Minutes
of

3rd Meeting of Standing Committee on Transmission Planning for State sectors (SSCM)

Date: 04.02.2016
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

MINUTES OF 3RD MEETING OF STANDING COMMITTEE ON TRANSMISSION PLANNING FOR STATE SECTORS (SSCM) HELD ON 28.01.2016 (THURSDAY) AT 11:00 HOURS AT ERPC, KOLKATA

List of participants is at **Annexure-A.**

PART – A

ITEM NO. A.1: Confirmation of minutes of 2nd SSCM of ERPC held on 04.12.15

The minutes were circulated vide letter dated 10.12.15 to all the constituents and also uploaded in ERPC website.

WBSETCL vide letter dated 15th January, 2016 requested for amendment for item no. B.2.6 which is as given below:

- *ERPC endorsed the reports of SLDC, WB regarding improvement of voltage profile after installation of the capacitors and ERPC shall communicate the same to PSDF Secretariat, NLDC.*
- *Regarding relieving congestion in intra-state transmission system which is incidental to the ISTS, ERLDC will made detail study for which additional information from WBSETCL and DVC are required.*

Members may confirm the minutes with above amendment.

Deliberation in the meeting

Members confirmed the minutes of 2nd SSCM with above amendment.

ITEM NO. A.2: Constitution of Standing Committee on Transmission Planning for State Sector of Eastern Region

In line with decision taken in 30th ERPC meeting Standing Committee on Transmission Planning for State Sectors in Eastern Region was formed.

Salient Decisions taken in the First meeting are as follows:

- Apart from STUs, one representative from each SLDC/CLD of ER and GM, ERLDC will be member of the Standing Committee.
- Powergrid (representatives from ER-I, ER-II and PG-Odisha) will also be members of the Standing Committee.
- CEA and CTU will also be invited for the meetings of Standing Committee and their System Study Group may be called as and when required by the Standing Committee.
- The meetings of the Standing Committee will be held on Quarterly basis. However, the meeting should be convened at least before the SCM for CTU planning as conducted by CEA/CTU.
- It was decided to focus the following points in the meeting:

    - STU evacuation system from 400 kV PG/CTU Substations for proper load anchoring.
    - STU network strengthening schemes.
    - Constraints/congestion experienced in STU networks.

- Any agenda of SCM for central sector, which needs detailed deliberation by ER States.
- Progress of all transmission schemes (CTU/STU schemes) of ER may be placed before the Standing committee for monitoring purpose.

In 31st TCC, JUSNL, Sikkim and Powergrid (ER-I, ER-II and PG-Odisha), CTU were advised to send the nomination before 2nd Standing Committee on State Sectors meeting scheduled to be held on 4th December, 2015.

TCC also advised all the STUs to nominate SLDC representative before 4th December, 2015.

In 2nd SSCM, CTU, Powergrid ER-II, Powergrid-Odisha and SLDC WB were nominated their representatives.

DVC and BSPTCL agreed to send their nomination of SLDCs within a week.

Committee requested JUSNL, Sikkim, SLDCs and Powergrid ER-I to nominate their representative for fruitful deliberation in the meeting.

JUSNL, Sikkim, DVC, BSPTCL and Powergrid-Er-I may nominate their representatives.

Deliberation in the meeting

It was informed that DVC has submitted their SLDC nomination.

Committee advised SLDC, BSPTCL to send their nomination at the earliest.

Committee took serious note of non-representation of JUSNL, Sikkim and Powergrid-ER-I, CTU in SSCM and advised to place the issue in upcoming 32nd TCC and ERPC meeting.

ITEM NO. A.3: Draft agenda items of the upcoming Standing Committee meeting on transmission planning for ER for SSCM meeting

During 30th & 31st ERPC meeting it was decided that Standing Committee of ER on central sector before placing an agenda in SCM must circulate the same to respective constituents to facilitate reviewing and finalising at state level in Standing Committee on transmission planning for state sectors.

In this regard it is to mention that repeated correspondences (recent letters vide dated 05.01.2016, 14.01.2016 and 20.01.2016) were made to CEA for forwarding the draft agenda items of the upcoming meeting of Standing Committee on Power System planning for ER for placing the issues in 3rd SSCM for detailed deliberation. But the response from CEA is still awaited.

Members may discuss.

Deliberation in the meeting

It was informed that in spite of assurance from highest authorities and repeated persuasion, PSP&A-II Division, CEA has not yet forwarded the draft agenda items of the upcoming meeting of Standing Committee (SCM) on Power System planning for ER.

Committee decided that on receipt of agenda items of SCM a SSCM meeting needs to be called on short notice for threadbare deliberation with all the state constituents.

Committee also decided to place the issue in upcoming 32nd TCC and ERPC meetings for guidance & further course of action.

PART – B :: AGENDA ITEMS BY UTILITIES FOR DISCUSSION

ITEM NO. B.1: Construction of additional 5 nos. 400/220/132 kV Sub-stations under Central Sector Scheme in Bihar-- BSPTCL proposal in 1st SSCM

To cater the future power demand of the State and to comply 24 x 7 PFA objective of Government of India, BSPTCL In 1st SSCM placed the following proposal:

Construction of additional 400/ 220/132 KV S/s at Begusarai, Chapra & Saharsa in North Bihar and Bhojpur /Bikramganj and Munger in South Bihar under Central Sector Scheme. Power transmission capacity in these new sub-station will be required – 400/220 KV- 2x500 MVA & 220/132 KV- 2x160 MVA.

In view of above proposal, CEA opined vide letter dated 19.11.2015 that, for these five sub-stations no justification was provided by BSPTCL. CEA requested BSPTCL to provide the following information:

i. Interconnection of the proposed sub-stations with ISTS system.
ii. Down linking 220/132kV system proposed for drawal of power from these sub-stations.
iii. Present peak load and anticipated load at year 2018-19 to be fed from these sub-stations.

In 2nd SSCM, BSPTCL explained that for meeting the growing demand of Bihar, BSPTCL is in very much need of these five 400/ 220/132 KV S/s sub-stations at Begusarai, Chapra & Saharsa in North Bihar and Bhojpur /Bikramganj & Munger in South Bihar.

BSPTCL submitted the draft/tentative information as required by CEA for the above sub-stations. Further, BSPTCL informed that the complete details as required by CEA is under preparation and will be submitted soon to CEA & ERPC secretariat as well.

BSPTCL may update.

Deliberation in the meeting

BSPTCL informed that the detailed proposal for construction of above five additional 400/220/132 kV sub-stations along with the linking 400 kV & 220 kV lines are under study by Powergrid (under consultancy works).

The complete details will be submitted after the completion of study.

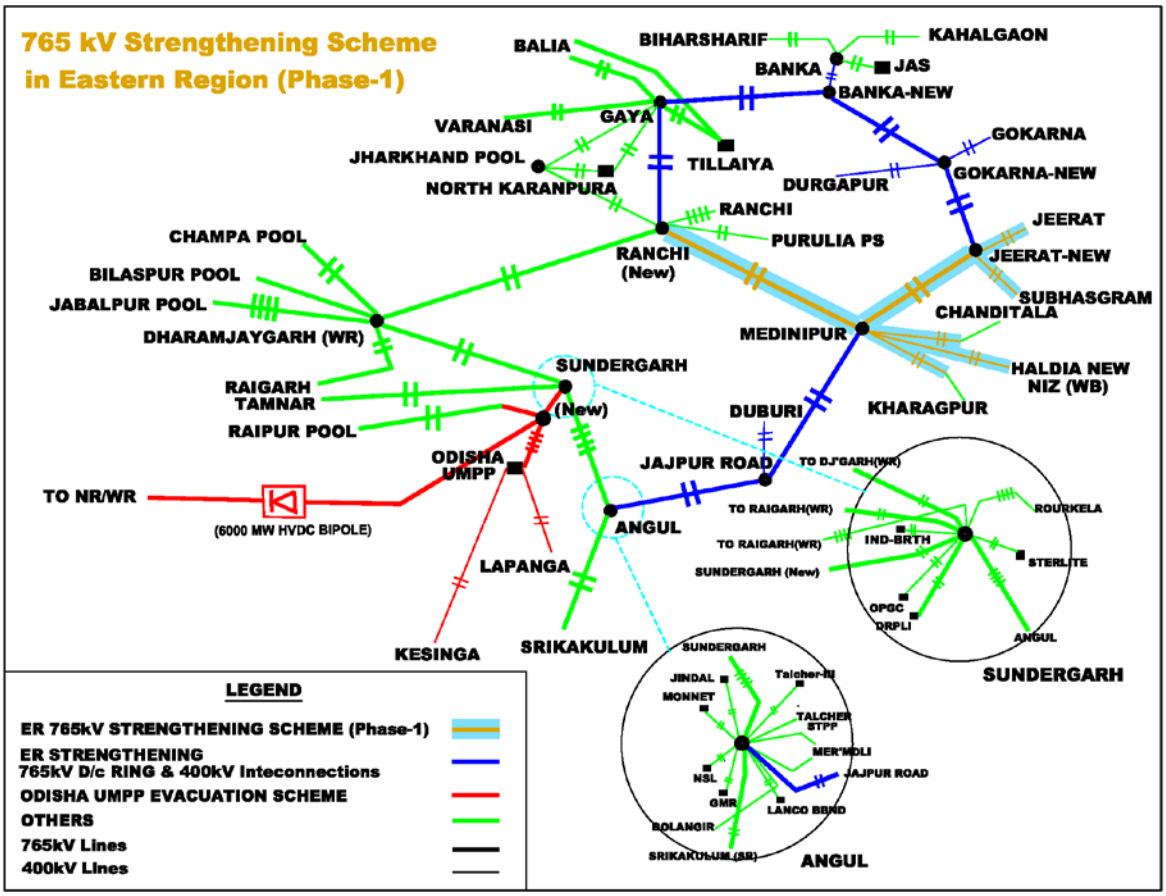
ITEM NO. B.2: Agenda by WBSETCL

ITEM NO. B.2.1: 765 kV System Strengthening Scheme in Eastern Region

In the 17th Standing Committee Meeting on Power System Planning in Eastern Region held on 25.05.2015 at NLDC, New Delhi, implementation of 765 kV ring as Eastern Region Strengthening Scheme -18 (ERSS-18) : 765 kV System Strengthening in ER (Phase-I) with the scope of works was approved as given below :

a) Establishment of 765 / 400kV, 2x1500 MVA substations at Medinipur & Jeerat (New)
b) Ranchi (New) –Medinipur 765 D/C line
c) Medinipur- Jeerat (New) 765 D/C line
d) Medinipur –Haldia New (NIZ) (WBSETCL) 400kV D/C line (quad /HTLS)
e) LILO of New Chanditala –Kharagpur 400kV D/C line at Medinipur
f) Jeerat (New)-Subhasgram 400kV D/C line (quad /HTLS)

g) *Jeerat (New)- Jeerat 400kV D/C line (quad /HTLS)*
h) *LILO of Jeerat (WB)-Subhasgram 400kV S/C section at Rajarhat*



The scheme was ratified in the 30th ERPC held on 20.06.205 at Shimla. The present status regarding execution of the project is not known to stake holders. CTU shall be requested to prioritize the project and take necessary action for immediate implementation.

Simultaneously, it is proposed to take up the 765 kV ring from Jeerat –Gokarna (New)- Banka (New)-Gaya 765kV D/C corridor. This will facilitate strong 765kV ring in the region. When establishment of 765kV substation at Gokarna & Banka would be necessary, this line would be utilized.

In 1st SSCM, members agreed to forward the proposed scheme to CTU for their study so that the same may be explained by their Study Group in the next meeting of Standing Committee.

In 2nd SSCM, CTU explained with the diagram of 765 kV ring of ER that the above mentioned lines as approved in 17th SCM will be constructed in first phase of 765 kV strengthening scheme of ER under TBCB which is presently at RFQ stage.

Further, CTU informed that the 765 kV ring from Jeerat –Gokarna (New)- Banka (New)-Gaya 765kV D/C corridor will be taken up in second phase after getting the exact schedule of UMPP Power Projects of Bihar (At Banka) and Jharkhand (At Chandwa).

However, committee felt that the 765 kV ring of ER should be completed for better stability and also in view of load growth of West Bengal, Bihar & Jharkhand.

Further, committee advised Bihar to furnish the status of Banka UMPP and load growth at adjoining areas to Banka.

West Bengal & Bihar were advised to give a forecast of future load growth in respective system.

West Bengal & Bihar agreed to submit the above information at the earliest.

CTU, West Bengal and Bihar may update.

Deliberation in the meeting

CTU representatives were not present in the meeting.

WBSETCL informed that the data of load growth will be submitted after the finalization of 19th EPS which will be ready by another 10-15 days.

BSPTCL informed that the data of future load growth is under preparation and will be submitted at the earliest.

ITEM NO. B.2.2: 220kV connectivity from 400kV Parulia (PG) substation

WBSETCL has planned to up-grade its Ukhra 132kV substation to 220kV GIS to meet the growing demand in that area. Feasibility study for construction of 220kV GIS has been done. Line route survey is also in progress.

Initially there was 220kV connectivity in between Parulia (PG) and Durgapur. After conversion of the said connectivity at 400kV level, 220kV bays has become idle. It is proposed that POWERGRID shall provide two nos. 220kV bays at Parulia(PG). The 220kV line will be constructed by WBSETCL at its cost.

In 1st SSCM, ERLDC informed that if WBSETCL wants to draw power from 400/220 kV Durgapur (PG) S/s, considering the growing demand of DVC the 2x315 MVA ICTs may need to be Augmented to 2x500 MVA.

Members requested ERPC/ERLDC to carry out the system study for the above system and place the results in next meeting of SSCM. WBSETCL was advised to provide the load and connectivity details to ERPC/ERLDC for system study.

In 2nd SSCM, ERLDC/ERPC presented the study results.

It was observed that N-1 compliance may be getting adversely affected for 400kV Parulia-Bidhanagar D/C line with future loading of the West Bengal. Committee advised ERPC/ERLDC to check the loading of DVC network simultaneously for all the cases.

WBSETCL informed that 400kV Parulia-Bidhanagar D/C line is a short line and its conductor is also being replaced with HTLS or with other high capacity conductor. This will further facilitate the N-1 criterion of 400kV Parulia-Bidhanagar D/C line.

CTU informed that the two bays will be provided to WBSETCL subject to their confirmation in the next SCM for central sector.

WBSETCL informed that they will confirm the establishment of 220 kV Ukhra Sub-station after the completion of survey of ROW of the line.

ERLDC/ERPC may present the study results for DVC network loading.

WBSETCL may update. Members may discuss.

Deliberation in the meeting

ERLDC and ERPC presented the load flow study which is given at **Annexure-B.2.2***. It was observed that with 220kV Ukhra-Parulia D/C line the loads at Ukhra and Bidhanngar are directly getting fed from 400kV Parulia(PG) and the 220kV lines Parulia(PG)-Parulia(DVC), Parulia(DVC)-Waria(DVC) and Waria(DVC)-Bidhannagar(WB) including 220/132kV ATRs at Bidhannagar are getting relief. The 315 MVA ICTs at Parulia(PG) and 400kV Parulia(PG)-Bidhannagar(WB) D/C lines are however getting loaded.*

WBSETCL informed that the route for 220 kV Ukhra-Parulia (PG) was surveyed and under finalization subject to the clearance from ECL as the line passes through ECL coalmines area.

Further, WBSETCL informed that the 132 kV Bidhanagar-Ukhra line will be upgraded with HTLS conductor to meet the contingency of 220 kV Ukhra-Parulia line.

The proposal is accepted subject to the fulfillment of the following upgradation/augmentation:

- *400 kV Parulia (PG)-Bidhannagar D/C line is required to be upgraded with HTLS conductor which is under consideration by WBSETCL.*
- *400/220 kV ICTs at Parulia(PG) & Bidhannagar (WBSETCL) needs to be augmented. Parulia (PG) ICTs were under augmentation by PGCIL, WBSETCL to consider the augmentation of Bidhannagar ICTs.*
- *400/220 kV ICTs at Maithon also needs to be augmented. Augmentation of these ICTs are in progress and expected to complete by June, 2016.*

Committee advised to place the issue before 32nd TCC & ERPC meetings with the aforementioned recommendation.

ITEM NO. B.2.3: LILO of 132 KV Kolaghat – Kharagpur – Musaboni D/C line of DVC at Kharagpur and Debra of WBSETCL

The existing Jamshedpur – Musaboni – Hizlee (DVC) – Kolaghat (DVC) 132 kV D/C line passes through very close proximity of WBSETCL's Kharagpur 400/220/132 kV sub-station (around 1 Km) and Debra 132/33 kV sub-station (around 0.5 Km).

- WBSETCL proposed LILO of Musaboni – Hizlee (DVC) portion of this line at Kharagpur 400/220/132 kV sub-station of WBSETCL for injection of power which will lead injection of power in between and reduce the effective length of continuous 132 kV line from 240 Km to 160 Km.
- WBSETCL proposed LILO of Hizlee (DVC) – Kolaghat (DVC) portion of this line at Debra 132 kV sub-station of WBSETCL, which is around 0.5 Km away from the line, for drawal of around 50-60 MW power. This will set aside construction of around 25 Km 132 kV D/C line from Midnapur to Debra.

In 31st TCC, ERPC gave a brief presentation on WBSETCL proposal and explained that since 400kV system is getting connected at 132kV Kharagpur(DVC) S/s, it will improve the voltage in around Kharagpur during peak load hours.

DVC also delivered a presentation and informed that they have installed 220/132 kV ATRs at Durgapur (DVC) due to which the low voltage problem at 132kV Kharagpur(DVC) S/s is now resolved.

After detailed discussion, TCC decided that a threadbare deliberation is required at State Standing Committee (SSCM) with all details.

In 2nd SSCM, ERLDC/ERPC presented the study results.

DVC raised certain observations and put forward certain cases under which non-compliance of N-1 contingencies were apprehended. After detailed discussion, the committee advised ERPC secretariat/ERLDC to make detailed study considering present and future network of the both

DVC and West Bengal.

ERLDC/ERPC may present the study results.

Deliberation in the meeting

ERLDC/ERPC presented the load flow study considering the future load of year 2018 for West Bengal and 10% increase for DVC load. Study results are given at ***Annexure-B.2.3****.*

From the study, it was felt that all the parameters of both DVC and West Bengal networks are within the limits except N-1 security criterion for 315 MVA, 400/220 kV ICTs at Kharagpur S/s.

Further, Load flow study with 220kV connectivity from 220kV Egra to Baripada D/C was also carried out and results are given in ***Annexure-B.2.4****. From these results it was observed that 315 MVA, 400/220 kV ICTs at Kharagpur S/s getting relief and N-1 security criterion is getting satisfied with this connectivity.*

Committee noted that N-1 security criterion of 315MVA, 400/220kV ICTs at Dubri S/s is not satisfied for all cases (i.e. even without connectivity of 220kV Egra-Baripada D/C line). Otherwise, all other parameters of DVC, West Bengal and Odisha systems are in the limits.

OPTCL appreciated the observation and agreed to look into the proposal of 200kV Egra-Baripada D/c line.

DVC informed that the fault level of the DVC system will increase with this interconnection. Fault level at each substation needs to verified and the system needs to be upgraded wherever it is required.

Committee advised ERPC/ERLDC to study the fault level at each substation before and after the interconnection. Committee also advised DVC, WBSETCL and OPTCL to provide the information on new generators going to be commissioned by 2018, if any.

ITEM NO. B.2.4: 220kV connectivity from Balasore (Orissa) to Egra 220 kV substation of WBSETCL

WBSETCL is constructing 220kV GIS at Egra to up-grade the existing 132kV substation at Egra for reliable and adequate power supply in the district Midnapur. The incoming 220kV line is from Kharagpur 400kV substation. The project is expected to be completed by 2016 end.

Now, the 220 kV substation will be established with a radial line. There is no other source to put it in ring main to satisfy the Grid Code. Considering the physical location, the nearest 220kV grid is Balasore 220kV substation of OPTCL.

It is proposed for approval of 220 kV D/C ISTS line between Egra to Balasore under Regional Scheme for reliable grid operation.

In 1st SSCM, the committee advised WBSETCL to discuss the issue bilaterally with OPTCL.

Thereafter, ERPC/ERLDC has done study with next 5 years planed network of WBSETCL, as per the data received from WBSETCL.

In 2nd SSCM, ERLDC/ERPC presented the study results. 10 % load growth is assumed for both DVC and West Bengal for complete system.

It was observed that around 140 MW of power is being imported from Balasore to Egra resulting in high loading of 220 kV Baripada-Balasore D/C.

After detailed discussion, the committee advised for detailed study considering future network of

the West Bengal and with direct connectivity between Baripada-Egra.

ERLDC/ERPC may present the study results.

Deliberation in the meeting

Discussed under Item no. B.2.3.

ITEM NO. B.2.5: Study report on System Improvement of State Transmission System of West Bengal

WBSETCL vide letter dated 23rd November, 2015 requested for study report of the following for onward submission to NLDC for PSDF funding:

- Scheme for relieving congestion in Intra-state transmission system which is incidental to the ISTS
- Scheme for R&M of transmission systems for relieving congestion
- Installation of shunt capacitors and other reactive energy generators for improvement of voltage profile

ERPC advised ERLDC to carry out the study for onward submission to NLDC.

In 2nd SSCM, ERLDC informed that preliminary study was made but for detailed analysis additional information from WBSETCL and DVC are required.

ERLDC may update.

Deliberation in the meeting

WBSETCL vide letter dated 15th January, 2016 requested for amendment for item no. B.2.6 which is as given below:

- *ERPC endorsed the reports of SLDC, WB regarding improvement of voltage profile after installation of the capacitors and ERPC shall communicate the same to PSDF Secretariat, NLDC.*
- *Regarding relieving congestion in intra-state transmission system which is incidental to the ISTS, ERLDC will make detail study for which additional information from WBSETCL and DVC are required.*

WBSETCL informed that study for the scheme for relieving congestion in Intra-state transmission system which is incidental to the ISTS will not be required as this project would not be considered for PSDF funding as it does not meet the criteria of PSDF regulations.

Committee requested ERPC to forward the reports of SLDC, WB regarding improvement of voltage profile after installation of the capacitors to PSDF Secretariat, NLDC for consideration.

ITEM NO. B.3: Agenda by OPTCL

i. Construction of 400kV DC line from TTPS to 400/220kV Meramundali "B" for power evacuation from TTPS expansion:

Generation is stepped up to 400kV and connected to 400kV bus of proposed Meramundali-B substation through 400kV D/C line. System Study has been done with connection of 1X660 at Meramundali “B”. It is a part of Transmission Plan for the year 2015-16 to 2018-19. It is required to evacuate state share of 50% power i.e from one unit (660 MW).

Deliberation in the meeting

OPTCL informed that a meeting was held on 20.01.2016 with NTPC, PGCIL and GRIDCO to discuss the Connectivity and Long Term Access to TTPS Stage-III (2x660 MW). In the meeting three options were discussed which is as given below:

1) *Connectivity of the TTPS Stage-III with CTU and evacuation to be done at CTU system including State share of 50 %.*
2) *Connectivity of the TTPS Stage-III with STU (i.e. 400 kV D/C Talcher Stage-III SY to Meramundali-B GIS, OPTCL) and total power to be evacuated up to Meramundai by STU system including State share of 50 %. From Meramundali onwards CTU shall evacute the balance 50 % power allocated to other beneficiary.*
3) *Connectivity through split bus arrangement system at the plant switchyard. This implies that one unit shall be connected to the STU, supplying 50 % towards State share of power whereas the other Unit shall be connected to CTU, evacuating rest 50 % power.*

In that meeting NTPC (TTPS) expressed that they have no objection to any of the proposals as mentioned subject to the approval of appropriate forum.

OPTCL, SLDC and GRIDCO are agreeable to option-2 for connectivity as it is commercially more prudent. Total power will be evacuated through 400 kV D/C Talcher Stage-III SY to Meramundali-B GIS, OPTCL and from Meramundali-B, CTU can evacuate 50 % of power.

Further, OPTCL added that from if CTU wants they can construct 400 kV Meramundali-B to Angul Pooling station (PG) line also.

In the said meeting Powergrid agreed to convey their views on the above proposal of OPTCL in 3rd SSCM meeting. But Powergrid representatives were not present in the 3rd SSCM.

