Agenda
for
73rd PCC Meeting

Date: 29.11.2018
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

AGENDA FOR 73RD PROTECTION SUB-COMMITTEE MEETING TO BE HELD AT ERPC, KOLKATA ON 29.11.2018 (THURSDAY) AT 10:30 HOURS

PART – A

ITEM NO. A.1: Confirmation of minutes of 72nd Protection sub-Committee Meeting held on 29th October, 2018 at ERPC, Kolkata.

The minutes of 72nd Protection Sub-Committee meeting held on 29.10.18 circulated vide letter dated 14.11.18.

Members may confirm the minutes of 72nd PCC meeting.

PART – B

ANALYSIS & DISCUSSION ON GRID INCIDENCES OCCURRED IN OCTOBER, 2018

ITEM NO. B.1: Tripping of 400 kV Rangpo-Binaguri-I and subsequent operation of SPS-I on 01.10.18 at 15:41 hrs.

At 15:41 hrs, 400 kV Binaguri - Rangpo - I tripped on high resistance R-N fault resulting operation of SPS - I at Rangpo. The operation of SPS-I led to tripping of running units at Teesta III, Dikchu, Jorethang, Chujachen and Tashiding HEP. Back up E/F operated at Rangpo end to clear the fault.

Generation Loss: 856 MW

Relay Indication:

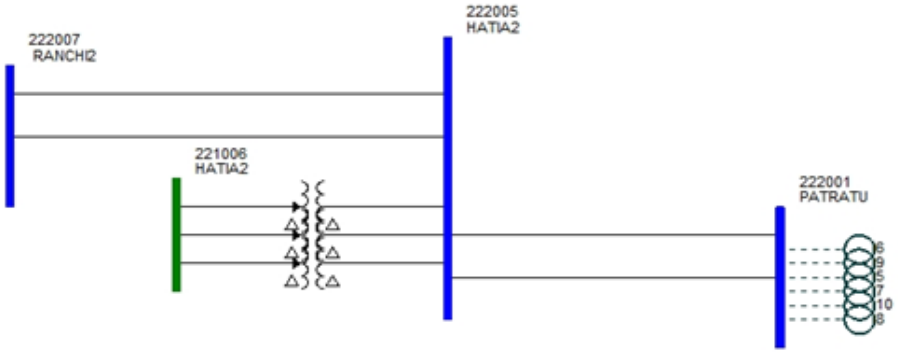
Name of the elements	End 1 Relay Indication	End 2 Relay Indication
400 kV Rangpo-Binaguri circuit-I	TEF/ I_N>1	Did not trip.

Powergrid may explain.

ITEM NO. B.2: Total Power failure at 220 kV Hatia (JUSNL) substation on 03.10.18 at 17:23 hrs and on 04.10.18 at 00:26 hrs

In both the instances, while closing man bus isolator of 220 kV Hatia PTPS – I at Hatia end, bus bar protection relay at Hatia operated and all other feeders tripped. 220 kV PTPS – Hatia D/C were out of service in both the events.

As per JUSNL report, one of the contacts of above mentioned isolator did not work properly at the time of the events and sent false DC command to bus bar protection panel.



Load Loss: 200 MW(on 03.10.18) ;
130 MW (on 04.10.18)

Generation Loss: 52 MW(on 03.10.18) ;
52 MW(on 04.10.18)

As per PMU data, there was no fault in both the instances.

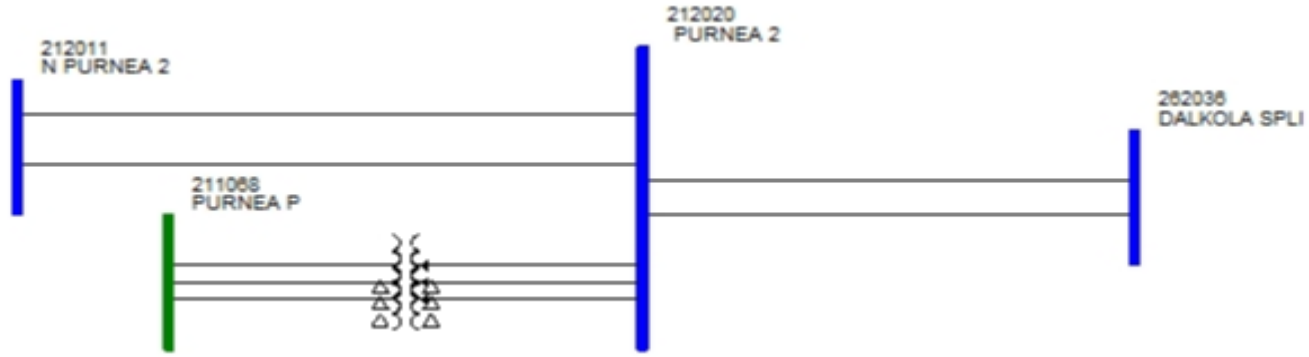
JUSNL may explain.

ITEM NO. B.3: Disturbance at 220 kV Purnea (Powergrid) S/s on 07.10.18 at 16:56 hrs.

At 16:56 hrs, Y phase line CVT of 220kV Purnea-New Purnea-I failed at Purnea end resulting operation of line differential protection of 220 kV Purnea – N. Purnea – I. In spite of initiation of inter-trip Tx and Rx, 86 trip relay did not operate at Purnea end though breaker opened at New Purnea end.

All 220 kV lines connected to Purnea S/S got tripped from remote end to clear the fault. 220 kV Dalkhola-I feeder tripped from Purnea end also in Zone-IV protection.

Load Loss: 160 MW



Relay indications are as follows:

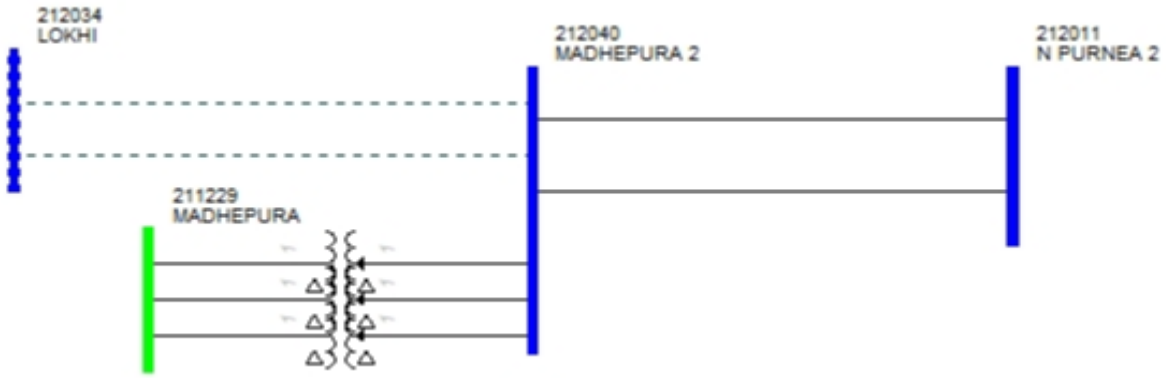
Name of the elements	***End 1 Relay Indication***	***End 2 Relay Indication***
220 kV New Purnea-Purnea-I	Line differential protection operated	RED 670 (Line differential relay) operated, Inter-trip Tx & Rx initiated but 86 trip relay not operated
220 kV New Purnea-Purnea-II	DEF protection operated	No tripping
220 kV Dalkhola-Purnea-I	Initially Y-N, Z-II; Later current increases in all three phases to 3.4 kA	Zone-IV
220 kV Dalkhola-Purnea-II	Initially Y-N, Z-II; Later current increases in all three phases to 3.4 kA	No tripping

Powergrid may explain.

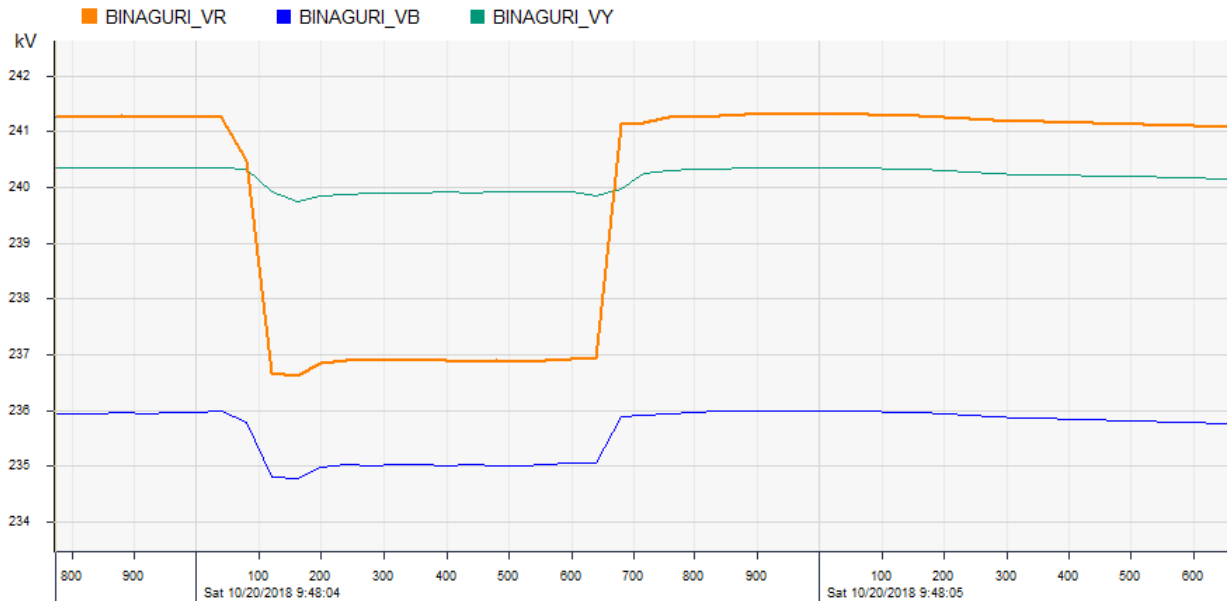
ITEM NO. B.4: Total Power failure at Madhepura(BSPTCL) S/s on 20.10.18 at 09:48 hrs.

220 kV Purnea Madhepura – I was under shutdown. At 09:48 hrs 220 kV Purnea Madhepura – II tripped on R-N fault resulting total power failure at Madhepura S/S.

Load Loss: 62 MW



Delayed fault clearance from Purnea end has been observed in PMU data.



BSPTCL & Powergrid may explain.

ITEM NO. B.5: Total Power failure at TLDP-III S/s on 27.10.18 at 10:24 hrs.

220 kV TLDP III - NJP S/C tripped due to Y-B-N fault on 27-10-18 at 10:24 hrs. As TLDP-III HEP is connected to rest of the grid via this S/C line, all four units at TLDP III got tripped due to loss of evacuation path.

Generation Loss: 134 MW

Relay indications are as follows:

Name of the elements	End 1 Relay Indication	End 2 Relay Indication
220 kV TLDP III – NJP – S/C	Y-B-I, Z-I, 1.4 KA	Y-B-I, Z-I, 57.9 KM from NJP

WBSETCL may explain.

ITEM NO. B.6: Disturbance at 765 kV Jharsuguda S/s on 31.10.18 at 23:52 hrs.

On 31st Oct 2018, at 23:35 Hs 765 kV Dharamjaigarh-Jharsuguda-3 was charged for first time with initial power flow of 358 MW. Later at 23:52 hrs, during PLCC testing of new 765kV Dharamjaygarh-Jharsuguda-4 at Jharsuguda S/S, Bus-2 at Jharsuguda S/S tripped along with following elements.

- 765KV, 240MVAR B/R 1
- 765KV, 240MVAR B/R 2
- 765KV Jharsuguda-Anugul-I
- 765KV Jharsuguda-Darlipali(NTPC)-I
- 765KV Jharsuguda-Darlipali(NTPC)-II

The detailed analysis report is attached in **Annexure B.6.**

Powergrid may explain.

ITEM NO. B.7: Tripping Incidences in the month of October, 2018.

