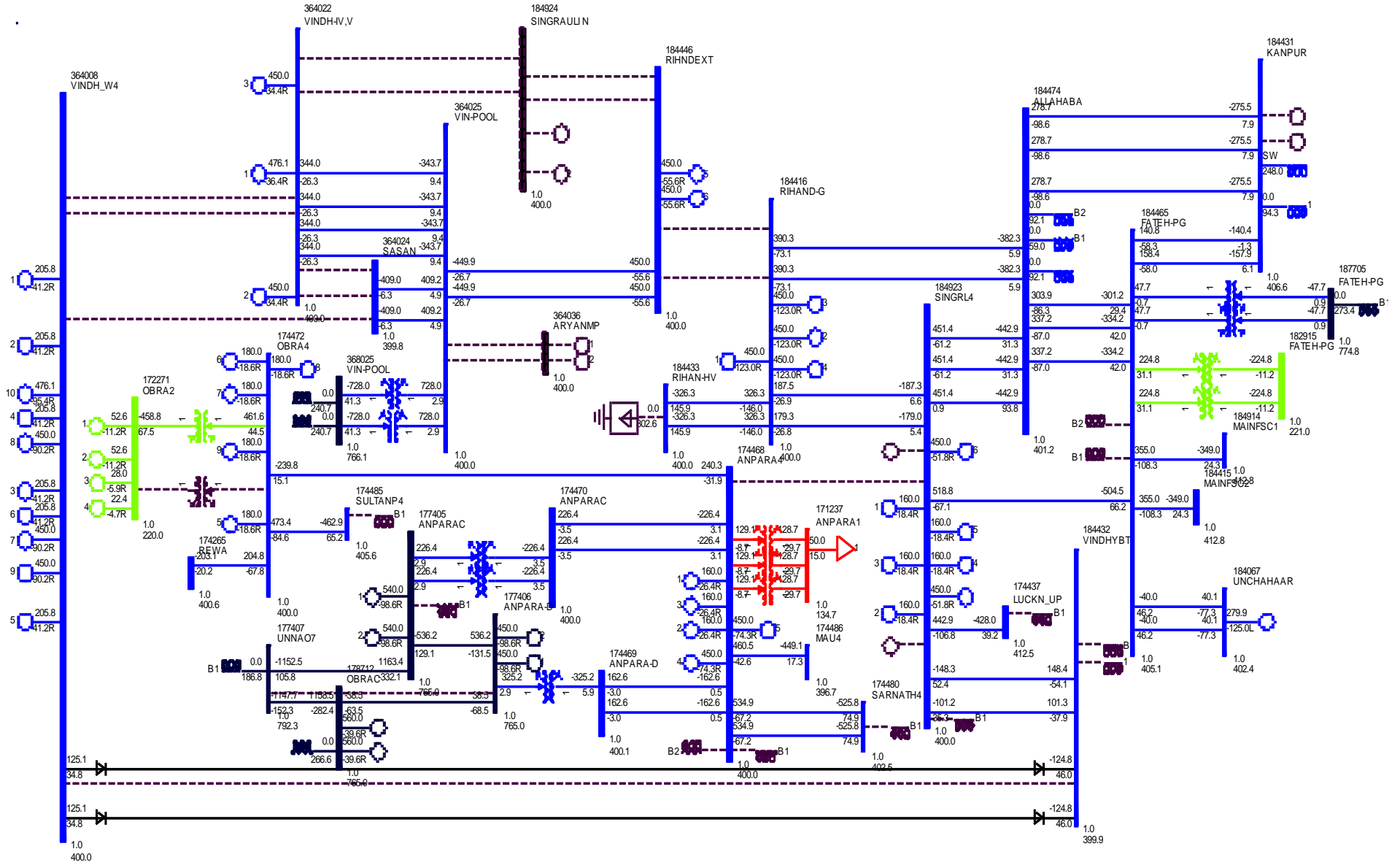
With Rihand-III in WR and with Singrauli –Anapara 400kV Line closed



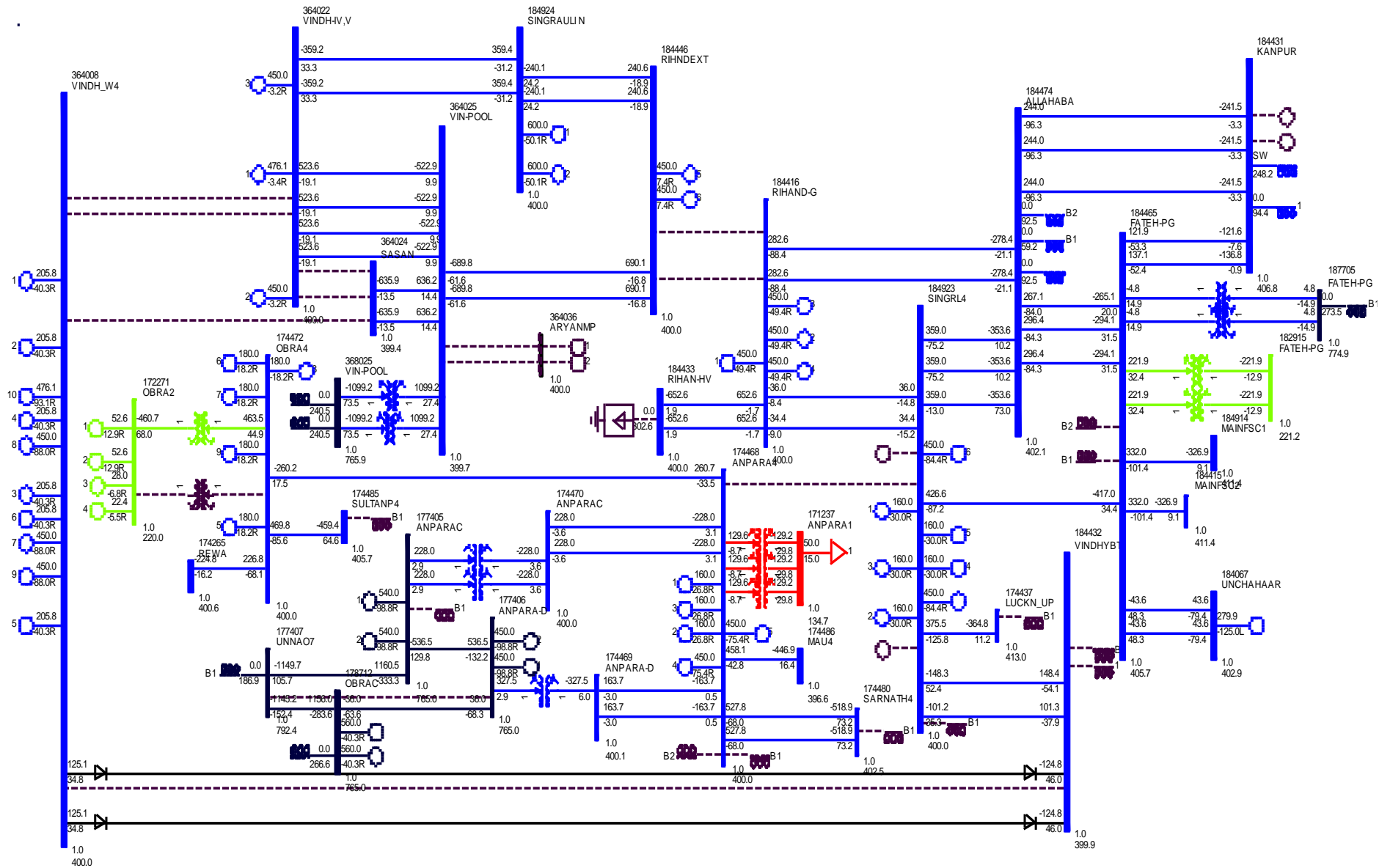
With Rihand-III in WR and Without Singrauli –Anapara 400kV Line



With Rihand-III in WR , Without Singrauli –Anapara 400kV Line, outage of one pole of Rihand –Dadri HVDC link