Absence of Powergrid- Odisha in SSCM was seriously viewed and it was advised to place the issue in ensuing 32nd TCC & ERPC meetings.

ii. Status of 400/220kV S/s at Meramundali "B":

With IPP power injection and 400kV connectivity at existing Meramundali 400/220kV substation, the fault level at existing Meramundali 400kV bus exceeds the 40kA breaker capacity. Hence, Meramundali B is required to reduce the fault level at existing substation and also for drawl of state share of power from IPPs. After Commissioning of Meramundali "B", the fault level at Meramundali will come down from 40kA to 20.3kA. It is a part of Transmission Plan for the year 2015. The connectivity details as explained in 2nd SSCM are as given below:

- Shifting of STPS to Meramundali 400kV D/C line from Meramundali to Meramundali-B.
- Shifting of Jeypore to Meramundali 400kV S/C line from Meramundali to Meramundali-B.
- Shifting of Mendhasal to Meramundali 400kV D/C line from Meramundali to Meramundali-B.

Deliberation in the meeting

OPTCL informed with a presentation that as 400kV Angul-Meramundali is major contributor of fault current at Meramundali. Hence, there is some modification in the connectivity of Meramundali-B. The present connectivity will be as follows:

- *Construction of 400kV D/C TTPS Stage-III to Meramundali-B line for power evacuation from TTPS expansion*
- *Shifting of Duburi to Meramundali 400kV D/C line from Meramundali to Meramundali-B.*
- *Shifting of GMR to Meramundali B (shifting of GMR Odisha state dedicated unit connected to existing Meramundali bus to Meramundali-B)*
- *Shifting of Duburi to Meramundali 220kV D/C line from Meramundali to Meramundali-B.*

On query, OPTCL informed that the Meramundali-B is being designed with fault level of 63 kA.

iii. Construction of 400/220kV S/s at Narendrapur with 400kV DC line from

Pandiabil(PGCIL) to Narendrapur.

This substation is required to cater the normal load growth and also upcoming bulk loads in Narendrapur area. The system study has been done. The connectivity details as explained in 2nd SSCM are as given below:

- 400kV D/C line from Pandiabil 400/220kV substation to Narendrapur
- New 220kV D/C line from Narendrapur 400/220kV substation to Aska 220/132kV
- LILO of both the circuits of existing 220kV D/C line from Therubali to Narendrapur at Narendrapur 400/220kV substation

2nd SSCM advised OPTCL to submit the relevant data of their proposals along with their study results, SLDs etc for further necessary study at ERLDC/ERPC. OPTCL agreed.

OPTCL vide mail dated 18.01.2016 has submitted the SLD showing the connectivity details which is enclosed at Annexure-B.3.

OPTCL may elaborate and place their justification for the proposal.

Deliberation in the meeting

OPTCL informed that Narendrapur S/s, in future, will be connected to 400 kV Theruvali and Jayanagar S/s which will complete the 400 kV ring of OPTCL system.

iv. Construction of 400/220kV Khuntuni S/s with LILO of 400kV D/C line from Meramundali-B to Dhubri.

OPTCL vide mail dated 18.01.2016 has submitted the SLD showing the connectivity details which is enclosed at Annexure-B.3. OPTCL also requested that 400/220kV Khntuni S/s may please be included for coming meeting.

Deliberation in the meeting

OPTCL informed that the 2x500 MVA, 400/220 kV Khuntuni S/s is proposed between Meramundali and Mendhasal to cater the growing demand in the area. It will be a part of 400 kV ring of OPTCL system. The connectivity details as explained in the meeting are as given below:

- *LILO of 400kV D/C Meramundali-B to Dhubri line*
- *LILO of Meramundali-Mendhasal 400kV D/C line*
- *220kV DC line from Khuntuni to Dhenkanal New and Bidanasi*
- *1X660 MW IPP of LANCO Babandh*

OPTCL presented the load flow study considering all the above proposals. They explained that for study the TTPS generation is stepped up to 400kV and connected to 400kV bus of proposed Meramundali-B substation through 400kV D/C line. It is a part of Transmission Plan for the year 2015-16 to 2018-19. It is required to evacuate state share of 50% power i.e from one unit(660 MW). System Study has been done with connection of 1X660 at Meramundali "B" and the flow diagram is attached at ***Annexure-B.3****.*

For all the above four (4) proposals, Committee requested ERLDC/ERPC to study the proposal of OPTCL and place the details in ensuing 32nd TCC & ERPC meetings. OPTCL was advised to forward the details of the connectivity and other data needed for study.

OPTCL agreed.

ITEM NO. B.4: AGENDA FROM DVC:

1. Patratu (DVC) – Patratu (JSEB) Tie-line is kept only charge from DVC end since long and if the same status is maintained for future also, then DVC is to find out alternate network arrangement and thus investment and similarly, for Kolaghat-Kolaghat tie line, this is out since June'12.

In 1st SSCM, JUSNL informed that 132 kV Patratu (DVC) – Patratu (JSEB) tie-line was kept out due to overloading of 220/132 kV ICT of Patratu (JSEB). The scenario may get changed after the commissioning of 220 kV Tenughat-Govindpur line.

The committee requested JUSNL to provide the details of their related schemes.

JUSNL agreed.

DVC and JUSNL may update.

Deliberation in the meeting

JUSNL representatives were not present the meeting.

2. 132KV Barhi – Rajgir and Barhi – Bihasariff and 132KV Chandil-Manikui tie lines are also remain charged from DVC end only, which have no utility at present condition. Such tie lines are to be revived for stability of the grid.

In 1st SSCM, BSPTCL informed that four (4) tower were collapsed from Barhi end. The order for restoration work has been placed.

In 2nd SSCM, BSPTCL informed that all the foundations were completed for 132KV Barhi – Rajgir and the line will be charged within a month. 132KV Barhi – Bihasariff line is in charged condition on ERS.

DVC and BSPTCL may update.

Deliberation in the meeting

BSPTCL informed that the line has been restored.

ITEM NO. B.5: Priority-based augmentation of ICT capacity

High loadings with consequent non-compliance of (n-1) security criterion were observed for the 400/220kV ICTs at Patna, Muzaffarpur, Maithon and Sasaram throughout July to October. Though the ICT capacities at these substations are scheduled for augmentation in a phased manner starting from Jan-16, in the interest of secure and unconstrained operation, an additional ICT or replacement of an existing 315 MVA ICT by a 500MVA ICT is required on priority basis by April 2016 i.e. before onset of next summer season.

Keeping in view the rapidly growing demand of Bihar and uncertainty of generation level within the 220kV system of DVC, POWERGRID may arrange for augmentation of ICT capacity as per the aforesaid priority.

In 31st TCC, Powergrid has given the schedule of commissioning as follows:

1. Patna- 1st ICT – Jan, 2016 & 2nd ICT- Mar, 2016
2. Muzaffarpur- Dec, 2015
3. Maithon- 1st ICT- Mar, 2016 & 2nd ICT- June, 2016
4. Sasaram- 1st ICT- Jan, 2016 & 2nd ICT- Mar, 2016

So all the ICTs will be available before Summer.

Director,BSPTCL informed that the up-gradation of 315 MVA ICT by 500 MVA ICT at Purnea was accomplished in less than 10 days and therefore thanked Powergrid.

TCC appreciated the effort of Powergrid and advised Powergrid to prepare a write up for early commissioning/up gradation of ICT which may be circulated in lower forum of ERPC for the benefit of ER constituents.

Powergrid may share the write up with members.

Deliberation in the meeting

Powergrid, ER-II informed that for Maithon ICTs work is going as per scheduled.

The status of other ICTs could not be updated as Powergrid, ER-I & Odisha were not present in the meeting.

Augmentation of ICTs at 400 kV Gaya (PG) S/s

BSPTCL informed that the load at Gaya would increase in the near future and suggested to install one more 500 MVA ICT at Gaya.

On the issue the following deliberation held in 39th PCC was placed:

In 39th PCC meeting members felt that N-1 security criterion is not satisfied at 400kV Gaya and advised Powergrid to augment 315 MVA ICT-II with 500 MVA.

BSPTCL informed that the load at Gaya would increase in the near future and suggested to install one more 500 MVA ICT at Gaya instead of upgrading the existing 315 MVA ICT.

After detailed deliberation, PCC felt that additional 500 MVA ICT may be installed at 400kV Gaya S/s subjected to availability of space. Otherwise, 315 MVA ICT-II should be replaced with 500 MVA. Powergrid was advised to check the required space availability at Gaya S/Stn.

In reply, Powergrid informed that there is space for one dia at 400kV side but space availability at 220kV side needs to be explored by their Engineering wing.

In SSCM it was decided to place the augmentation proposal before ensuing ERPC/TCC.

ITEM NO. B.6: Priority-based commissioning of bus reactor for control of high voltage during lean periods

With approach of winter season, the demand in E. Region and W. Bengal in particular has started reducing, thereby aggravating the high voltage problem at some of the 400kV S/Stns.

At Beharampur, the 400kV bus voltage is frequently exceeding 420kV, with corresponding rise of 400kV AC side voltage at HVDC B-t-B Bheramara. Persistent high voltage at Farakka and at Sagardighi power stations is also responsible for causing high voltage at Beharampur.

As the switching in/out of harmonic filter banks is dependent on HVDC power order and cannot be controlled manually, Bangladesh is often expressing difficulty in importing the full quantum of power scheduled from NTPC and W. Bengal, to avoid overvoltage tripping of any 400kV incoming circuit, on account of automatic switching in of additional filter bank.

Therefore an additional bus-reactor of 80MVAR or 125 MVAR capacity needs to be installed at Beharampur on urgent basis to control the 400kV voltage below 420kV. In addition, bus reactor capacity also needs to be enhanced at Farakka to control the voltage

Further, the bus reactor of Jamshedpur (125 MVAR) and Biharshariff (125 MVAR) needs to be installed in order of priority, as early as possible.

In 31st TCC, Powergrid informed that for additional bus-reactor of 125 MVAR capacity at Beharampur, NIT will be done in Nov, 2015 and best efforts will be made for commissioning the same by Dec, 2016 even when commissioning schedule is Apr, 2017.

Regarding Bus reactor of Jamshedpur and Biharshariff, it was informed that the reactors will be available by April/May 2016 and will be commissioned in another 3 months.

TCC advised Powergrid to expedite the diversion of reactors from other regions/locations.

NLDC informed that additional bus reactor at Behrampur is urgently required as Bangladesh power is getting curtailed because of high voltage issues.

Powergrid informed that efforts are being made to divert 50 MVAR reactor from Rourkela which is kept as a spare to Beharampur and to commission by June 2016.

In 2nd SSCM, Powergrid informed that Jeypore reactor was commissioned in November, 2015 and rest all the reactors are as per the above schedule.

Powergrid may update.

Deliberation in the meeting

Powergrid, ER-II informed that for 50 MVAR reactor from Rourkela is being shifted to Beharampur and will be installed as per schedule i.e. by June 2016. Regarding the installation of 125MVAR reactor it was informed that it is also as per schedule and will be installed by December, 2016. However, the status of 50 MVAR reactor after the commissioning of 125 MVAR was could not be updated.

The status of other Reactors could not be updated as Powergrid, ER-I & Odisha were not present in the meeting.

ITEM NO. B.7: Identification of non-ISTS carrying inter-state power

The CERC (Sharing of Transmission charges and Losses) (Third Amendment) Regulations, 2015 require the identification of STU lines carrying interstate power. The certification of such lines carrying interstate power are to be done by RPC in consultation with RLDC. List of lines proposed to be carrying interstate power had been sought from all the states, however, only WBSETCL and OPTCL have responded.

In a Suo-Motu Petition (Petition No-15/Suo-Motu/2012 dated 14.06.2012), CERC had observed thus:

6. As a first step towards inclusion of non-ISTS lines in the PoC transmission charges, the Commission proposes to include the transmission lines connecting two States, for computation of PoC transmission charges and losses. However, for the disbursement of transmission charges, tariff for such assets needs to be approved by the Commission in accordance with the provisions of Sharing Regulations. Accordingly, we direct the owners of these inter-State lines to file appropriate application before the Commission for determination of tariff for facilitating disbursement.

Many STU's have already filed their petitions (Petition No. 246/TT/2013 (Haryana), 232/TT/2013 (KSEB), 217/TT/2013 (MP), etc) before CERC for inclusion of STU lines connecting two states.

Constituents may confirm whether they have filed petitions before CERC for inclusion of transmission lines connecting two states.

Since some of the lines proposed by WBSETCL and OPTCL are in the nature of transmission lines connecting two states, ERPC may certify these as Inter State Lines for the purpose of inclusion for tariff recovery under PoC mechanism.

In case any intra state line is desired to be certified as carrying interstate power, the list of such lines may be sent to ERPC Secretariat and ERLDC for further necessary action.

In 31st TCC, it was informed that WBSETCL and OPTCL have filed petitions for inclusion of their lines as interstate lines. CERC vide their Order dated 08.06.15 (Pet No-259/TT/2013) has already considered the 400 kV Kharagpur-Baripada and 220 kV Santhaldih-Chandil lines of WBSETCL. However for OPTCL (petition No- 203/TT/2013) order may not have been issued by CERC as on date. BSPHCL and JUSNL informed that they are on the job of identifying the lines in their system.

It was also informed that as per CERC order lines connecting two states may be considered as natural ISTS. For such lines the constituents may directly approach the commission for adoption of SERC tariff or for determination of tariff in case SERC tariff was not available.

For balance lines TCC members were informed that Certification of non-ISTS lines carrying inter-State power, which were not approved by the RPCs on the date of notification of the Central Electricity Regulatory Commission (Sharing of Transmission Charges and Losses) Regulations, 2009, shall be done on the basis of load flow studies. For this purpose, STU shall put up proposal to the respective RPC Secretariat for approval. RPC Secretariat, in consultation with RLDC, using WebNet Software would examine the proposal. The results of the load flow studies and participation factor indicating flow of Inter State power on these lines shall be used to compute the percentage of usage of these lines as inter State transmission.

List of Lines considered by CERC in their Suo Motu order in petition No-15/Suo-Motu/2012 dated 14.03.12

Voltage (KV)	LINES		
400	Kolaghat	Baripada	WBSETCL-PG
220	Waria	Bidhannagar 1	DVC-WBSETCL
220	Waria	Bidhannagar 2	DVC-WBSETCL
220	Chandil	Santaldih	JSEB-WBSETCL
220	Patratu	BodhGaya 1	JSEB-BSEB
220	Patratu	BodhGaya 2	JSEB-BSEB
220	Patratu	BodhGaya 3	JSEB-BSEB
220	Tenughat	Biharshariff	JSEB-BSEB
220	Joda	Ramchandrapur	OPTCL-JSEB
220	Jindal	Jamshedpur	OPTCL-JSEB (DVC)

Lines carrying Inter State Power as Submited by WBSETCL

SL. NO.	Voltage (kV)	TIE LINE		REMARKS
1	132	BIRPARA (PG)	BIRPARA CKT 1	WBSETCL
2	132	BIRPARA (PG)	BIRPARA CKT 2	WBSETCL
3	132	NJP	NBU CKT 1	WBSETCL
4	132	NJP	NBU CKT 2	WBSETCL
5	132	MALDA (PG)	MALDA CKT 1	WBSETCL
6	132	MALDA (PG)	MALDA CKT 2	WBSETCL
7	400	JEERAT	BERHAMPORE CKT	PGCIL

8	400	JEERAT	SUBHASGRAM CKT	PGCIL
9	400	KHARAGPUR	BARIPADA CKT	WBSETCL
10	220	STPS	CHANDIL CKT	WBSETCL
11	220	BIDHANNAGAR	WARIA CKT 1	DVC
12	220	BIDHANNAGAR	WARIA CKT 2	DVC
13	132	RANGIT	RAMMAM CKT	WBSETCL
14	220	SUBHASGRAM(PG)	SUBHASGRAM CKT 1	WBSETCL
15	220	SUBHASGRAM(PG)	SUBHASGRAM CKT 2	WBSETCL
16	400	PARULIA	BIDHANNAGAR CKT 1	WBSETCL
17	400	PARULIA	BIDHANNAGAR CKT 2	WBSETCL
18	400	SGTPP	FARAKKA CKT	PDCL
19	400	SGTPP	SUBHASGRAM CKT	PDCL
20	400	SGTPP	PARULIA CKT 1	PDCL
21	400	SGTPP	PARULIA CKT 2	PDCL
22	220	DALKHOLA (PG)	DALKHOLA CKT 1	WBSETCL
23	400	SGTPP	PARULIA CKT 2	PDCL
24	132	KURSEONG	RANGIT CKT	PGCIL
25	132	KURSEONG	SILIGURI CKT	WBSETCL
26	220	SUBHASGRAM (PG)	EMSS (CESC) CKT 1	CESC
27	220	SUBHASGRAM (PG)	EMSS (CESC) CKT 2	CESC
28	220	SUBHASGRAM (PG)	BANTALA CKT	WBSETCL
29	220	SUBHASGRAM (PG)-	NEW TOWN CKT	WBSETCL
30	400	SUBHASGRAM (PG)	HEL CKT 1	HEL
31	400	SUBHASGRAM (PG)	HEL CKT 2	HEL
32	400	SGTPP	BERHAMPORE CKT 1	PGCIL
33	400	SGTPP	BERHAMPORE CKT 2	PGCIL

Sl.No 9, 10 have already been considered by CERC for inclusion in PoC vide Order dated 08.06.15 (Pet No-259/TT/2013)

Sl No 11,12,13 & 24 may be in the nature of natural ISTS lines as per CERC order dated 14.03.12 (petition No-15/Suo-Motu/2012)

Tie LINES MAINTAINED BY OPTCL & USED AS ISTS LINES as submitted by OPTCL				
SL.NO.	**Voltage (KV)**	**LINES**		**CIRCUIT**
1	400	INDRAVATI PH	INDRAVATI (PGCIL)	1
2	400	RENGALI PG	KOLAGHAT	1
3	220	BALIMELA PH	U SILERU	1
4	220	JAYANAGAR	JAYANAGAR (PGCIL)	2
5	220	BUDHIPADAR	KORBA DC	2
6	220	TARKERA	BISRA	2
7	220	JODA	RC PUR (JSEB)	1
8	220	JODA-JSPL	JAMSHEDPUR (DVC)	1
9	220	RENGALI (OPTCL)	RENGALI (PGCIL)	2
10	220	RENGALI PH	KANIHA	1
11	220	KANIHA	TTPS	1
12	220	KANIHA	MERAMUNDALI	2
13	220	KUCHEI	BALASORE	2
14	132	JODA	KENDUPOSI (JSEB)	1
15	132	KUCHEI	RAIRANGPUR	1
16	132	KUCHEI	BARIPADA	1

For Sl.No 5 CERC in order dated 29.05.15 (Pet No-185/TT/2013) has already directed that wheeling charges for the line are to be pooled in PoC w.e.f 01.07.2011.

Sl.No 2,3,7,8 &14 may be in the nature of natural ISTS lines as per CERC order dated 14.03.12 (petition No-15/Suo-Motu/2012)

All constituents were requested to provide the list of their lines with details of portion (in % and Km) under their ownership along with latest status of filing of petition/order of CERC to ERPC Secretariat for initiating action in this regard.

OPTCL has submitted the updated list of lines.

Committee advised all the other STUs to submit the updated list of lines.

WBSETCL, DVC, Bihar, Jharkhand and Sikkim may update the respective status.

Deliberation in the meeting

BSPTCL submitted the list of lines, which is given at ***Annexure-B.7.***

ITEM NO. B.8: Efficient Evacution of Power from 2x210 MW Tenughat TPS, Lalpania

Arrangement for evacuation of power from Tenughat TPS is through the following two transmission lines:

1) Tenughat TPS to Bihar Sharif(BSEB) S/S through 400 KV Single Circuit line.
2) Tenughat TPS to Patraru TPS through 400 KV Single Circuit line.

Both lines are operating at 220 kV due to non readiness of 400 KV S/S at terminating ends.

In 27th TCC, TVNL informed that, at TVNL end the up gradation to 400 kV level is in process. Accordingly, TCC also advised JSEB to deposit the requisite amount to Powergrid for up gradation/termination work entrusted to Powergrid for operation of the line at rated voltage. This will facilitate Tenughat-Biharshariff line to be operated at 400 kV and stability of the TVNL units.

In 21st PCC, TVNL informed that 2x250 MVA ICT is already available at TVNL and the erection work is in progress. TVNL reported that work will be completed by December, 2014 at TVNL end.

Powergrid informed that, up gradation related works at 400 kV Biharshariff S/s has now stalled due to some payment issues with JSEB. However, it is expected to complete the work by December, 2014, if in the mean time payment issues get settled at earliest.

In 29th TCC, Powergrid informed that payment of around 4.58 cr. is pending from JUSNL for up gradation work at Biharsharif S/s and 2.3 cr. From TVNL for up gradation work at TVNL S/s.

Powergrid informed that they will complete the work at respective ends within three months from the date of receipt of payments from JUSNL and TVNL.

TCC advised JUSNL, TVNL and PGCIL to ensure the schedule.

In 1st SCM, JUSNL informed that the payment will be released soon.

JUSNL/ CTU may update.

DVC and JUSNL may update.

Deliberation in the meeting

The status could not be updated as representatives from JUSNL as well as Powergrid, ER-I were not present the meeting.

ITEM NO. B.9: Status of Downstream Projects of Daltonganj and Chaibasa Sub-stations of JUSNL

In 1st SSCM, JUSNL updated the status; the same is given at ***Annexure- B.9.***

JUSNL/ Powergrid may update.

Deliberation in the meeting

The status could not be updated as representatives from JUSNL were not present the meeting.

ITEM NO. B.10: Connectivity of CESC system with Central Transmission Utility -CESC

CESC vide its letters dated 2/12/15 & 11/9/15 informed that considering the present peak demand & growth rate, it would require about 300MW power in the next 3 to 4 years and another 200 MW power in next 2 to 3 years.

In order to meet the future demand, CESC informed that it has placed the following proposal to CEA:

- Construction of 400/220kV substation at Rajarhat very close to PGCIL sub-station with 2x500MVA transformers
- For a connectivity to the 400/220kV Rajarhat (PGCIL) S/s for 500MW power
- 220kV underground D/C cable connection to the load centre (East Calcutta substation)

It was also informed that WBSETCL was already requested to give "No objection" for the above connectivity.

In 2nd SSCM, CTU informed that the proposal will be placed in next LTOA meeting.

The committee advised WBSETCL to consider the CESC proposal and give their official communication in this regard.

WBSETCL/CESC may update.

Deliberation in the meeting

WESETCL informed that bilateral discussions were going on and it will be resolved at the earliest.

ITEM NO. B.11: ANY OTHER ITEM.