Other tripping incidences occurred in the month of October 2018 which needs explanation from constituents of either of the end is given in **Annexure-B.7.**

In 58th PCC, ERLDC informed that most of the constituents are not submitting the DR and EL data for single line trippings.

PCC advised all the constituents to upload the details along with DR and EL in PDMS on-line portal and referred the issue to TCC for further guidance.

In 36th TCC, all the constituents were advised to use the PDMS on-line portal for uploading the single line tripping details along with DR (comtrade files), EL and other relevant files for all trippings of August 2017 onwards. Otherwise, it will be considered as violation of compliance of clause 5.2(r) & 5.9 of IEGC.

Members may discuss.

PART- C:: OTHER ITEMS

ITEM NO. C.1: Islanding scheme at IbTPS- OPGC

68th PCC opined that the draft scheme submitted by Odisha was three years old and the draft scheme is needed to be reviewed with existing network configuration.

PCC decided to discuss the islanding scheme in next PCC Meeting and advised OPTCL to submit all the relevant details to ERPC and ERLDC.

In 69th PCC, OPTCL presented the revised islanding scheme based on updated network configuration and power flows. The details are enclosed at **Annexure-C.1**.

In 70th PCC, OPGC has submitted the updated details which are enclosed at **Annexure-C1.a.**
It was decided that ERLDC and ERPC will study and finalize the islanding scheme in next PCC Meeting.

In 72nd PCC, OPTCL and OPGC were advised to prepare a joint presentation highlighting the below mentioned points in order to have a clarity of the overall scheme.

- The logic for islanding operation such as frequency limit, overvoltage settings, vector shift settings etc.
- Logic/Actions to be adopted for different grid scenarios for both generator side and transmission side.
- The actions to be taken at generator side vis-a vis at transmission side for different conditions.

OPTCL and OPGC may explain.

ITEM NO. C.2: Total power failure at 220kV Hatia (JUSNL) S/s on 20.07.18 at 09:10 hrs.

Due to clearance issue with some 11 KV feeder (which has an in feed from Hatia old) repeated faults occurred in 220 kV Ranchi - Hatia-I and II. As a result total power failed at 220kV Hatia S/s.

In 70th PCC, JUSNL informed that repeated disturbances and total power failure at Hatia substation on 20.07.18 was due to the clearance issue with 11kV feeder under 220kV Ranchi-Hatia D/C line. JUSNL informed that the 11 kV feeders were re-routed after the above incidences to get the sufficient clearance.

PCC advised JUSNL to check the Sag level and clearance of 220 KV lines to avoid this type of tripping.

From the analysis of PMU plot and disturbance recorders at Ranchi & Hatia end, a number of protection related issues came into notice.

PCC analysed the issue & advised JUSNL to take the following actions

- Whenever PLCC will remain out of service, the auto reclose operation should be made to non-auto mode and zone 2 timing may be reduced (preferably less than 0.35 Sec.) to minimize the fault clearing time.
- The trip on reclose function should be enabled in the relay whenever autoreclose function is in operation.

Regarding unwanted tripping of 220/132 kV ATRs at Hatia and Patratu substations and tripping of Hatia-Patratu line in zone-4, PCC felt that there was a protection coordination issue and advised JUSNL to submit the corresponding relay settings to ERPC/ERLDC at the earliest.

The issue of delayed opening of breaker at Hatia end i.e.400 msec after zone-I tripping initiation was remained unexplained. The sequence of operation as well as the details of elements tripped during the incident could not be explained by JUSNL.

PCC decided to discuss this issue in next PCC meeting and advised JUSNL to explain the issue in next meeting with all the relevant details.

In 71st PCC, JUSNL was advised the details at the earliest.

JUSNL submitted the tripping details along with the disturbance recorders vide mail dated 06.11.18. The details are submitted in **Annexure-C.2.**

JUSNL may explain.

ITEM NO. C.3: FOLLOW-UP OF DECISIONS OF THE PREVIOUS PROTECTION SUB-COMMITTEE MEETING(S)

The decisions of previous PCC Meetings are given at **Annexure-C.3**.

Members may update the latest status.

ITEM NO. C.4: Zone 3 settings of ISTS lines

Based on the data available in PDMS, the zone 3 settings of all ISTS lines in Eastern Region were verified and compared with the corresponding resistive reach of the line thermal loading. Zone 3 settings were also checked with the agreed protection philosophy of ER. The discrepancies observed in the settings will be presented in the meeting.

In 67th PCC, PRDC presented the list of ISTS lines where they observed the discrepancy in zone-3 setting.
In 70th PCC, PRDC was advised to resend the list of the lines to all constituents and constituents were advised to verify the settings at the earliest.

In 72nd PCC, it was informed that some of the constituents have verified the settings. PCC advised all other constituents to verify the settings by next month and report discrepancy, if any.

Members may update.

ITEM NO. C.5: Status of Third Party Protection Audit

The compliance status of 1st Third Party Protection Audit observations is as follows:

Name of Constituents	Total Observations	Complied	% of Compliance
Powergrid	54	46	85.19
NTPC	16	14	87.50
NHPC	1	1	100.00
DVC	40	26	65.00
WB	68	49	72.06
Odisha	59	42	71.19
JUSNL	34	25	73.53
BSPTCL	16	5	31.25
IPP (GMR, Sterlite and MPL)	5	5	100.00

** Pending observations of Powergrid are related to PLCC problems at other end.*

The substation wise status of compliance are available at ERPC website (Observations include PLCC rectification/activation which needs a comprehensive plan).

Members may note.

ITEM NO. C.6: Non-commissioning of PLCC / OPGW and non-implementation of carrier aided tripping in 220kV and above lines.

According to CEA technical standard for construction of electric plants and electric lines -Clause 43(4) (c), transmission line of 220 KV and above should have single-phase auto-reclosing facility for improving the availability of the lines. However, from the tripping details attached June-August, 2016 it is evident that the some of 220kV above Inter & Intra-Regional lines do not having auto-reclose facility either at one end or at both ends. Out of these for some of the lines even PLCC/OPGW is not yet installed and carrier aided protection including Autorecloser facility is not yet implemented. Based on the trippings of June- August, 2016 and PMU analysis a list of such lines has been prepared and as given below:

List of line where auto reclose facility is not available(Information based on PMU data analysis)							
S. No	**Transmission Lines name**	**Date of Tripping**	**Reason of Tripping**	**Owner Detail**		**Present Status**	
				End-1	**End-2**	**OPGW/PLCC Link available**	**AR facility functional**
13	220KV BUDIPADAR-KORBA-II	23.06.16	Y-N FAULT	OPTCL	CSEB	PLCC available	will be activated in consultation with Korba
17	220 KV TSTPP-RENGALI	17.07.16	EARTH FAULT	NTPC	OPTCL		by March 2018
18	220KV BUDIPADAR-RAIGARH	21.07.16	EARTH FAULT	OPTCL	PGCIL	PLCC defective	
20	220 KV FARAKKA-LALMATIA	03.08.16	B-N FAULT .	NTPC	JUNSL	Yes	Old Relay and not functional. 7-8 months required for auto re-close relay procurement.
23	220 KV MUZAFFARPUR - HAZIPUR - II	10.08.16	B-N FAULT	PGCIL	BSPTCL		Voice established. For carrier required shutdown
24	220 KV ROURKELA - TARKERA-II	11.08.16	B-N FAULT	PGCIL	OPTCL	OPGW available	Expected to install protection coupler by Jan 17
27	220 KV BIHARSARIF-TENUGHAT	07.09.16	B-N FAULT	BSPTCL	TVNL		
33	220KV Jamshedpur-Jindal-SC						

34th TCC advised all the respective members to update the above list along with the last tripping status in next PCC meeting.

TCC further advised all the constituents to give the latest status of PLCC of other 220kV and above lines under respective control area.

OPTCL:

1. 220kV Rengali(PG)-Rengali S/Y (Proposal for Commn. in OPGW is pending): *PSDF appraisal committee accepted the proposal*
2. 220kV Indravati(PG)-Indravati(PH) (Proposal for Commn. in OPGW pending): *PSDF appraisal committee accepted the proposal*
3. 132kV Baripada(PG)-Baripada (Tendering in Progress for OPGW): *Contract awarded*
4. 132kV Baripada(PG)-Rairangpur (Tendering in Progress for OPGW): *Contract awarded*

BSPTCL:

1.	220kV Purnea (PG)-Madhepura line	*Work is in progress expected to be commissioned by December 2017.*
2.	220 kV Biharshariff- Begusarai line	
3.	220 kV Biharshariff- Bodhgaya line	
4.	220kV MTPS-Motiari line	
5.	220KV Madhepura-New Purnea D/C	Auto recloser is out of service at Madhepura
6.	220KV Muzaffarpur-Hajipur D/C line	Auto recloser is out of service at Hazipur
7.	220KV FSTPP-Lalmatia-1	Auto recloser is out of service at Lalmatia
8.	220KV Patna-Khagaul-SC	Auto recloser is out of service at Khagual

In 67th PCC, BSPTCL informed that they are planning to hire an agency for implementing PLCC system in all the lines in their network.

Members may update.

ITEM NO. C.7: Disturbance monitoring equipment(DME) standardization

The power system is routinely subjected to faults or disturbances which can range from transient faults on transmission lines to system-wide disturbances involving multiple control areas, states and even countries. Investigation of each incident is critical in optimizing the performance of protection systems with the goal of preventing future incidents from becoming wide-area disturbances. The tools required to perform post-incident analyses include DME which can capture pre-event, event, and post-event conditions with a high degree of accuracy.

Recorders can be classified into two categories:

- FR (Fault Recorder)
- Sequence of events Recorder (SER)

For FR (Fault Recorder) following points may be standardized:

a. Deployment
b. Record Length
c. Triggers
d. Sampling Rates

For Sequence of events Recorder following points may be standardized:

a. SER Capability
b. Point Assignments
c. Use of RTUs for SER

Common issues:

a. Data format

b. Power Supply
c. Monitoring

Reference documents for this:

1. NERC Standard PRC-002-2 Disturbance Monitoring and Reporting Requirements

2. NPCC Regional Reliability Reference Directory # 11 Disturbance Monitoring Equipment Criteria

In 72nd PCC all the constituents were advised to submit the settings related to configuring disturbance recorders to ERLDC.

Members may update.

ITEM NO. C.8: Issue of Static Overvoltage Relay at 400 kV Binaguri Substation in Eastern region

400 kV Binaguri Substation recently has seen spurious over voltage tripping of circuit. The details of these events are given below:

1. **On 13th June 2018 at 06:32 Hrs :**There was a successful Auto-Reclosure on 400 kV Binaguri- Bongaigaon 2 circuit due to B phase to earth fault. At the same time , 400 kV Binaguri-Rangpo circuit 2 which is in same diameter of 400 kV Binaguri-Bongaigaon 2 at Binaguri end got tripped from Binaguri end on Over voltage stage 2 operation (Y phase voltage). In addition 400 kV Bingauri-Tala 1 also has tripped on over voltage stage 2 operation from Binaguri end (R phase Voltage). The reason for the transient overvoltage is not known. Rest of the circuit from Binaguri end did not trip during this event.
2. **On 10th Sept 2018 at 11:31 hrs :** 400 kV Tala-Binaguri 4 circuit tripped on overvoltage protection from Binaguri end while the voltage at Binaguri was 407 kV. During this event, there was no fault in the system.
3. **On 11th Sept 2018 2018 at 08:10 Hrs:** 400 kvBinaguri-Malbase circuit tripped on overvoltage protection from Binaguri end while the voltage at Binaguri was 404 kV. During this event, there was no fault in the system.

The above tripping of lines from Binaguri on spurious over voltage protection when the system is not having high voltage is serious in view of long outage of 400 kV Purnea-Biharsharif D/C and 400 kV Kishenganj-Patna D/C. PGCIL ERTS-2 has informed that the event 2 and 3 have occurred due to sensitive over voltage static relay.

In view of the above three events, Following issues need detailed deliberation:

4. Detailed analysis and Reason for Over-Voltage Stage 2 operation at Binaguri in case of event 1.
5. Why the numerical relay over voltage protection are not being utilised when such mal-operation are being observed from the static relay.