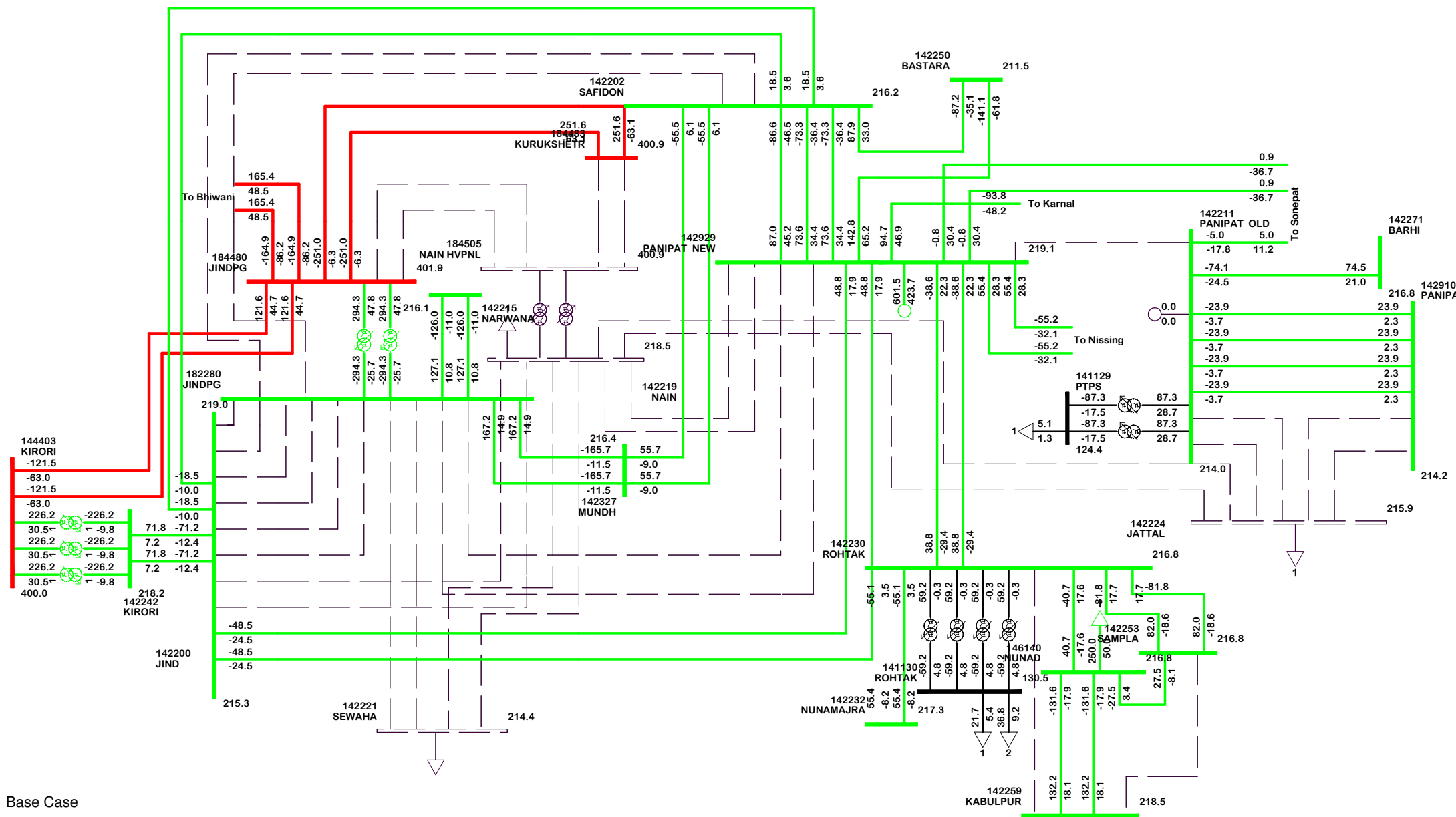


Singrauli-III generation , without Anpara-Singrauli 400kV line

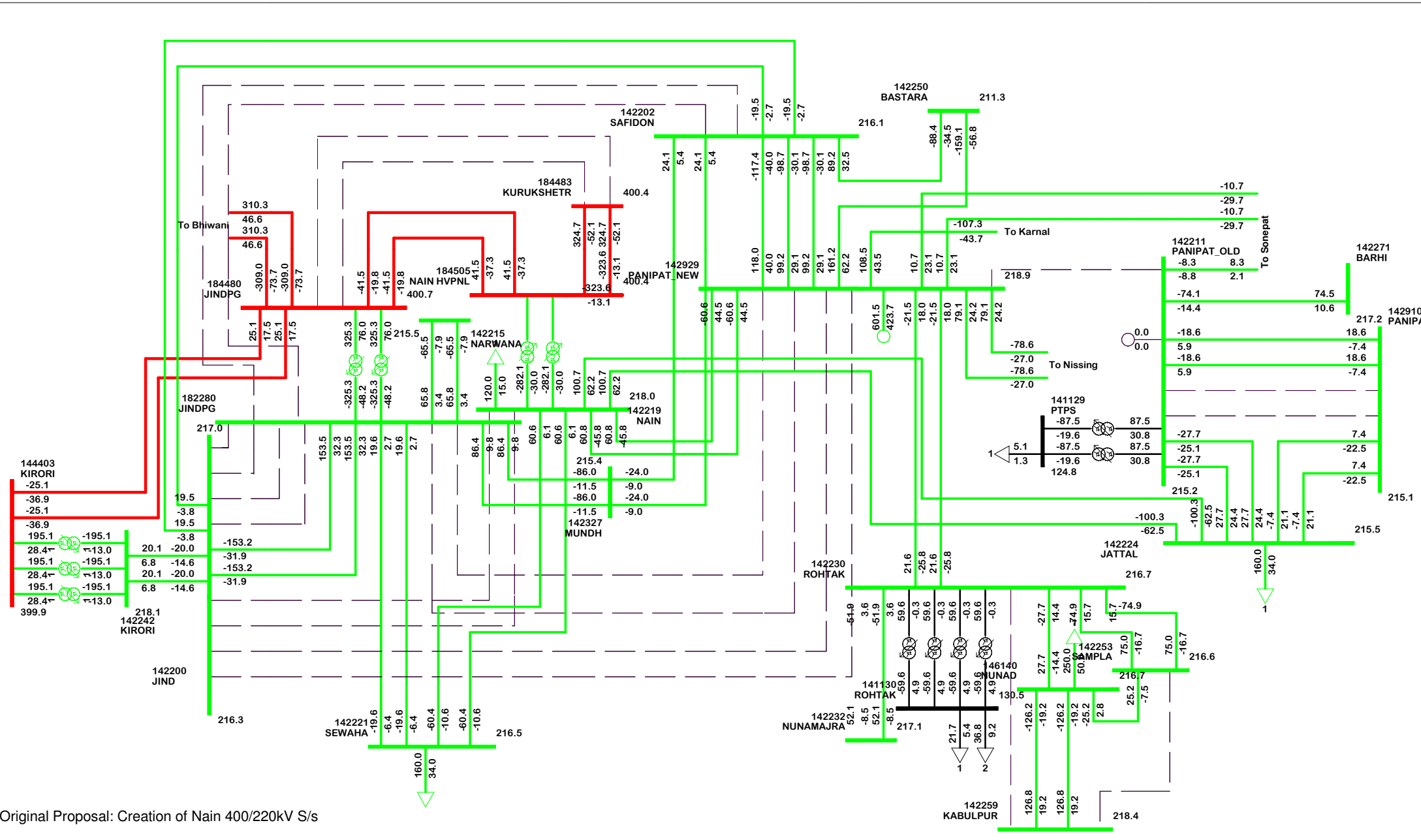




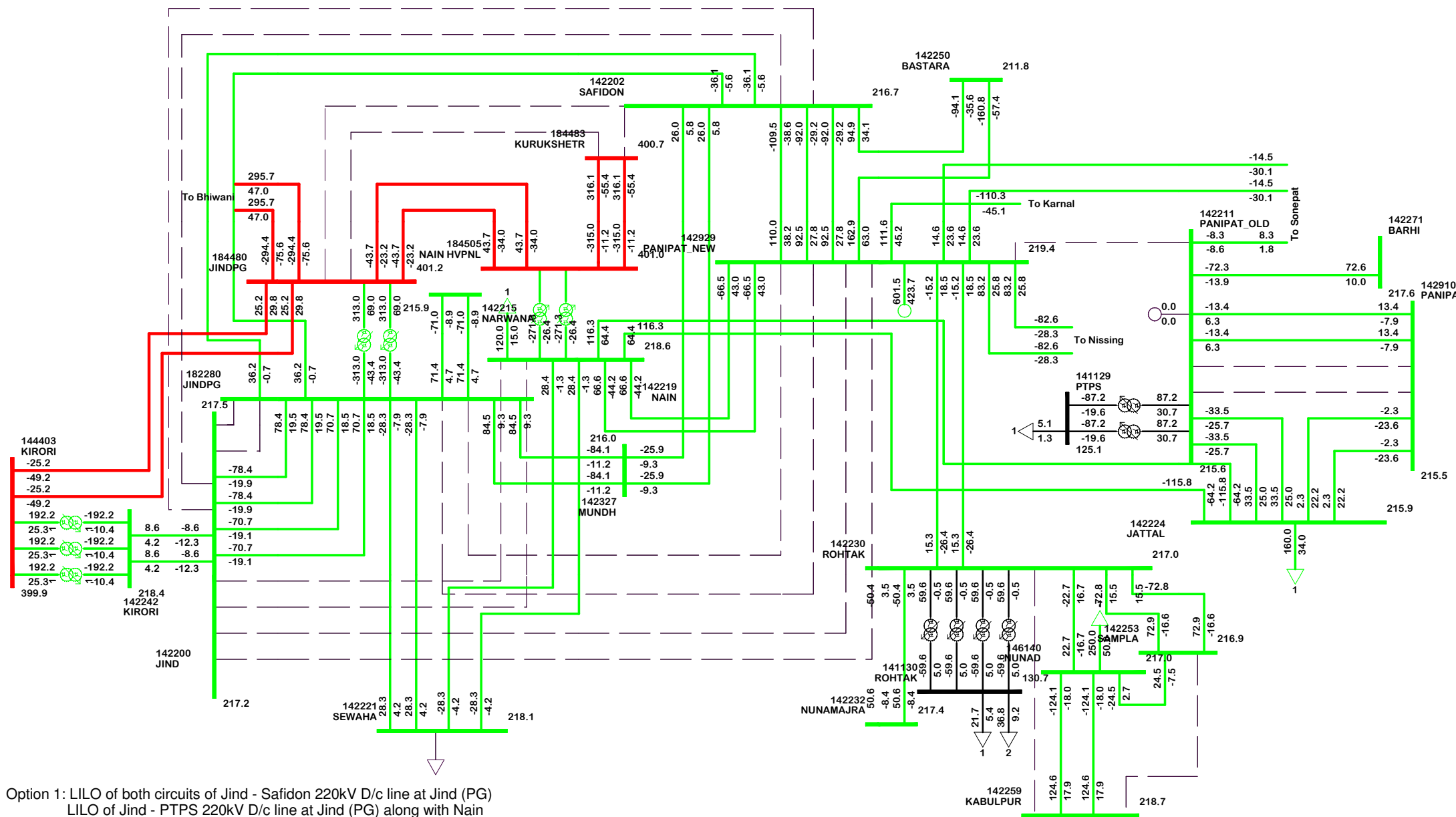




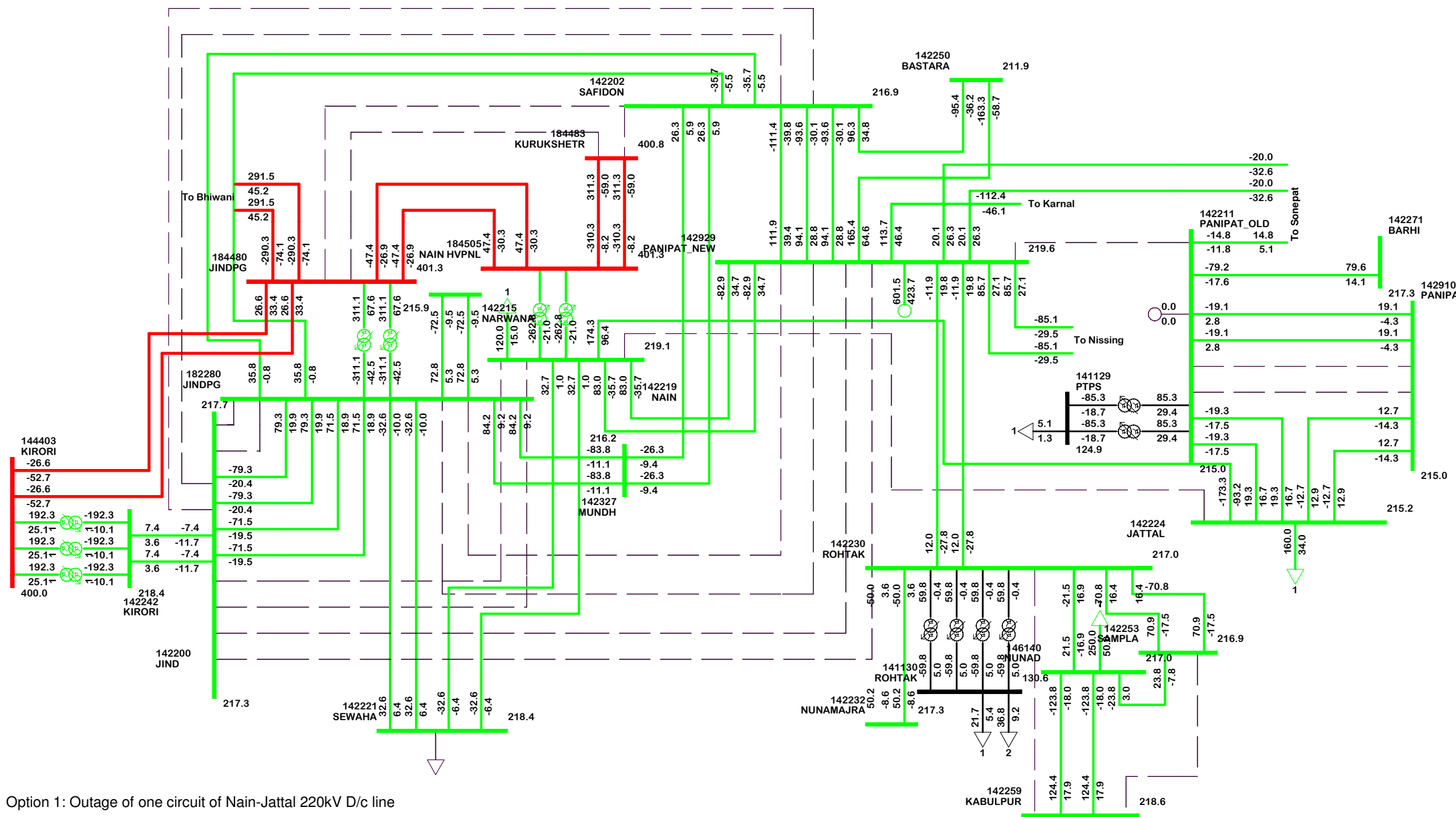
Base Case



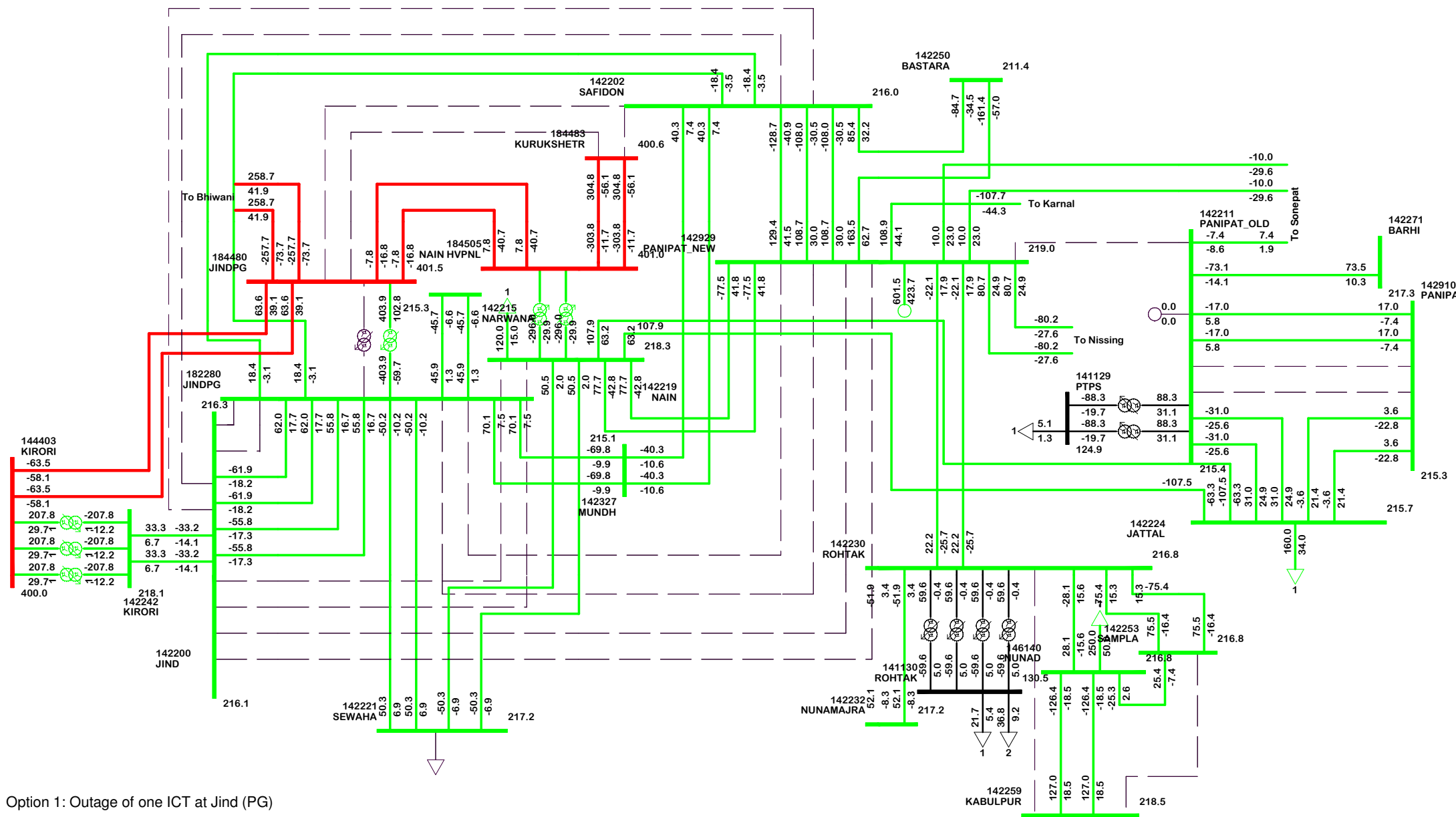
Original Proposal: Creation of Nain 400/220kV S/s



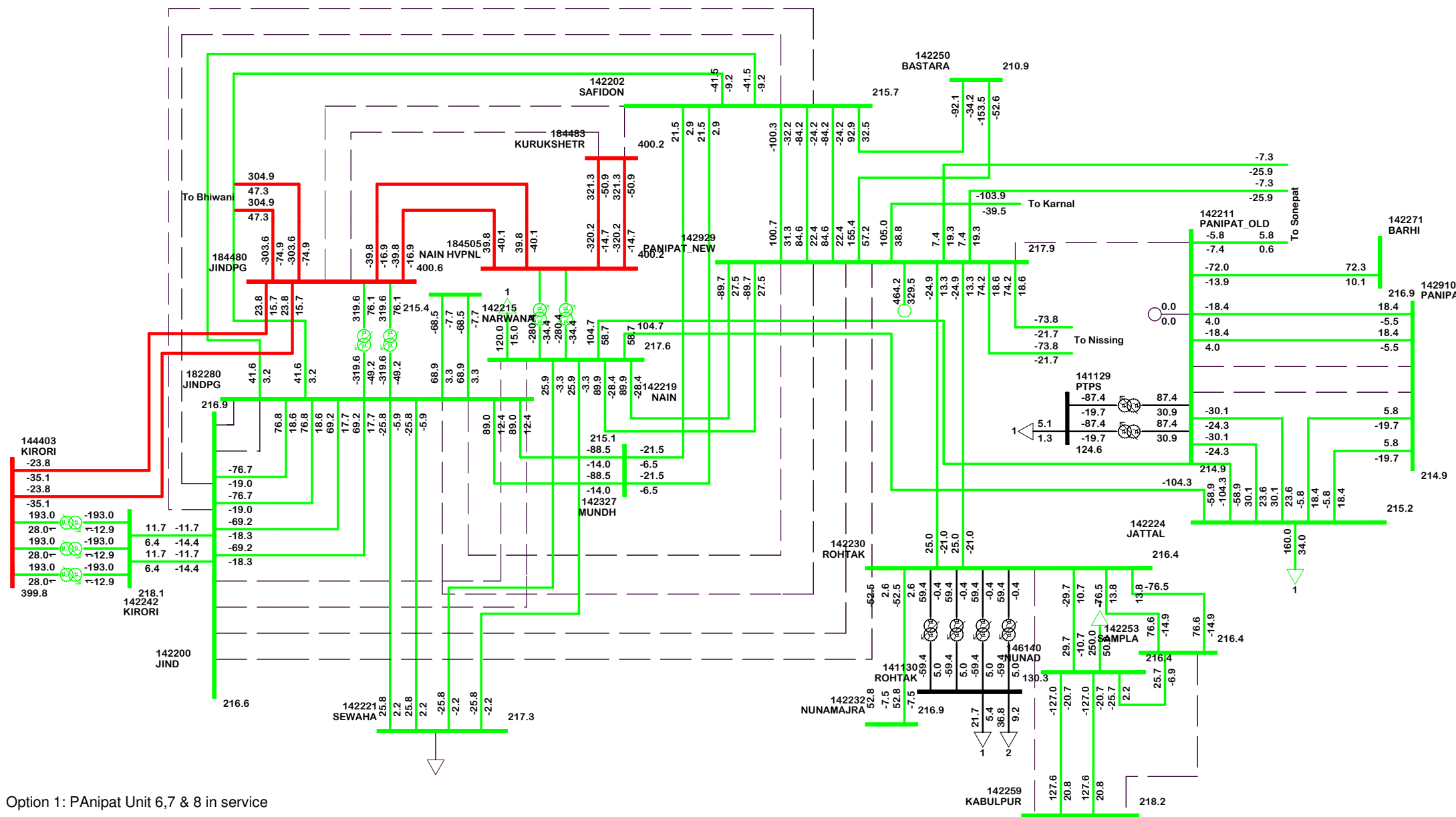
Option 1: LILO of both circuits of Jind - Safidon 220kV D/c line at Jind (PG)  
LILO of Jind - PTPS 220kV D/c line at Jind (PG) along with Nain