****

Annexure – A

Participants in the 3rd SSCM meeting of ERPC

Venue: ERPC Conference Hall, Kolkata Time: 11:00 hrs Date: 28.01.2016 (Thursday)

Sl No	Name	Designation/ Organization	Contact Number	Email	Signature
1	A K Bandyopadhyay	MS, ERPC	9433068533	mserpc-power@nic.in	
2	U. K. Verma	GM, ERLDC	09902496210	ujwalkverma@gmail.com	
3	P. P. BANDYOPADHYAY	DGM (GM), ERLDC	7044083323	Parth_banerjee@yahoo.co.in	
4	P.S Das	Asst GM (SO), ERLDC	9433041837	psdao_psd@yahoo.com	
5	S. Banerjee	DGM / ERLDC	9433041823	suvajitb@gmail.com	
6	B. Pan	CE/CCDC/DVC	9903247102	bpan.dvc@gmail.com	
7	M. Rana	CE (SPC) DVC	9831954263	mukut.rana@dvc.gov.in	
8	J. DUTTA	SE (OS&U) DVC	9433515712	jayanta.dutta@dvc.gov.in	
9	UN Mishra	CGM (GRID) GRIDCO	9438907774	cgm.pr@gridco.co.in	
10	R. R. Panda	CGM (O) OPTCL	8943890737	cgm.com@optcl.co.in	
11	M. R. Mohanty	Sr. GM (CS) SLDC office	9438907310	mrmohanty113@gmail.com	
12	A K Banerjee	AGM, OPTCL	9438907351	akb_bbsr@yahoo.com	
13	C. R. Mishra	AGM, OPTCL	9438907305	ele.crmishra@optcl.co.in	
14	R. P. Kandu	Engr, ERLDC	9903329591	rajpratim@gmail.com	
15	M. K. Thakur	Dy. Manager ERLDC	9432351832	mkthakur@gmail.com	
16	Saurav K. Sahay	Sr Engineer ERLDC	9432013173	Sahay.saurav@gmail.com	
17	B. Verma	Engr, ERLDC	9903180731	bramhanand18@gmail.com	
18	D K Bauri	EE, ERPC	9883617236	eeopc.erpc@gov.in	
19	S. KEJRIWAL	EE, ERPC	9831419509	eecom2-erpc@gov.in	
20	G. K. Choubey	CE, Trans BSPTCL	7763817705	ce.trans664@gmail.com cetrans664@gmail.com	

Participants in the 3rd SSCM meeting of ERPC

Venue: ERPC Conference Hall, Kolkata Time: 11:00 hrs Date: 28.01.2016 (Thursday)

Sl No	Name	Designation/ Organization	Contact Number	Email	Signature
21	S. Roy	A.C.E. SLDC WBSETCL	9434910543	snbyan60@yahoo.com	[signature]
22	A. Ghosh	C.E (CPD) WBSETCL	9434910019	cpd@wbsetcl.in arundhati.ghosh@wbsetcl.in	[signature]
23	A. Karmakar	ACE: CPD, WBSETCL	9434910090	asit.karmakar@wbsetcl.in	[signature]
24	V. Kalyanaraman	S.E, ERPC	8902493969	[illegible]	[signature]
25	S. A. Ansari	Sr. Engineer.	9434713585	ests2am@gmail.com	[signature]
26	G. Rao	AEE	9547891353	ereb-cea@yahoo.in	[signature]
27					
28					
29					
30					
31					
32					
33					
34					
35					
36					
37					
38					
39					
40					