In 71st PCC, Powergrid informed that the overvoltage issue was due to the static relays used in those lines. They added that all the static relays have been removed and they had already been replaced by numerical relays.

They further informed that the overvoltage function of numerical relays has been enabled but testing is yet to be done.

Powergrid may update.

ITEM NO. C.9: Checklist for submission of updated data for Protection Database

The network data in Protection Database needs to be updated on regular basis on account of commissioning of new elements in the CTU as well as STU networks. Accordingly a checklist has been prepared which is enclosed in **Annexure-C9**.

All the constituents requested to submit the checklist on monthly bases in every OCC/PCC meetings.

Constituents may note.

ITEM NO. C.10: Additional Agenda

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पावर सिस्टम ऑपरेशन करपोरेशन लिमिटेड
(भारत सरकार का उद्यम)
POWER SYSTEM OPERATION CORPORATION LIMITED
(A Government of India Enterprise)
Eastern Regional Load Despatch Centre: 14, Golf Club Road, Tollygunge, Kolkata-700 033.
CIN: U40105DL2009GOI188682
फ़ोन: 033- 24235755, 24174049 फैक्स : 033-24235809/5029 Website:www.erldc.org, Email ID- erldc@posoco.in

Tripping of Bus-II at Jharsuguda at 23:52 Hrs on 31st October 2018

Antecedent Conditions: -

- All India Demand: -143000 MW
- ER Demand: - 16900 MW
- Grid Frequency: - 49.99 Hz.
- Flow on 765 kV Dharamjaigarh-Jharsuguda-I,II&III : - 355 MW/ ckt
- Flow on 765 kV Jharsuguda-Angul I&II: - 385 MW/ckt
- Flow on 765/400 kV ICT-I & II at Jharsuguda: - 142 MW each ICT (towards 765 kV side)

Incident: -

On 31st Oct 2018, at 23:35 Hs 765 kV Dharamjaigarh-Jharsuguda-3 first time charged with initial power flow of 358 MW. Later at 23:52 hrs, during PLCC testing of new 765kV Dharamjaygarh-Jharsuguda-4 at Jharsuguda S/S, Bus-2 at Jharsuguda S/S tripped along with following given elements.

Element	Outage time and date	Revival time and date
1. 765KV, 240MVAR B/R 1	31-10-18 & 23:52 Hrs	01-11-18 & 00:50 Hrs
2. 765KV, 240MVAR B/R 1	31-10-18 & 23:52 Hrs	01-11-18 & 00:55 Hrs
3. 765KV Jharsuguda-Angul-1	31-10-18 & 23:52 Hrs	01-11-18 & 01:14 Hrs
4. 765KV Jharsuguda-Darlipali(NTPC)-1	31-10-18 & 23:52 Hrs	01-11-18 & 01:25 Hrs
5. 765KV Jharsuguda-Darlipali(NTPC)-2	31-10-18 & 23:52 Hrs	Kept out due to overvoltage

765 kV Bus-II at Jharsuguda normalised along with 765KV, 240MVAR B/R 1 at 00:50 Hrs on 01st Nov 2018.

Power grid has reported that while testing of PLCC in Dharmajaygarh ckt#4 at Jharsuguda, tie Breaker (which was in open condition) trip relay operated and LBB initiation sent to Tie Breaker and wrongly initiation sent to main bay of Angul#1 Main Bay. Signal sent to main bay was due to wrong wiring configuration. Due to operation of Main CB LBB of Angul#1, main and tie CB's of Bus #2 got tripped. Due to which, Angul#1, NTPC#1&2, Bus Reactor#1&2 got tripped.

Power grid also reported that wrong wiring issue has been resolved and matter has been referred to O&M department.

Analysis based on SCADA Data

765 kV Dharamjaigarh-Jharsuguda-3 first time charged at 23:35 Hrs (31st Oct 18). Line MVAR of both the ends is given below in fig 1. Later at 23:52 Hrs, with the tripping of 765KV Jharsuguda-Angul-1 along with BUS-II at Jharsuguda, flow on 765KV Jharsuguda-Angul-2 rose to 583 MW from 400 MW and voltage at Jharsuguda rose to 802 kV from 789 kV. Power flow on 765KV Jharsuguda-Angul-D/C and voltage of Bus-II at Jharsuguda is given below in fig 2 & 3 respectively.

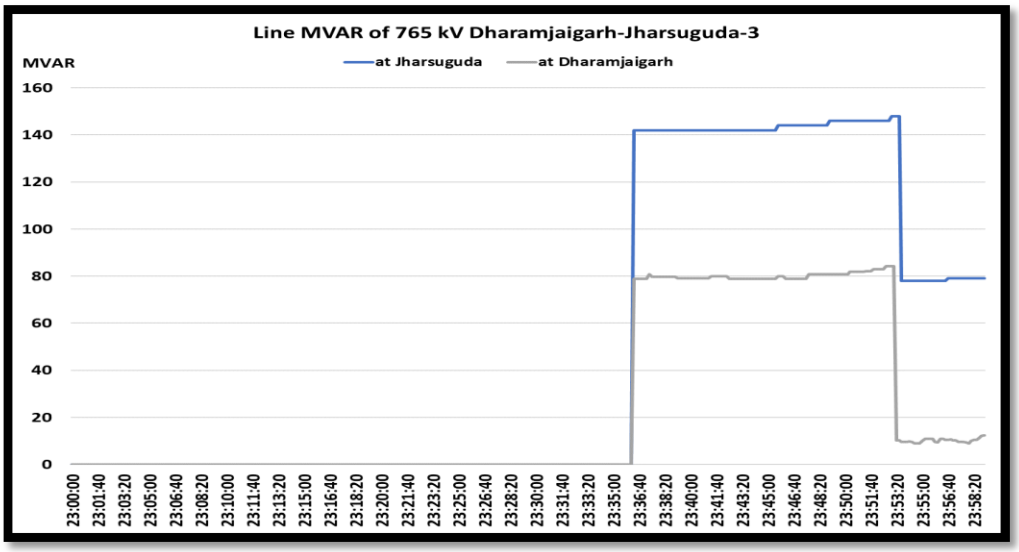


Fig 1:- Line MVAR of both ends of 765 kV Dharamjaigarh-Jharsuguda-3

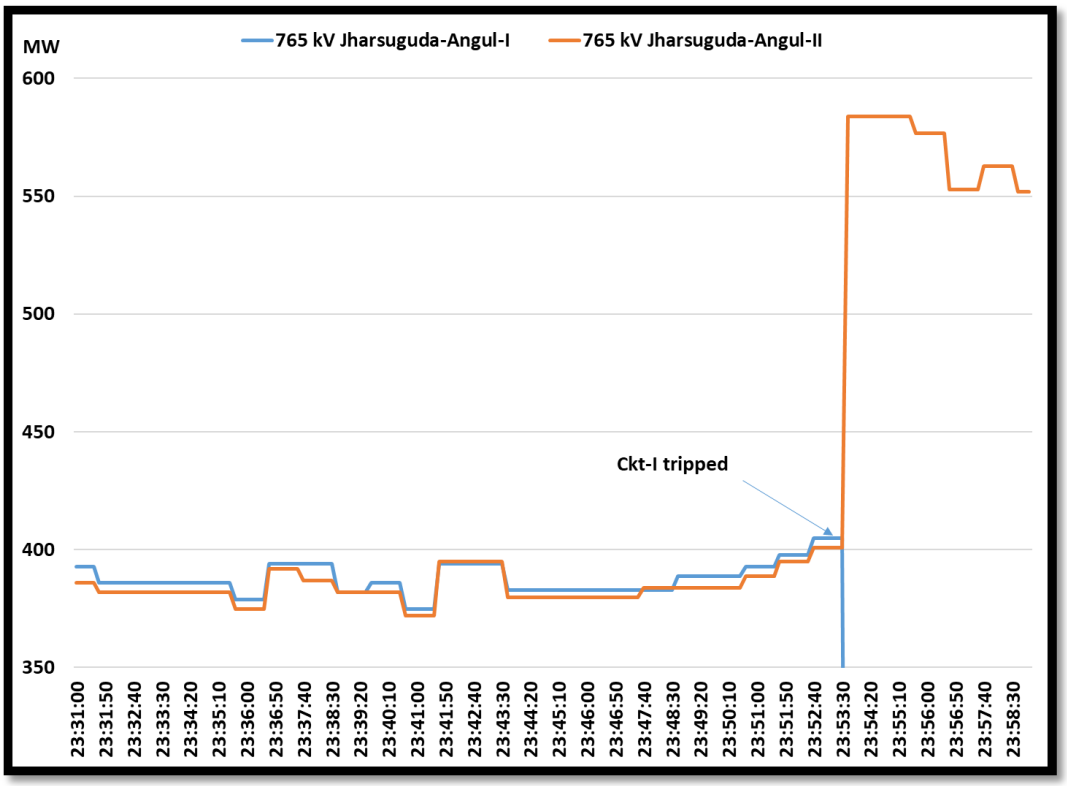


Fig 2: - Flow on 765KV Jharsuguda-Angul-D/C

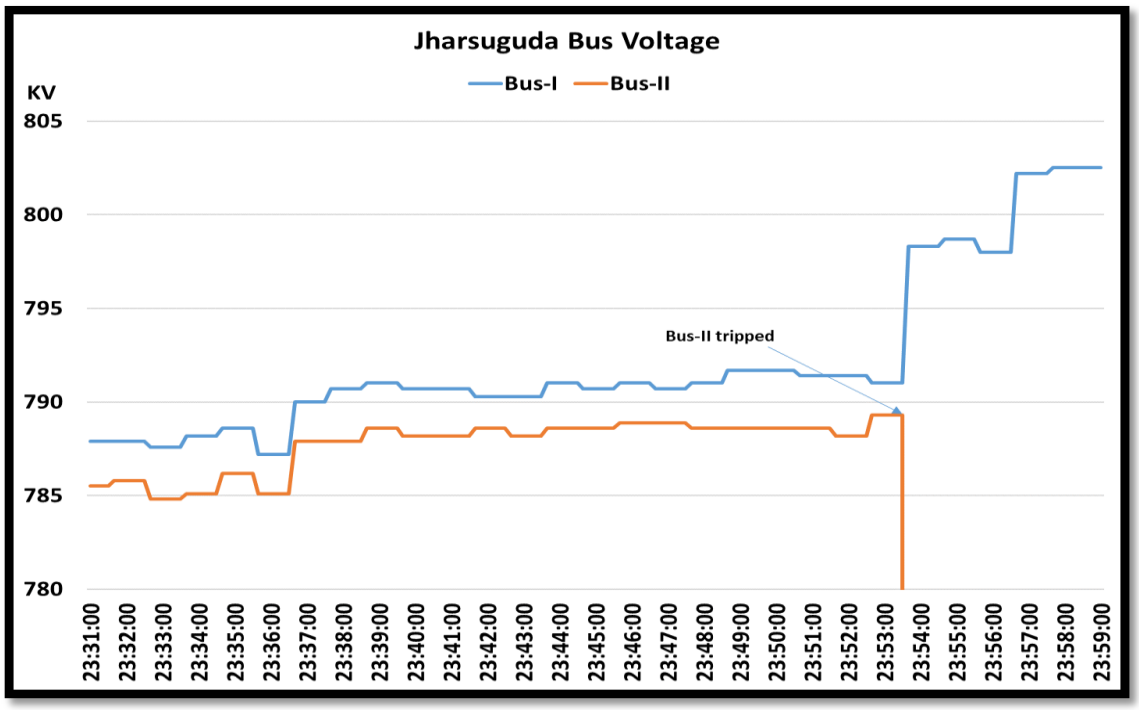


Fig 3: - Jharsuguda Bus Voltage

Analysis based on PMU.