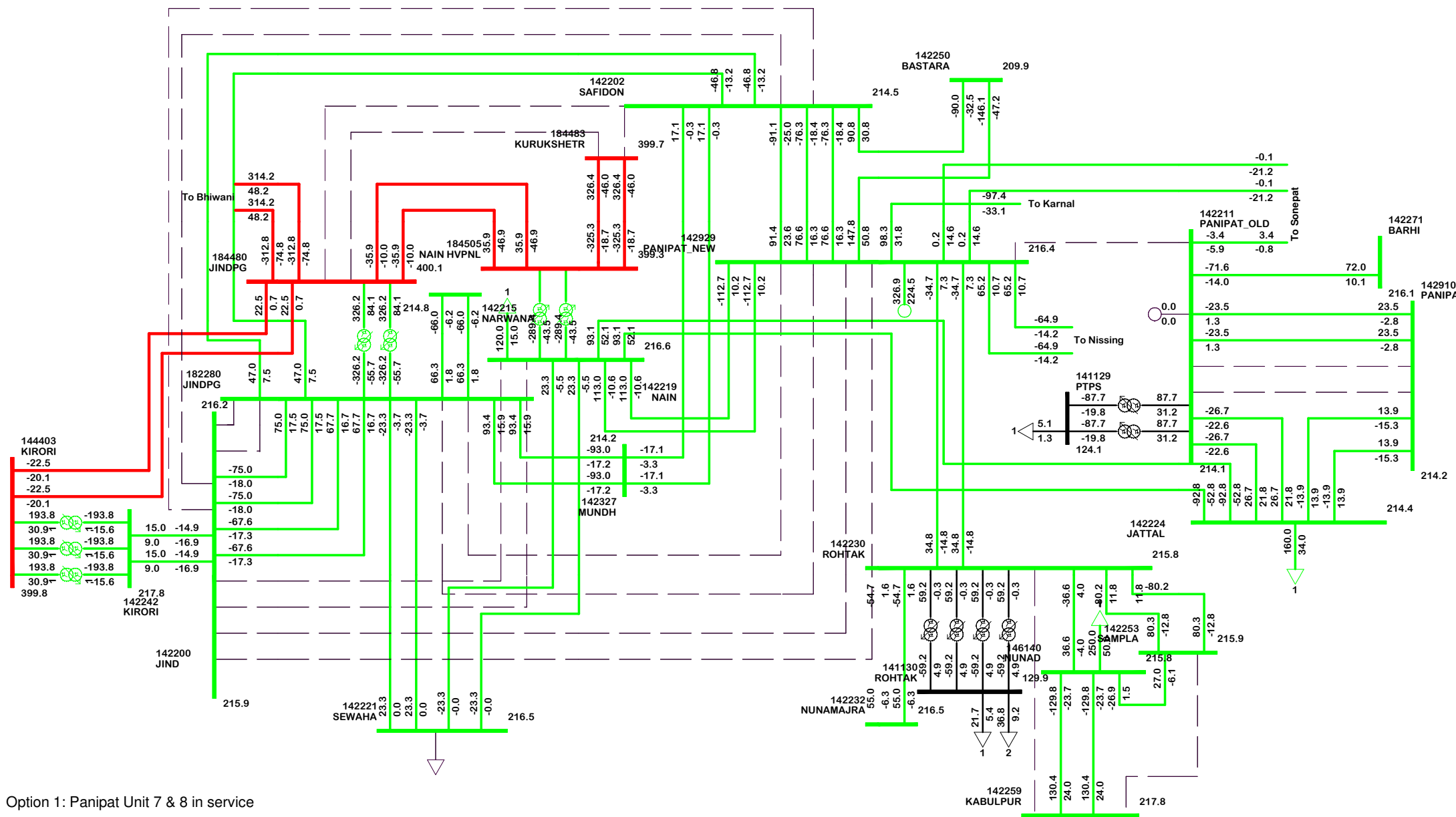
Option 1: Outage of one circuit of Nain-Jattal 220kV D/c line



Option 1: Outage of one ICT at Jind (PG)