Peak Present Case

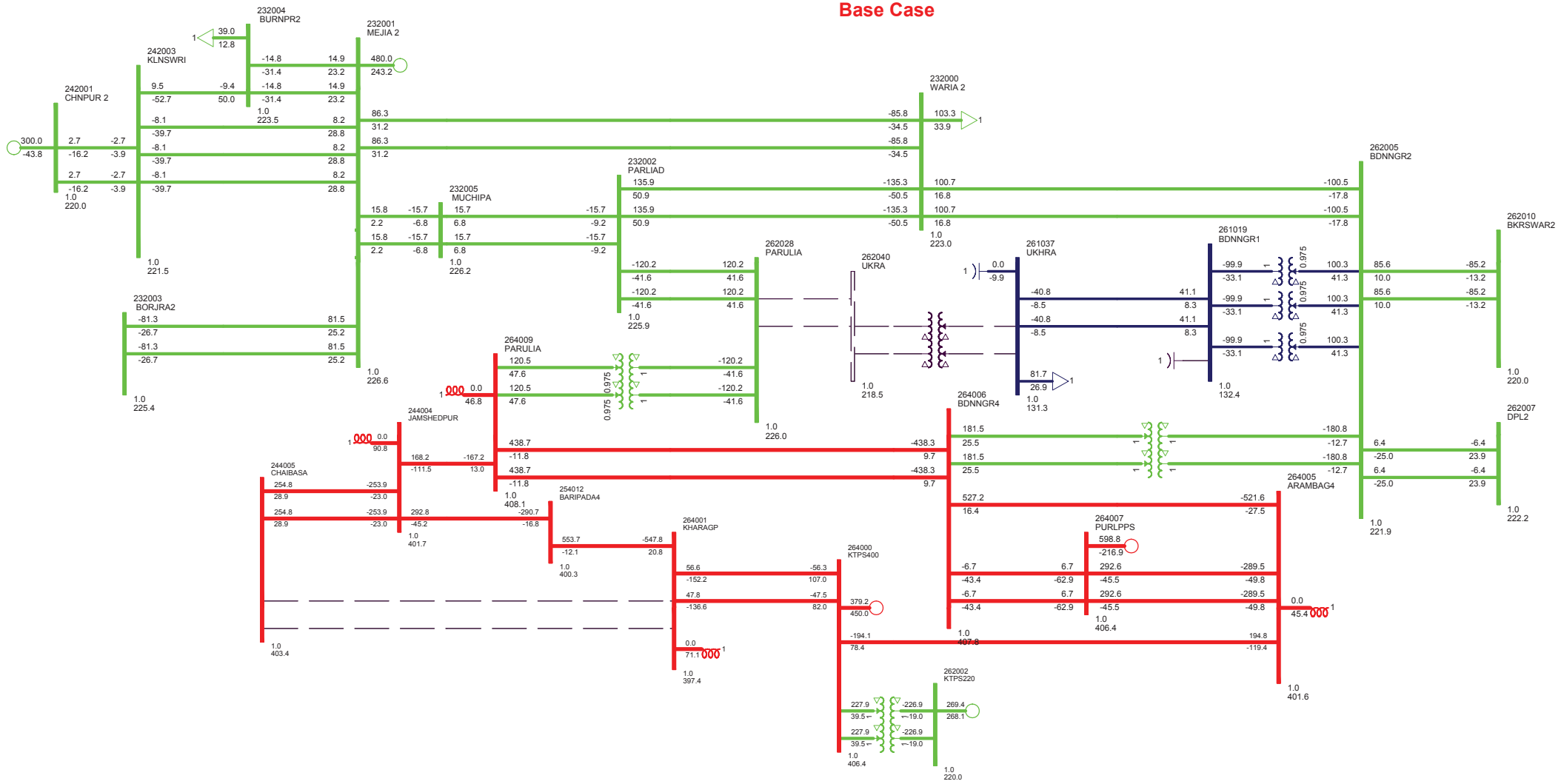
220kV Ukhra S/s is not in service

Ukhra Simulation Studies

Peak Case:- DVC LOAD- 2700 MW & GEN- 3500 MW, W.B LOAD- 7650 MW & GEN- 4800 MW

Present year base case without 220 kV Ukhra

Base Case

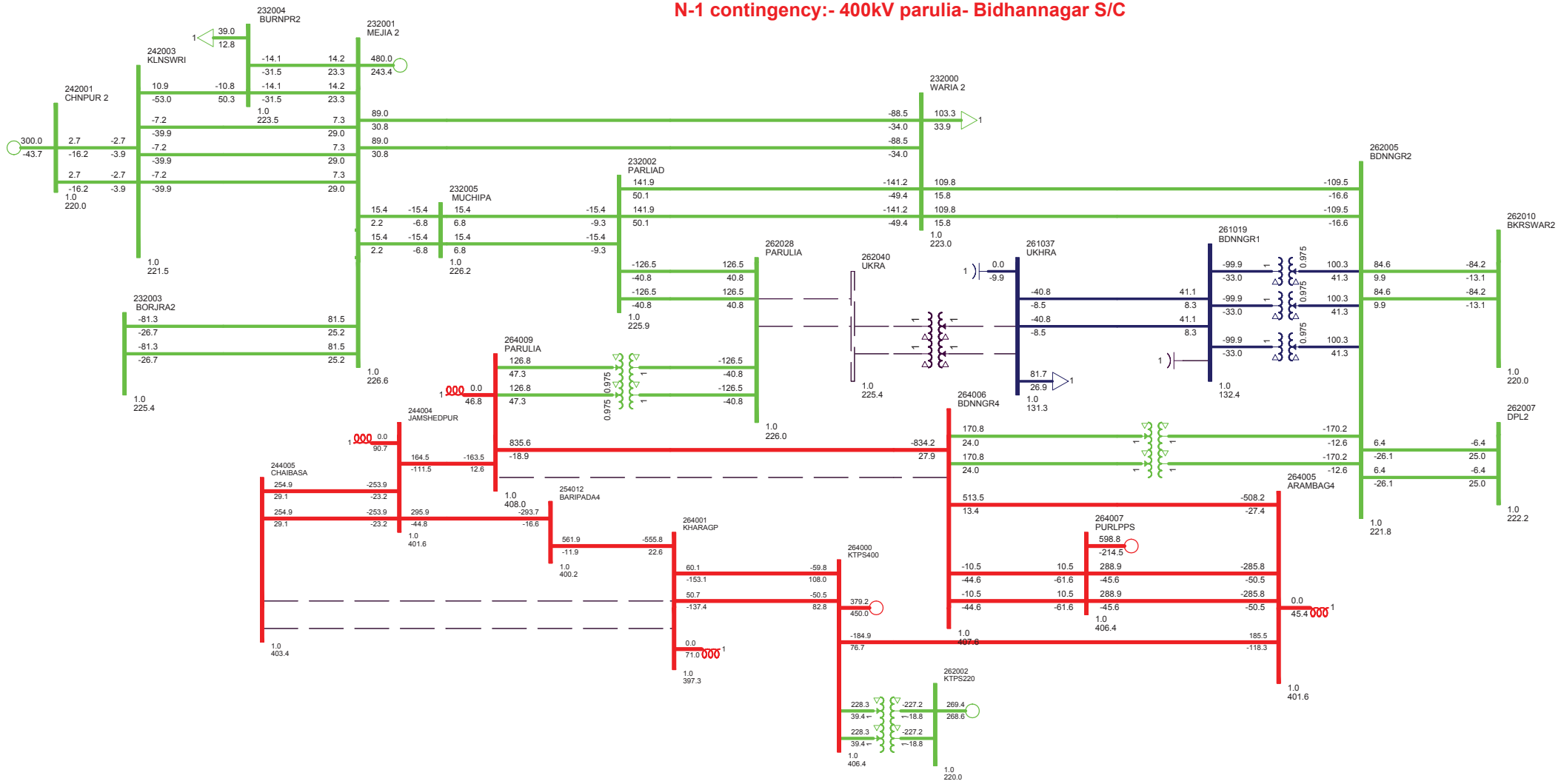


Ukhra Simulation Studies

Peak Case:- DVC LOAD- 2700 MW & GEN- 3500 MW, W.B LOAD- 7650 MW & GEN- 4800 MW

Present year base case without 220 kV Ukhra

N-1 contingency:- 400kV parulia- Bidhannagar S/C

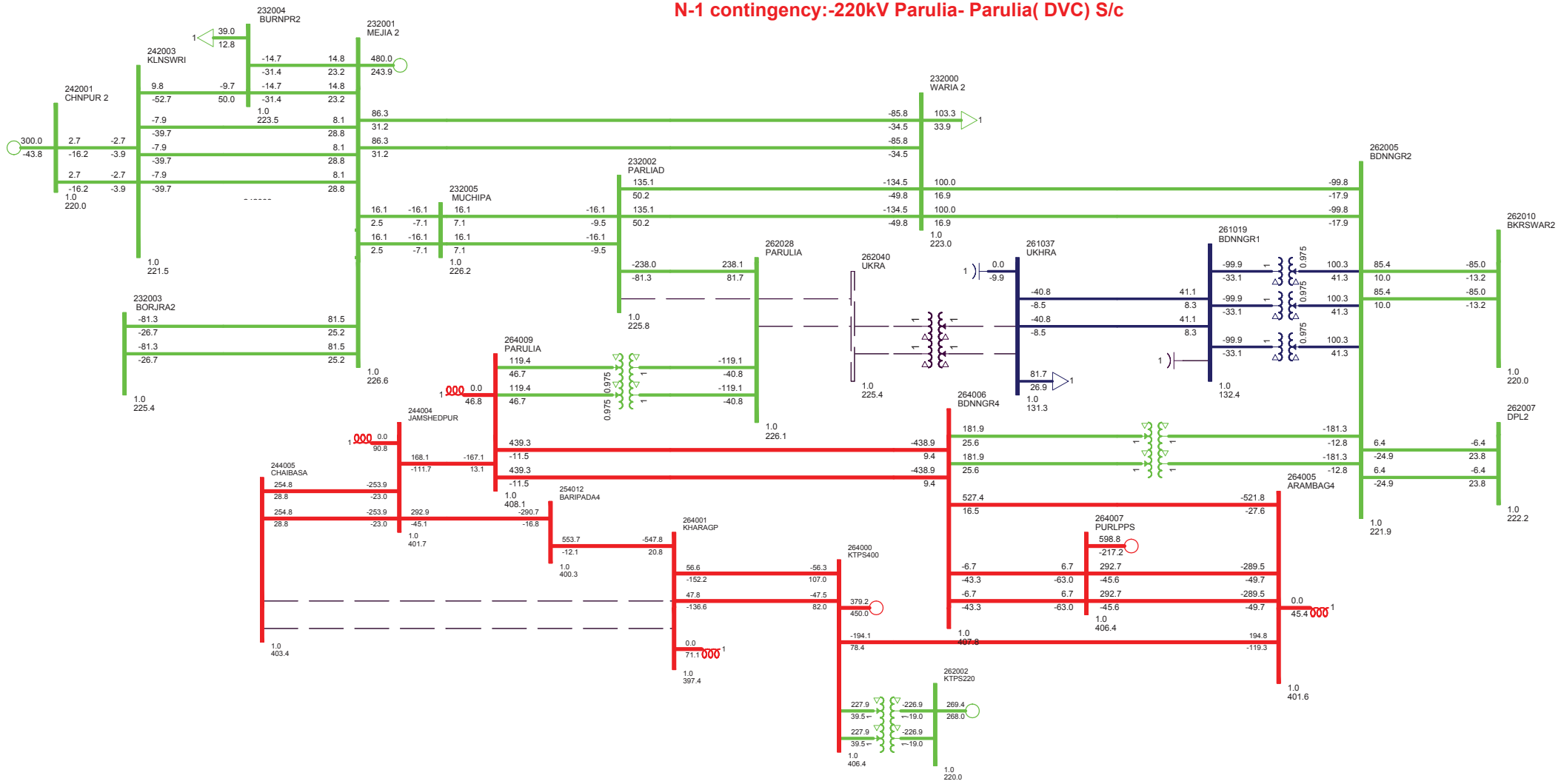


Ukhra Simulation Studies

Peak Case:- DVC LOAD- 2700 MW & GEN- 3500 MW, W.B LOAD- 7650 MW & GEN- 4800 MW

Present year base case without 220 kV Ukhra

N-1 contingency:-220kV Parulia- Parulia(DVC) S/c



Peak Future Case

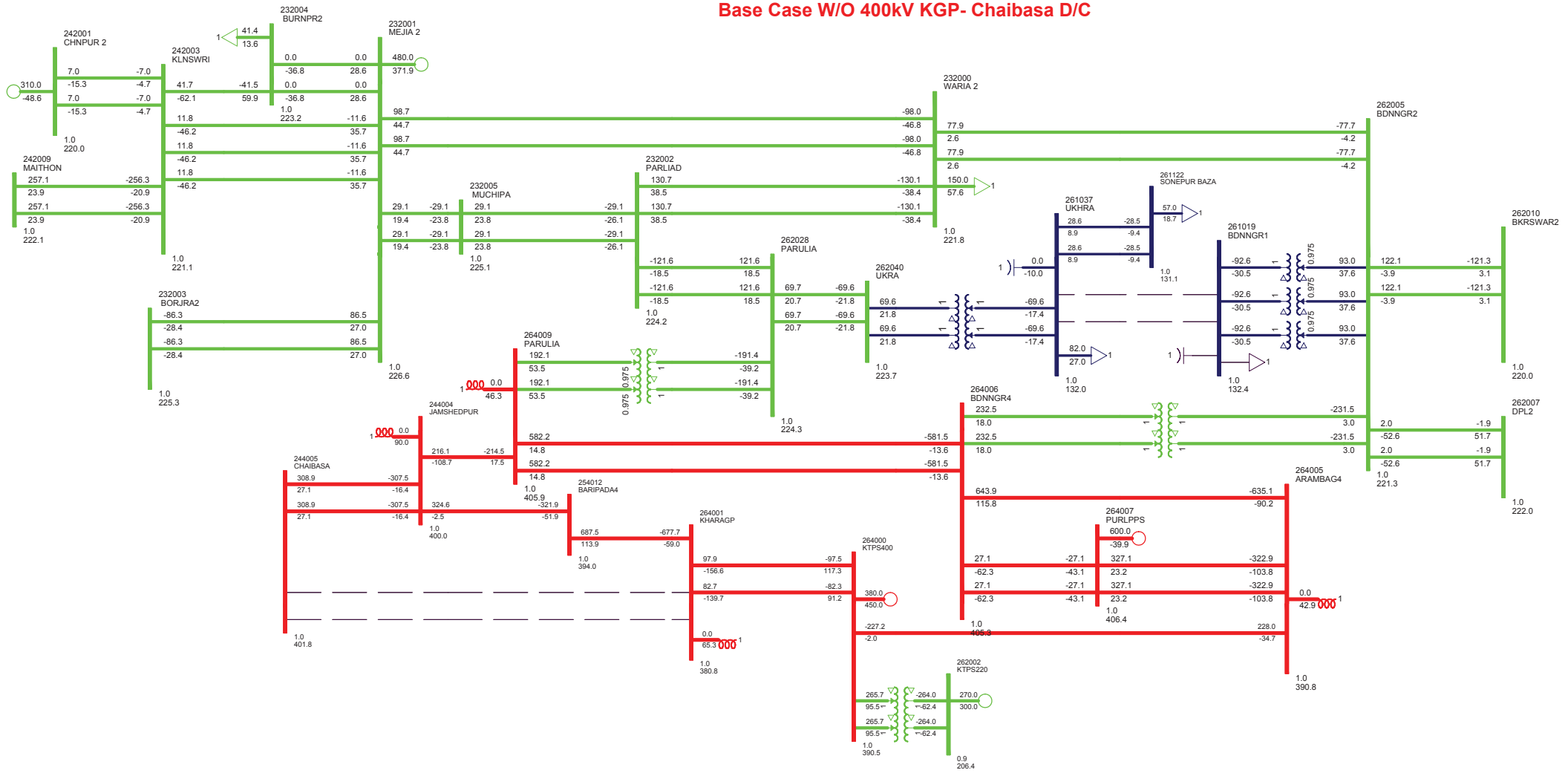
220kV Ukhra S/s is in service

Ukhra Simulation Studies

Peak Case:- DVC LOAD- 3000 MW & GEN- 3500 MW, W.B LOAD- 8500 MW & GEN- 4800 MW

Future year base case with 220 kV Ukhra

Base Case W/O 400kV KGP- Chaibasa D/C

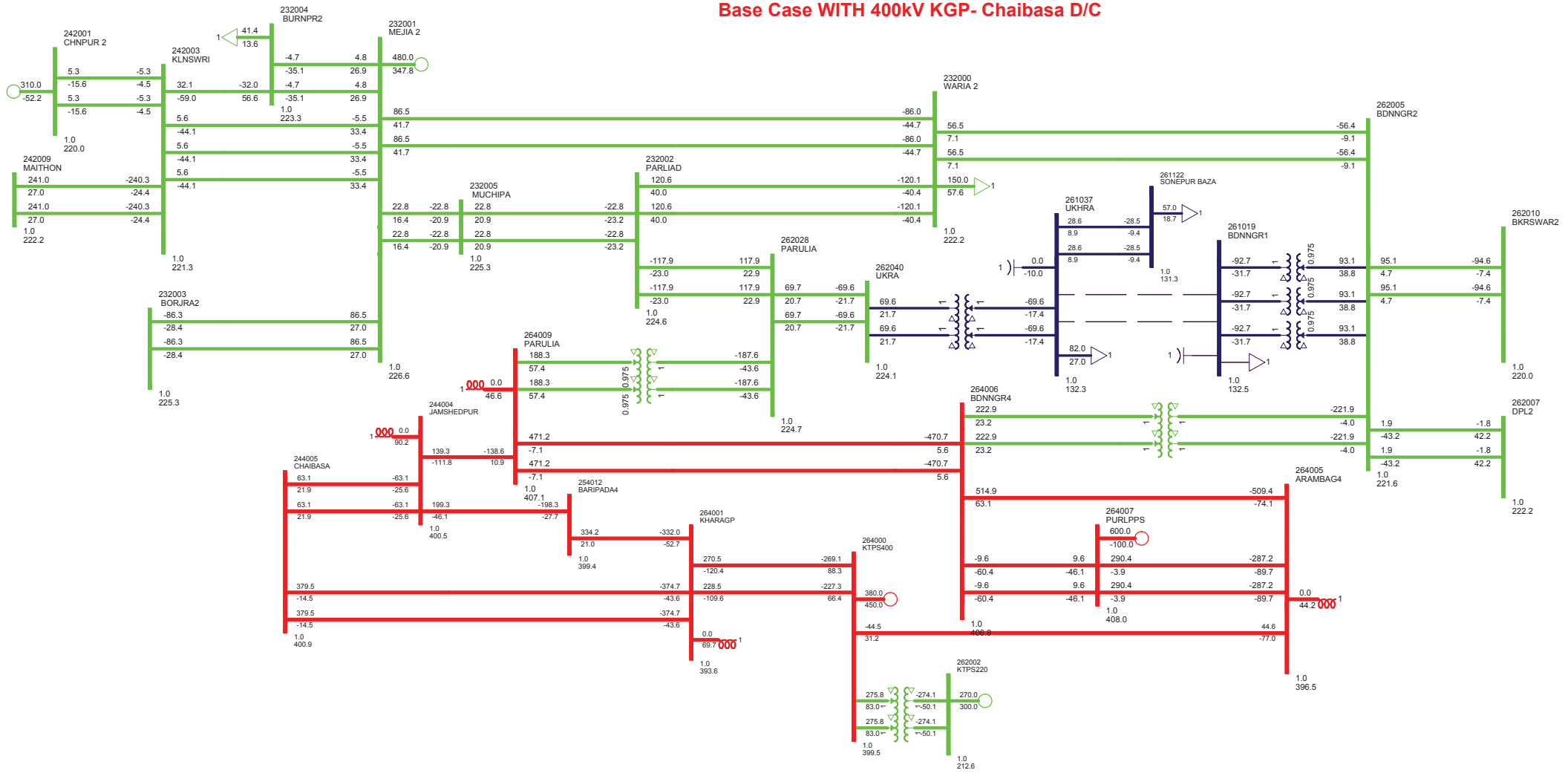


Ukhra Simulation Studies

Peak Case:- DVC LOAD- 3000 MW & GEN- 3500 MW, W.B LOAD- 8500 MW & GEN- 4800 MW

Future year base case with 220 kV Ukhra

Base Case WITH 400kV KGP- Chaibasa D/C

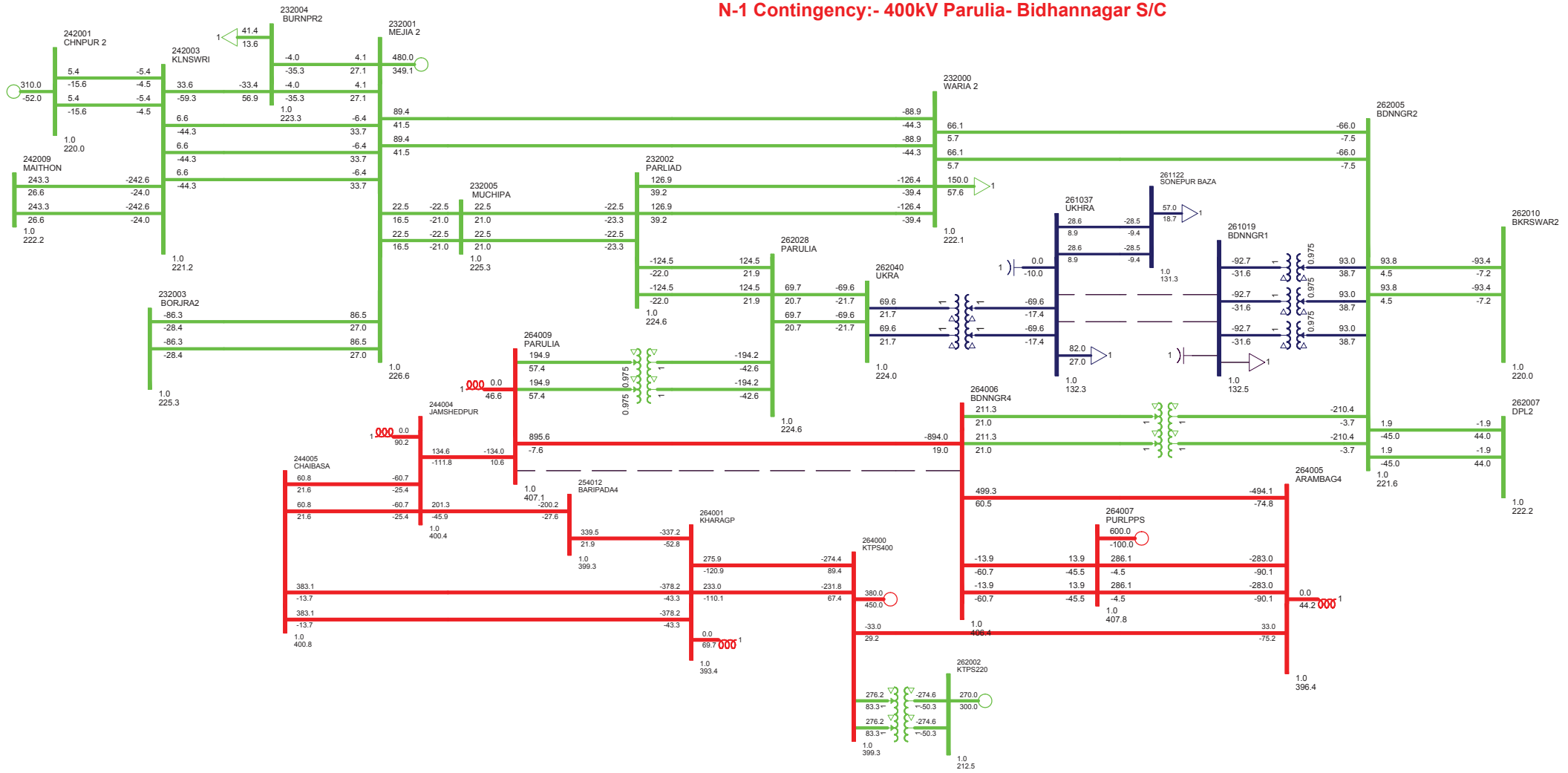


Ukhra Simulation Studies

Peak Case:- DVC LOAD- 3000 MW & GEN- 3500 MW, W.B LOAD- 8500 MW & GEN- 4800 MW

Future year base case with 220 kV Ukhra

N-1 Contingency:- 400kV Parulia- Bidhannagar S/C

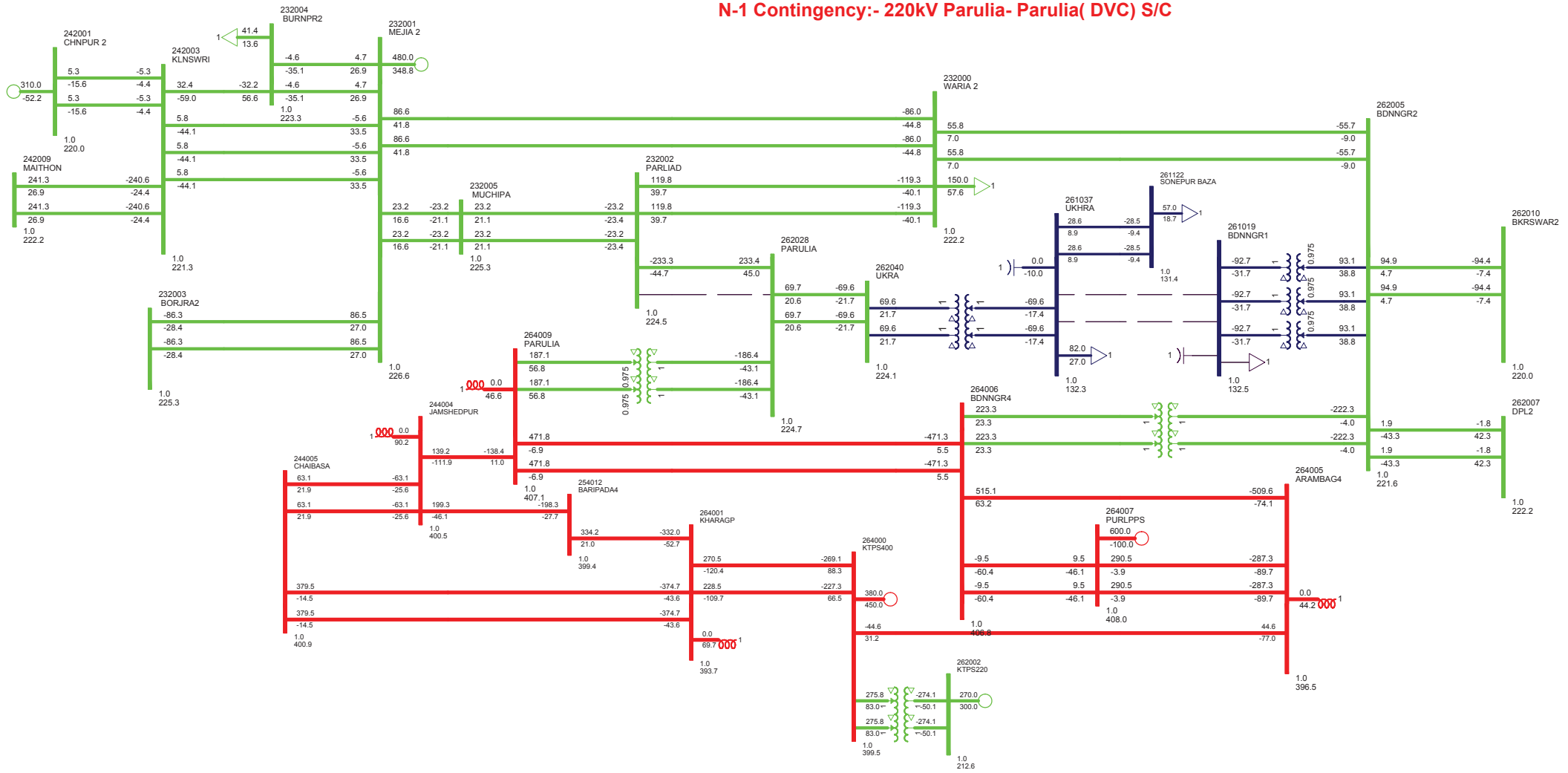


Ukhra Simulation Studies

Peak Case:- DVC LOAD- 3000 MW & GEN- 3500 MW, W.B LOAD- 8500 MW & GEN- 4800 MW

Future year base case with 220 kV Ukhra

N-1 Contingency:- 220kV Parulia- Parulia(DVC) S/C

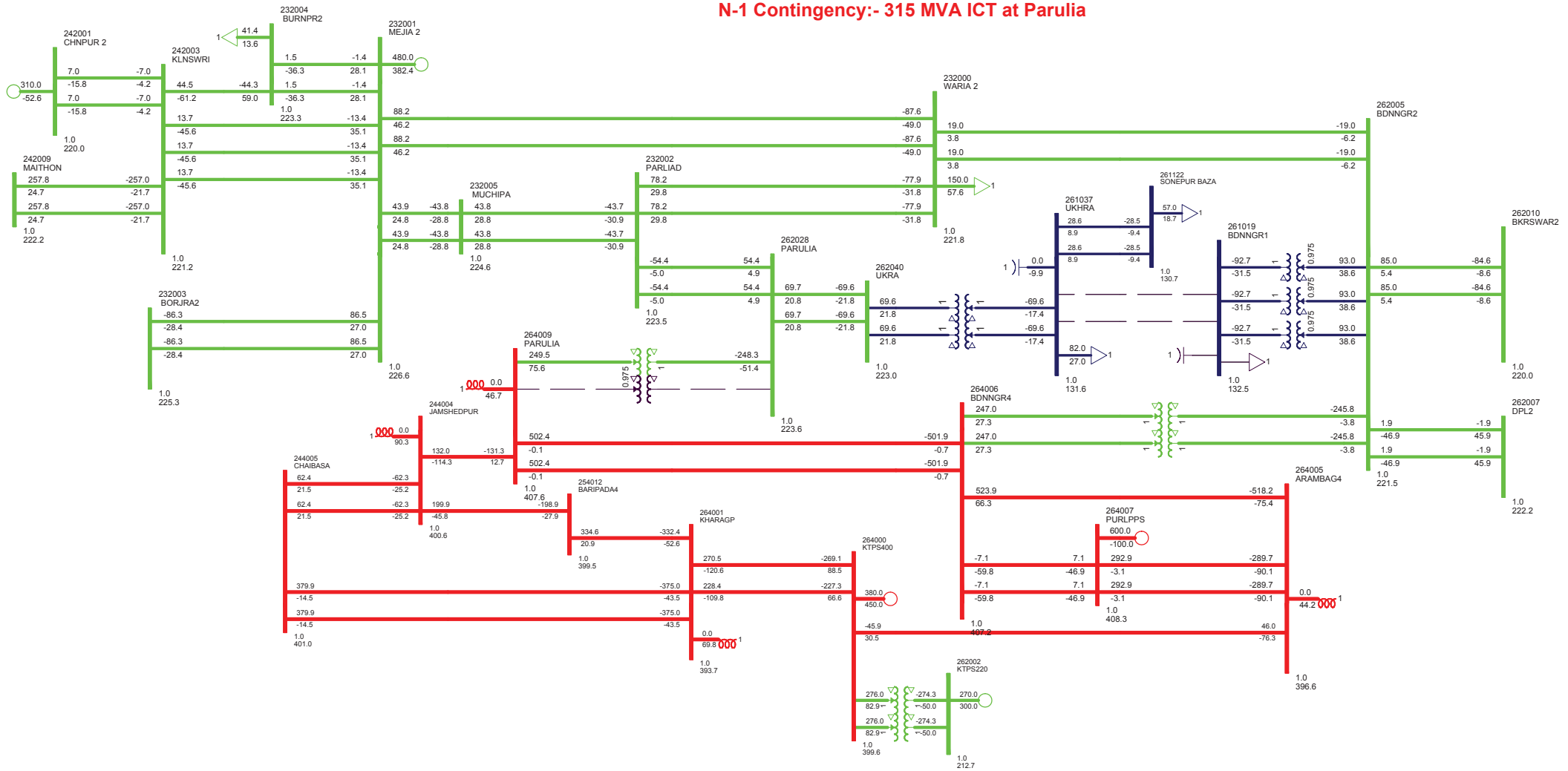


Ukhra Simulation Studies

Peak Case:- DVC LOAD- 3000 MW & GEN- 3500 MW, W.B LOAD- 8500 MW & GEN- 4800 MW

Future year base case with 220 kV Ukhra

N-1 Contingency:- 315 MVA ICT at Parulia

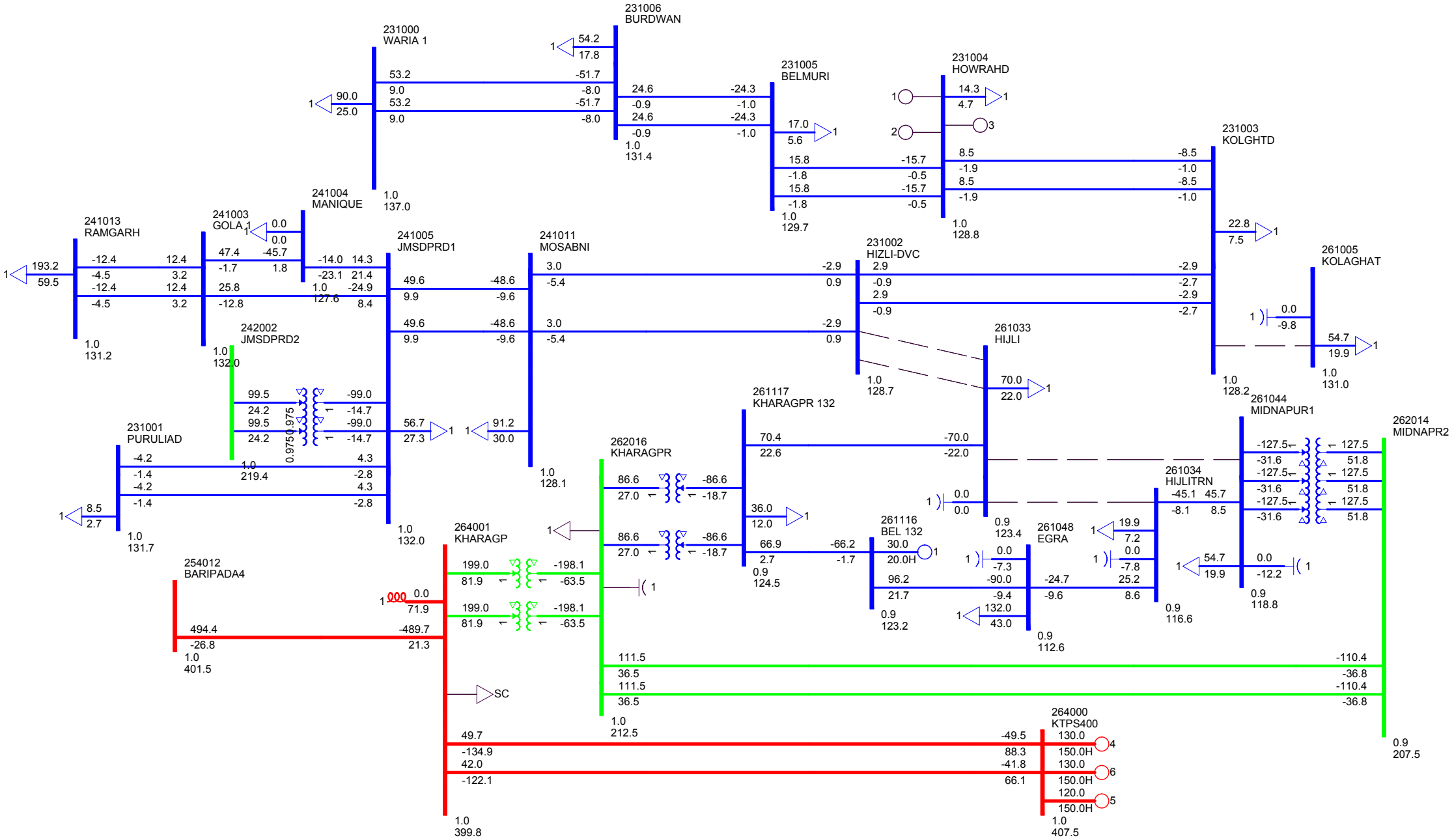


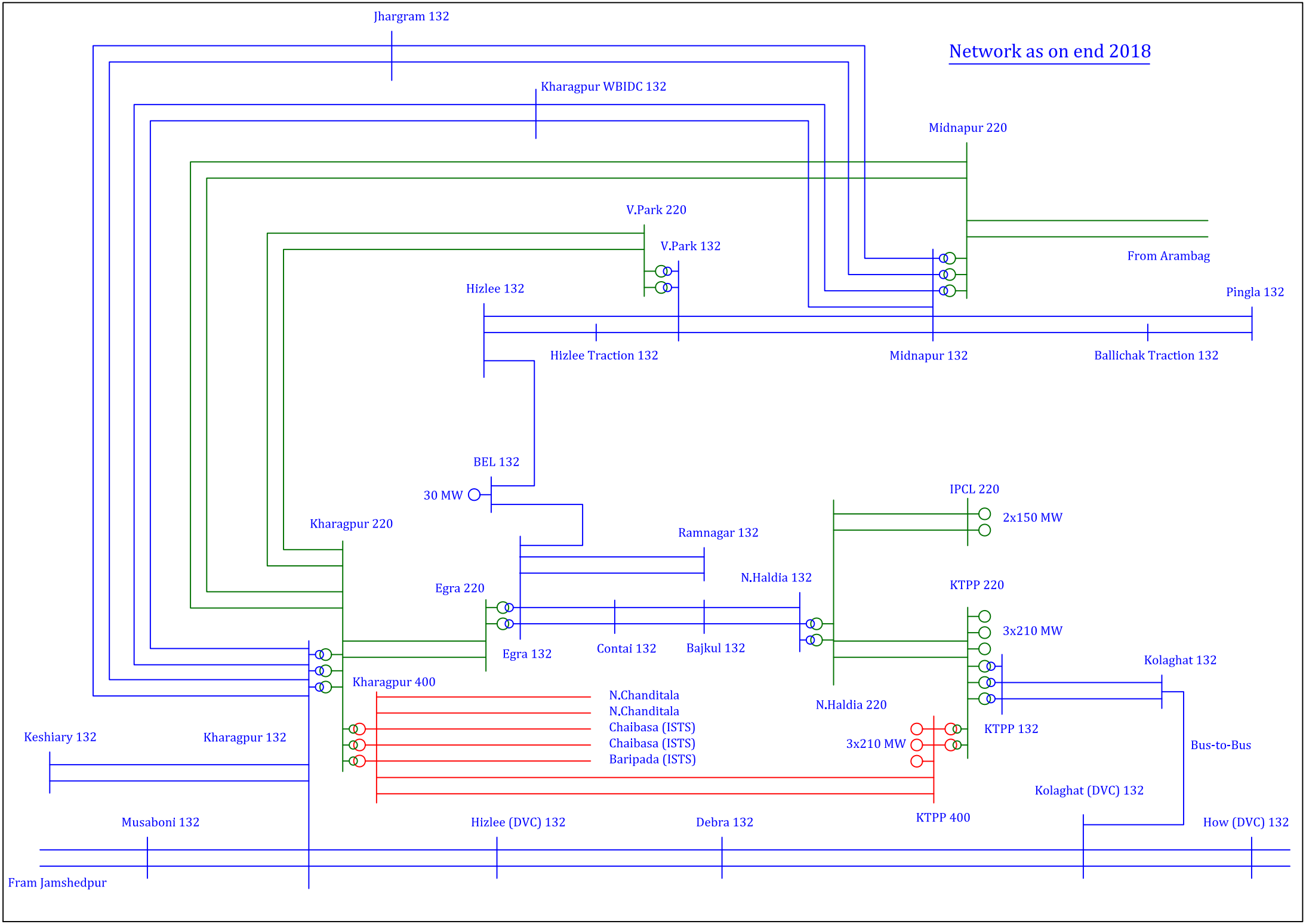
Musaboni-Hizlee(DVC) LILO at Kharagpur(WB) Study

Annexure-B.2.3

Peak LGB considered

Present Year Base Case




Network as on end 2018
Jhargram 132
Kharagpur WBIDC 132
Midnapur 220
V.Park 220
V.Park 132
From Arambag
Hizlee 132
Pingla 132
Hizlee Traction 132
Midnapur 132
Ballichak Traction 132
BEL 132
30 MW
IPCL 220
2x150 MW
Kharagpur 220
Ramnagar 132
N.Haldia 132
KTPP 220
Egra 220
3x210 MW
Egra 132
Contai 132
Bajkul 132
Kolaghat 132
Kharagpur 400
N.Chanditala
N.Chanditala
Chaibasa (ISTS)
Chaibasa (ISTS)
Baripada (ISTS)
N.Haldia 220
KTPP 132
Keshiary 132
Kharagpur 132
3x210 MW
Bus-to-Bus
Kolaghat (DVC) 132
KTPP 400
Musaboni 132
Hizlee (DVC) 132
Debra 132
How (DVC) 132
Fram Jamshedpur

Load to be considered for study related to proposed Debra 132 KV SS

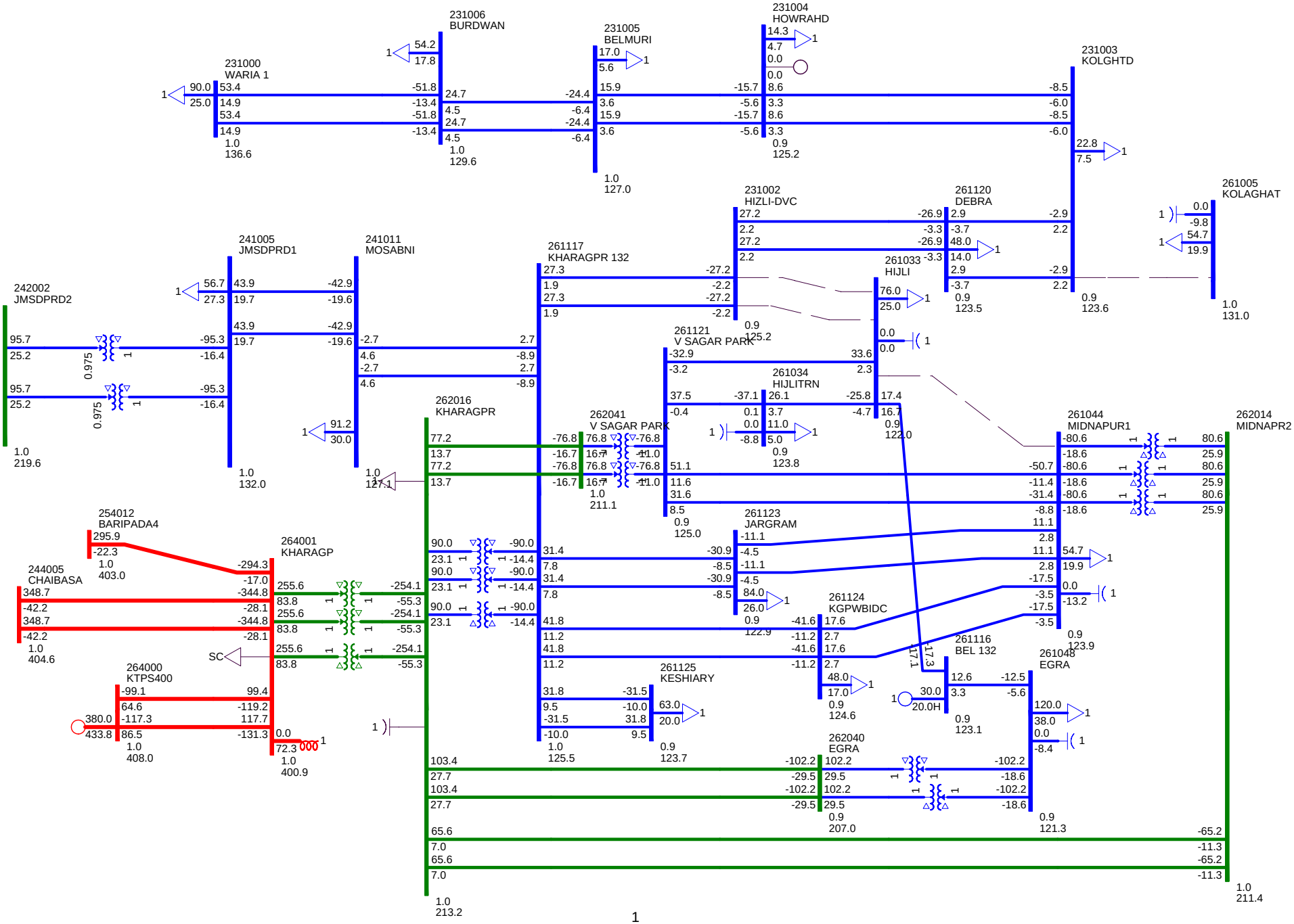
Substation	Present Peak Demand at 132/33 KV level			Year wise Projected Peak Demand (MVA)				
				2016-17	2017-18	2018-19		
	MVA	P	Q			MVA	P	Q
Hijli 132 KV SS	73	69	24	80	73	80	76	25
Kharagpur WBIDC 132 KV SS	38	36	12	42	46	51	48	17
Egra 132 KV SS	120	114	37	132	133	126	120	38
Jhargram 132 KV SS	66	63	20	73	80	88	84	26
Keshiary 132 KV SS					60	66	63	20
Bajkul 132 KV SS				63	69	76	72	24
Contai 132 KV SS	93	88	30	80	88	77	73	24
Haldia 132 KV SS	42	40	13	46	51	56	53	18
New Haldia 220 KV SS	58	55	18	51	56	62	59	19
Debra 132/33 KV SS					45	50	48	14
Ramnagar 132 KV SS						40	38	12
Pingla	130	124	39	123	79	87	83	26
Kharagpur 400 KV SS	0	0	0	0	0	0	0	0
Hizli TSS 132 KV Demand	12	11	5	12	12	12	11	5
Balichak TSS 132 KV Demand	18	17	6	18	18	18	17	6