The nearest PMU is Talcher and Ranchi and it was not reporting at the time of incident. As per voltage PMU of Raipur, there is only 0.5 kV rise in voltage. The voltage PMU is given below: -

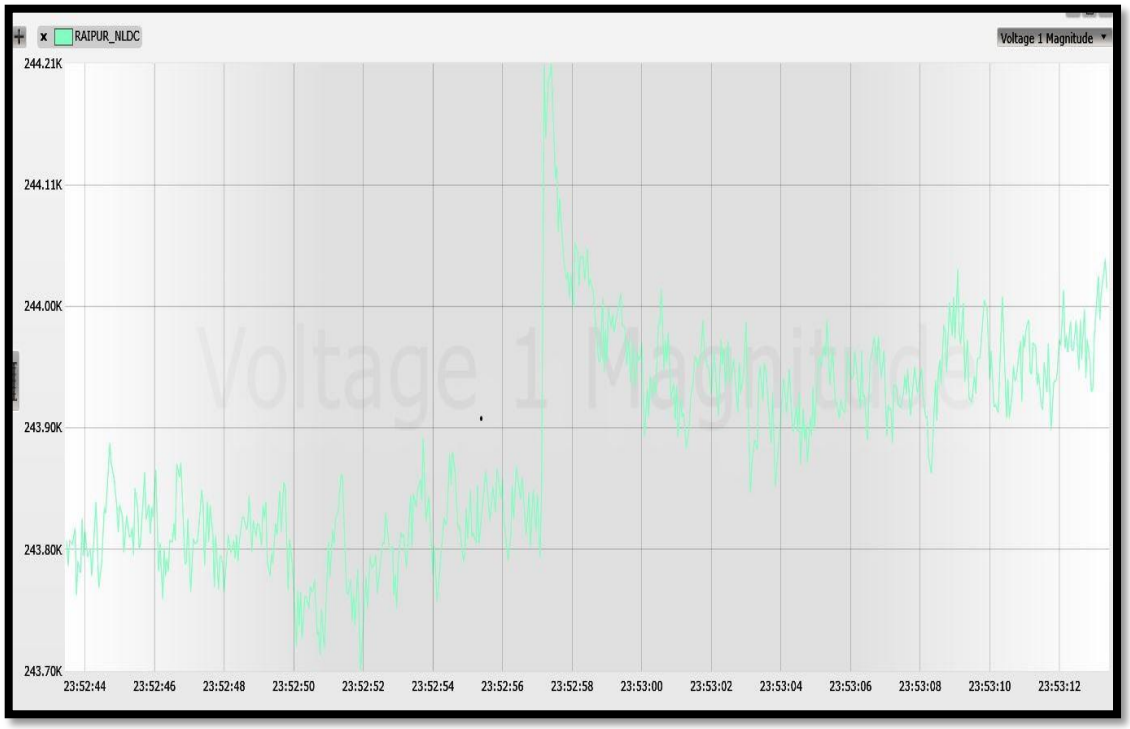


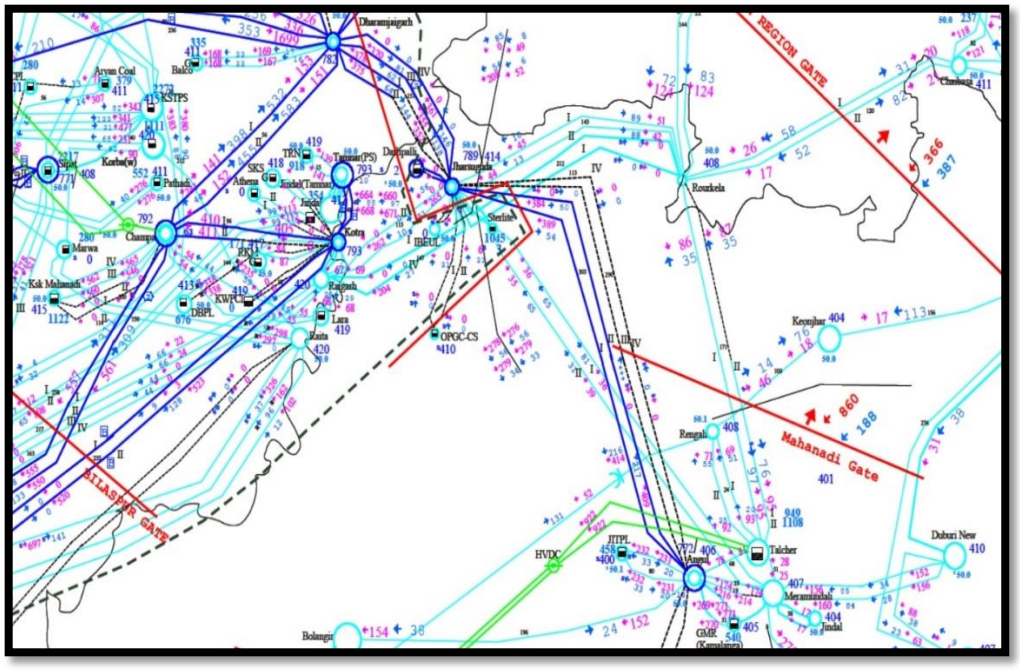
Fig 4: - Voltage PMU of Raipur

Points of concern: -

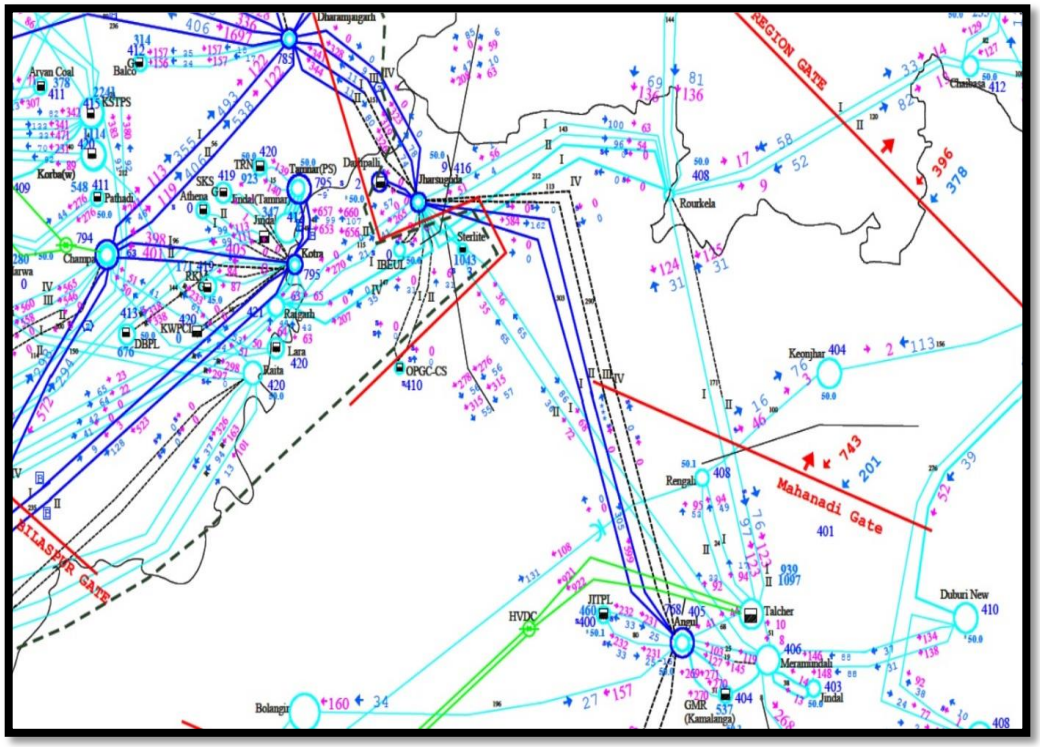
- Before commissioning of any new element, all the protection scheme need to be cross check again by protection engineer/ commissioning expert to avoid any issue of mal operation.

Annexure

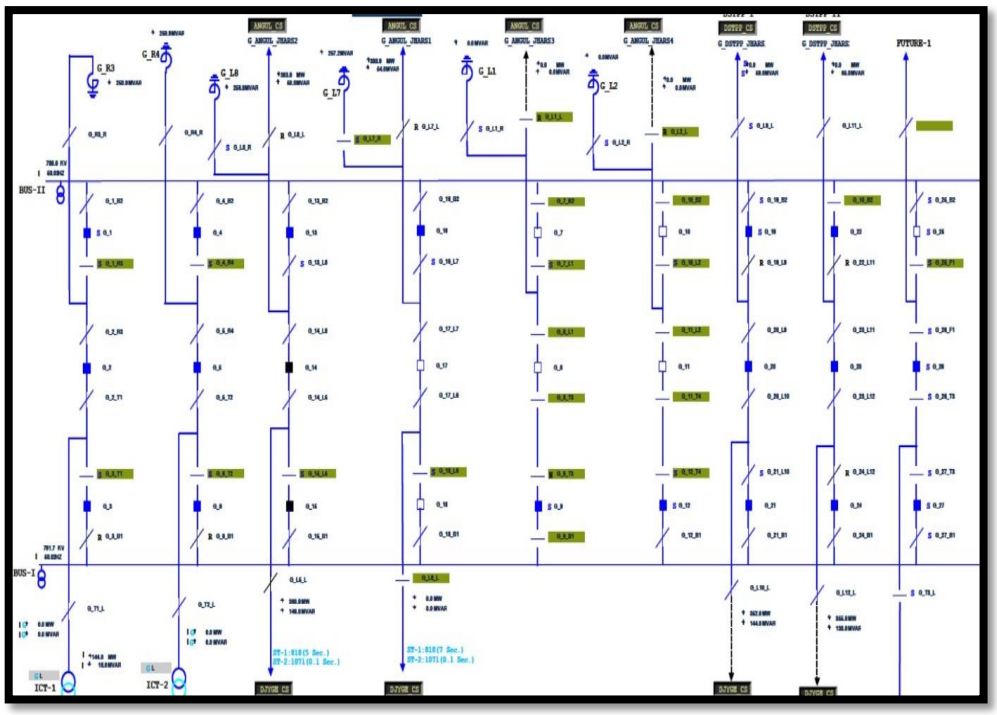
Annexure 1: - Jharsuguda region snapshot before the incident (at 23:50 Hrs).



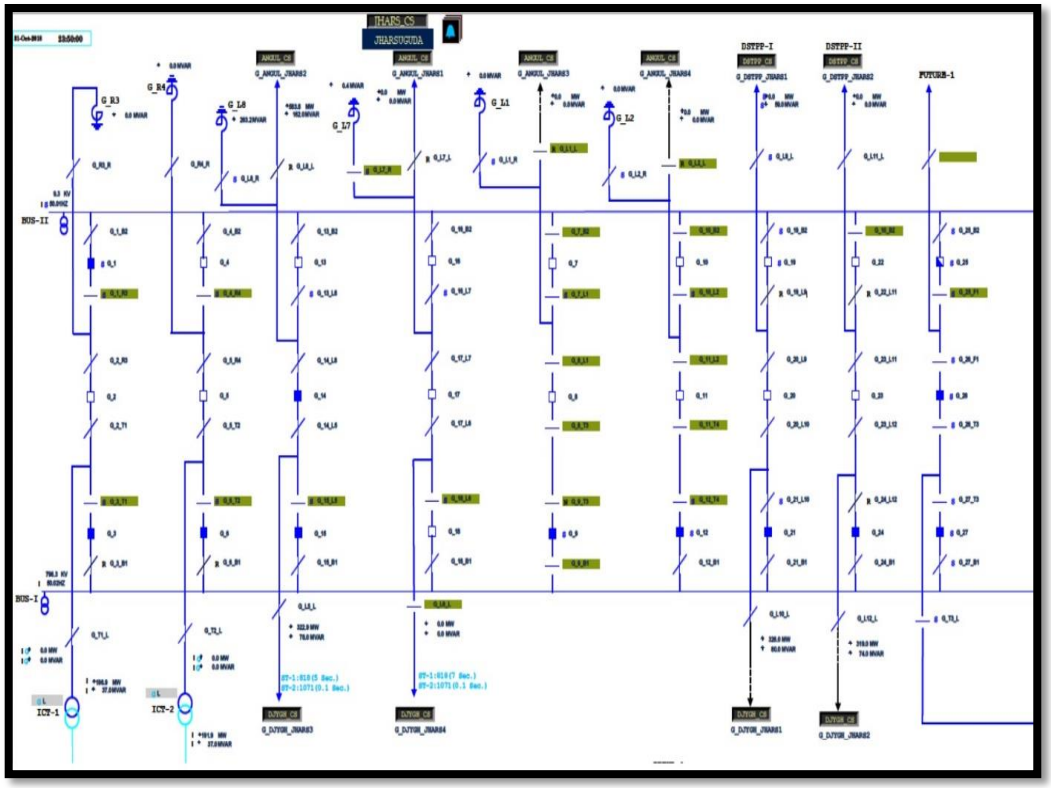
Annexure 2: - Jharsuguda region snapshot after the incident (at 23:54 Hrs).