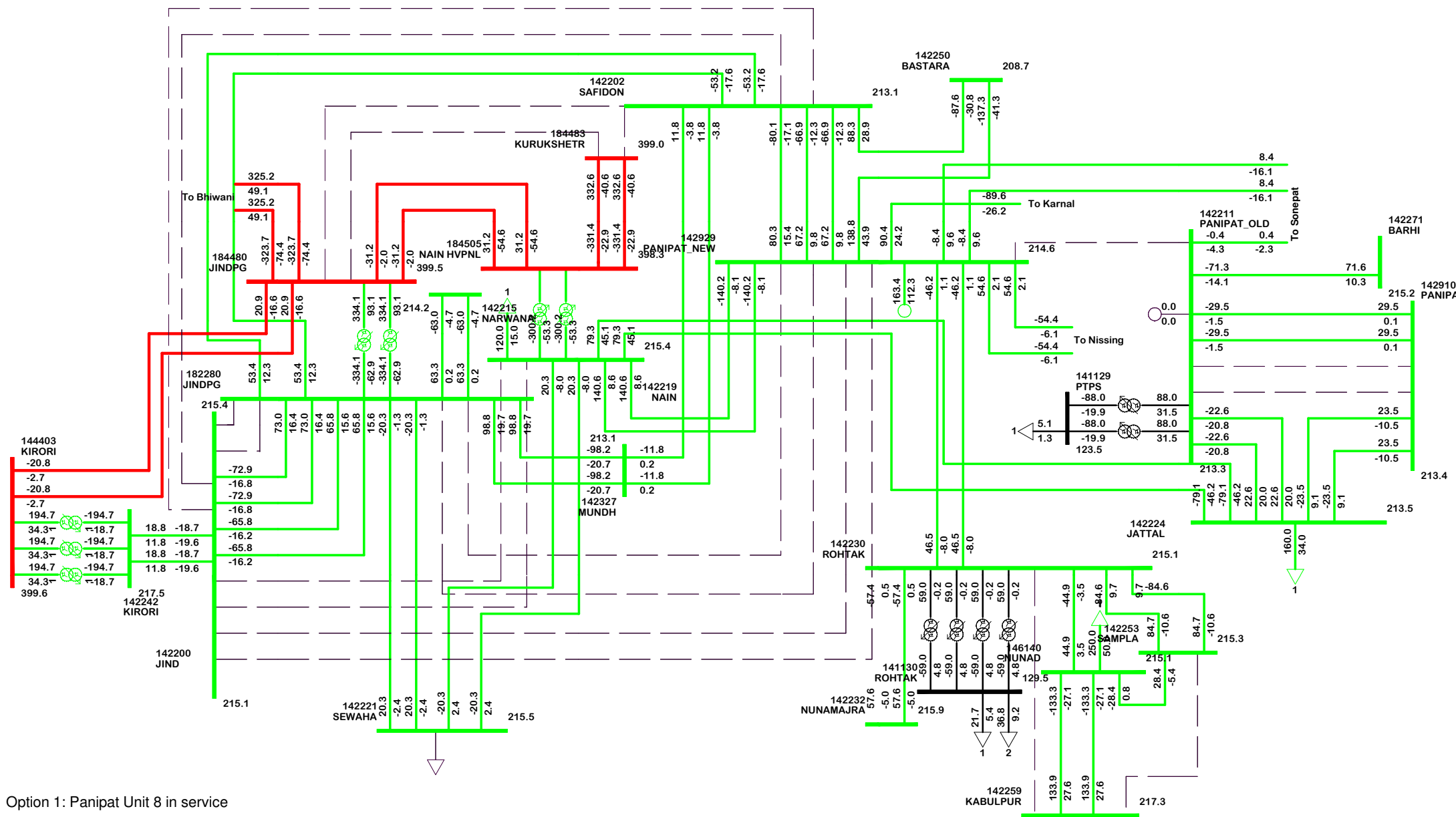


Option 1: PANIPAT Unit 6,7 & 8 in service

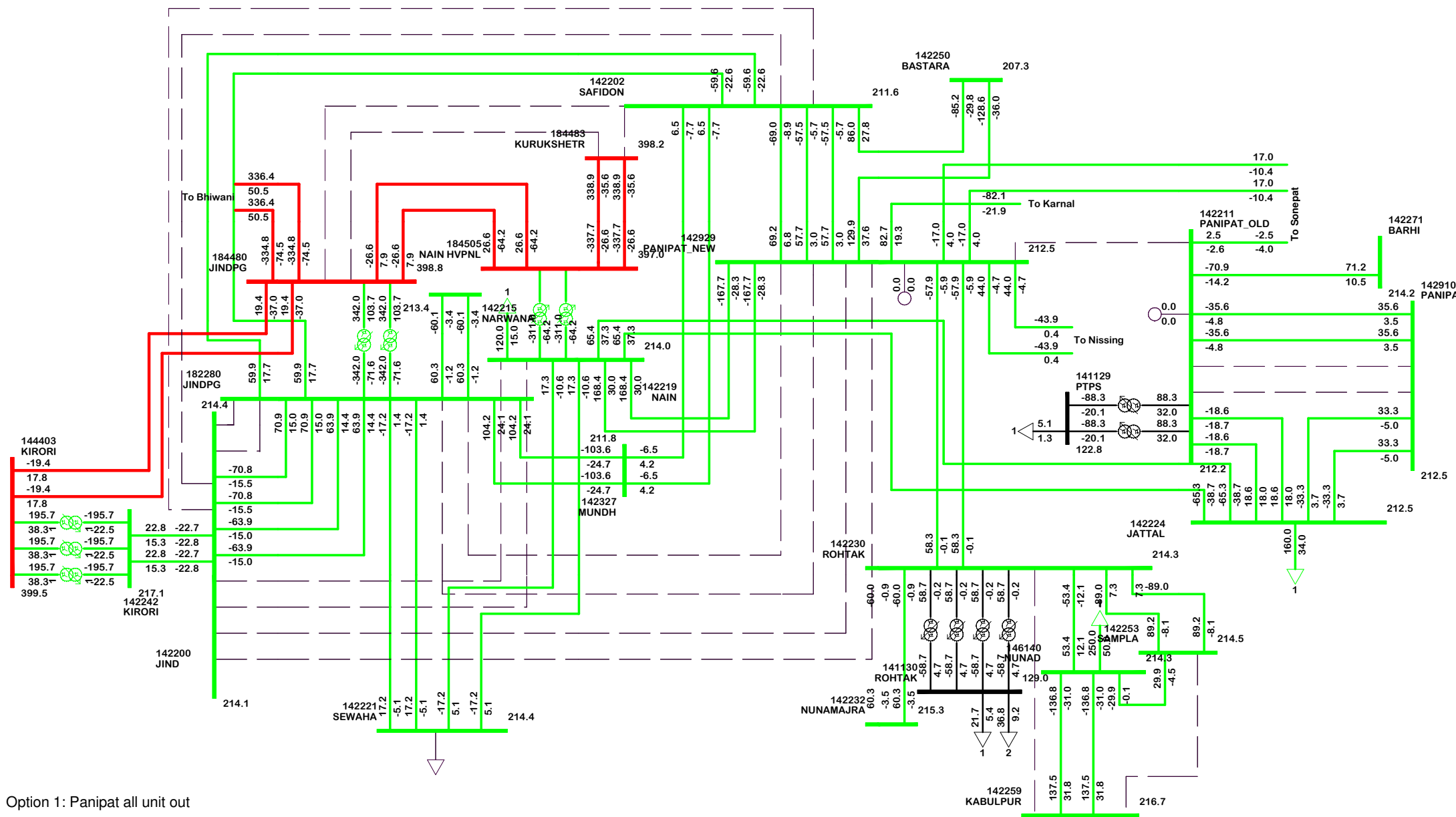


Option 1: Panipat Unit 7 & 8 in service

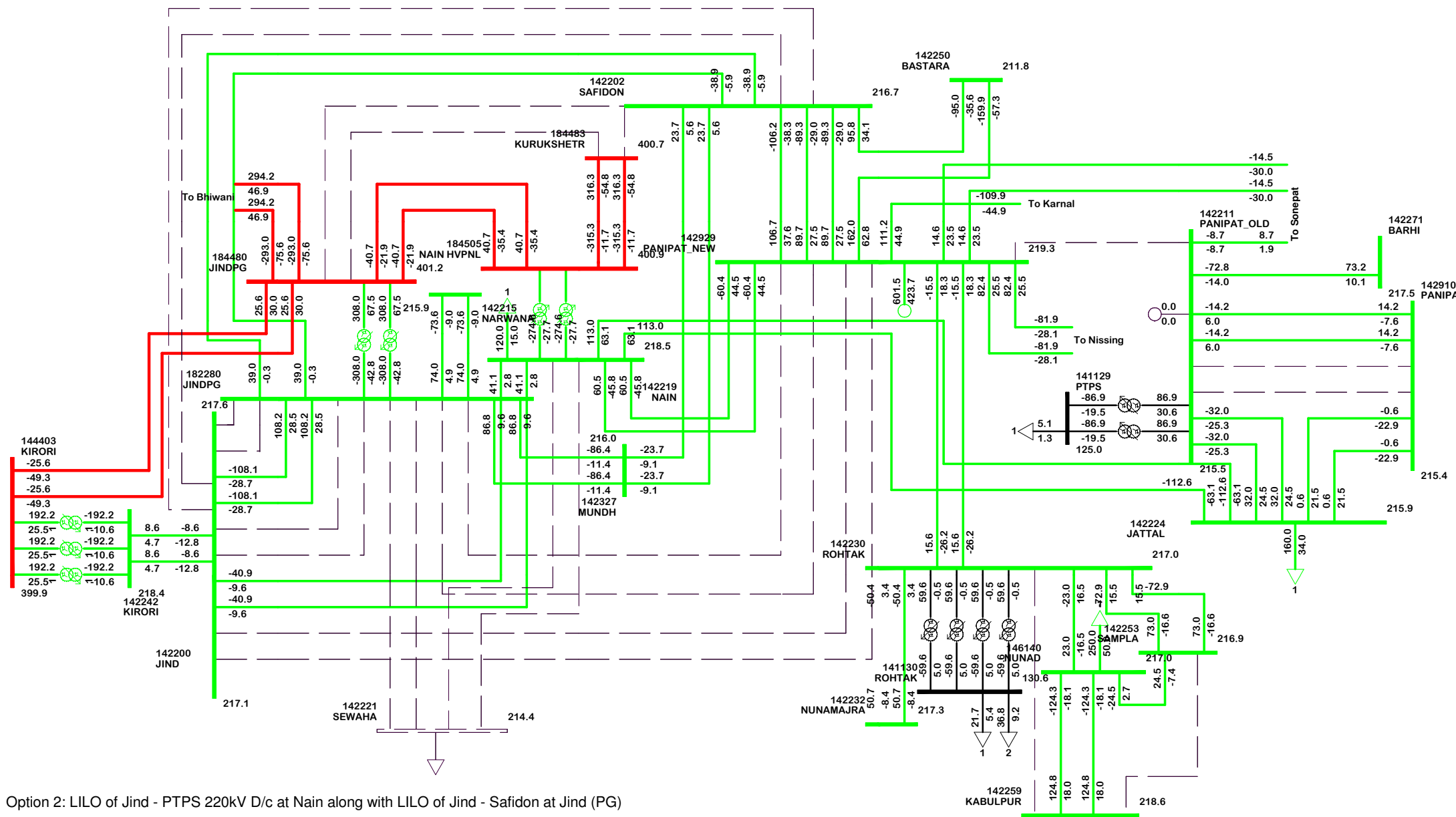




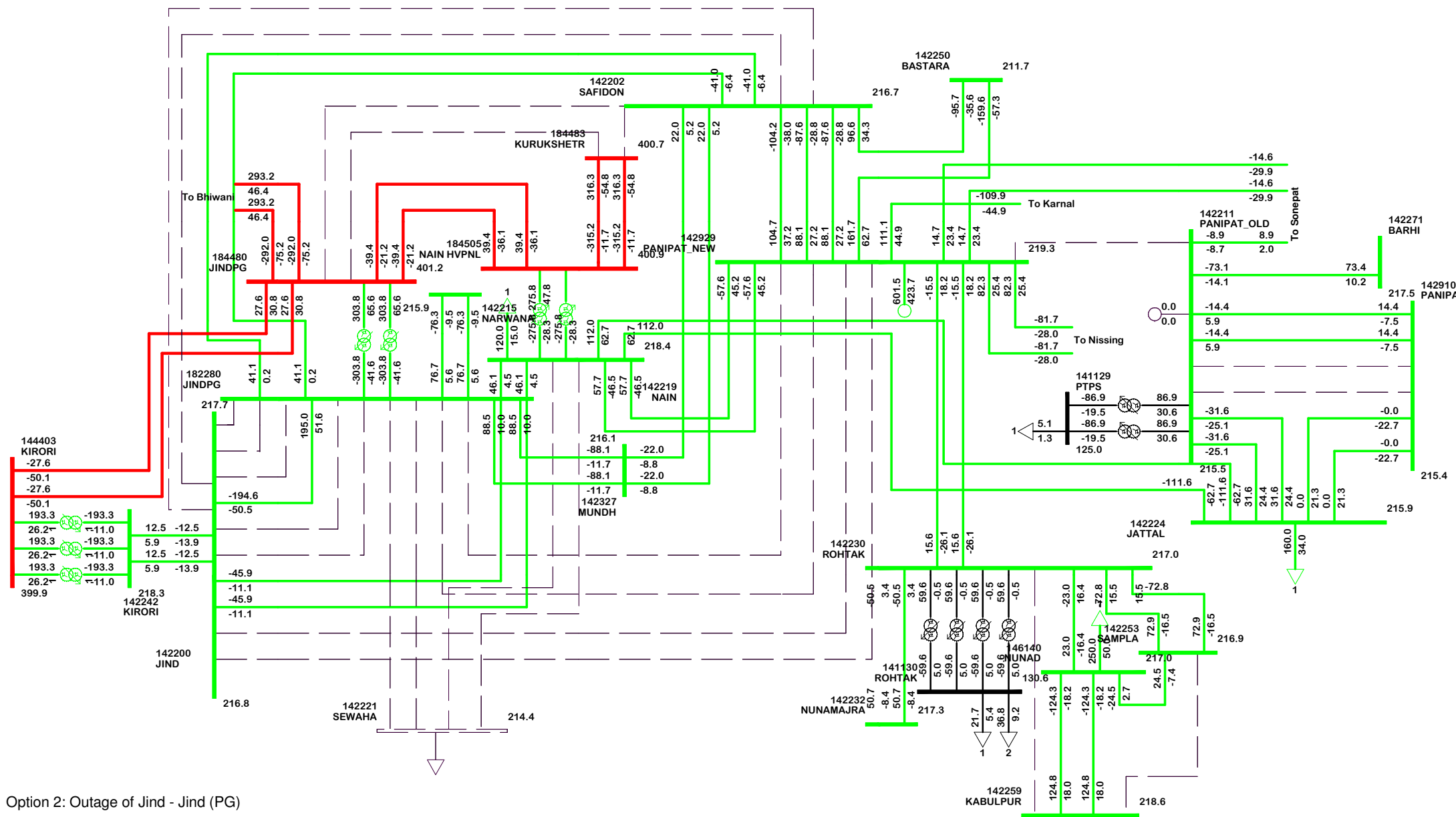
Option 1: Panipat Unit 8 in service



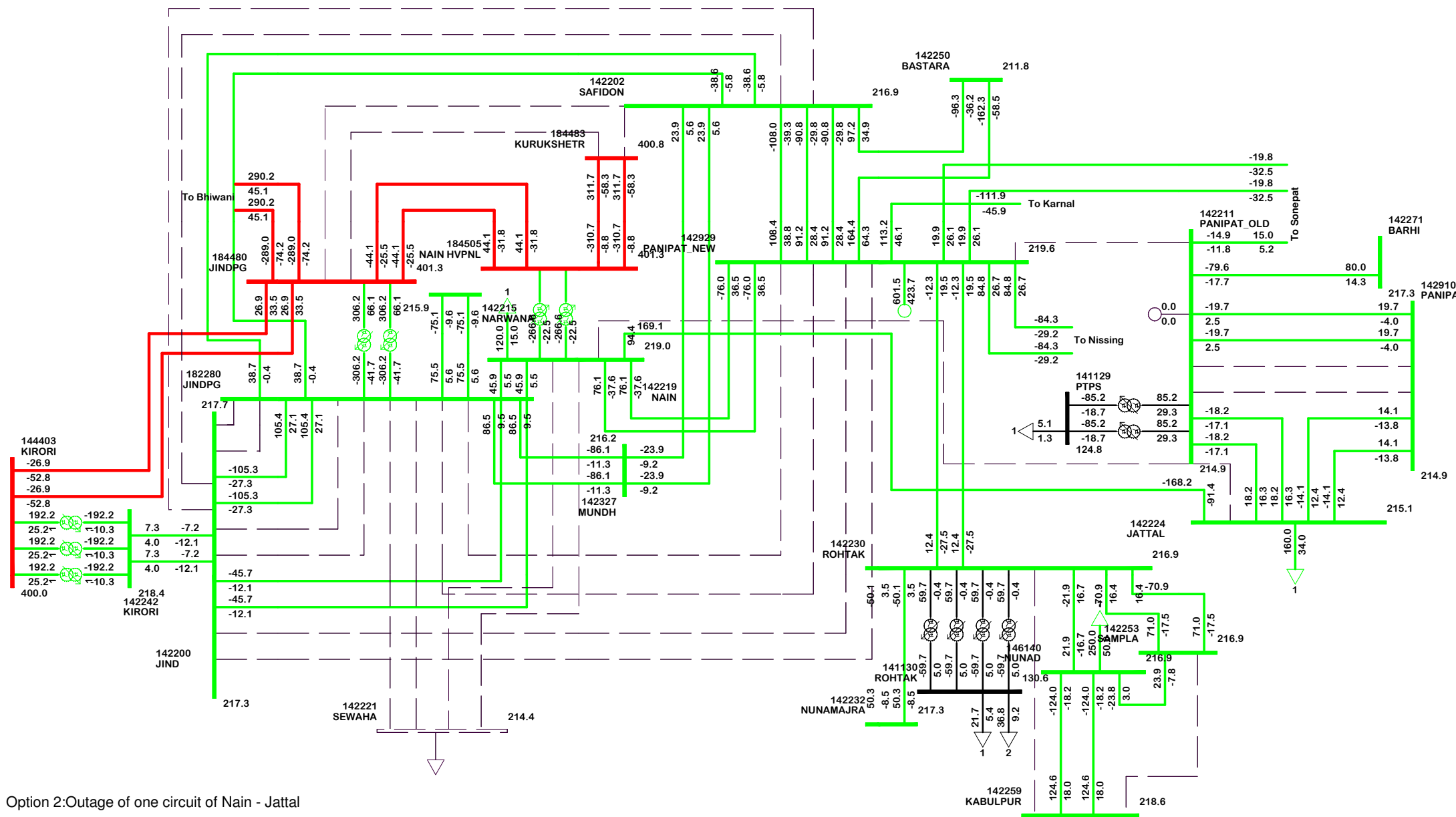
Option 1: Panipat all unit out



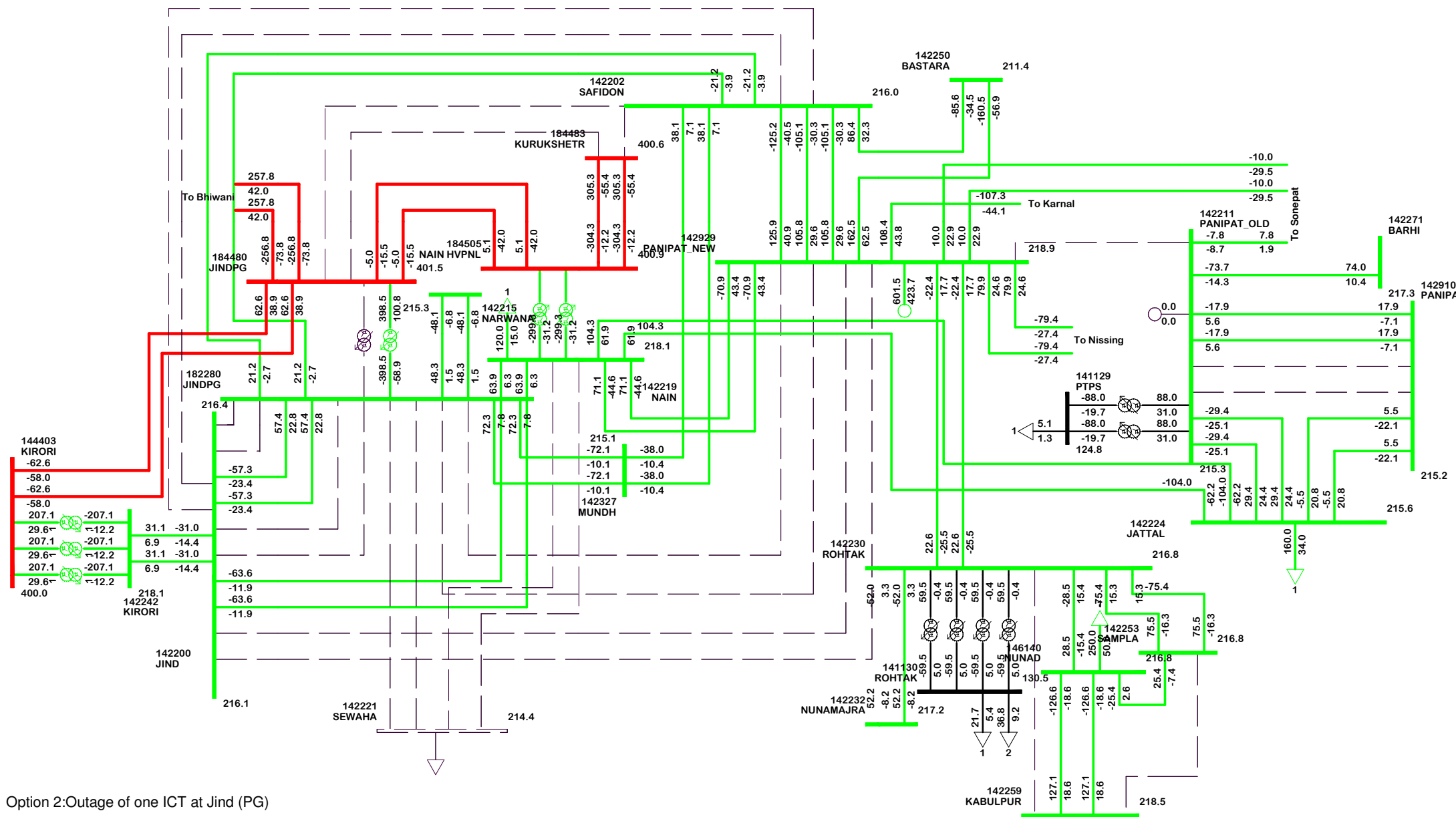
Option 2: LILO of Jind - PTPS 220kV D/c at Nain along with LILO of Jind - Safidon at Jind (PG)



Option 2: Outage of Jind - Jind (PG)