Musaboni-Hizlee(DVC) LILO at Kharagpur(WB) Study

Peak LGB considered

Proposed LILO at 132kV Kharagpur

LILO at 132kV Debra

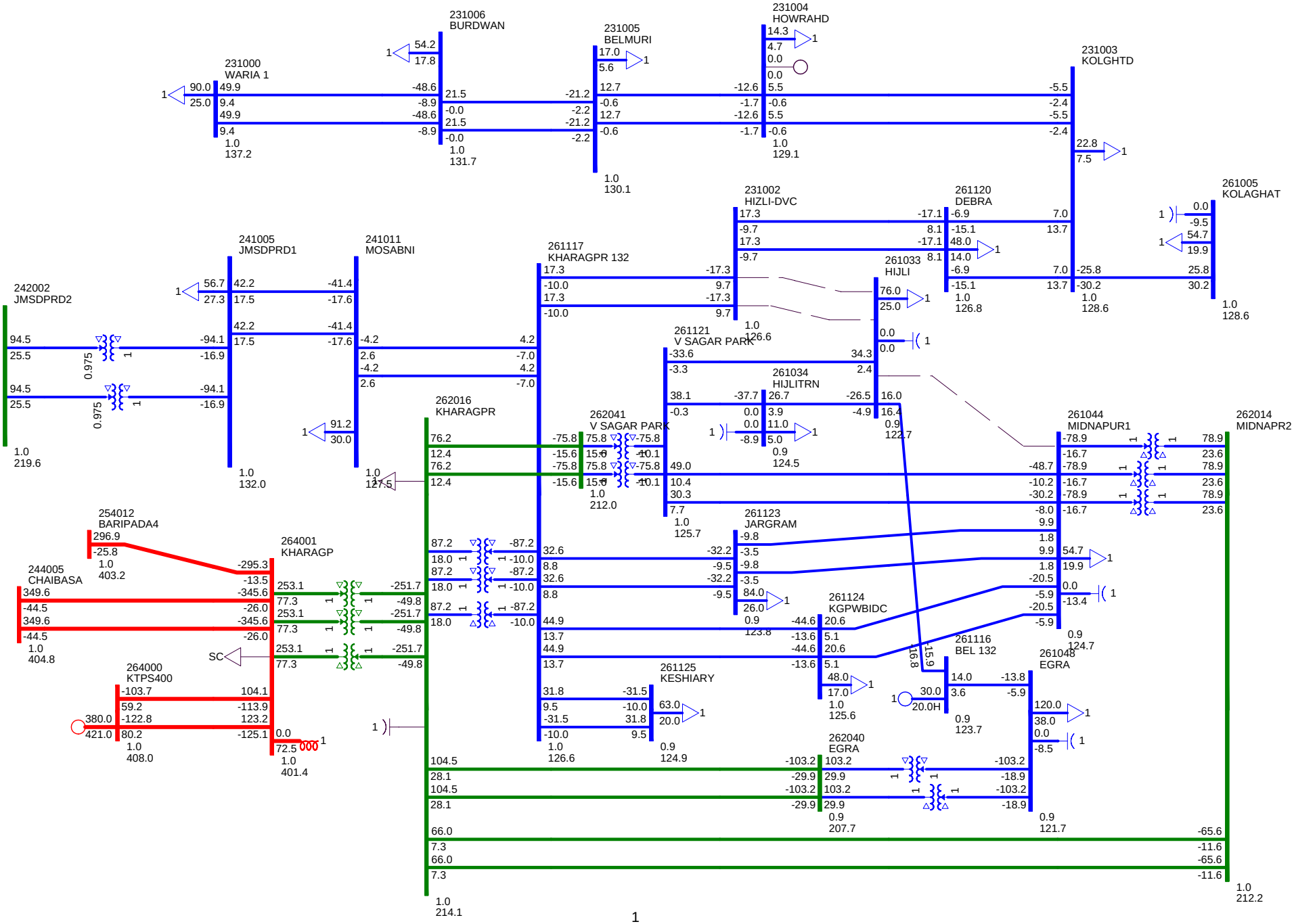


Musaboni-Hizlee(DVC) LILO at Kharagpur(WB) Study

Peak LGB considered

Proposed LILO at 132kV Kharagpur and LILO at 132kV Debra

With 132kV Kolaghat DVC -Kolaghat WB line closed

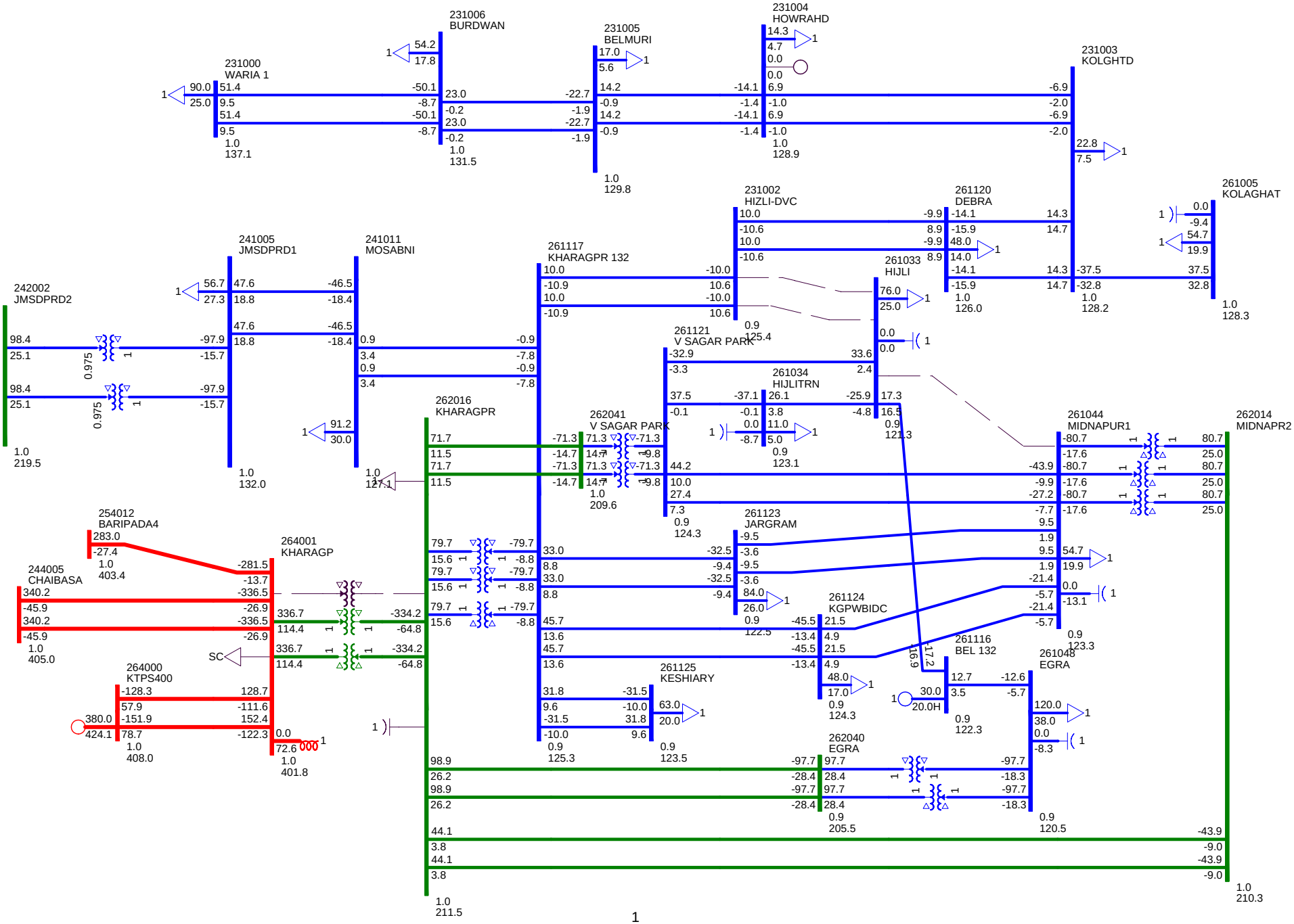


Musaboni-Hizlee(DVC) LILO at Kharagpur(WB) Study

Proposed LILO at 132kV Kharagpur and LILO at 132kV Debra

With 132kV Kolaghat DVC -Kolaghat WB line closed

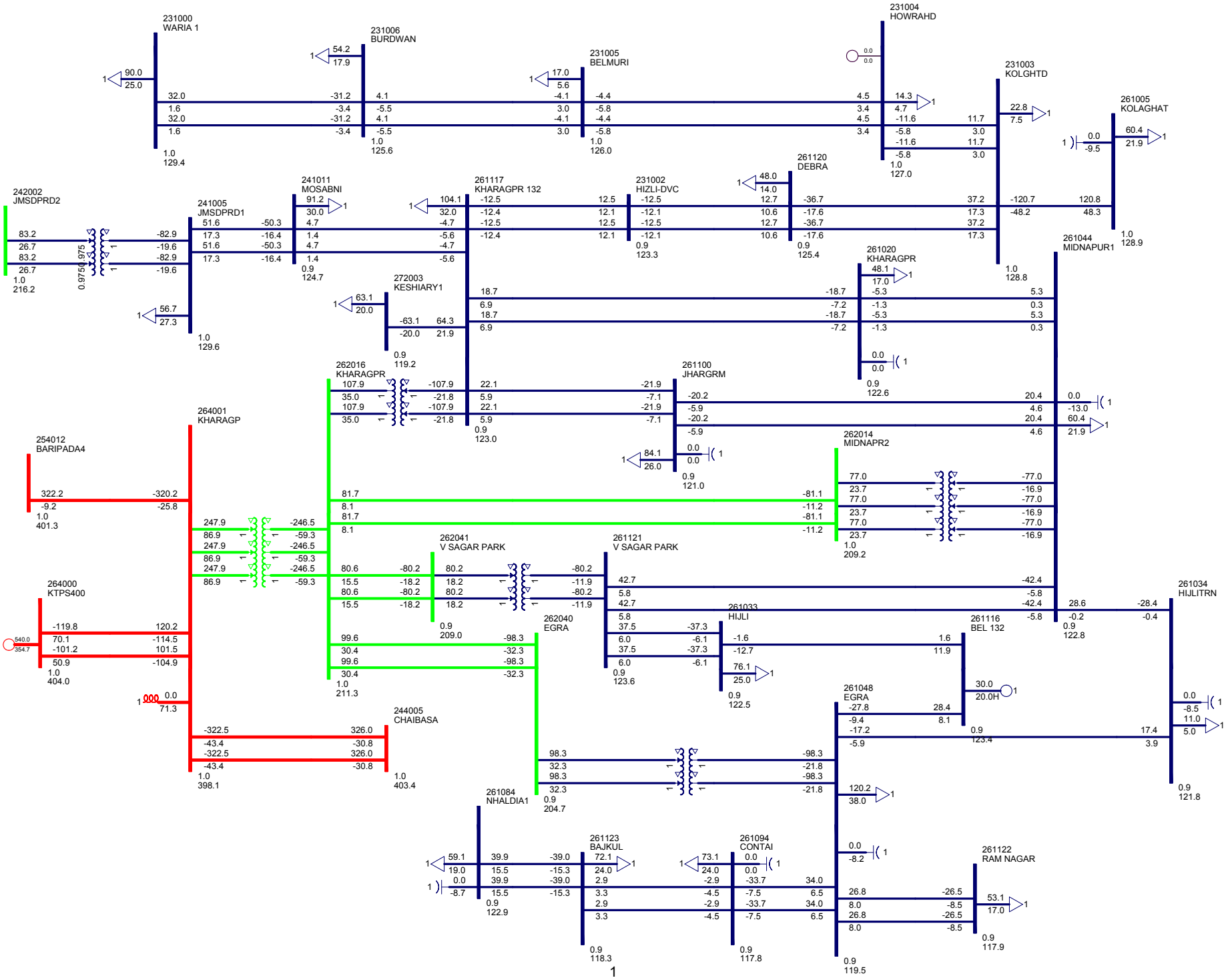
N-1 Contingency of 315 MVA ICT at Kharagpur