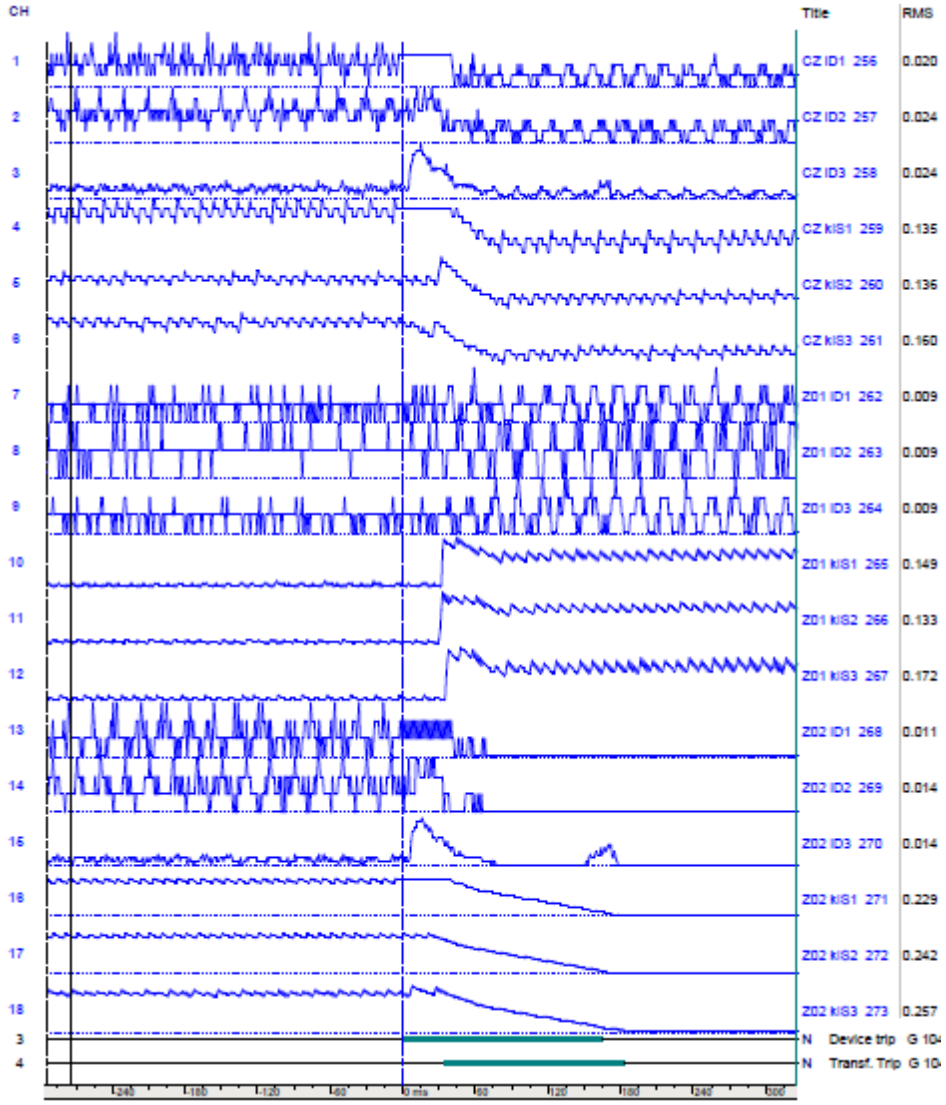
Annexure 3: - Jharsuguda SLD before the incident (at 23:50 Hrs).



Annexure 4: - Jharsuguda SLD after the incident (at 23:54 Hrs).



Annexure 5: - B/B DR received from POWERGRID



Annexure-B.7

List of line tripping in the month of October 2018 which may be discussed in PCC

LINE NAME	TRIP DATE	TRIP TIME	RESTORATION DATE	RESTORATION TIME	Relay Indication LOCAL END	Relay Indication REMOTE END	Reason	Fault Clearance time in msec	Remarks
Miscellaneous: Tripping on DT, No Fault observed in PMU									
400KV INDRAVATI(PG)-INDRAVATI(GR)-SC	10-10-2018	16:49	10-10-2018	17:47	OVERVOLTAGE TRIPPED AT GRIDCO END		OVERVOLTAGE TRIPPED AT GRIDCO END	--	PMU Voltage : 413 KV
400KV MALBASE-BINAGURI-I	13-10-2018	0:16	13-10-2018	0:38	Tripped only at Binaguri, DT received		DT received at Binaguri	--	No fayult observed in PMU
400KV BOLANGIR-ANGUL-SC	16-10-2018	2:54	16-10-2018	3:24	DT received at Bolangir	line did not trip from Angul	DT received at Bolangir	--	
400KV BOLANGIR-ANGUL-SC	16-10-2018	3:27	16-10-2018	5:17	DT received at Bolangir	line did not trip from Angul	DT received at Bolangir	--	No fayult observed in PMU
400KV ALIPURDUAR-BONGAIGAON-II	16-10-2018	10:44	16-10-2018	11:37	R-N Fault DT Recived		R-N Fault	--	No fayult observed in PMU
Autoreclose related issues									
220KV JODA-RAMCHANDRAPUR-SC	02-10-2018	12:10	02-10-2018	12:36	Y-N,245 A,-1 km from joda	y-n,53.71 km,1.99 KA,o/c	Y-N Fault	< 100 msec	No A/R operation found in PMU
400KV ALIPURDUAR-BONGAIGAON-I	09-10-2018	9:07	09-10-2018	9:18	Z2 R-N ,FC 1.107 KA,FD not given	A/R successful,, Z1,R-N,3.39 KA,FD 30.49	R-N Fault	700 msec	No A/R operation found in PMU
400KV KHARAGPUR-CHAIBASA-I	12-10-2018	13:02	12-10-2018	13:36	R-N, Z-1, 21.72km, 8.3 kA	A/R attempted at Chaibasa	R-N Fault	< 100 msec	No A/R operation found in PMU
400KV BARH-MOTIHARI-I	14-10-2018	10:32	14-10-2018	10:56		27.8 KM, BN, 3.3 KA	B-N Fault	< 100 msec	No A/R operation found in PMU
400KV KHARAGPUR-CHAIBASA-II	20-10-2018	11:02	20-10-2018	11:13	B_N Fault	A/R successful	B-N Fault	< 100 msec	No A/R operation found in PMU
220KV JODA-JINDAL-JAMSHEDPUR-I	22-10-2018	12:52	22-10-2018	13:17		BN, Z1, 49.27 KM	B-N Fault	< 100 msec	No A/R operation found in PMU
220KV PUSAULI-SAHUPURI-SC	23-10-2018	12:24	23-10-2018	13:53	R-N, 3.5KA, 40KM		R-N Fault	< 100 msec	No A/R operation found in PMU
220KV KATAPALLI-BOLANGIR(PG)-SC	23-10-2018	12:35	23-10-2018	13:12	B-N, 5.8KA		B-N Fault	< 100 msec	No A/R operation found in PMU
400KV BINAGURI-ALIPURDUAR-I	28-10-2018	11:20	28-10-2018	11:52			B-N Fault (As per PMU)	800 msec	No A/R operation found in PMU
400KV KHARAGPUR-CHAIBASA-I	29-10-2018	12:24	29-10-2018	12:36	Z1, RN, 25.1 KM, 7.29 KA, A/R L/O	RN, 1.70 KA, Z2, 173.5 KM	R-N Fault	< 100 msec	No A/R operation found in PMU

ISLANDING SCHEME FOR IB THERMAL – BUDHIPADAR GSS

ISLANDING SCHEME DESCRIPTION

1. Islanding schemes are implemented by generating stations & transmission system to isolate the healthy subsystems following a large-scale disturbance. This is a system requirement under contingency conditions according to which the power network may be split into healthy and self-sustaining zones so that cascade tripping of all generating stations in the entire region is avoided.
2. With a view to protect the generation of IB TPS during sudden and major disturbance in power system network, one special islanding scheme with part loads of Budhipadar GSS of OPTCL has been proposed.
3. Two numbers 210 MW generators of IB TPS connect to 220/132/33kV Grid substation through four numbers dedicated 220kV lines.
4. The islanding scheme envisages segregation of a group of matching 132kV load in closed loop with the IB generators.

ISLANDING SCHEME DESCRIPTION

5. 132kV feeders will be arranged radially in order to form islanding scheme with IB generation.
6. 220kV Budhipadar GSS has system has two main bus and a transfer bus system. The generation & matching loads put into two buses with bus coupler in operation.
7. The two numbers 220kV feeders from IB TPS put into Bus –II and the other two are kept in the other bus as normal arrangement.
8. 220 kV interstate line to Korba-2 & 3 and Raigarh will be in normal condition distributed to both the buses.
9. The islanding relay Micom P341 is installed at Bus coupler panel of the 220kV system.

ISLANDING SCHEME DESCRIPTION

10. In the event of system disturbance and actuation of islanding relay:

a. Relay will give command to trip all 220KV feeders connected to Bus-I and Bus II along with Bus coupler except selected islanding IB ckts. either (IB -1 & 3)/ (IB-2 & 4) and Auto transformer- I & II.
b. It will also trip non- selected islanding IB ckts. incomer breaker either (IB -1 & 3)/ (IB-2 & 4).
c. It will send carrier command to Tarkera end and to trip 132kV Tarkera –Rajgangpur feeder I & II and 132kV Tarkera- Kalunga feeder so as to feed Rajgangpur , Kuchinda and Kalunga Grid Load will be in radial arrangement.
d. It will send carrier signal to Lapanga end to trip 132kV Lapanga – Jharsuguda feeder at Lapanga in order to feed Jharsuguda load radially.
e. It will send carrier signal to IB thermal to start ramping and adjust IB generation to match the load.