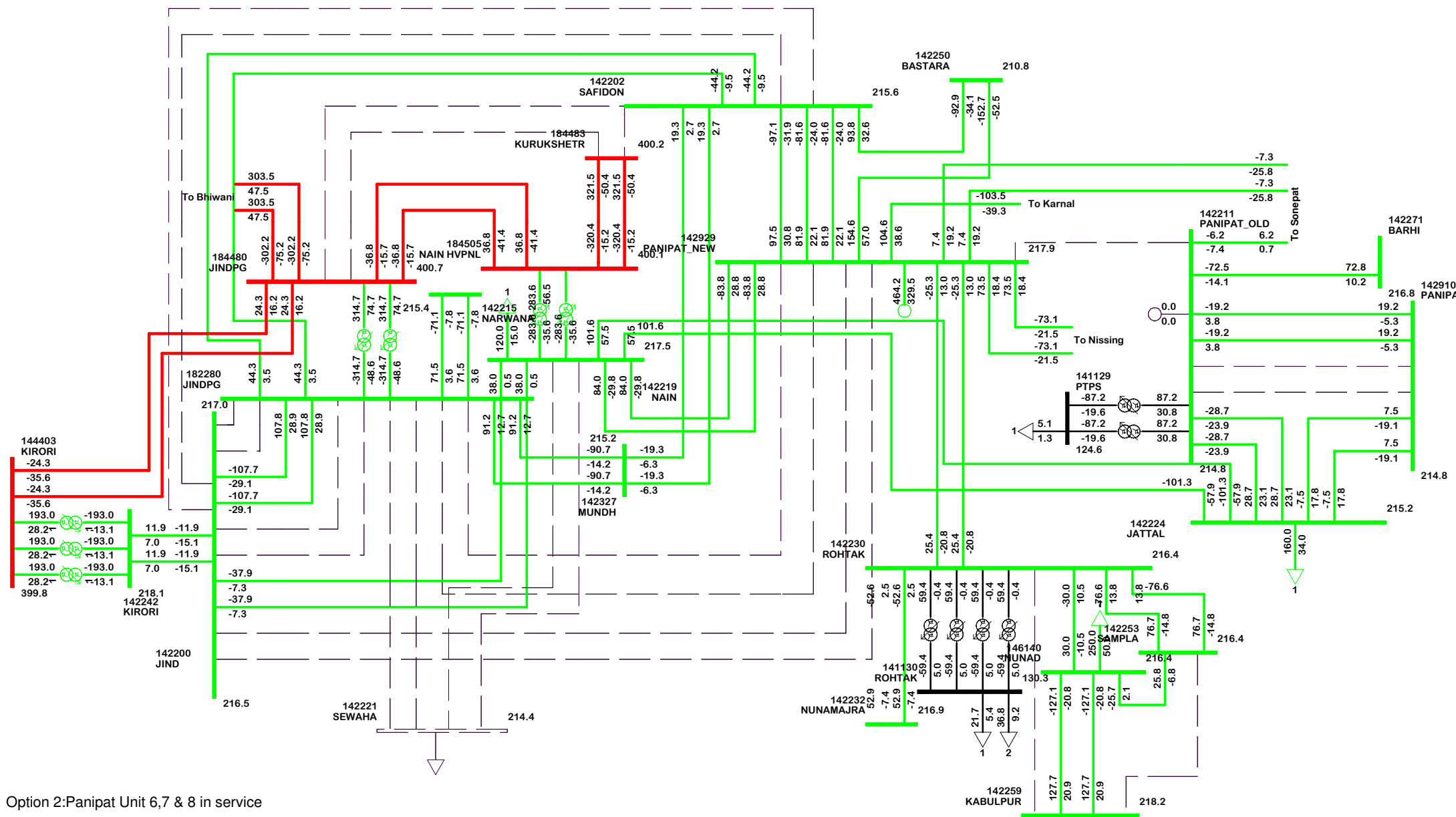


Option 2: Outage of one circuit of Nain - Jattal



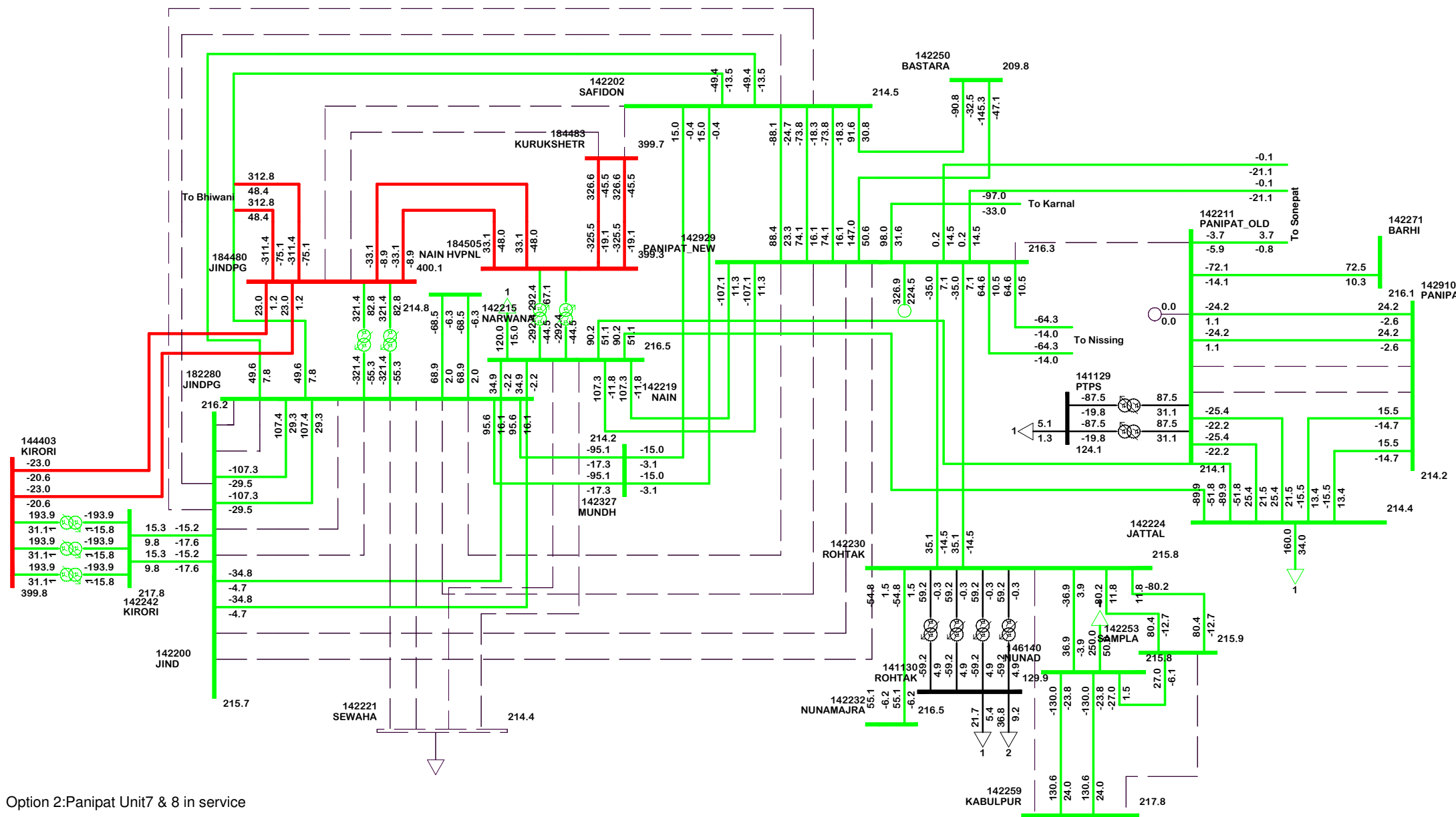
Option 2: Outage of one ICT at Jind (PG)





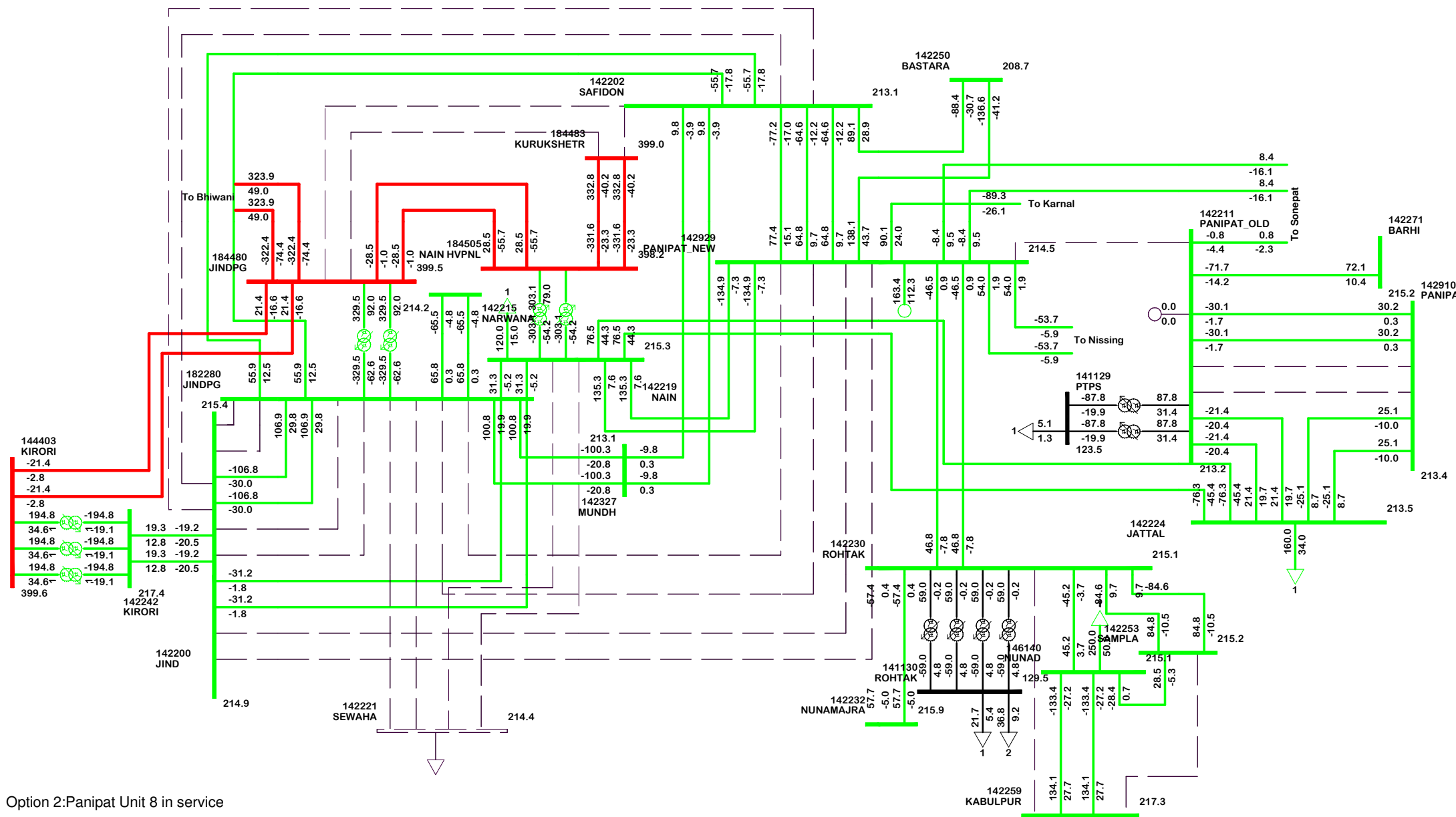
Option 2: Panipat Unit 6, 7 & 8 in service