Musaboni-Hizlee(DVC) LILO at Kharagpur(WB) Study

Peak LGB considered (year 2018-19) Wb Dem- 8650 MW & Gen- 5600 MW

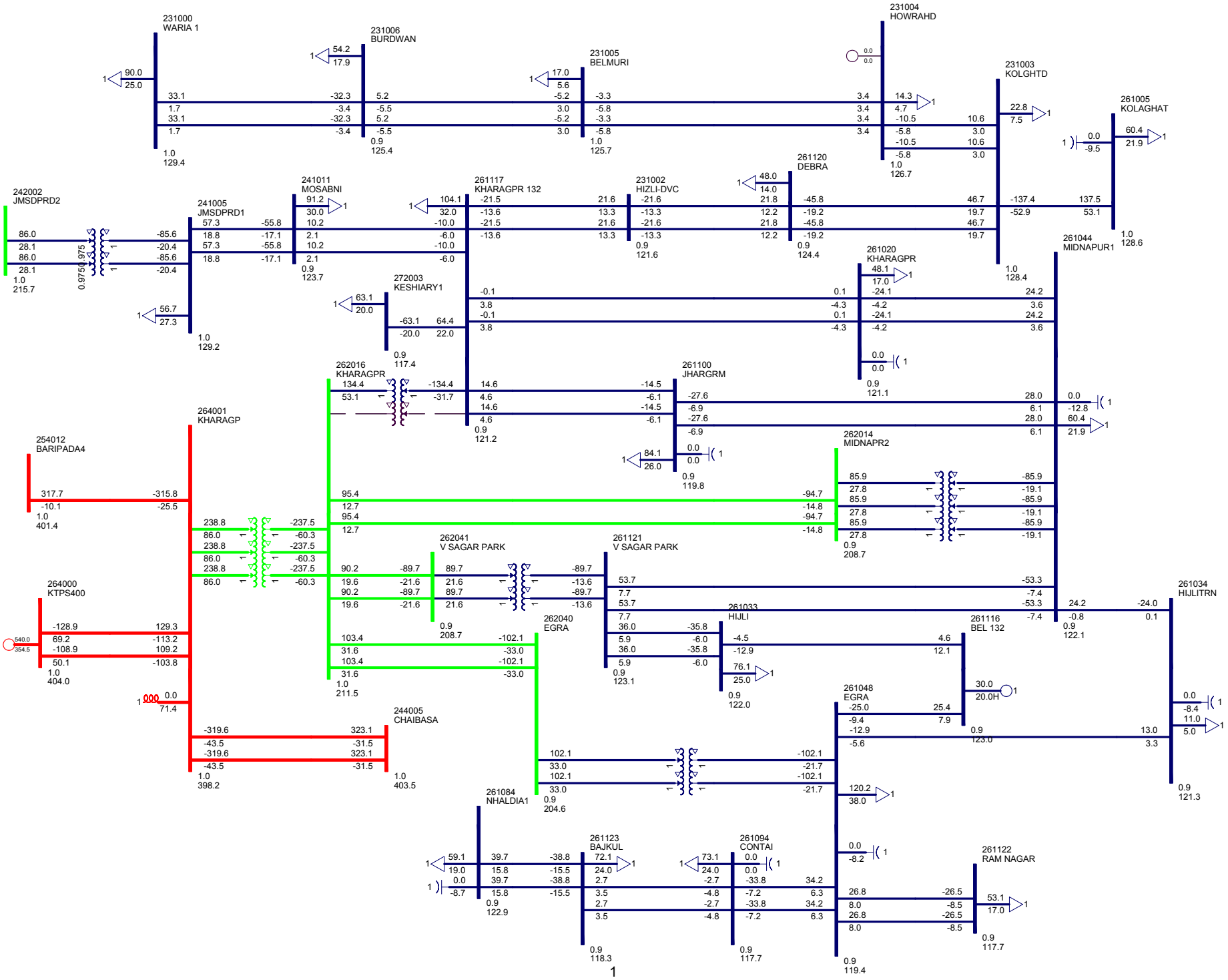
Base case



Musaboni-Hizlee(DVC) LILO at Kharagpur(WB) Study

Peak LGB considered (year 2018-19) Wb Dem- 8650 MW & Gen- 5600 MW

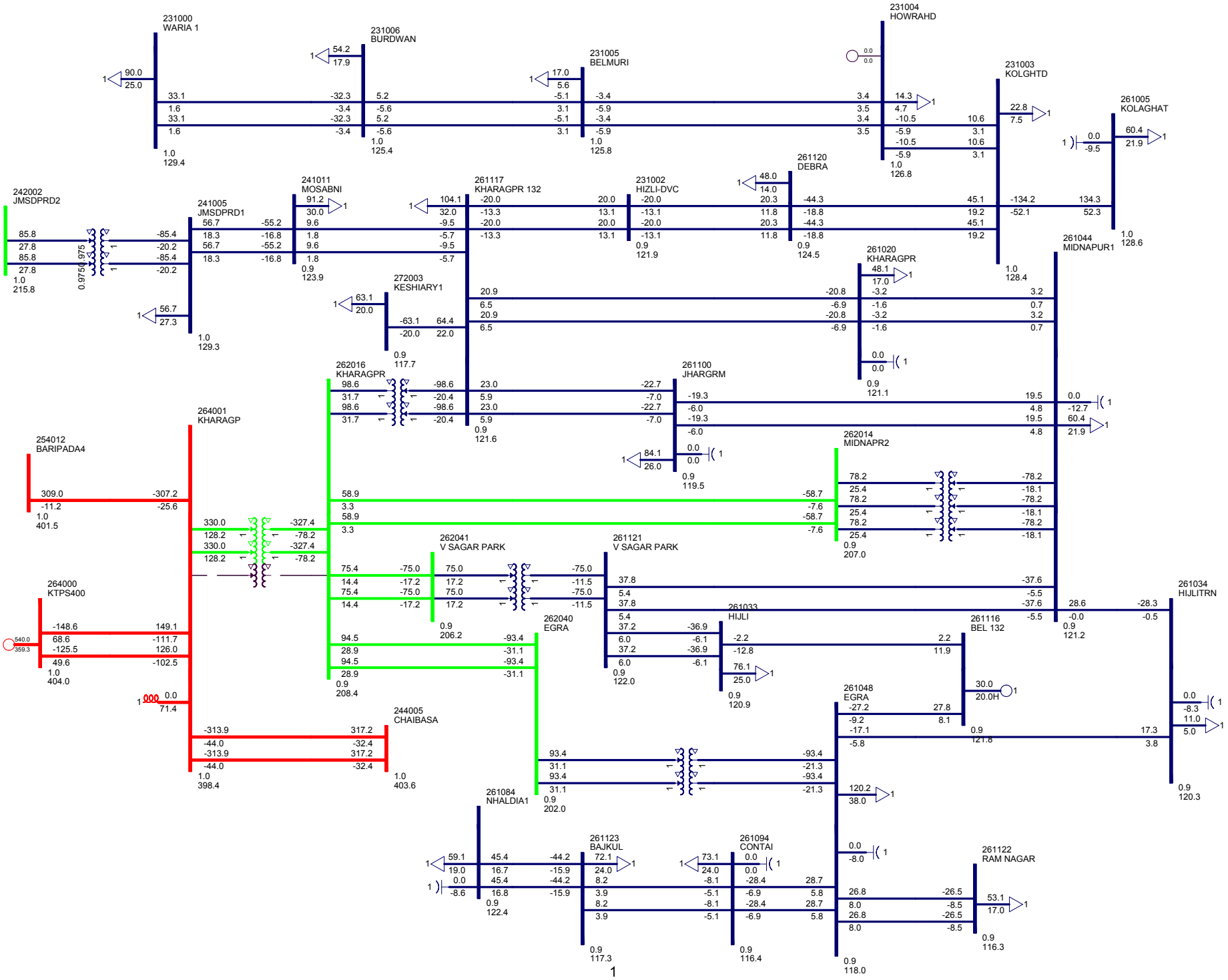
N-1 contingency:- 220/132kV ICT at KGP



Musaboni-Hizlee(DVC) LILO at Kharagpur(WB) Study

Peak LGB considered (year 2018-19) Wb Dem- 8650 MW & Gen- 5600 MW

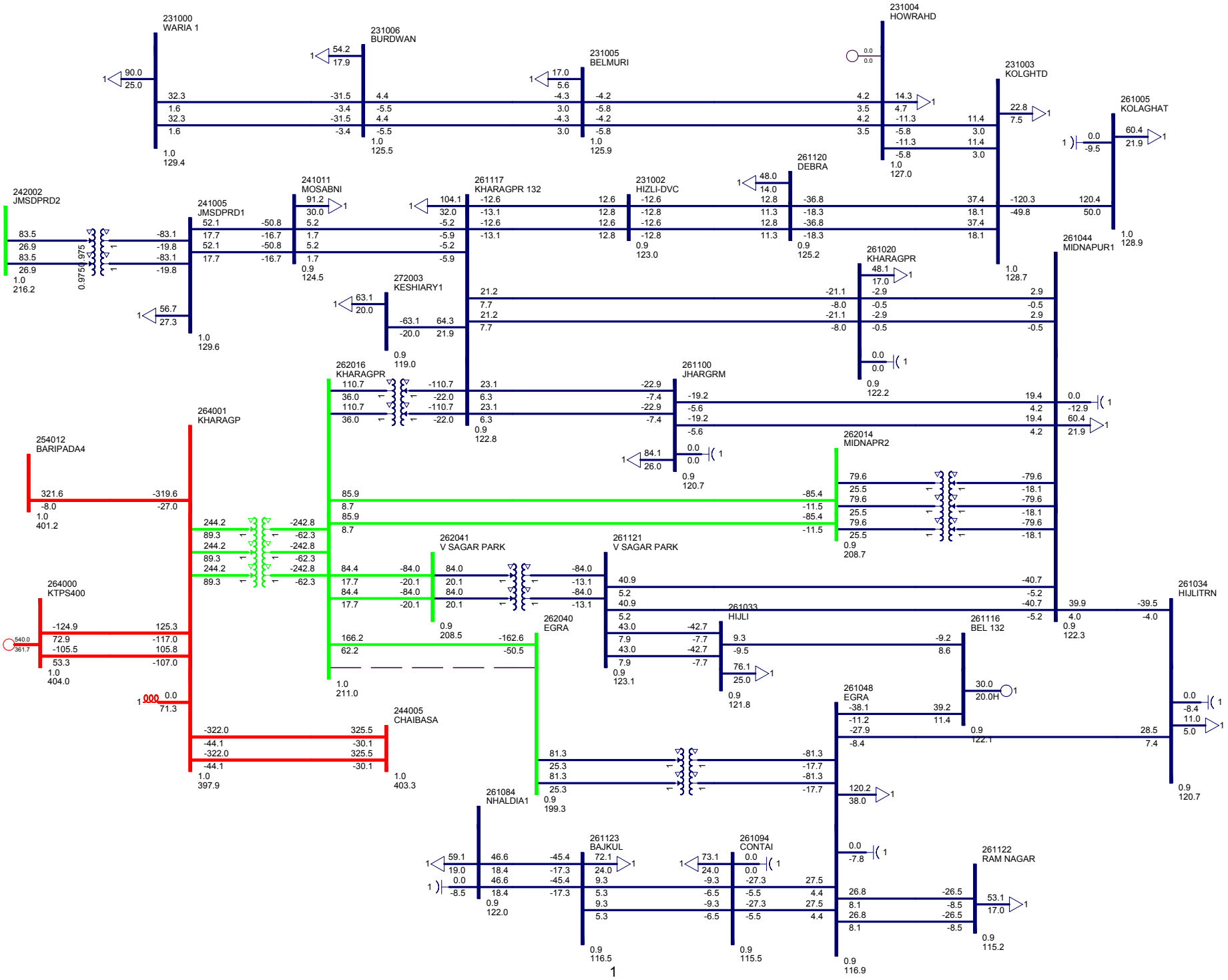
N-1 contingency:-315 MVA ICT at KGP



Musaboni-Hizlee(DVC) LILO at Kharagpur(WB) Study

Peak LGB considered (year 2018-19) Wb Dem- 8650 MW & Gen- 5600 MW

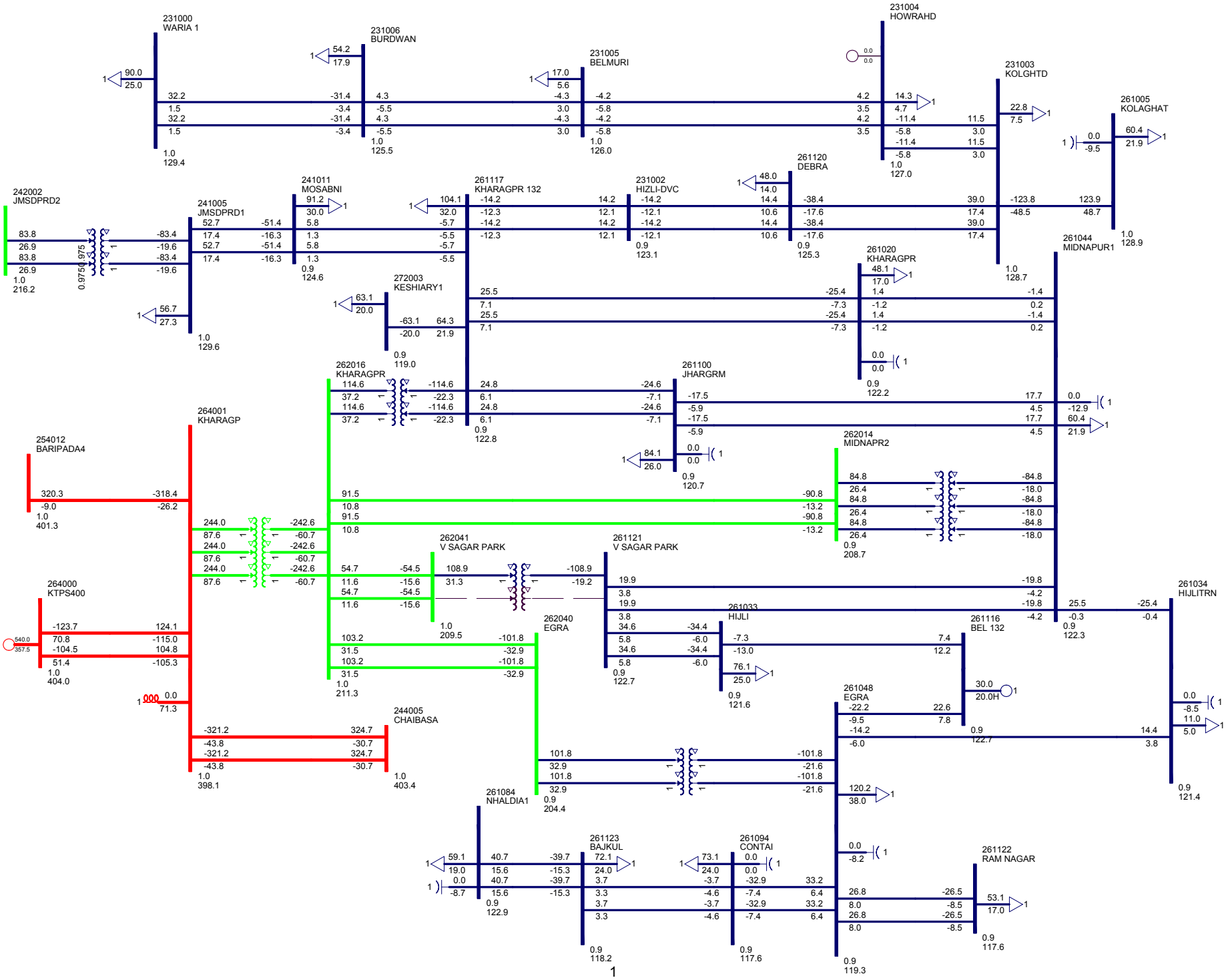
N-1 contingency:-220kV KGP- Egra S/c



Musaboni-Hizlee(DVC) LILO at Kharagpur(WB) Study

Peak LGB considered (year 2018-19) Wb Dem- 8650 MW & Gen- 5600 MW

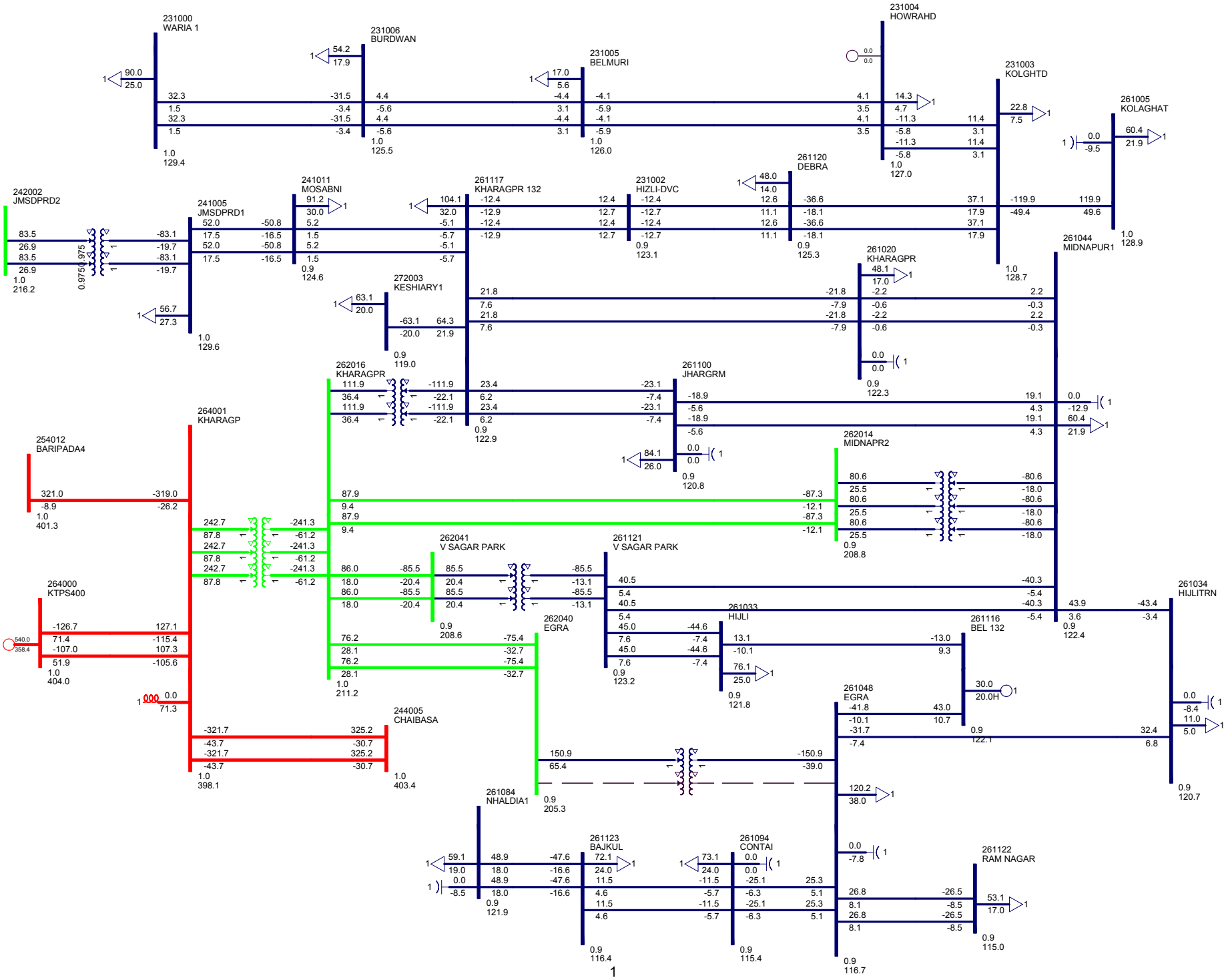
N-1 contingency:-220/132kV ICT at V Sagar



Musaboni-Hizlee(DVC) LILO at Kharagpur(WB) Study

Peak LGB considered (year 2018-19) Wb Dem- 8650 MW & Gen- 5600 MW

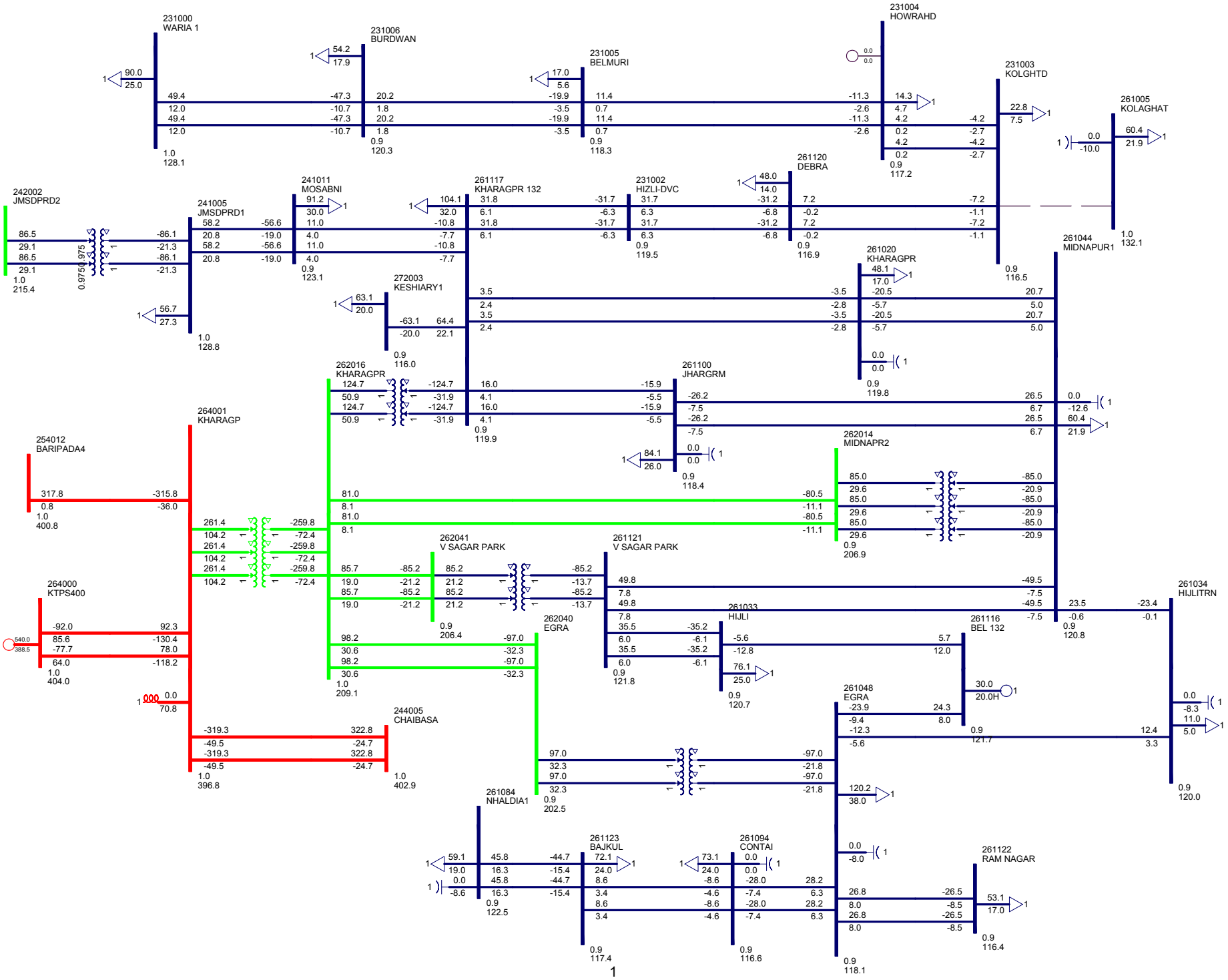
N-1 contingency:-220/132kV ICT at Egra



Musaboni-Hizlee(DVC) LILO at Kharagpur(WB) Study

Peak LGB considered (year 2018-19) Wb Dem- 8650 MW & Gen- 5600 MW

N-1 contingency:-132kV Kolaghat- Kolaghat(D) S/c

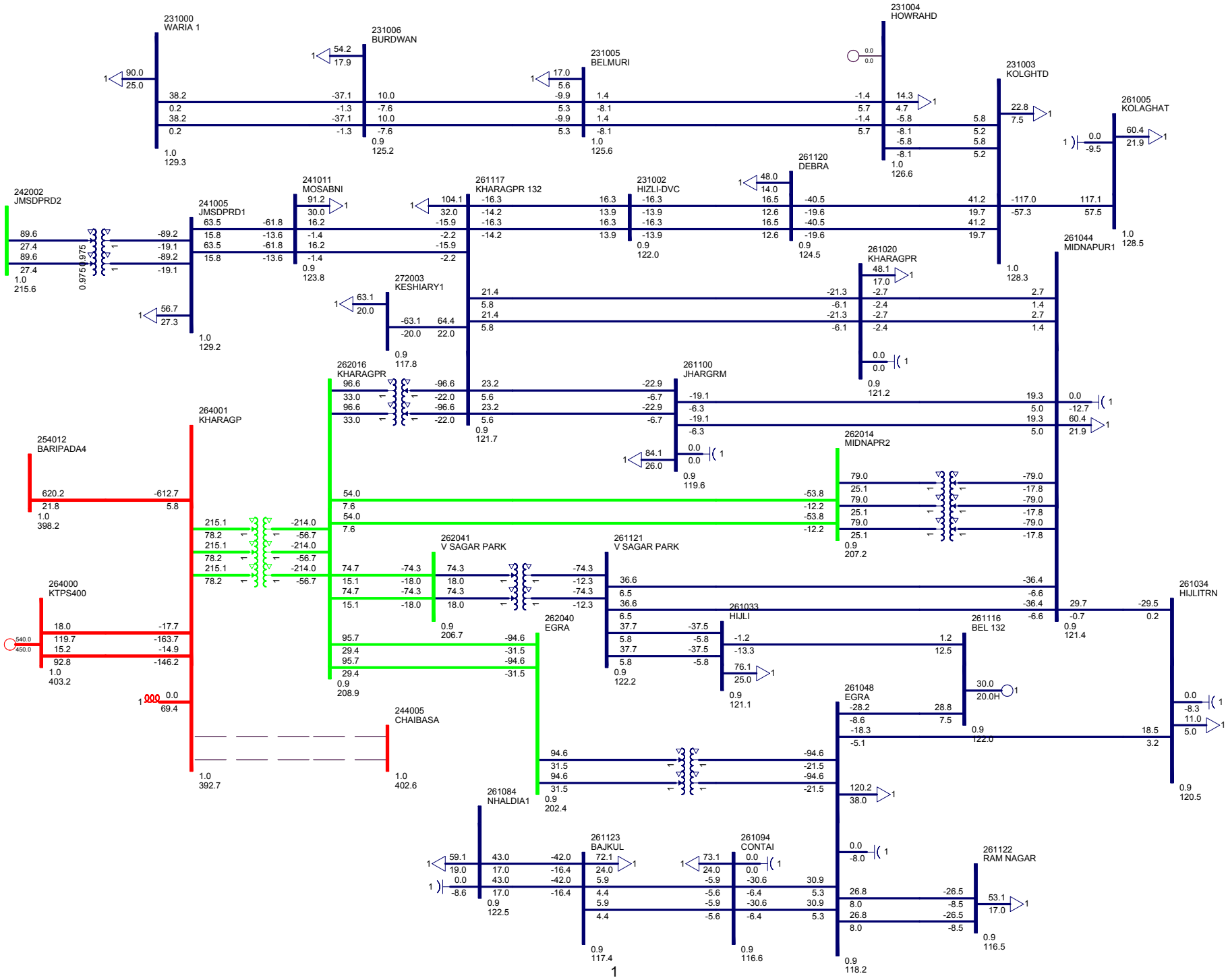


Musaboni-Hizlee(DVC) LILO at Kharagpur(WB) Study

Peak LGB considered (year 2018-19) Wb Dem- 8650 MW & Gen- 5600 MW

400kV KGP- Chaibasa D/C is not in service

Base case

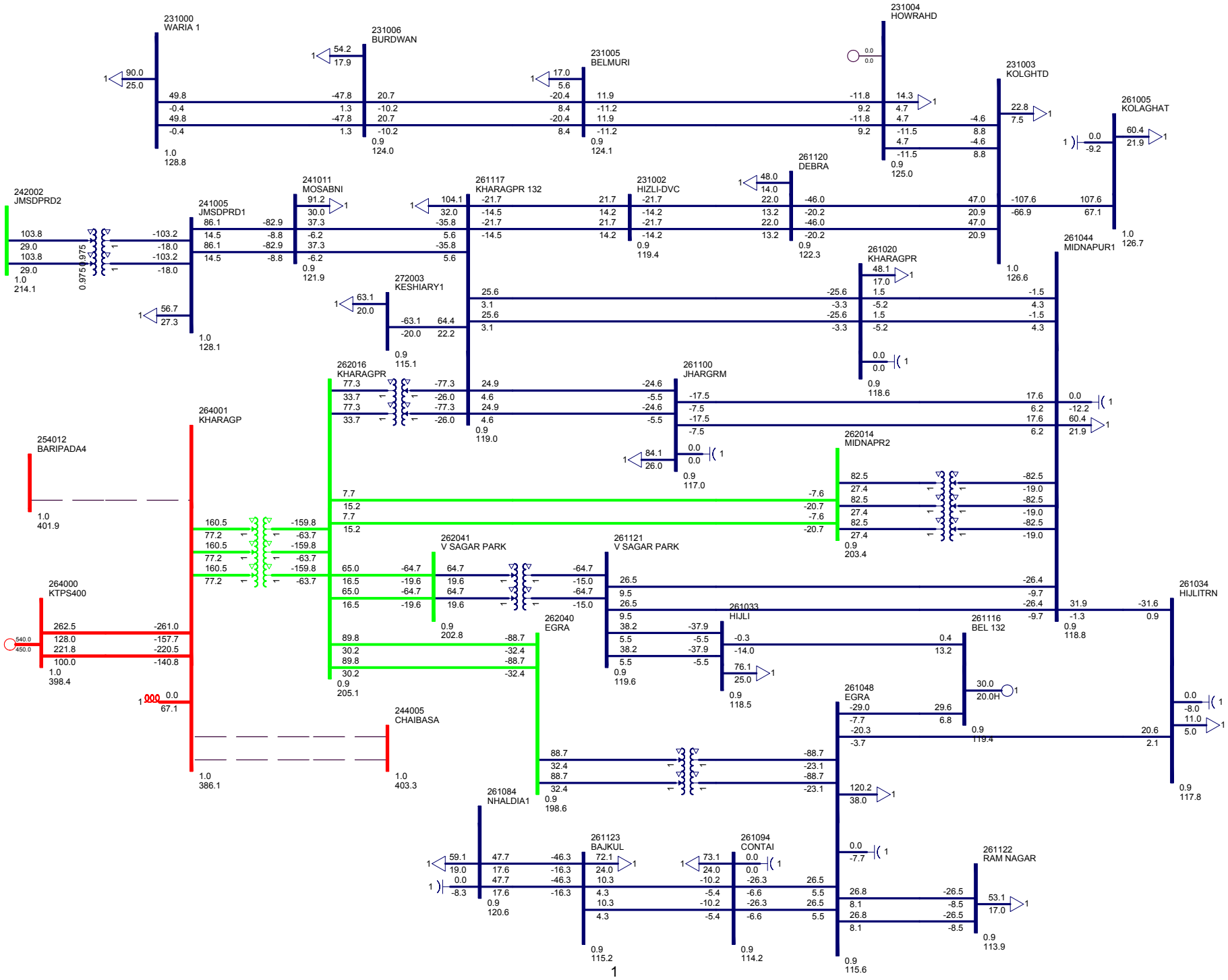


Musaboni-Hizlee(DVC) LILO at Kharagpur(WB) Study

Peak LGB considered (year 2018-19) Wb Dem- 8650 MW & Gen- 5600 MW

400kV KGP- Chaibasa D/C is not in service

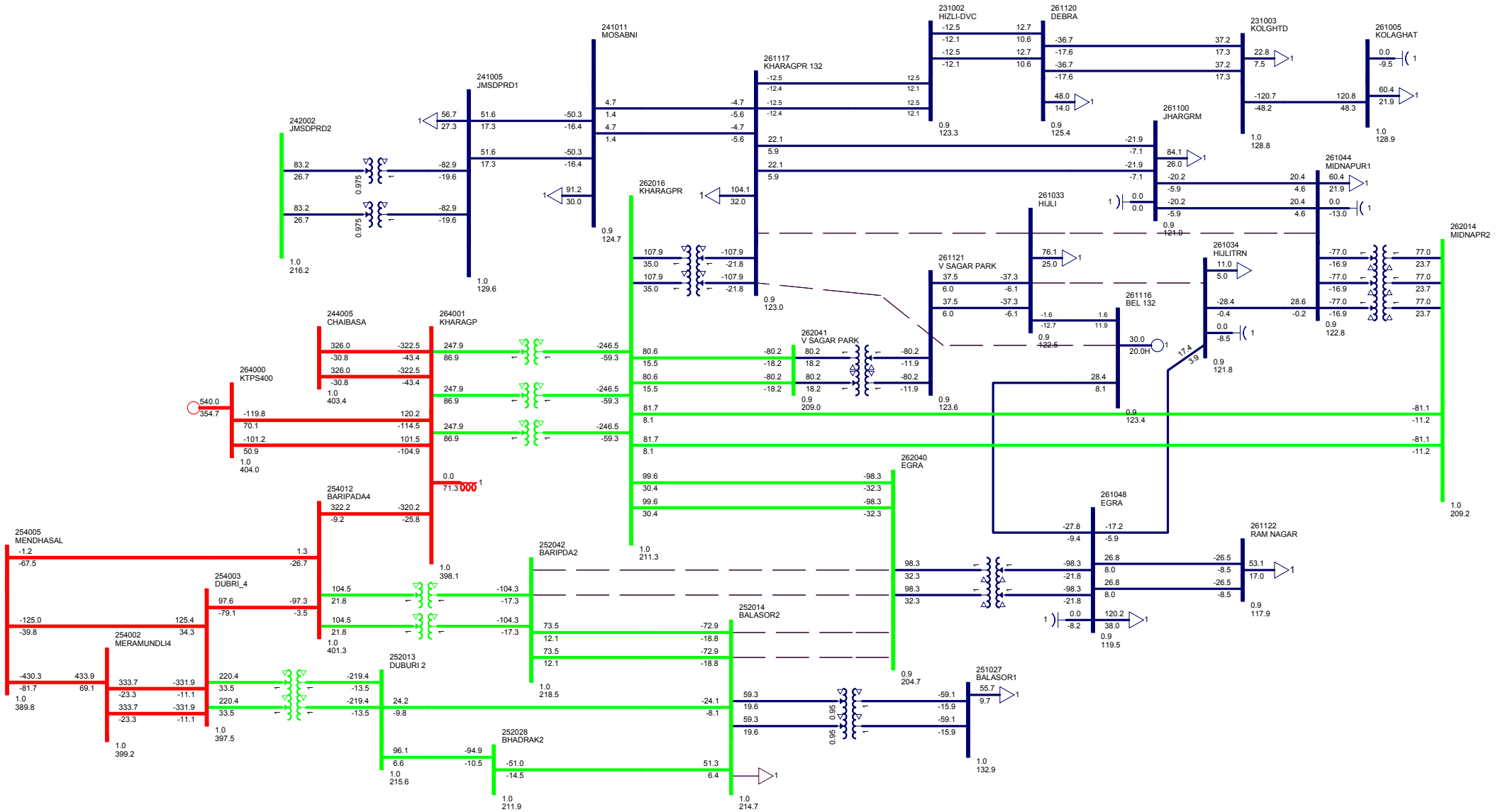
N-1 contingency:-400kV KGP- Baripada S/c



220kV EGRA Study

Peak case :- Gridco Demand- 4350 MW, Gen- 2800 MW West Bengal Demand- 8650 MW , Gen.- 5600 MW