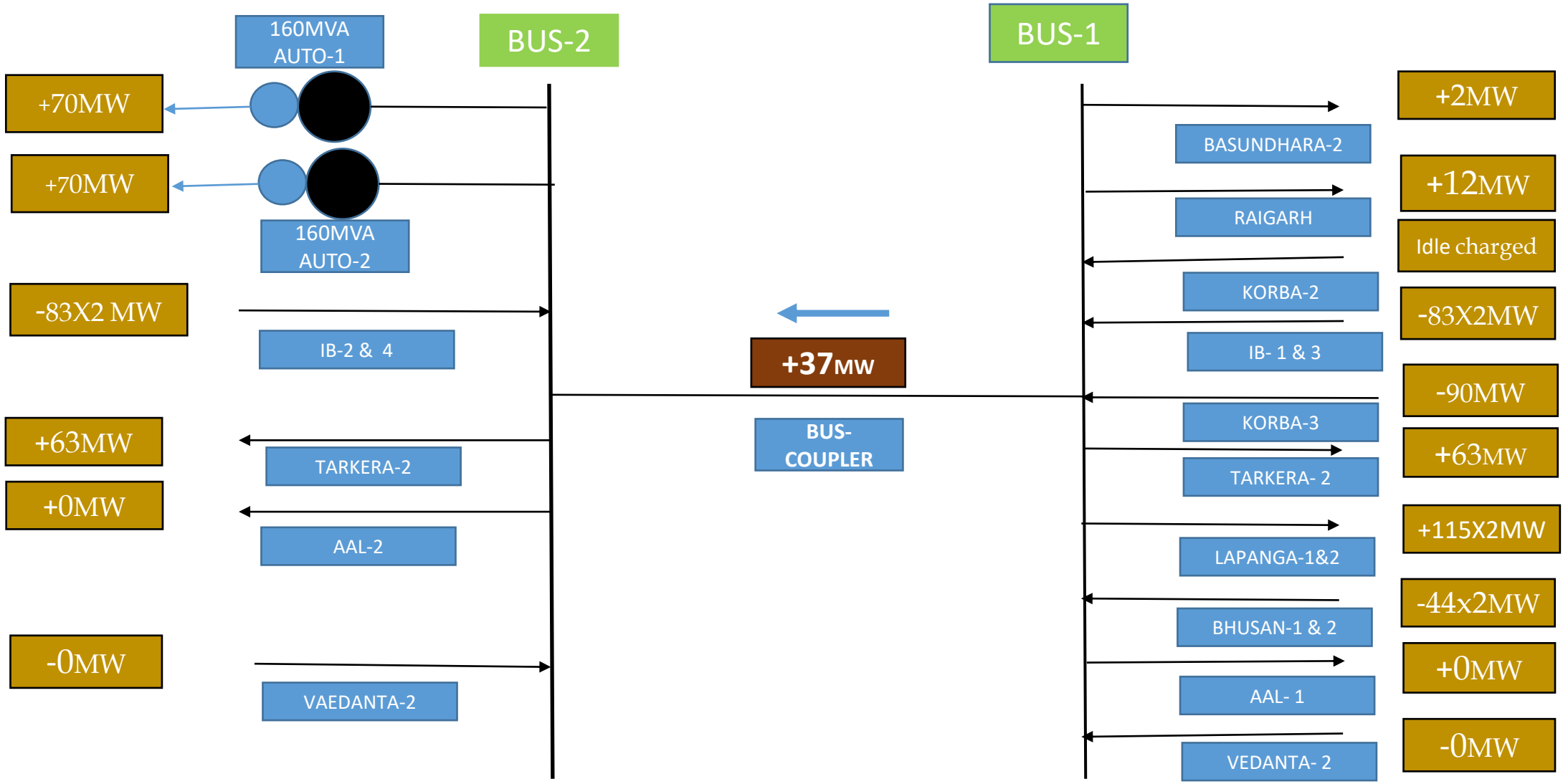
ISLANDING SCHEME DESCRIPTION

11. The CGP feeders such as Vedanta , Bhusan and Aditya Aluminium have their own islanding schemes to cater their industry load.

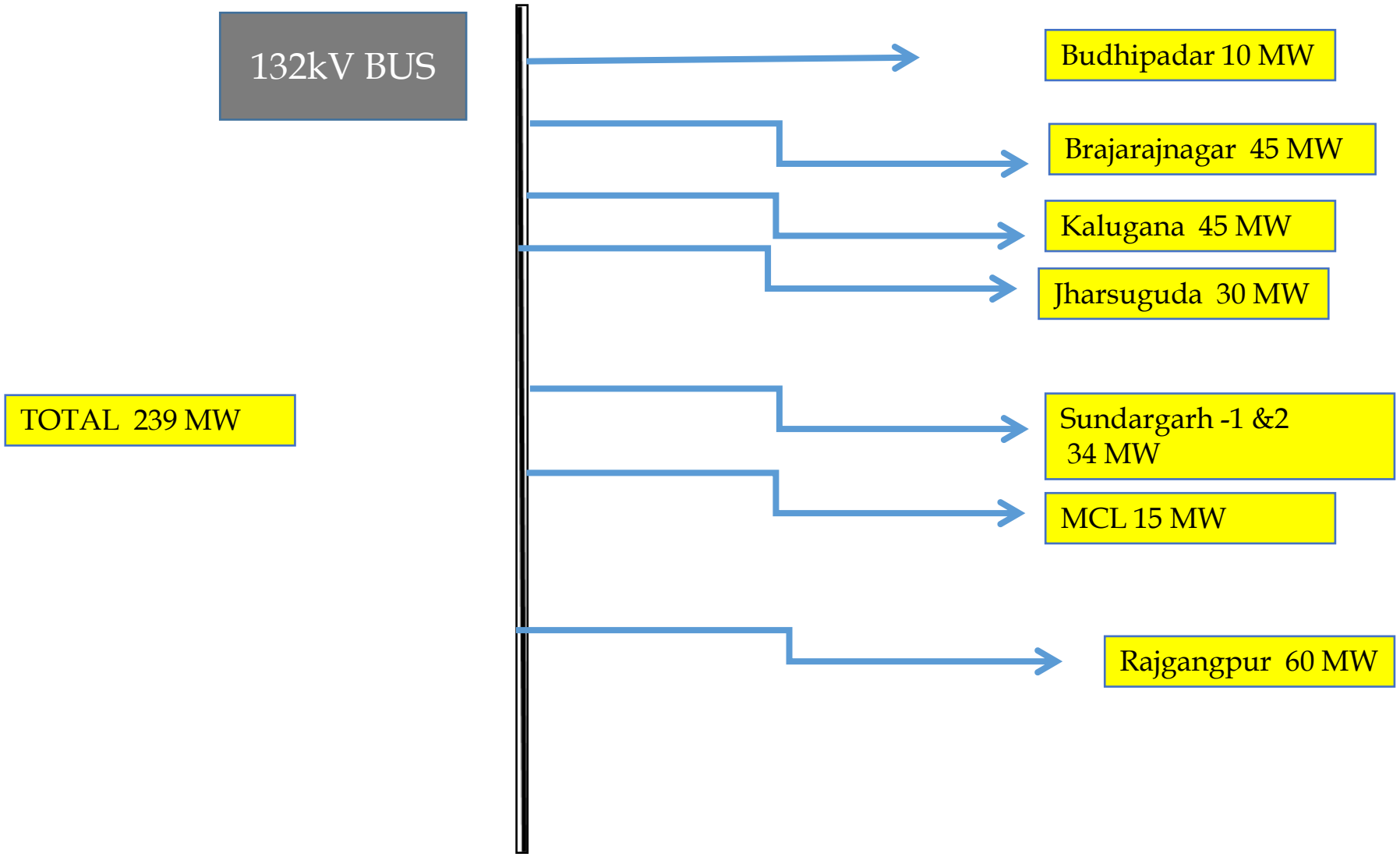
12. The general arrangement of 220kV feeder configuration, 132kV loads for islanding has shown in following slides.

POWER FLOW DETAILS OF 220KV SYSTEM

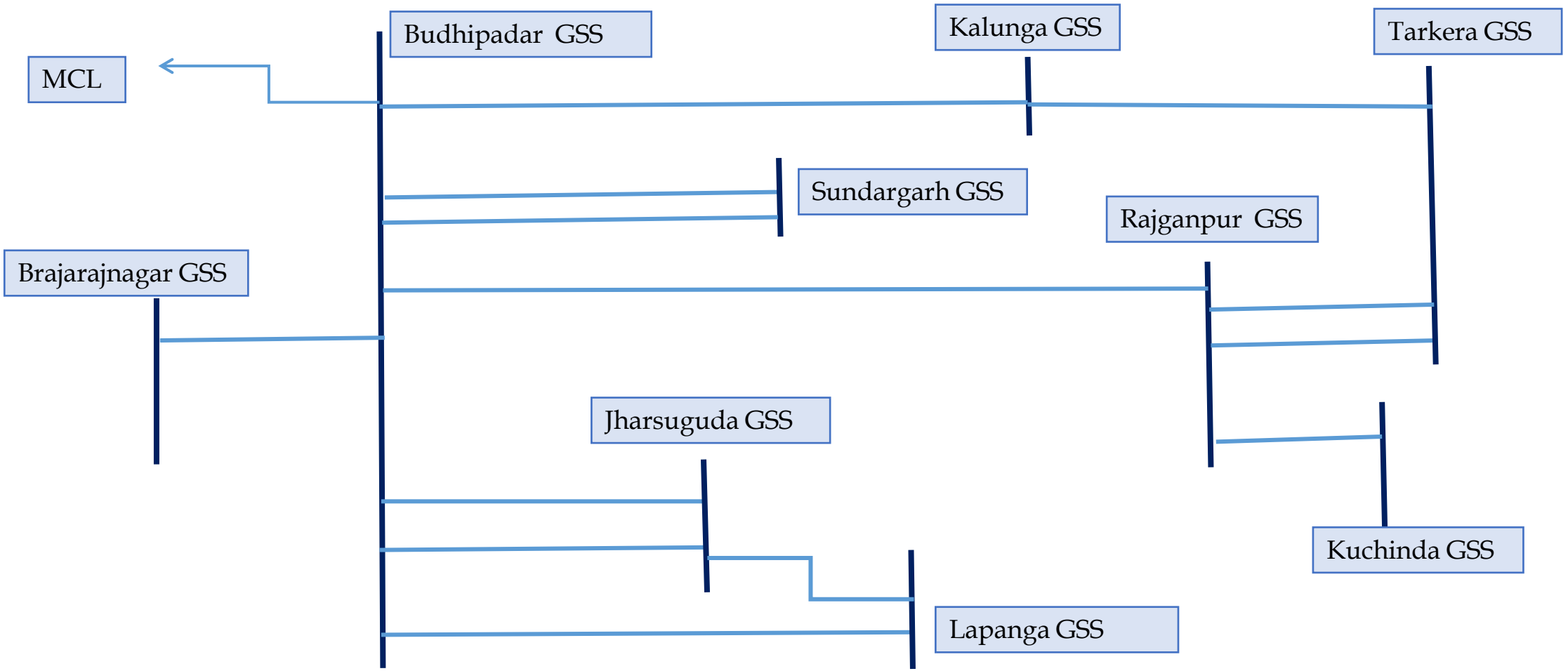
LOAD PATTERN OF DIFFERENT FEEDERS 12.07.2018 AT 12.00 HRS.