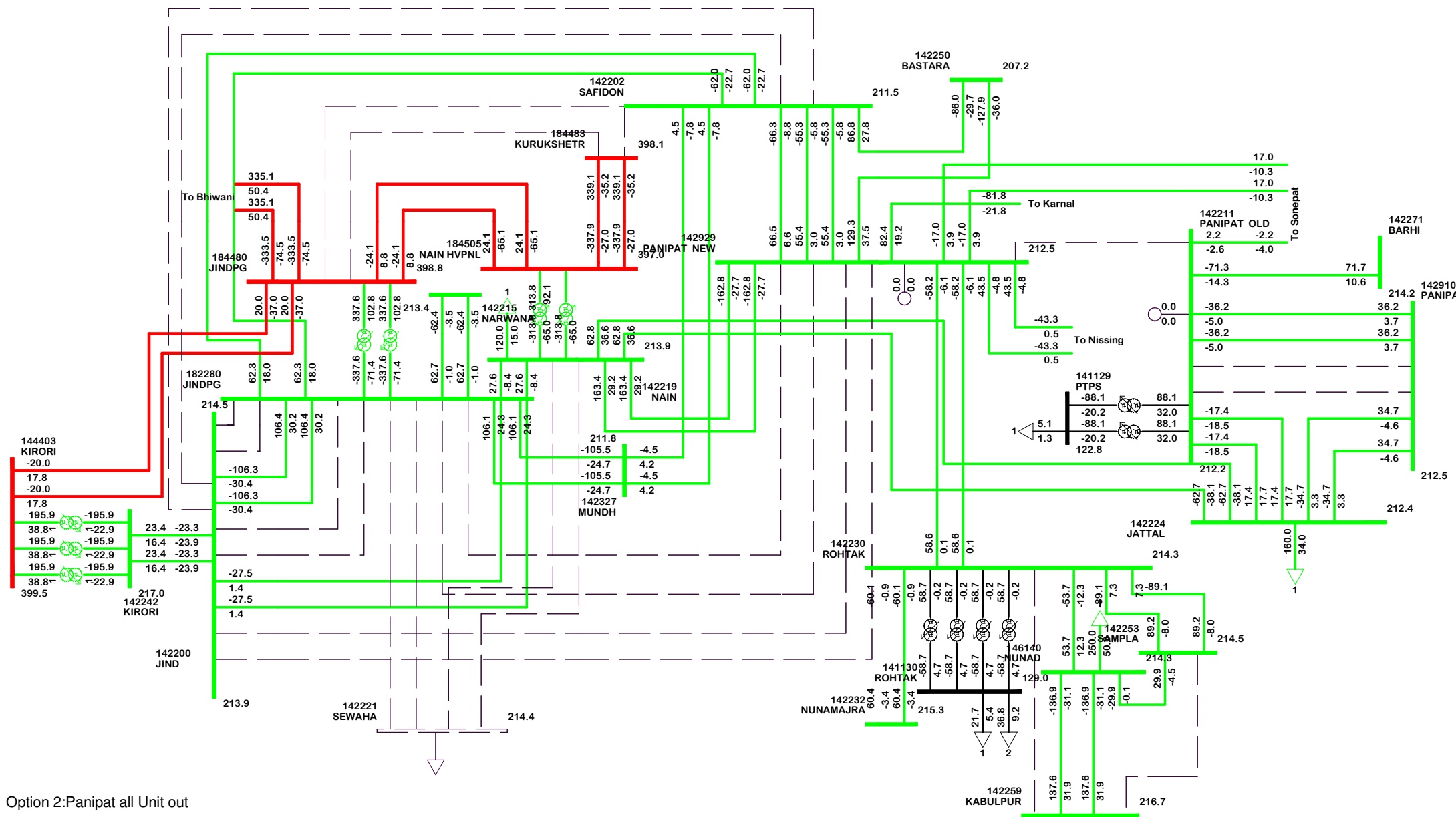




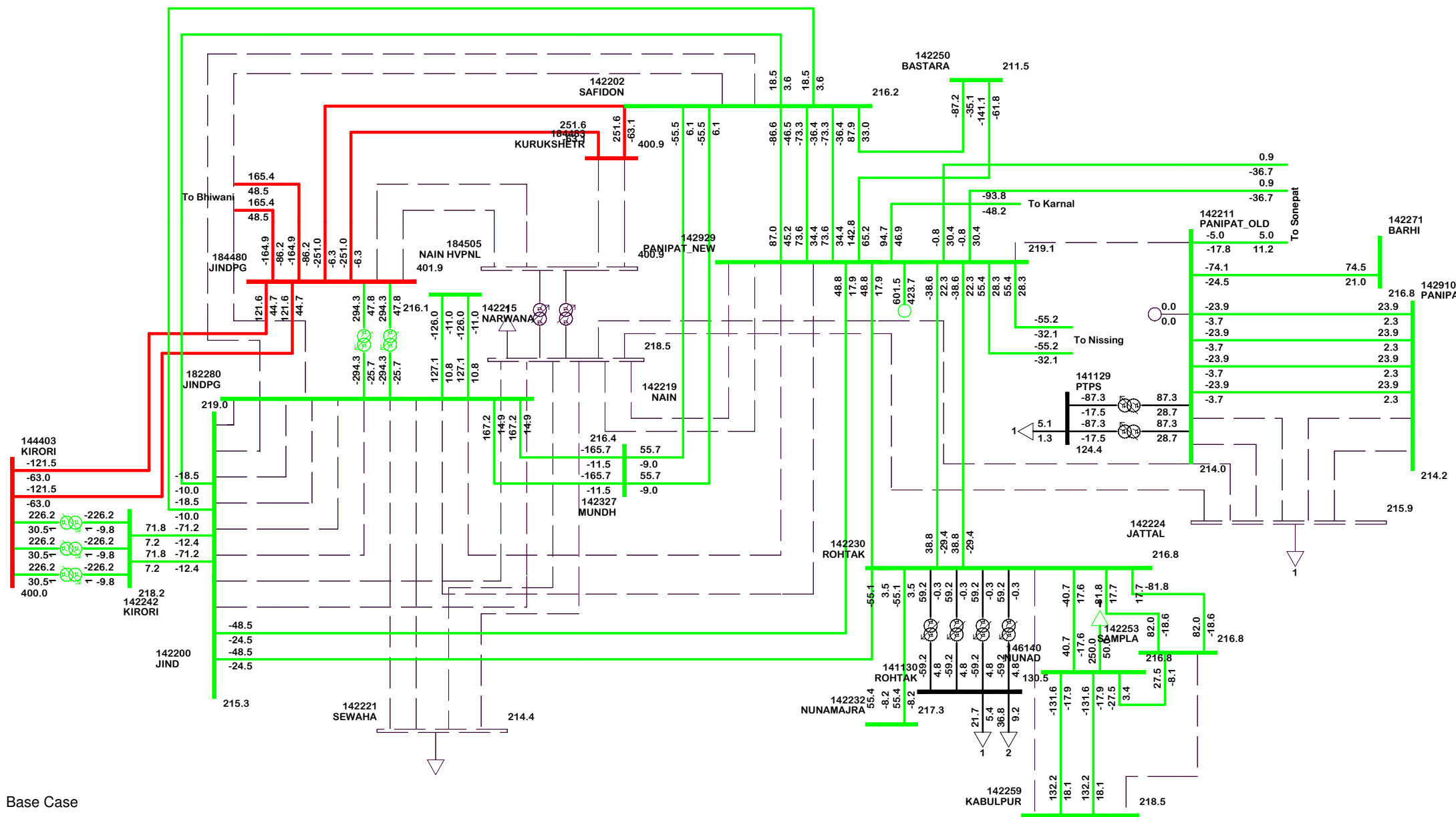
Option 2: Panipat Unit 7 & 8 in service

Option 2: Panipat Unit 8 in service



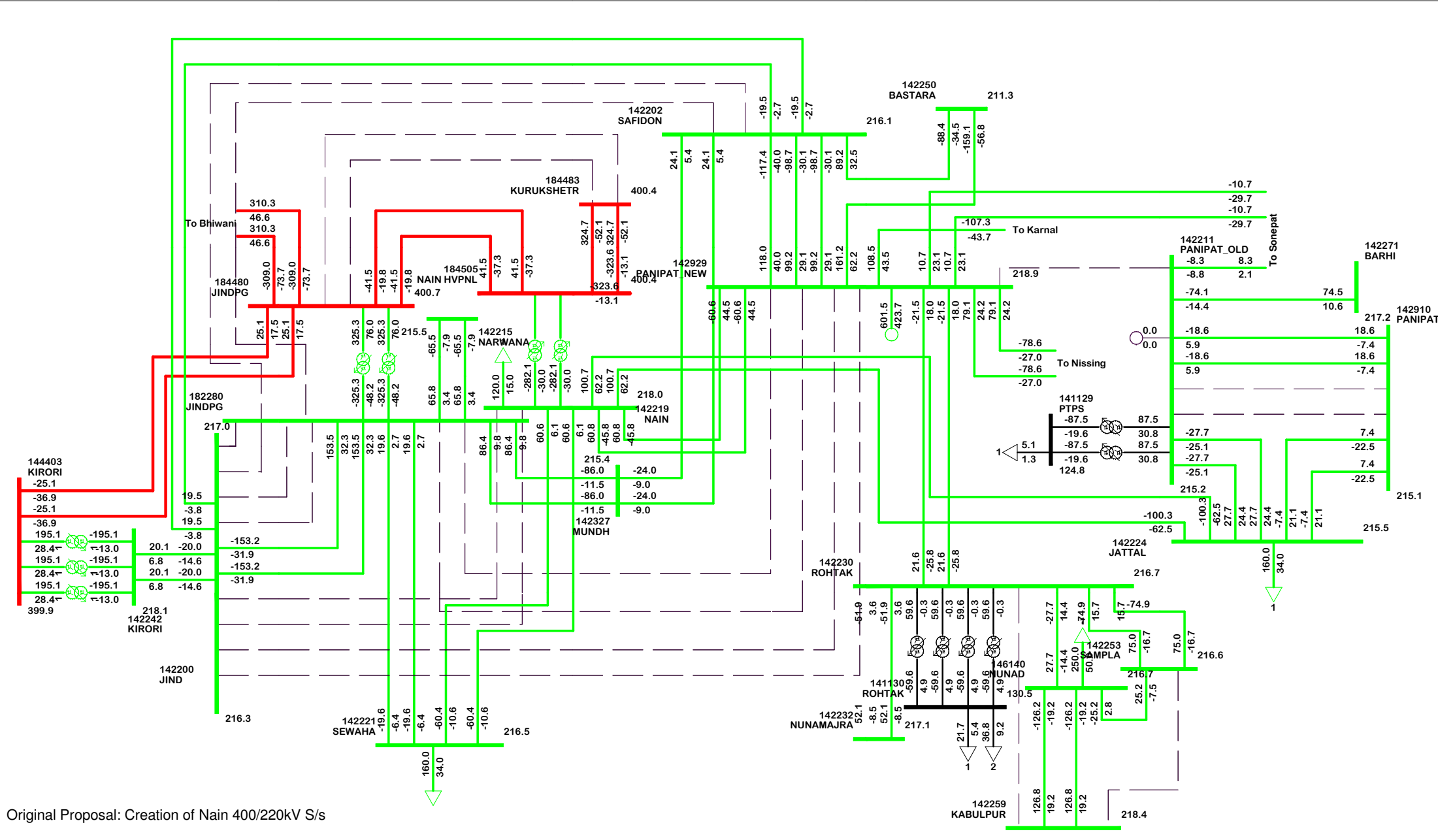


Option 2: Panipat all Unit out



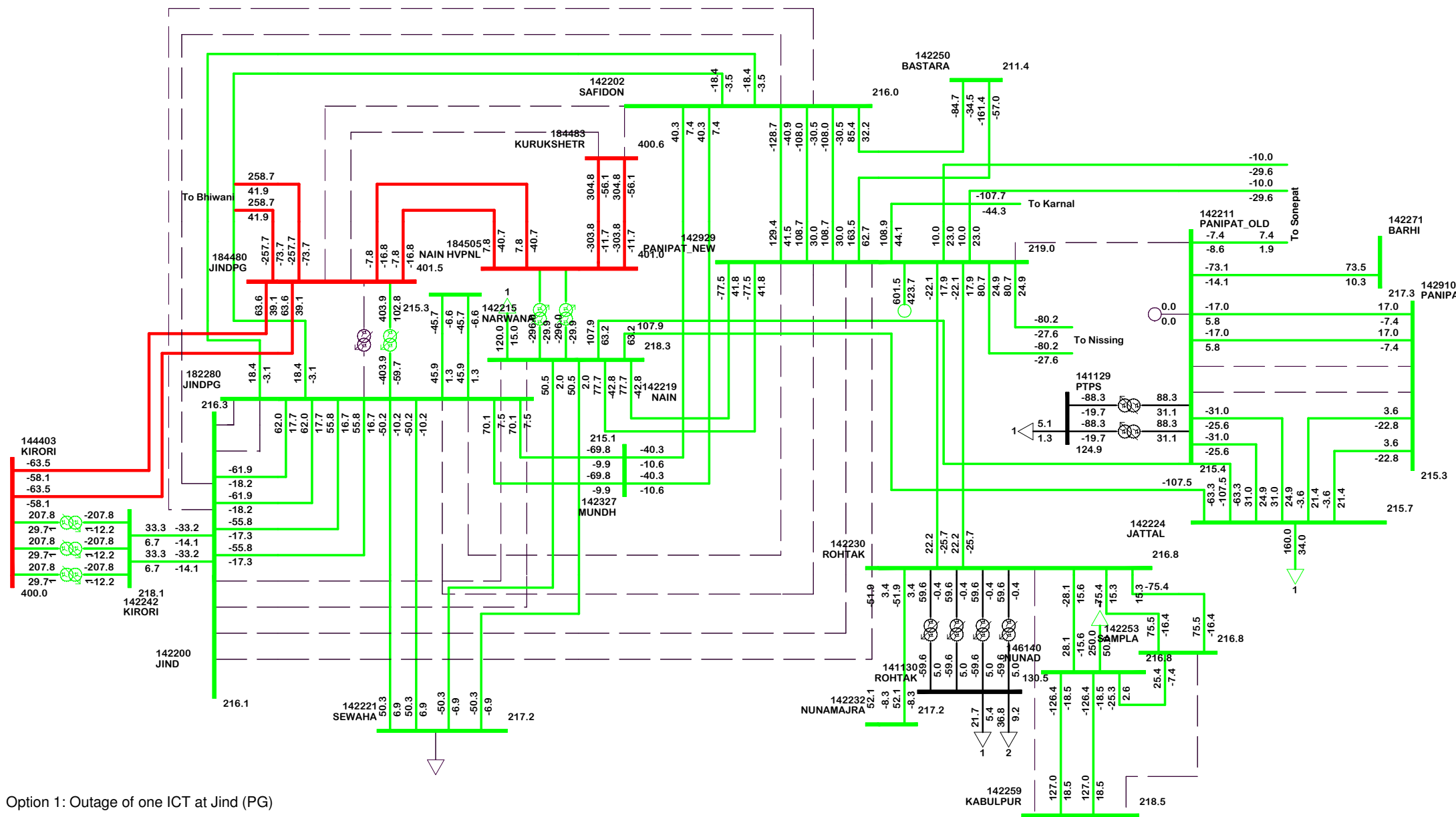
Base Case

Original Proposal: Creation of Nain 400/220kV S/s



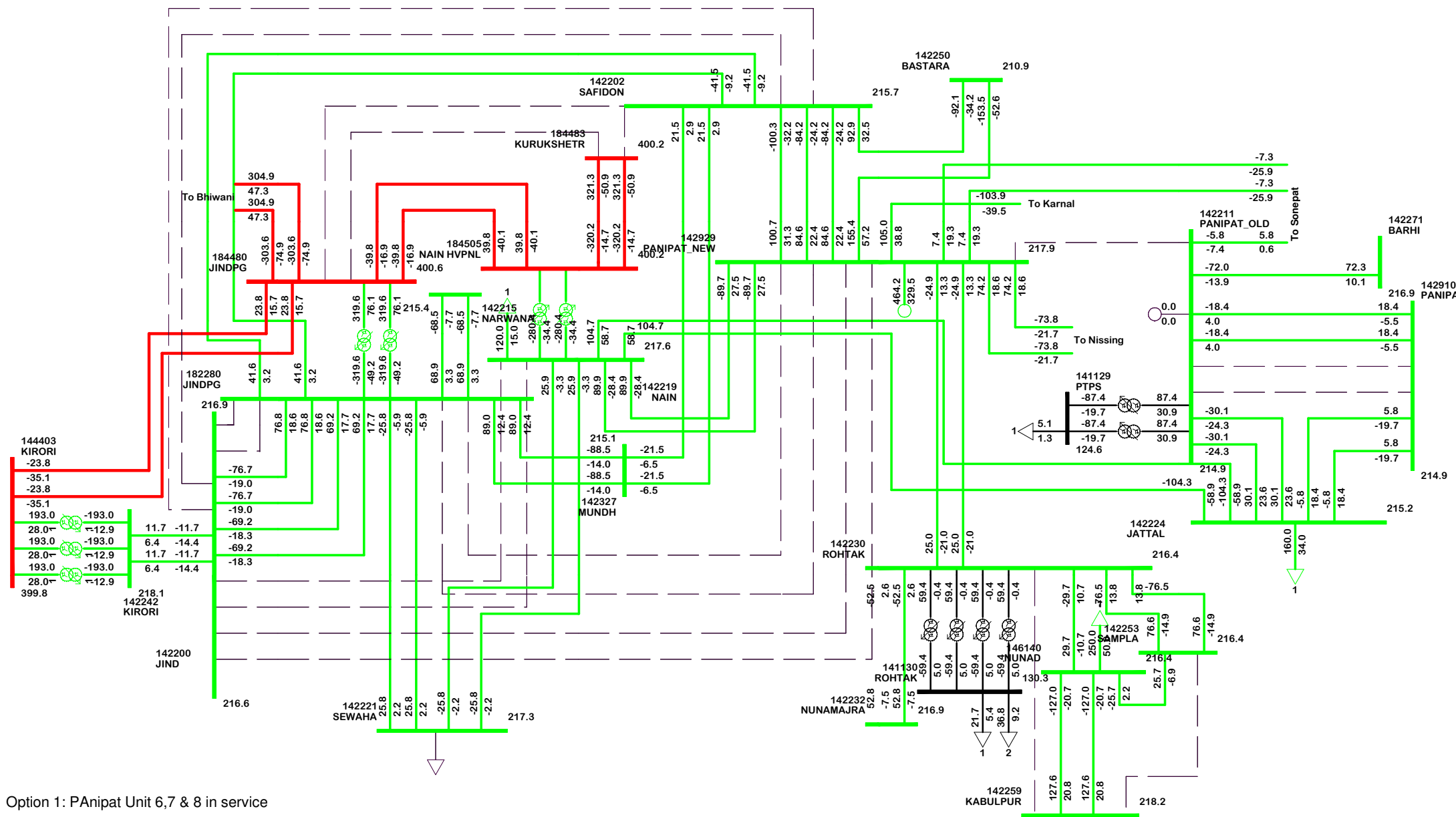




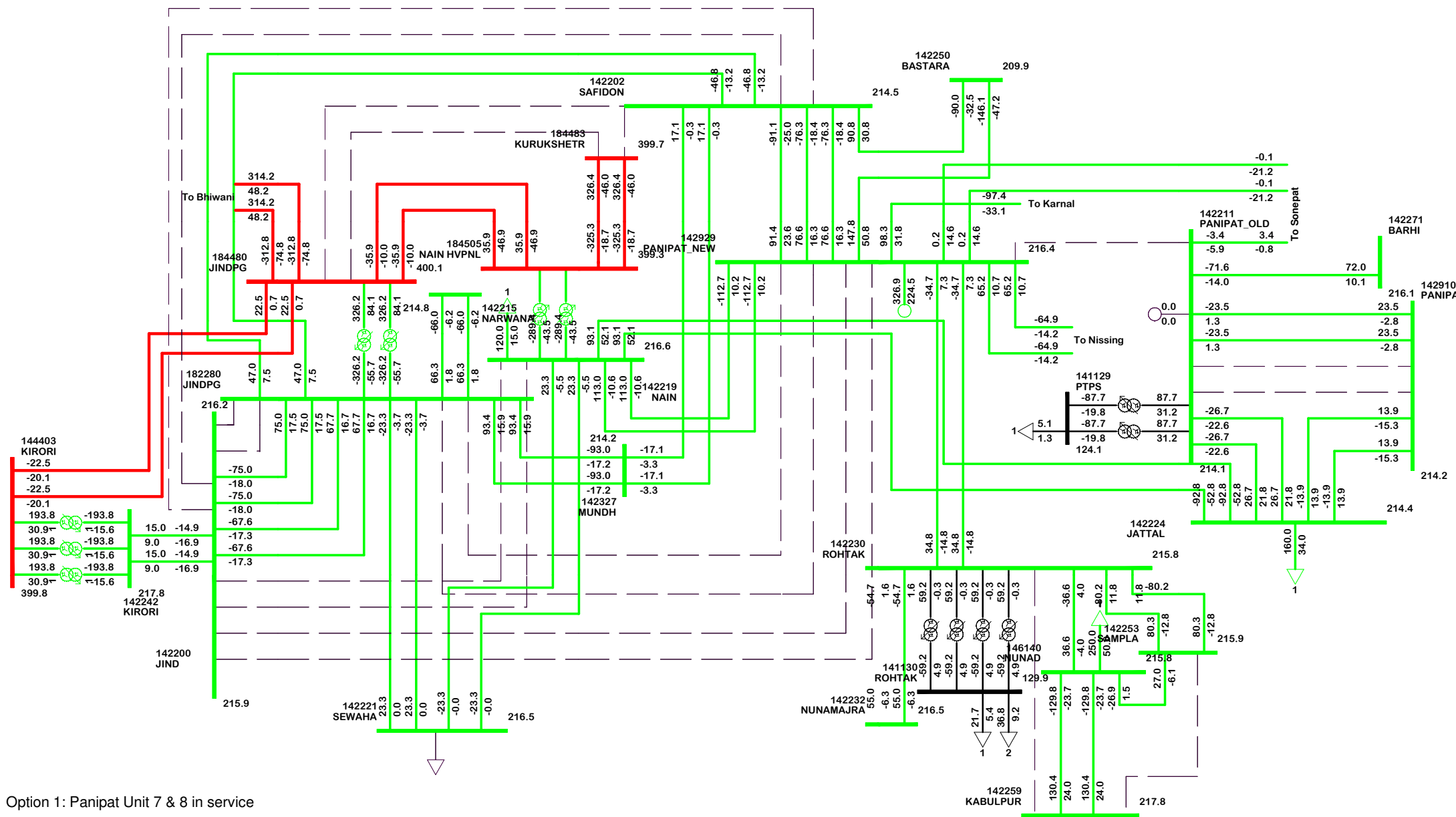


Option 1: Outage of one ICT at Jind (PG)