Base Case



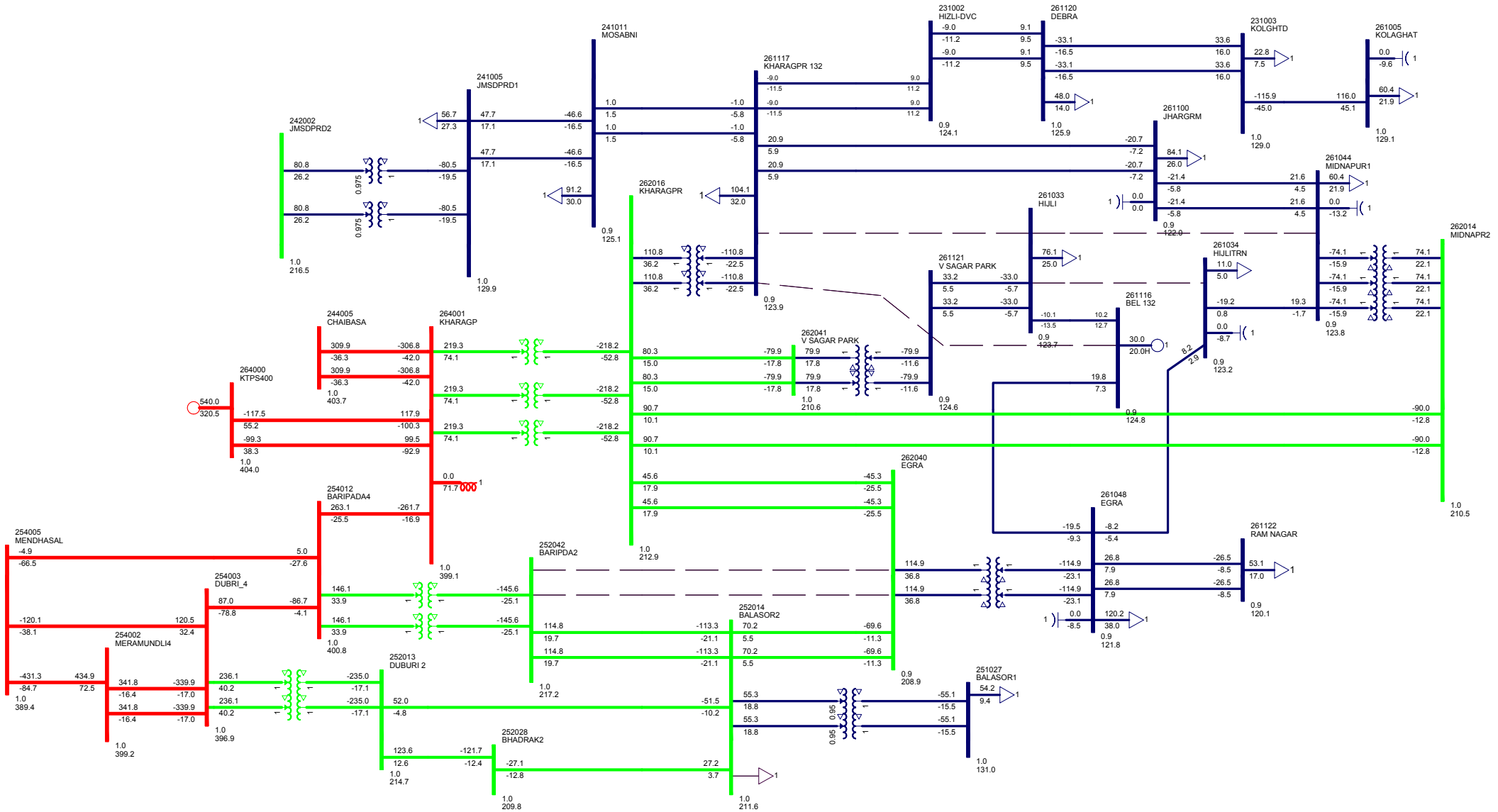
Peak Case

220kV Balsore- Egra D/c is in service

220kV EGRA Study

Peak case :- Gridco Demand- 4350 MW, Gen- 2800 MW West Bengal Demand- 8650 MW , Gen.- 5600 MW

Case:1- 220 kV Balsore- Egra D/c is in service

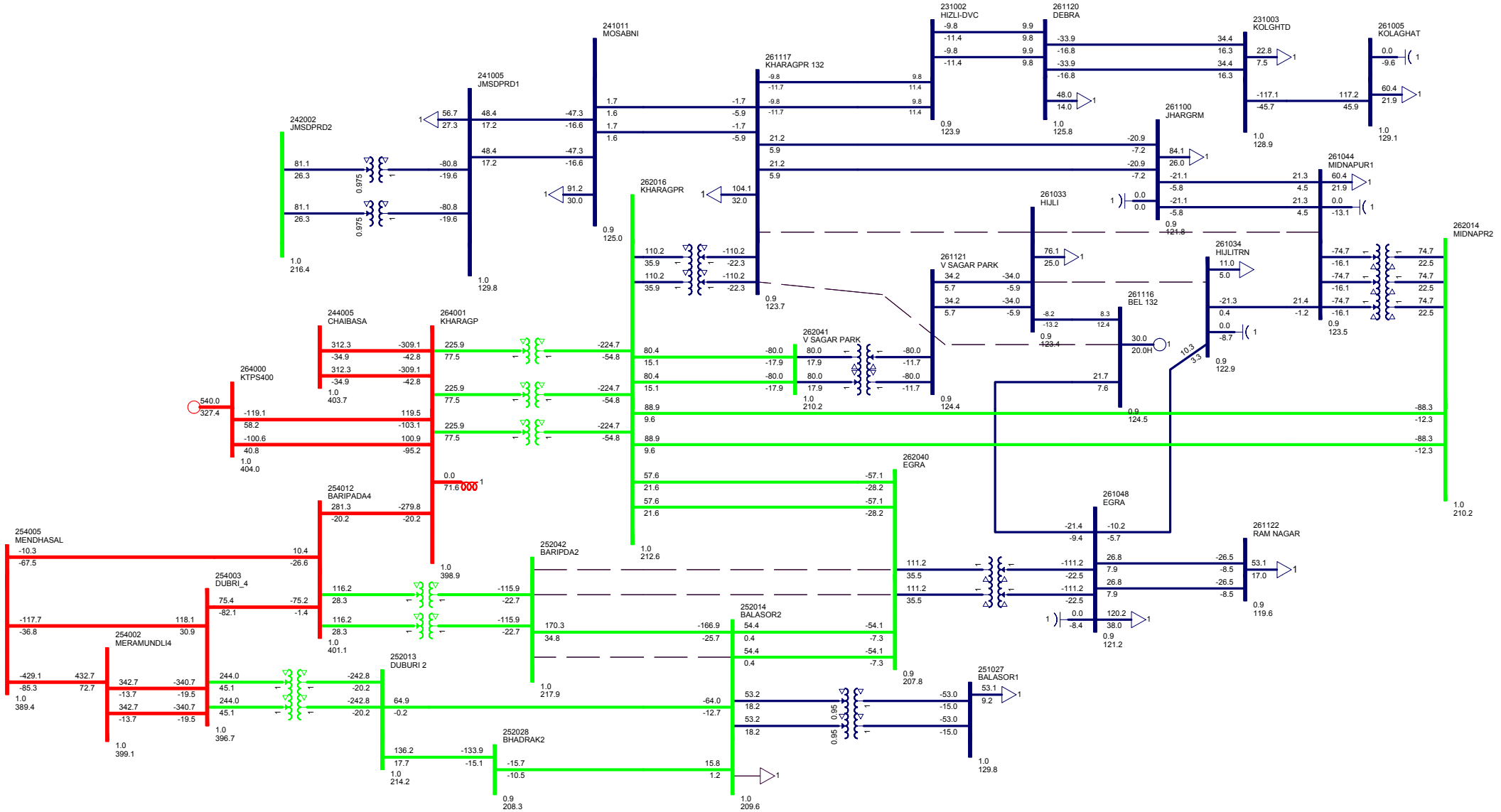


220kV EGRA Study

Peak case :- Gridco Demand- 4350 MW, Gen- 2800 MW West Bengal Demand- 8650 MW , Gen.- 5600 MW

Case:1- 220 kV Balsore- Egra D/c is in service

N-1 contingency:- 220kV Baripada- Balsore S/c

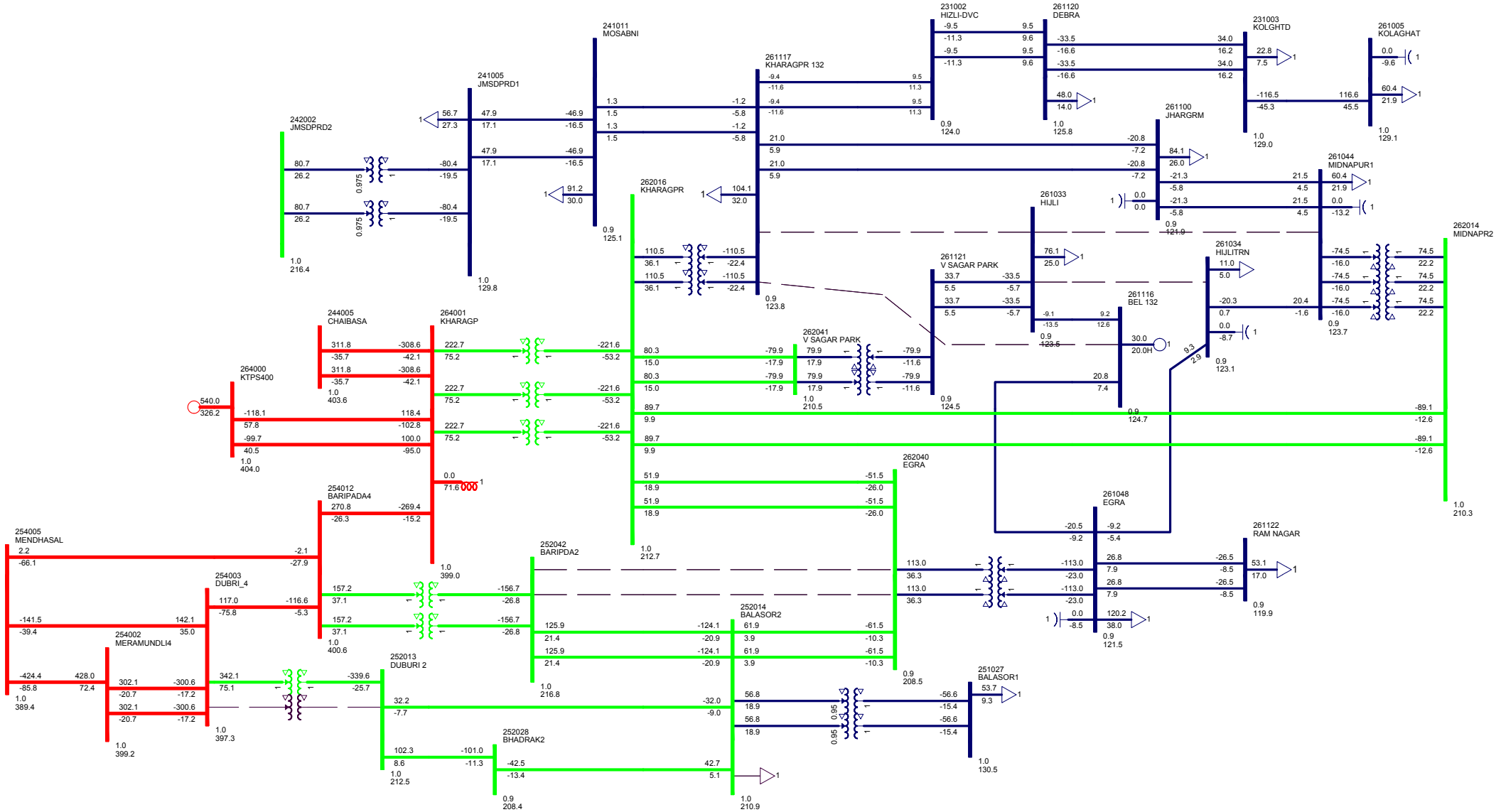


220kV EGRA Study

Peak case :- Gridco Demand- 4350 MW, Gen- 2800 MW West Bengal Demand- 8650 MW , Gen.- 5600 MW

Case:1- 220 kV Balsore- Egra D/c is in service

N-1 contingency:- 315 MVA ICT at N. Duburi

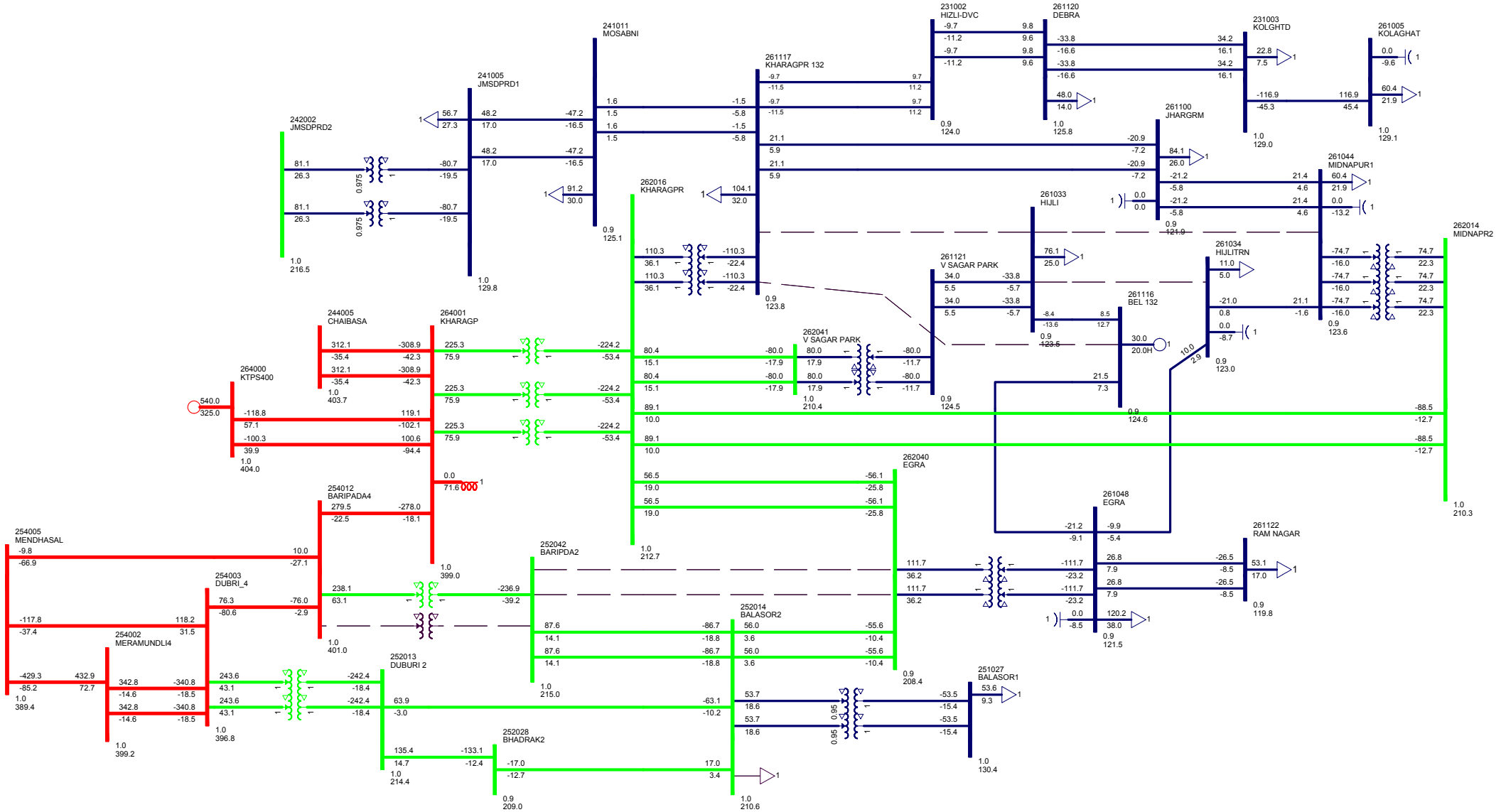


220kV EGRA Study

Peak case :- Gridco Demand- 4350 MW, Gen- 2800 MW West Bengal Demand- 8650 MW , Gen.- 5600 MW

Case:1- 220 kV Balsore- Egra D/c is in service

N-1 contingency:- 315 MVA ICT at Baripada



Peak Case

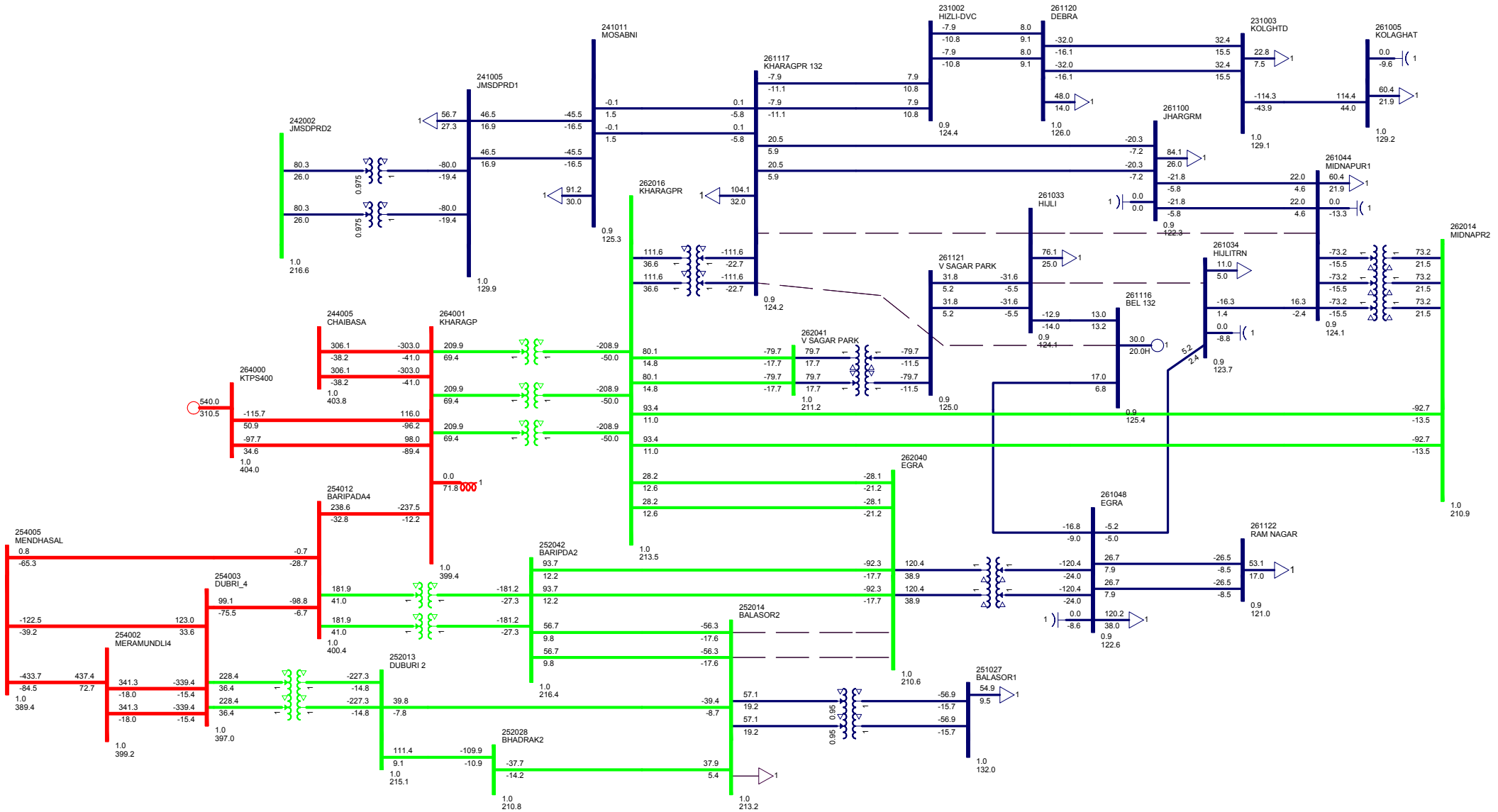
220kV Baripada- Egra D/c is in service

220kV EGRA Study

Peak case :- Gridco Demand- 4350 MW, Gen- 2800 MW West Bengal Demand- 8650 MW , Gen.- 5600 MW

Case:2- 220 kV Baripada- Egra D/c is in service

Base Case

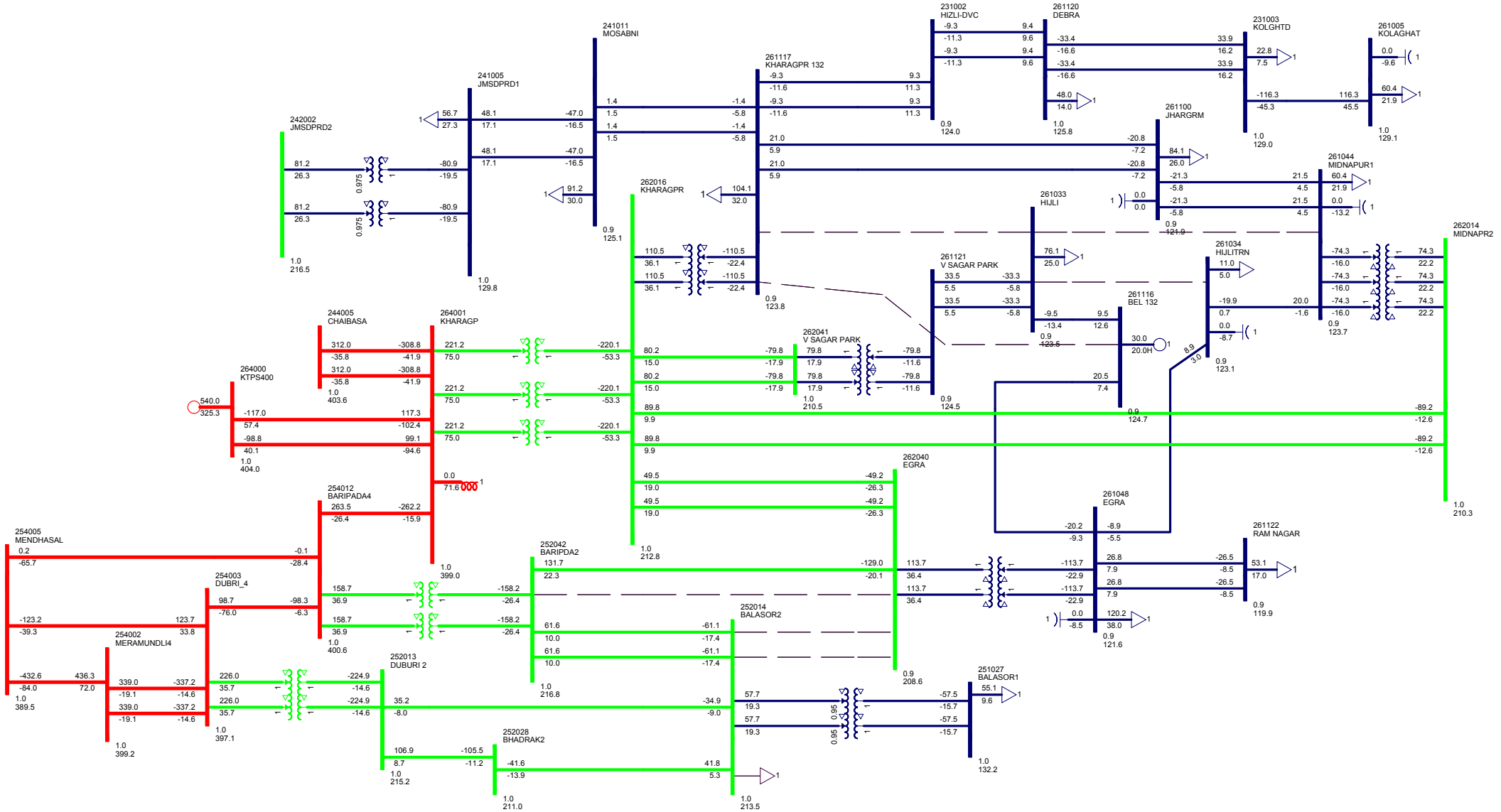


220kV EGRA Study

Peak case :- Gridco Demand- 4350 MW, Gen- 2800 MW West Bengal Demand- 8650 MW , Gen.- 5600 MW