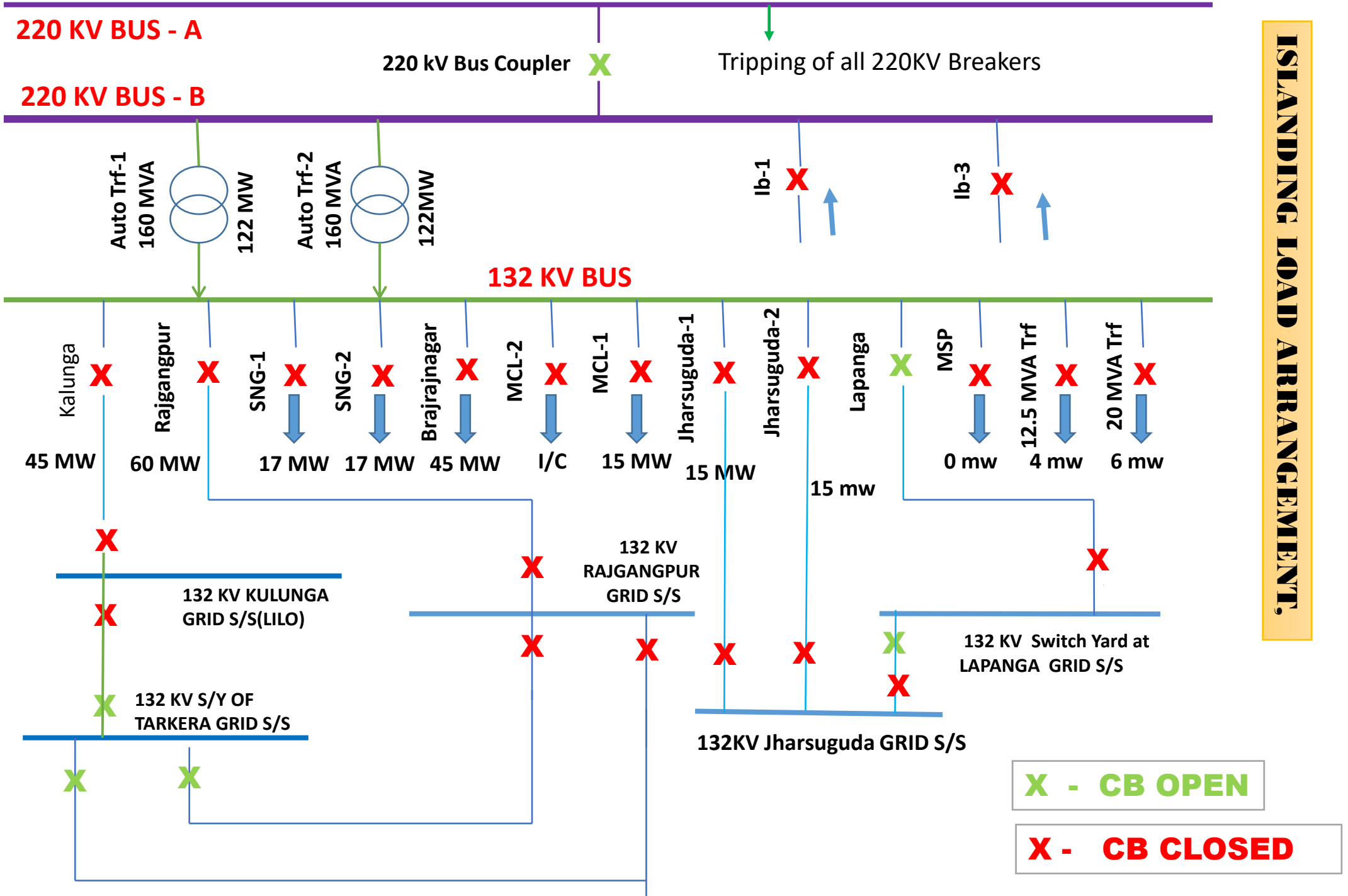


132kV RADIAL LOAD ARRANGEMENT FOR ISLAND SCHEME

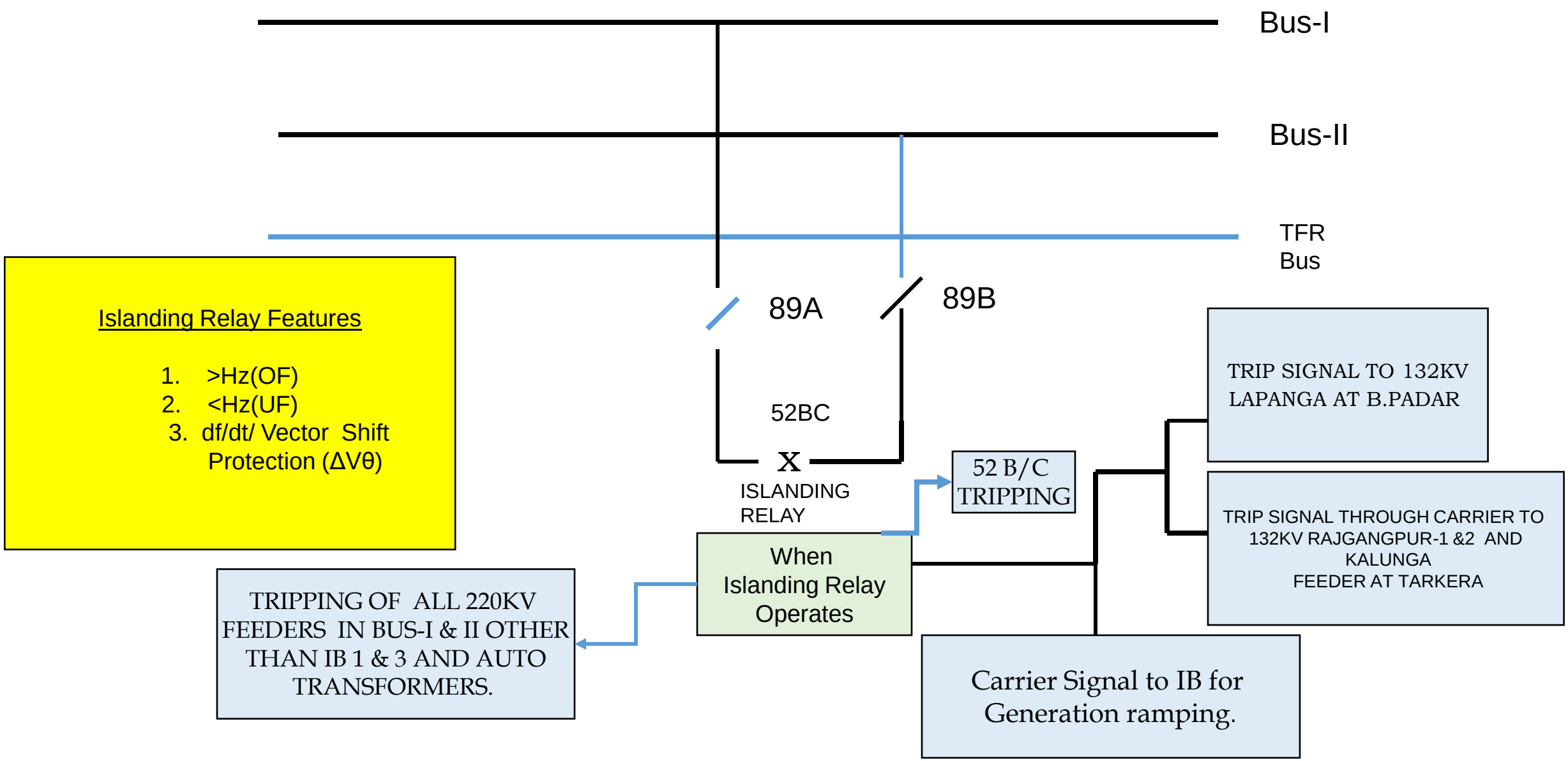


132KV Connectivity of Budhipadar GSS

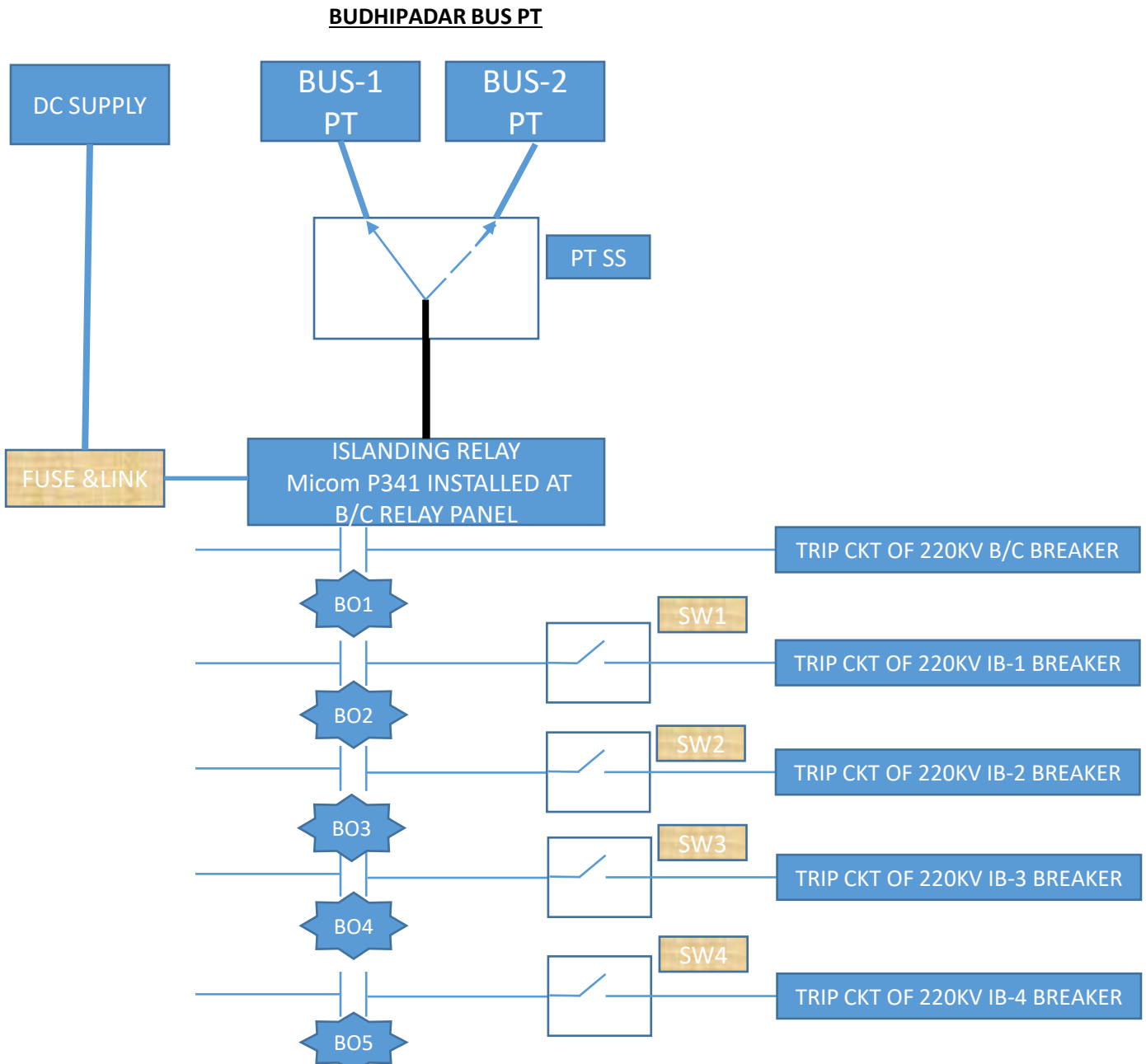


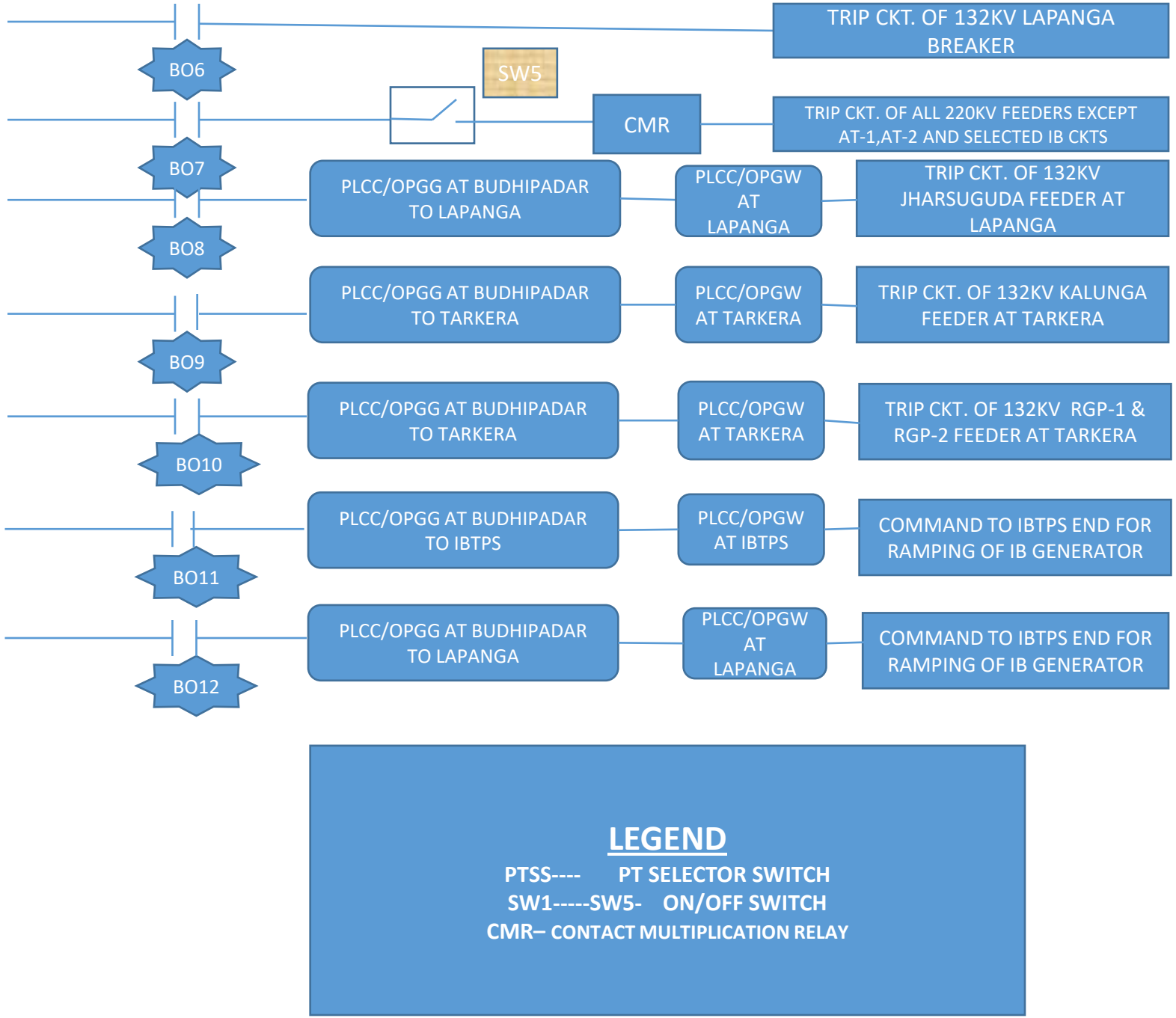

220 KV BUS - A
220 kV Bus Coupler
Tripping of all 220KV Breakers
220 KV BUS - B
Auto Trf-1
160 MVA
122 MW
Auto Trf-2
160 MVA
122MW
Ib-1
Ib-3
132 KV BUS
Kalunga
Rajgangpur
SNG-1
SNG-2
Brajrajnagar
MCL-2
MCL-1
Jharsuguda-1
Jharsuguda-2
Lapanga
MSP
12.5 MVA Trf
20 MVA Trf
45 MW
60 MW
17 MW
17 MW
45 MW
I/C
15 MW
15 MW
15 mw
0 mw
4 mw
6 mw
132 KV KULUNGA GRID S/S(LILO)
132 KV RAJGANGPUR GRID S/S
132 KV S/Y OF TARKERA GRID S/S
132KV Jharsuguda GRID S/S
132 KV Switch Yard at LAPANGA GRID S/S
ISLANDING LOAD ARRANGEMENT,
X - CB OPEN
X - CB CLOSED

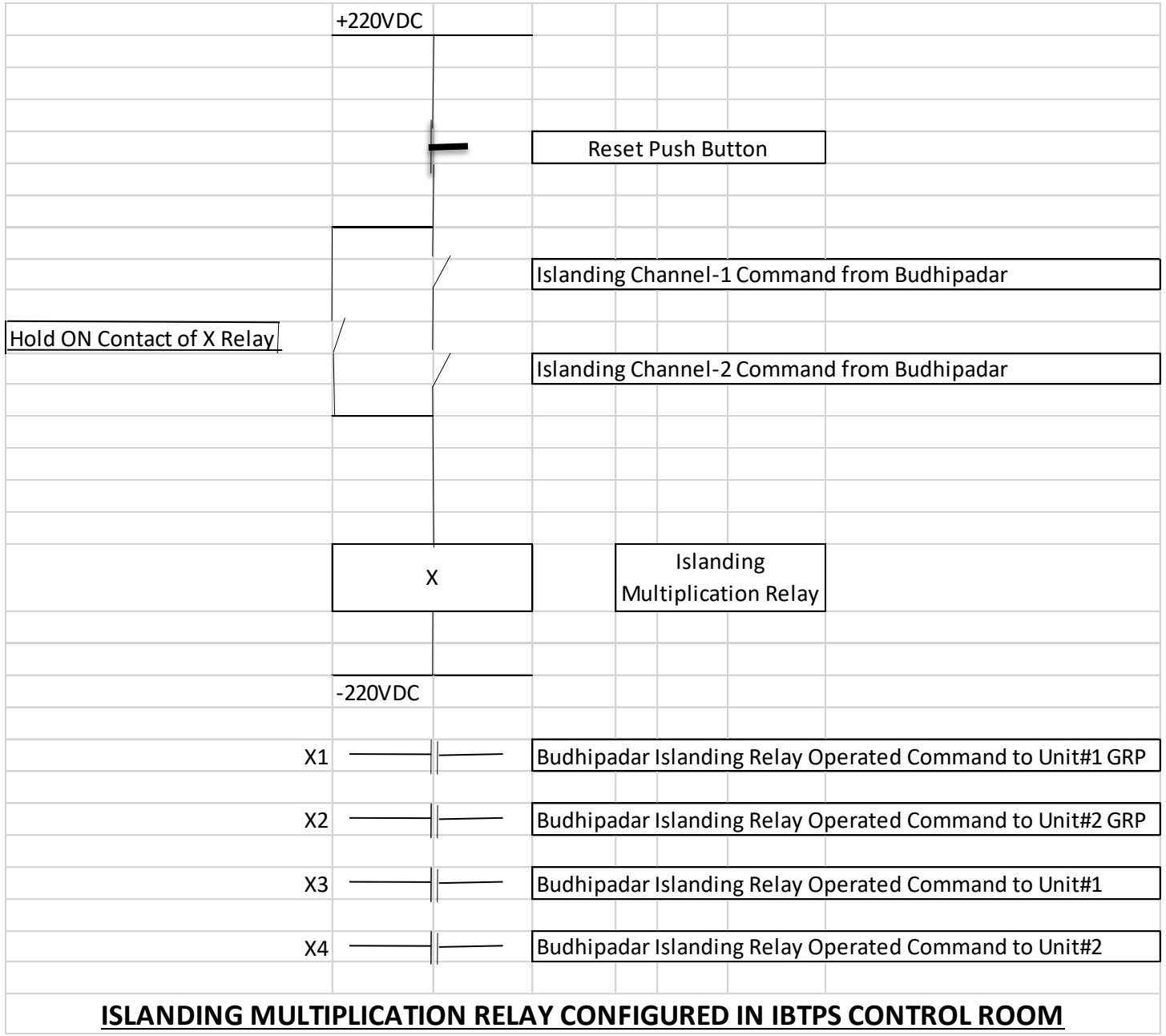
SCHEMATIC DRAWING OF ISLANDING RELAY INSTALLED IN B/C PANEL FOR TRIPPING OF DIFFERENT FEEDERS AT BUDHIPADAR GRID S/S.