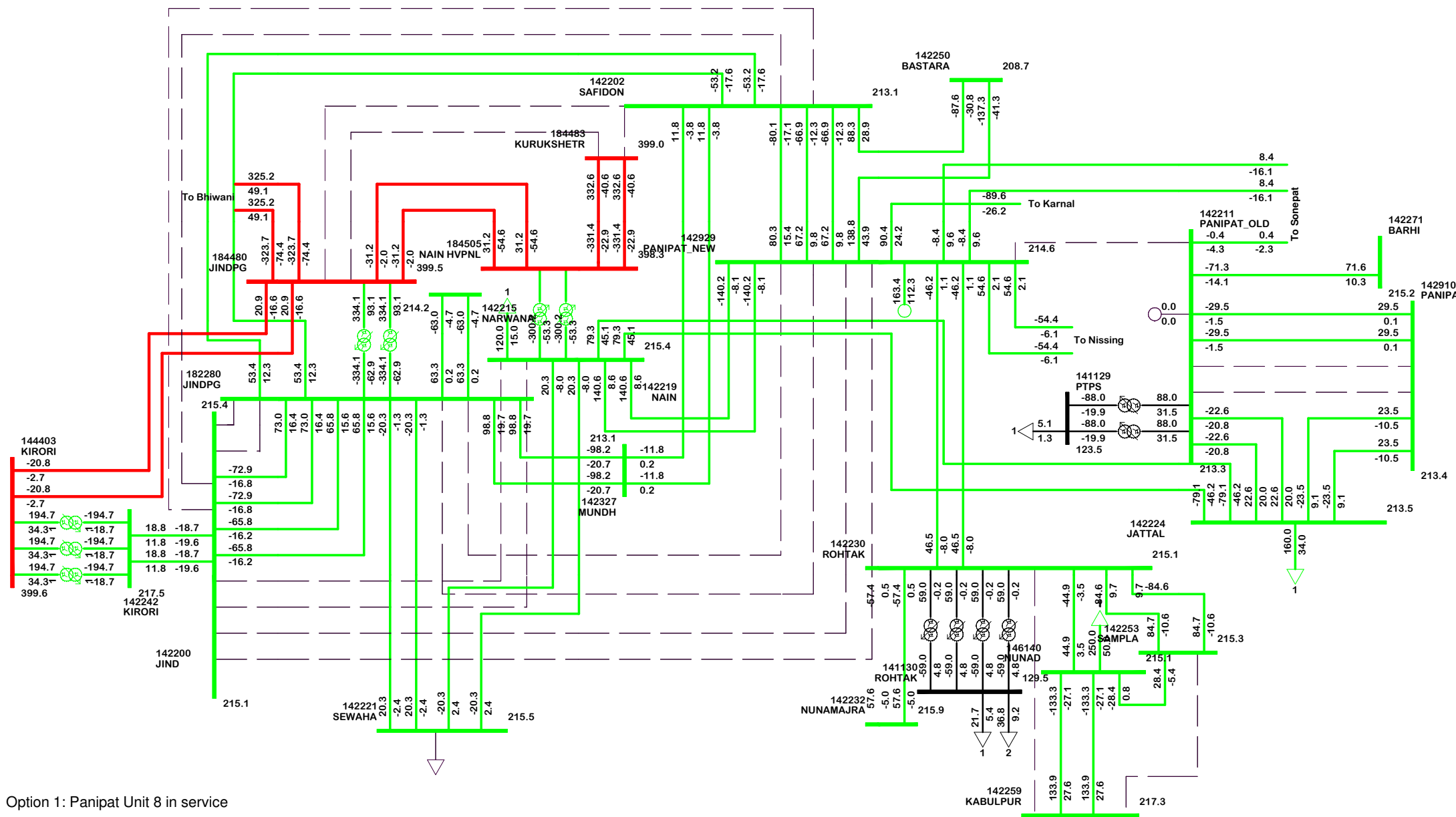




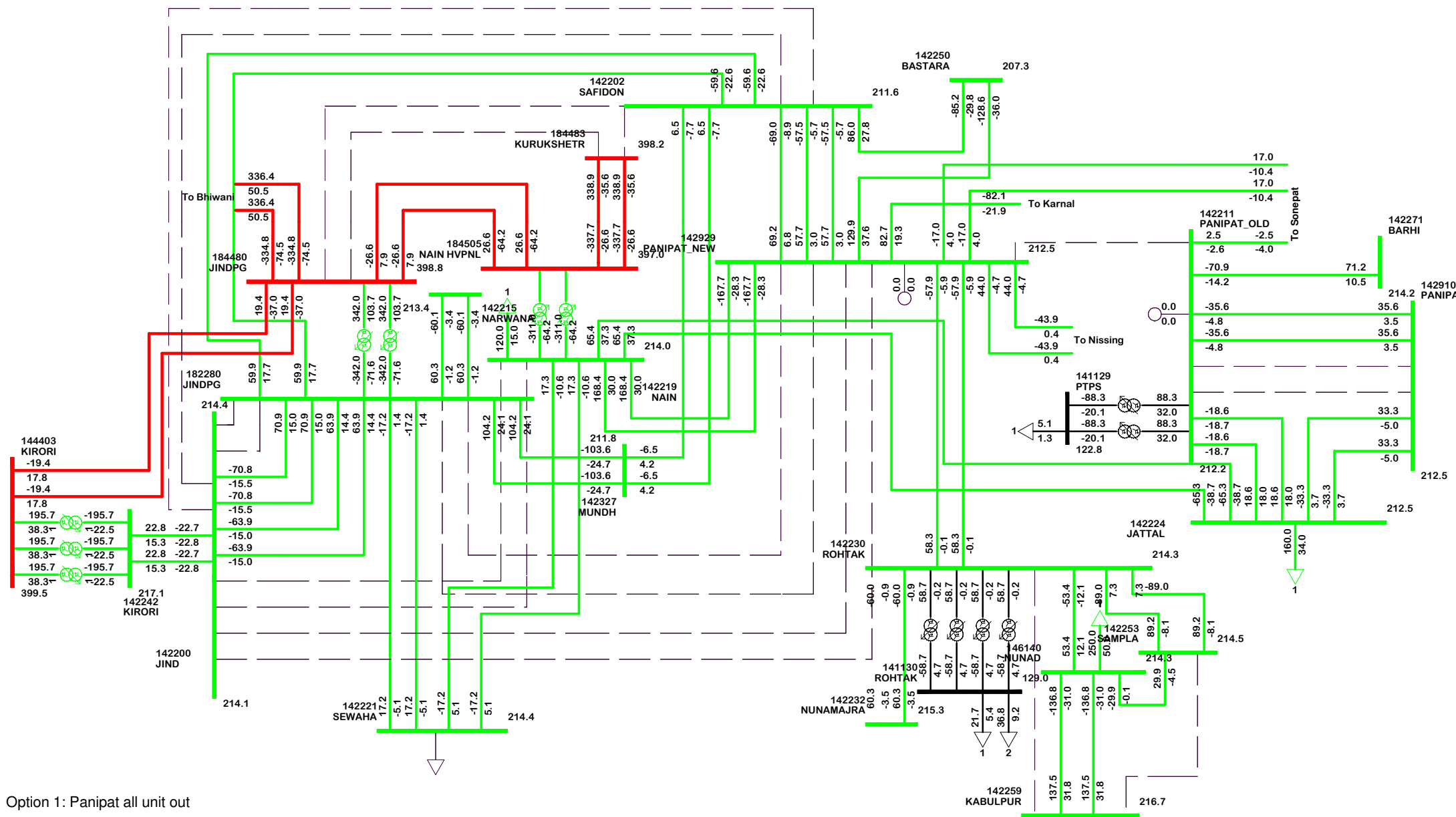
Option 1: PANIPAT Unit 6,7 & 8 in service



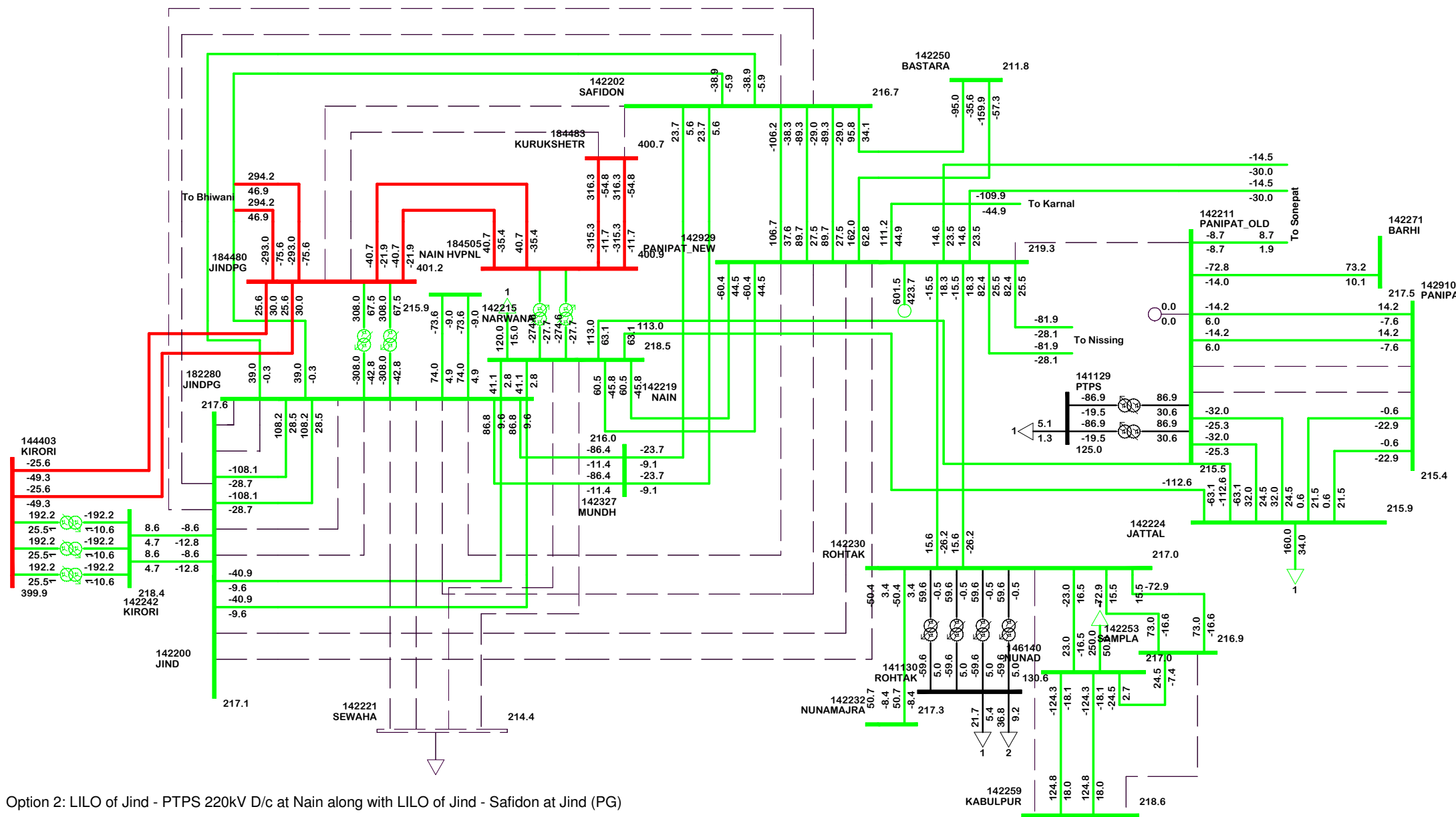
Option 1: Panipat Unit 7 & 8 in service



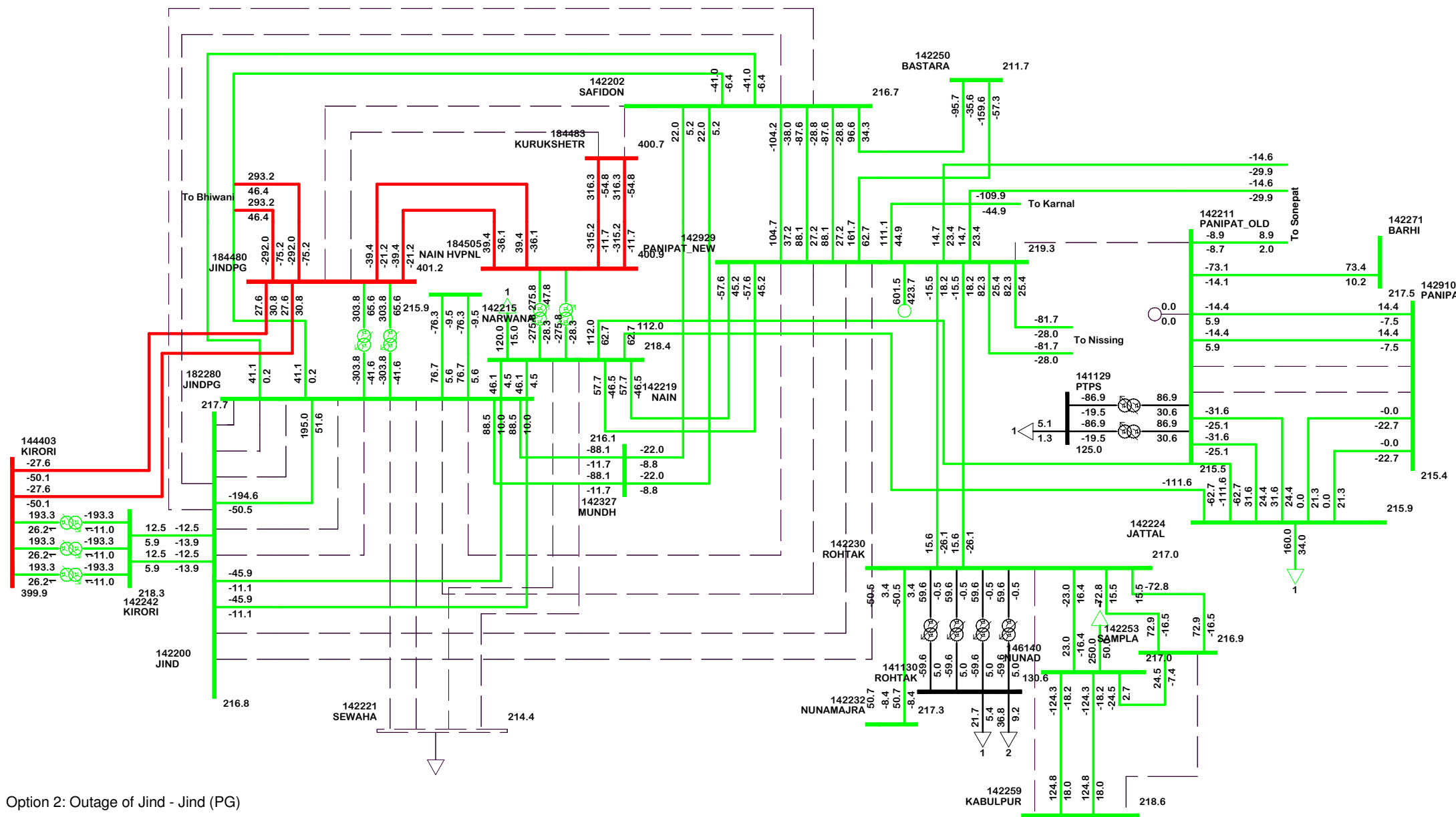
Option 1: Panipat Unit 8 in service



Option 1: Panipat all unit out



Option 2: LILO of Jind - PTPS 220kV D/c at Nain along with LILO of Jind - Safidon at Jind (PG)