Case:2- 220 kV Baripada- Egra D/c is in service

N-1 contingency:- 220kV Baripada- Egra S/c

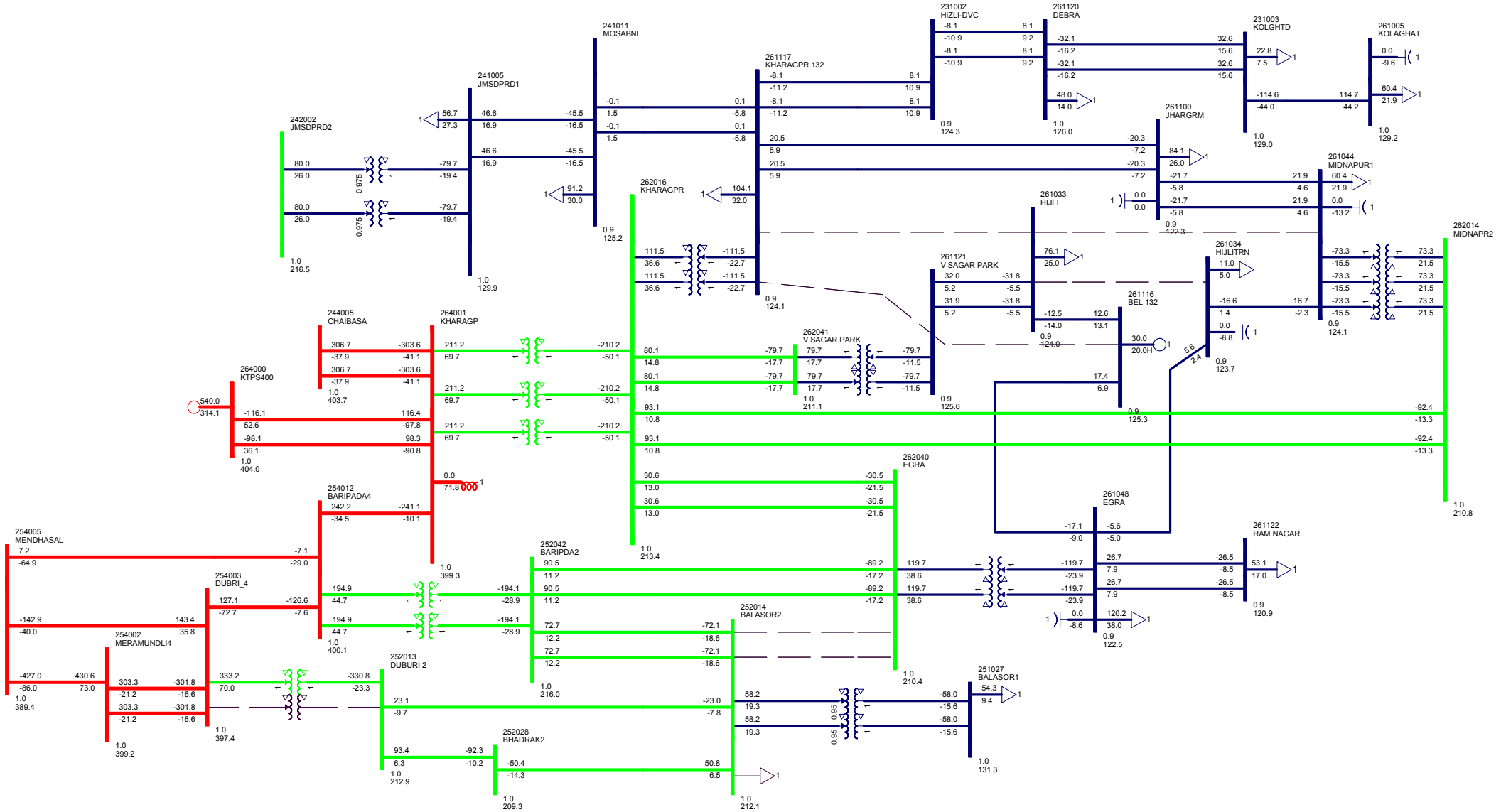


220kV EGRA Study

Peak case :- Gridco Demand- 4350 MW, Gen- 2800 MW West Bengal Demand- 8650 MW , Gen.- 5600 MW

Case:2- 220 kV Baripada- Egra D/c is in service

N-1 contingency:- 315 MVA ICT at N. Duburi

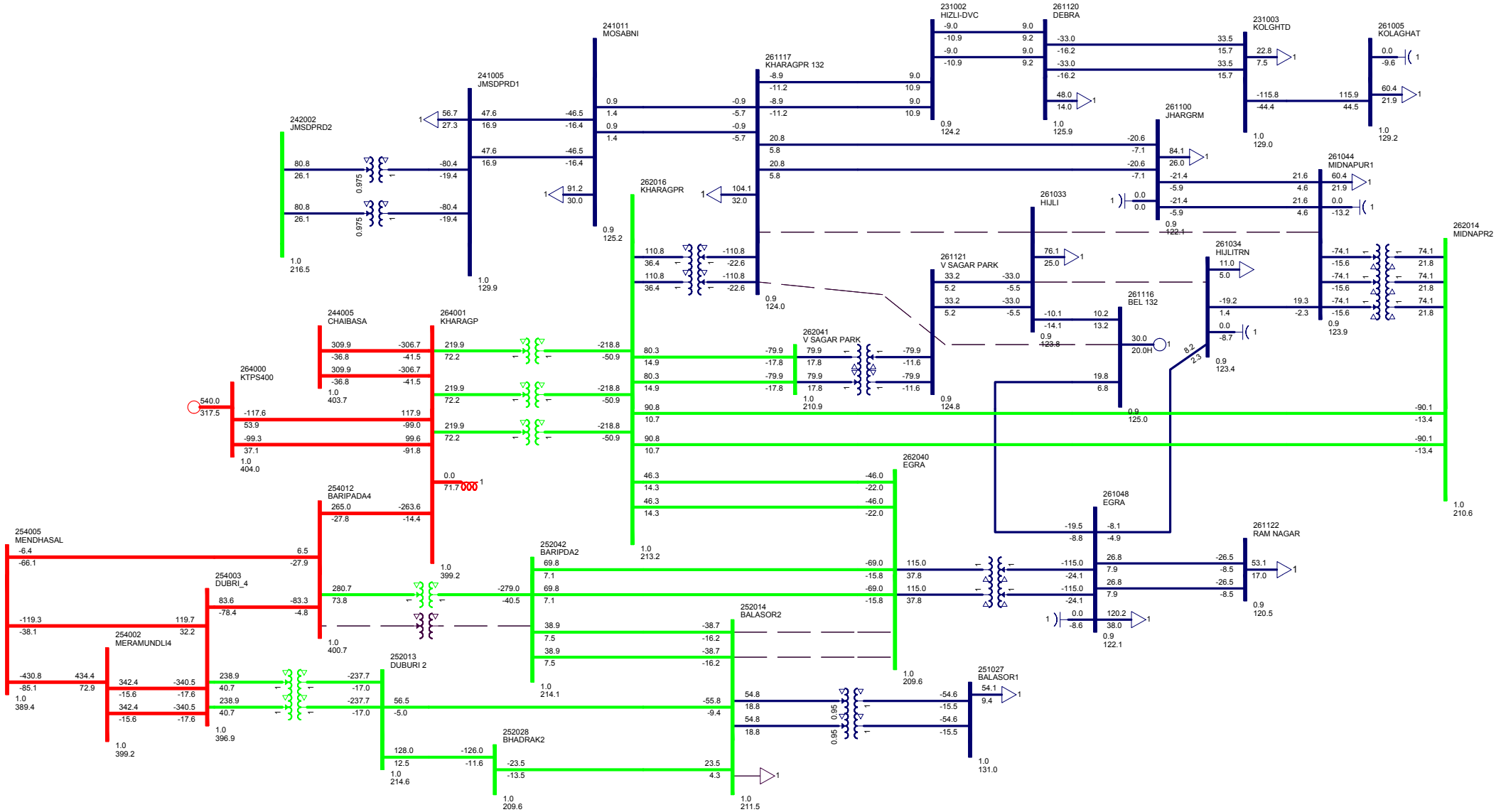


220kV EGRA Study

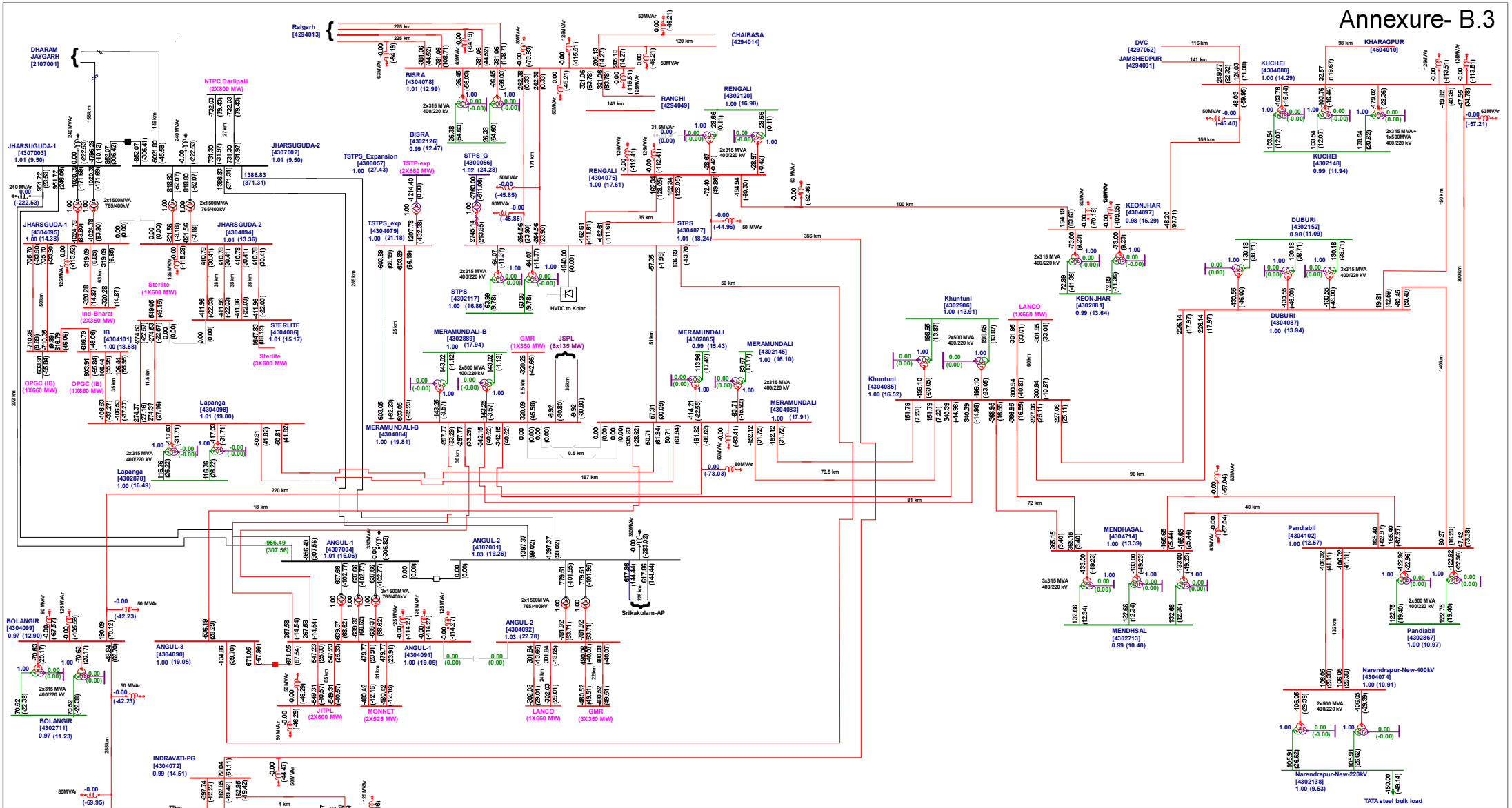
Peak case :- Gridco Demand- 4350 MW, Gen- 2800 MW West Bengal Demand- 8650 MW , Gen.- 5600 MW

Case:2- 220 kV Baripada- Egra D/c is in service

N-1 contingency:- 315 MVA ICT at Baripada



Annexure- B.3



Bus Voltage	Colour code
765 kV	
400 kV	
220 kV	
33 kV	

Display Notation
Injection into the bus : +ve
Drawl away from the bus : -ve
Voltage Mag(//Ang) in PU /degree
Flows in MW and (Mvar)

DESCRIPTION	REV	DATE:	REMARKS
LFA	R6	14.01.2016	
LFA	R5	13.01.2016	
LFA	R4	12.01.2016	
LFA	R3	12.01.2016	
LFA	R2	11.01.2016	
LFA	R1	07.12.2015	
LFA	R0	05.10.2015	

APPROVED	REVEIWED	CHECKED	DRAWN

Load Flow Study Results - Case study

Single line diagram of 765kV and 400kV transmission network - Odisha State 2018-19 condition

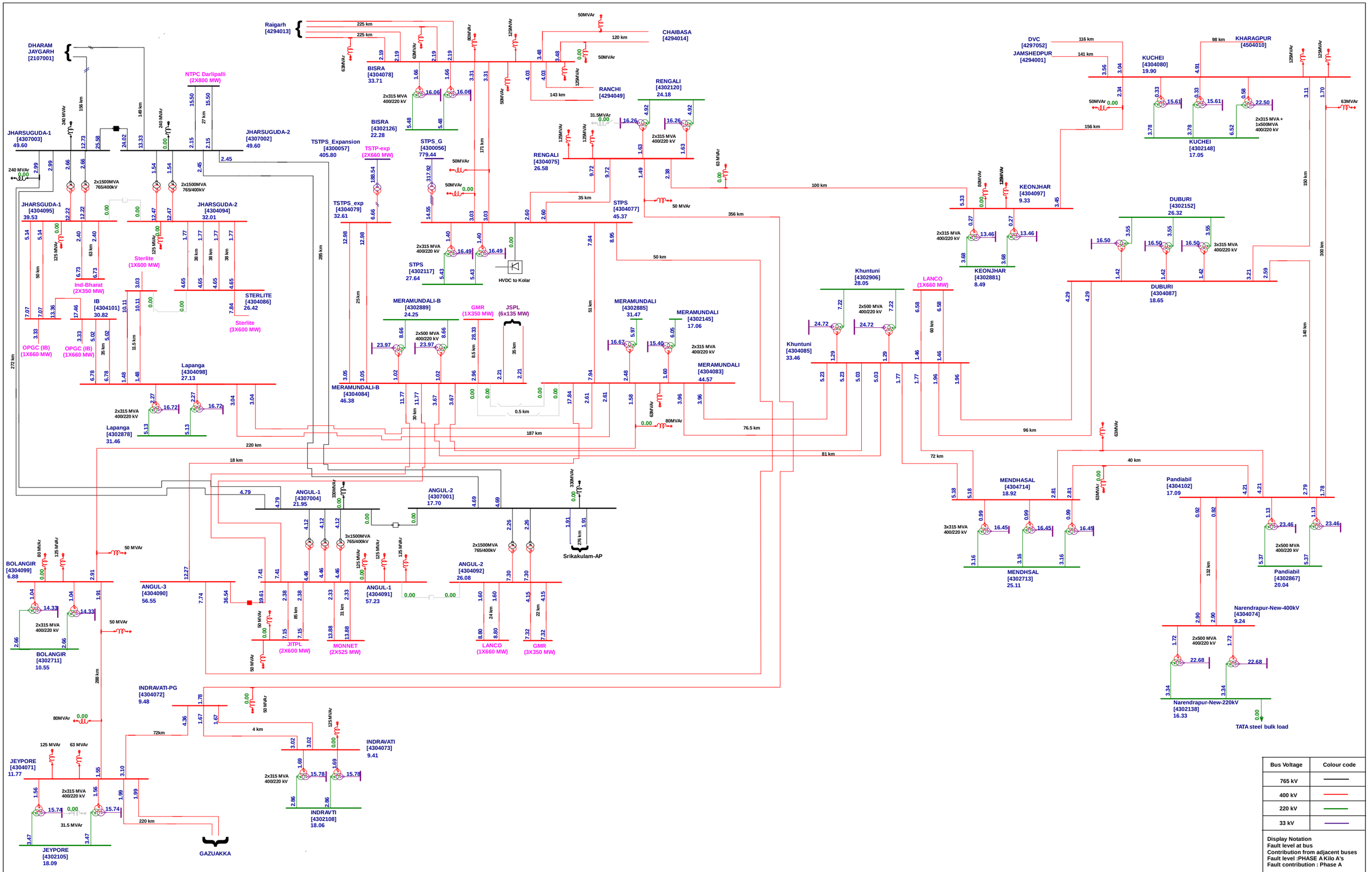
Orissa Power Transmission Corporation Ltd.,
Registered Office: Janpath,
Bhubaneshwar-751022
Phone: (0674)-2541320/2542320

Power Research & Development Consultants Pvt. Ltd.,
#5, 11th Cross, 2nd Stage,
West of Chord Road,
Bangalore- 560086, INDIA
Ph : +91-080-2319 2209,2199
Fax: +91-080-2319 2210
E-mail : prdc@vsnl.com

PO details: CP-12/2015/10043(8)/epc dated 17 October 2015.

DRAWN IN : MiPower™

DWG. NO : LFA\2018-19\765-400kV-Case study



Bus Voltage	Colour code
765 kV	
400 kV	
220 kV	
33 kV	

Display Notation
Fault level at bus
Contribution from adjacent buses
Fault level :PHASE A Kilo A's
Fault contribution : Phase A

				DESCRIPTION	REV	DATE:	REMARKS
				SCS	R6	14.01.2016	
				SCS	R5	13.01.2016	
				SCS	R4	12.01.2016	
				SCS	R3	12.01.2016	
				SCS	R2	11.01.2016	
				SCS	R1	07.12.2015	
				SCS	R0	05.10.2015	
APPROVED	REVEIWED	CHECKED	DRAWN				

Short circuit study results - Case study

Three phase to ground fault in kA.

Single line diagram of 765kV and 400kV transmission network - Odisha State 2018-19 condition

Orissa Power Transmission Corporation Ltd.,
Registered Office: Janpath,
Bhubaneshwar-751022
Phone: (0674)-2541320/2542320

PO details: CP-12/2015/10043(8)/epc dated 17 October 2015.

Power Research & Development Consultants Pvt. Ltd.,
#5, 11th Cross, 2nd Stage,
West of Chord Road,
Bangalore- 560086, INDIA
Ph : +91-080-2319 2209,2159
Fax: +91-080-2319 2210
E-mail : prdc@vsnl.com

DRAWN IN : MiPower™

DWG. NO : SCS-3PHG\2018-19\765-400kV-Case study

Annexure - B7

137

Tie line of Bihar with neighbouring State/utilities					
Sl no.	Tie-line	State-I	State-II	Flow of Power Quantam	Remarks
1	**132 KV level**				
i	Karmnasha-Shahpuri	Bihar	UP	Less than 50%	Sometimes on Emergency
ii	Karmnasha-Chandauli	Bihar	UP	Less than 50%	Sometimes on Emergency
iii	Sonenagar-Rihand	Bihar	UP	Less than 50%	Sometimes on Emergency
iv	Gharwa-Sonenagar	Bihar	Jharkhand	More than 50%	.....
v	Sabour-Lalmatia	Bihar	Jharkhand	Less than 50%	Sometimes. Drawn by Jharkhand.
vi	Biharsharif-Barhi	Bihar	~~Jharkhand~~ (DVC)	More than 50%	.....
vii	Sultanganj-Deoghar	Bihar	Jharkhand	Less than 50%	Sometimes on Emergency
2	**220 KV level**				
i	TTPS-Bihasharif	Bihar	Jharkhand	More than 50%	.....

Bihar Tr. system connected with:—

1. PGCIL Sub-station:—(i) 400/220 KV → Purnea, Muzaffarpur, Pusauli Biharsarif, Patna, Gaya

(ii) 400/132 → Banka, Lakhisarai

(iii) 220/132 → Ara, Purnea

2. KhSTPS (NTPC) — one 132KV two (S/C) tr line
3. Jharkhand —
4. DVC —
5. UP. —

} Details given above

Report for Meeting on Status of Downstream Projects of Daltonganj and Chaibasa Substation to be Held on 21.09.2015 at 15:00 hrs. at ERPC , Kolkata

Power evacuation from 400/220 kV Daltonganj Grid Sub-Station (item No. 14 of records of discussion of 17th SCMPSP of ER)

Proposal of JUSNL (Jharkhand Urja Sancharan Nigam Limited) for provision of 220/132 kV Auto transformer in proposed 400/220 kV GSS of M/s POWERGRID at Daltonganj with provision of 02 nos. 132 kV bays for JUSNL

JUSNL has informed that due to land acquisition constraints at Daltonganj, it is not possible to create 220 kV level at Daltonganj. POWERGRID is constructing 2x315 MVA 400/220 kV S/S at Daltonganj. JUSNL has requested to provide 2x160 MVA 220/132 kV Auto transformer in the Daltonganj 400 kV S/S of POWERGRID along with necessary 132 kV bays. The existing 220 kV D/C Latehar – Daltonganj transmission line (presently charged at 132 kV level) of JUSNL is passing nearby Daltonganj of POWERGRID. JUSNL has proposed that line from Latehar to Daltonganj will be LILO at Daltonganj (PG) in such a way Daltonganj (PG)-Latehar would be operated at 220 kV and Daltonganj (PG)- Daltonganj (JUSNL) would be operated at 132 kV. JUSNL has also informed that they are constructing 220/132kV Garhwa Rd. S/S as well as Daltonganj Garwah Rd. 220kV line which would now be connected at Daltonganj (PG) substation.

Taking care of the reliability aspect of 220/132 kV ICT at Daltonganj, the following was proposed :
a) 2x160 MVA, 220/132 kV Auto transformer at Daltonganj substation along with 4 number of 132 kV line bays (under the scope of POWERGRID)
b) LILO of Daltonganj (JUSNL)-Latehar 220kV D/c (operated at 132kV) line of JUSNL at Daltonganj (PG) so that Daltonganj (PG)-Latehar D/c would be operated at 220 kV and Daltonganj (PG)-Daltonganj (JUSNL) would be operated at 132 kV. (Scope of JUSNL)
c) Daltonganj (PG) –Garwa Rd. 220kV D/c line along with 220/132kV S/s at Garwa Rd. (Scope of JUSNL)

Director (Projects), BSPTCL stated that cost of 220/132 kV ICT and associated bays should be borne by Jharkhand, as Jharkhand is the sole beneficiary**.** AGM, POWERGRID said that ISTS sub-stations are created for the drawl of power by the state and because of land acquisition constraint,
JUSNL is not able to construct 220/132 kV sub-station at Daltonganj.

CE (Trans), JUSNL informed that following transmission would be constructed by JUSNL for drawl of power at 220 kV and 132 kV level from Daltonganj (PG).
a) Daltonganj (PG)-Latehar (JUSNL) 220 kV D/C
b) Daltonganj (PG)-Garwa (JUSNL) 220 kV D/C
c) Daltonganj (PG)-Daltonganj (JUSNL) 132 kV D/C
d) Daltonganj (PG)-Chatrapur / Lesliganj (JUSNL) 132 kV D/C

After, further discussion, it was agreed to create 132 kV level at Daltonganj (PG) along with 2x160 MVA 220/132 kV ICT and 4 no. 132 kV line bays by POWERGRID as a part of Easter Region strengthening scheme-17 (ERSS-17).

In view of above land for 220/132KV GSS at Garhwa is being identified and the project has been included in 24x7 Power for all scheme.

Power evacuation from 400/220 kV Chaibasa Grid Sub-Station

Construction of 220/132/33 kV GSS at Chaibasa is already in progress & likely to be completed soon. This scheme is under consultancy projects awarded to M/s PGCIL Under Jharkhand Consultancy Project , under the same project following Transmission line is being constructed and status is as mentioned below:-

- 220KV D/C Chaibasa(JUSNL) to Chaibasa(PGCIL) Transmission line, -
  This transmission line has been completed only dead end terminations is to be done
- LILO of 220KV S/C Ramchanderpur-Joda Transmission line at 220/132/33KV GSS Chaibasa
  Completed
- 220KV Ramchanderpur-Chaibasa transmission line
  Foundation 111/130, Erection – 110/130 and Stringing 18.41/38Km Completed

For power evacuation at 132 kV level, following transmission lines are under construction by PGCIL under Jharkhand Consultancy from 220/132/33 kV GSS at Chaibasa:

a) 132 kV D/C, 3 phase Chaibasa – Manoharpur transmission line
   Foundation 295/337, Erection – 295/337 and Stringing 31.59/96Km Completed

b) 132 kV D/C, 3 phase Manoharpur – Simdega transmission line
   Foundation 280/319, Erection – 271/319 and Stringing 26.17/96Km Completed

For evacuation at 33KV Level one No. 33KV Feeder of 20MW load capacity has already been completed and another 2No. 33KV feeder is being constructed by JBVNL , which is likely to be completed within 45Days.

Also JUSNL have planned to construct following 132 kV D/C, 3 phase transmission line from 220/132/33 kV GSS at Chaibasa:

a) 220 kV D/C, 3 phase Chaibasa – Gua transmission line (SAIL DEPOSIT WORK).

Agenda has been approved BoD , JUSNL and requisition of fund has been made from M/s SAIL .

b) 132 kV D/C, 3 phase Chaibasa – Chakradharpur transmission line

b) 132 kV D/C, 3 phase Chaibasa – Noamundi transmission line

c) 132 kV D/C 3 Ph. Chaibasa -Rajkharsawan line with construction of 132 kV bay at 132/33 kV Rajkharsawan grid.

d) LILO of one Ckt Of 132 KV D/C 3 ph Noamundi- Chaibasa Transmission Line at132/33 KV GS/S Kendposi including with 2 nos. of 132 kV bay.

e) LILO of one Ckt Of 132 KV D/C 3 ph Chaibasa - Manoharpur Transmission Line at 132/33 KV GS/S at Goelkera including with 2 nos. of 132 kV bay.

Scheme from Sl. No. (b) to (f) could not be taken in financial year 2015-16 due to non-availability of fund from State Govt./ other sources. Efforts are being made to get funds from World Bank and other Financial institutions to implement these projects under 24x7 , Power for all . After availability of fund these scheme will be taken in financial year 2016-17 and onwards.