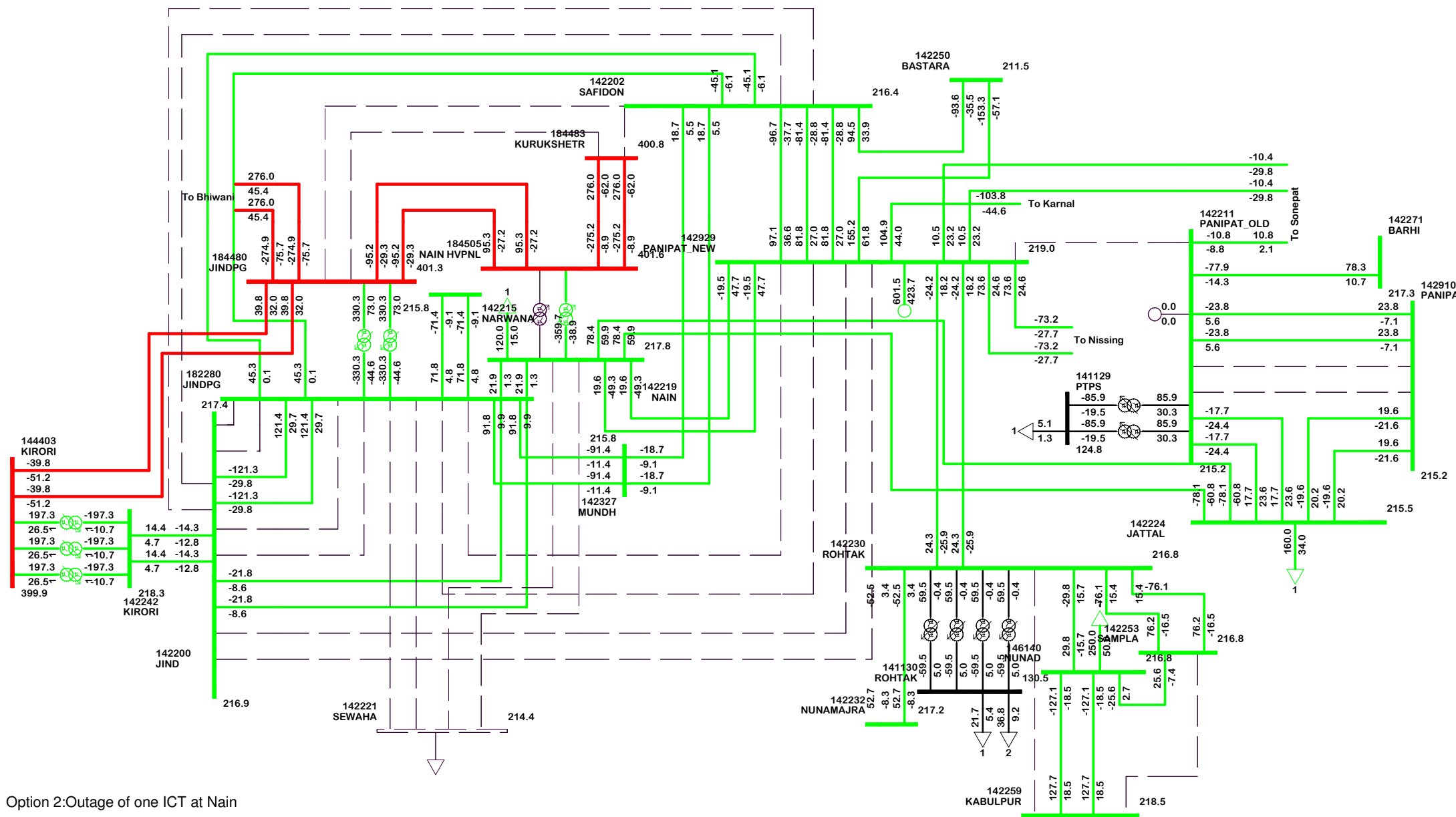


Option 2: Outage of Jind - Jind (PG)

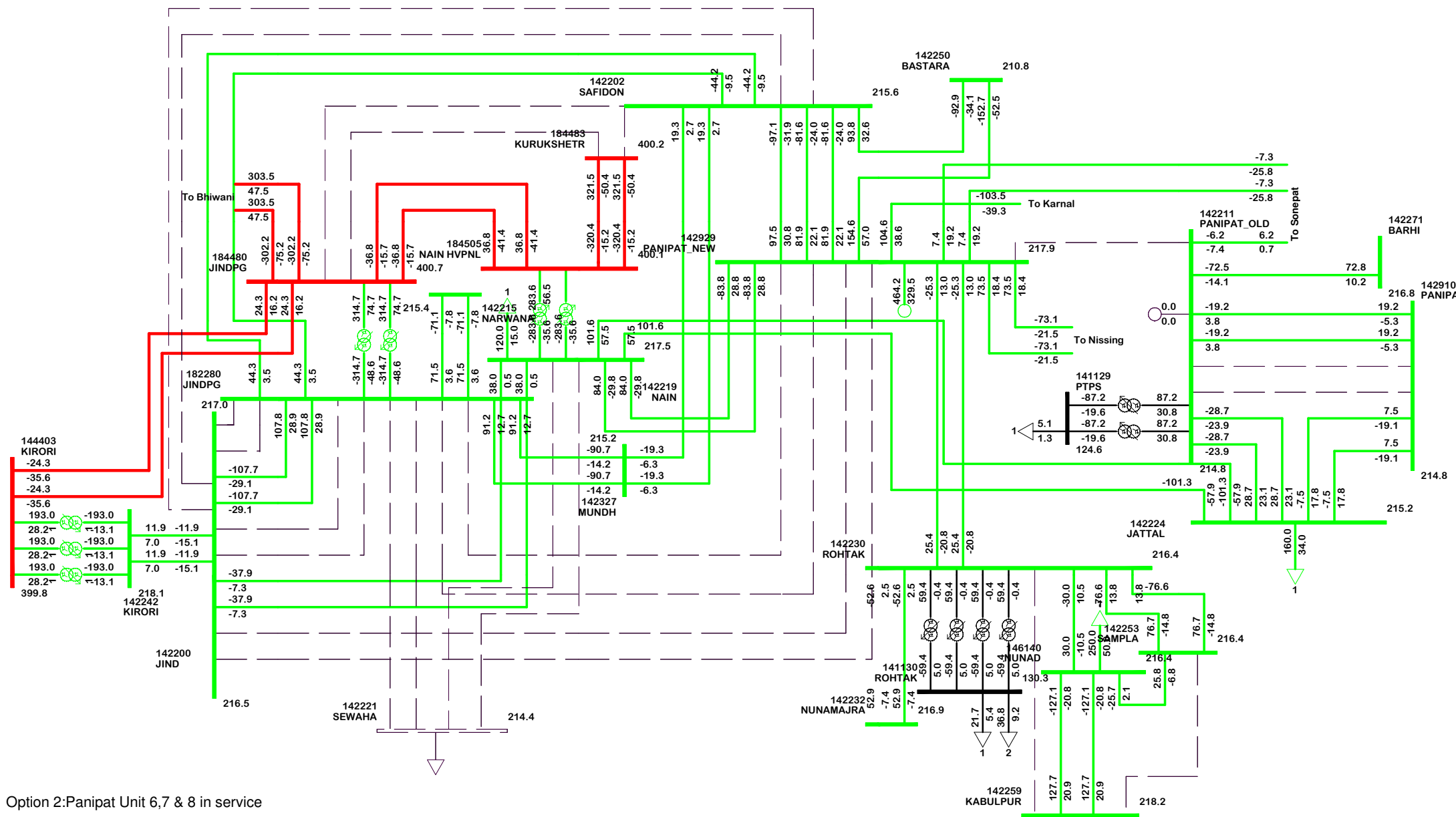


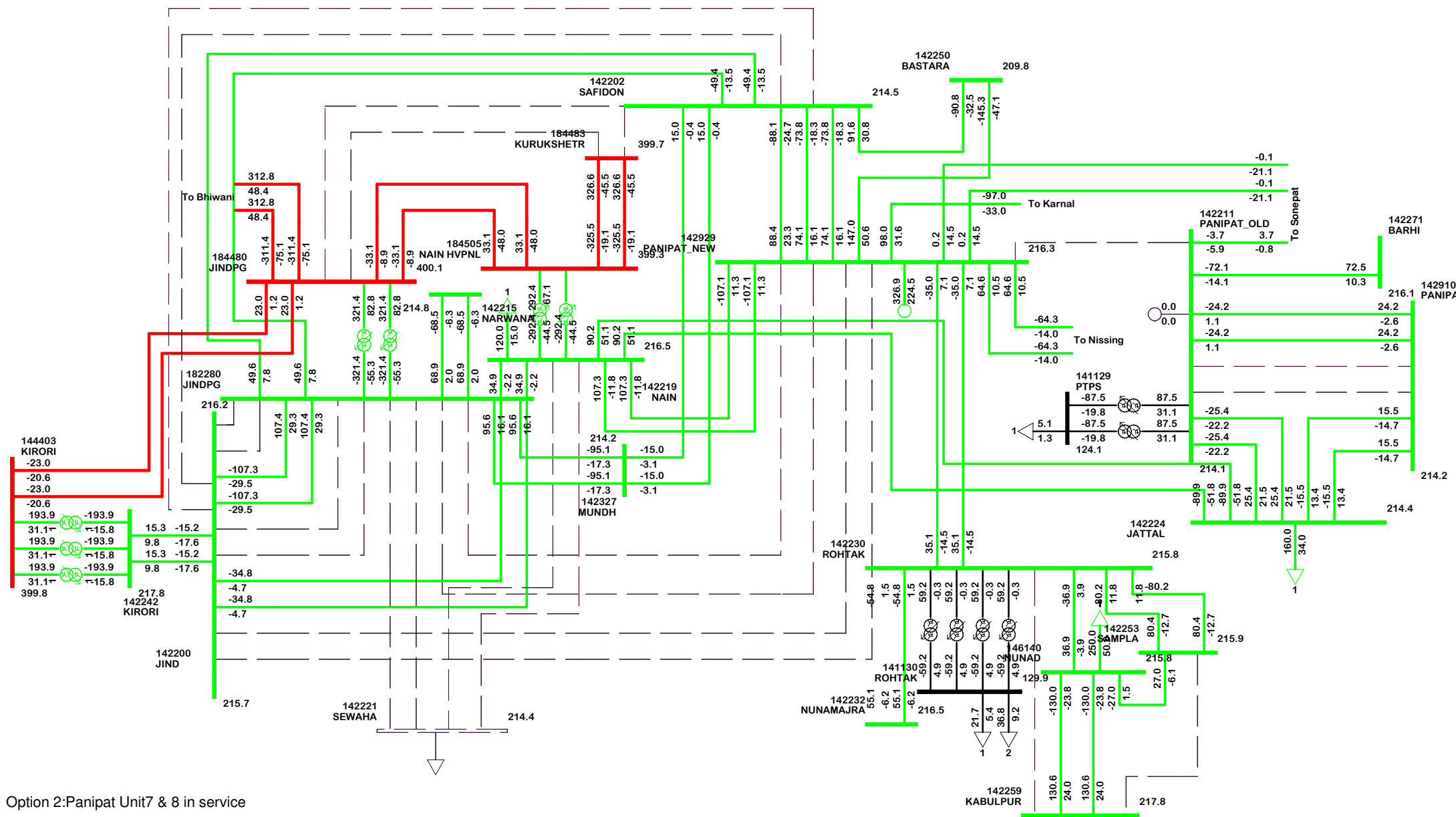






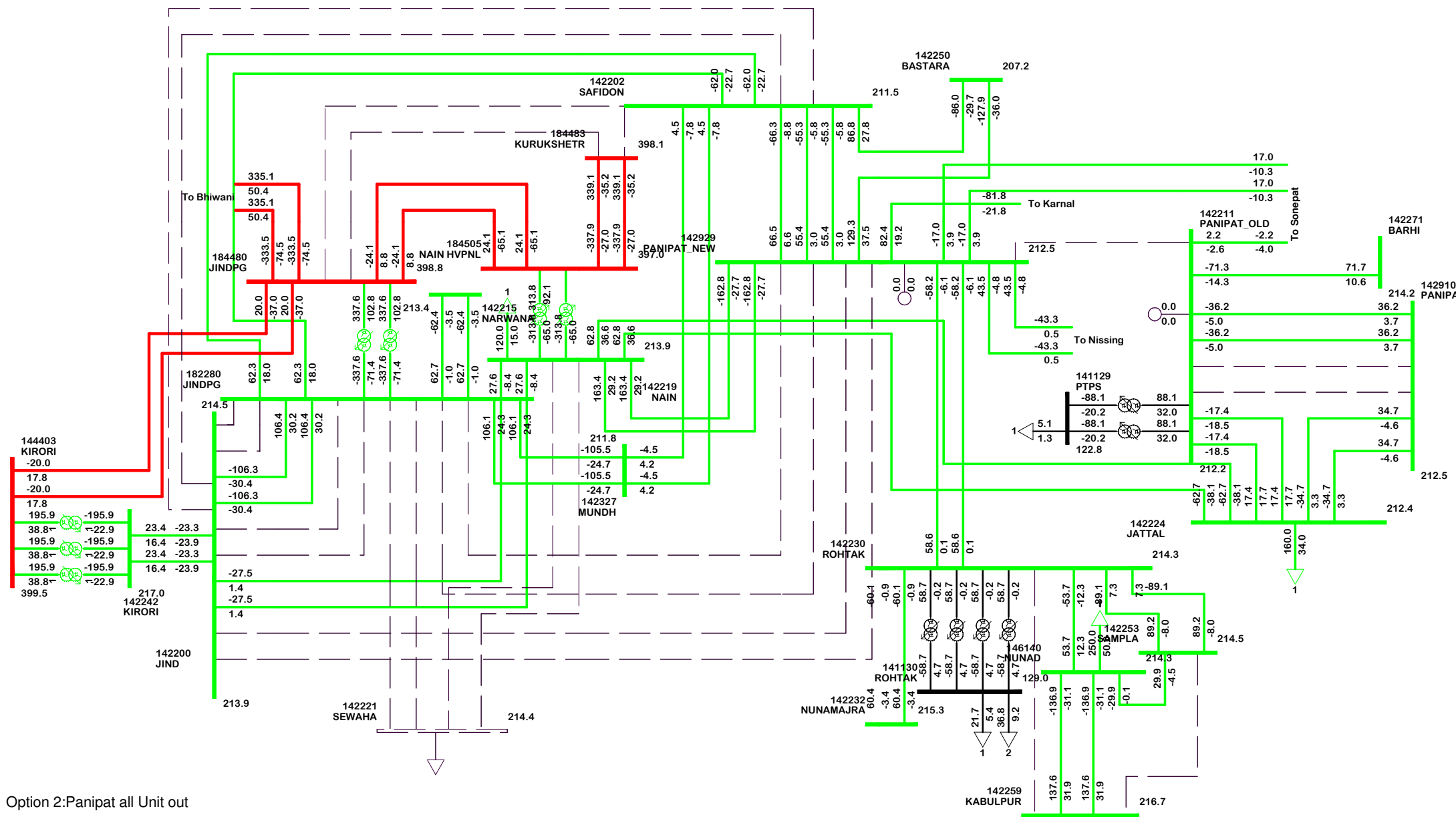
Option 2: Outage of one ICT at Nain





Option 2: Panipat Unit 7 & 8 in service





Option 2: Panipat all Unit out