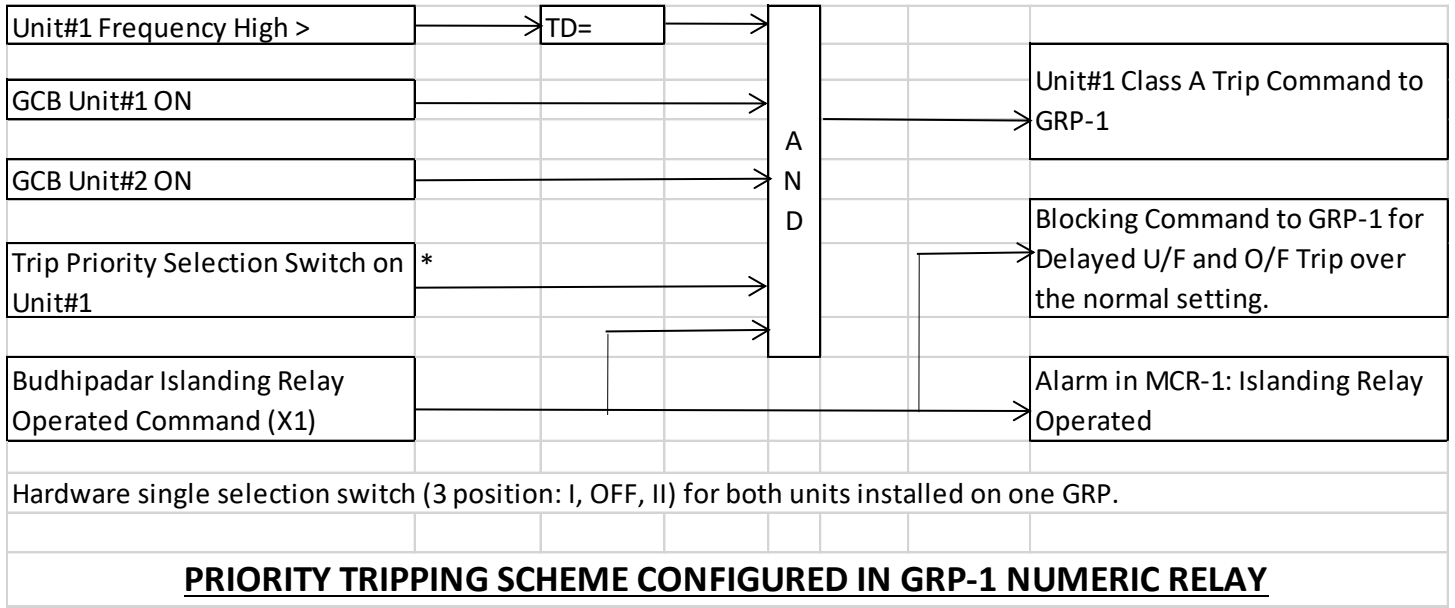
CONNECTION DIAGRAM OF ISLANDING RELAY (Micom P341) AT BUDHIPADAR SUB-STATION



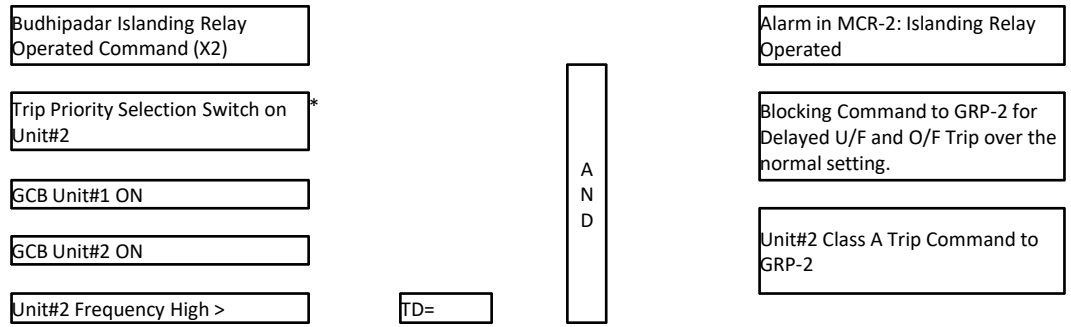

BO6
SW5
TRIP CKT. OF 132KV LAPANGA BREAKER
CMR
TRIP CKT. OF ALL 220KV FEEDERS EXCEPT AT-1,AT-2 AND SELECTED IB CKTS
BO7
PLCC/OPGG AT BUDHIPADAR TO LAPANGA
PLCC/OPGW AT LAPANGA
TRIP CKT. OF 132KV JHARSUGUDA FEEDER AT LAPANGA
BO8
BO9
PLCC/OPGG AT BUDHIPADAR TO TARKERA
PLCC/OPGW AT TARKERA
TRIP CKT. OF 132KV KALUNGA FEEDER AT TARKERA
BO10
PLCC/OPGG AT BUDHIPADAR TO TARKERA
PLCC/OPGW AT TARKERA
TRIP CKT. OF 132KV RGP-1 & RGP-2 FEEDER AT TARKERA
BO11
PLCC/OPGG AT BUDHIPADAR TO IBTPS
PLCC/OPGW AT IBTPS
COMMAND TO IBTPS END FOR RAMPING OF IB GENERATOR
BO12
PLCC/OPGG AT BUDHIPADAR TO LAPANGA
PLCC/OPGW AT LAPANGA
COMMAND TO IBTPS END FOR RAMPING OF IB GENERATOR
LEGEND
PTSS---- PT SELECTOR SWITCH
SW1-----SW5- ON/OFF SWITCH
CMR– CONTACT MULTIPLICATION RELAY



ISLANDING MULTIPLICATION RELAY CONFIGURED IN IBTPS CONTROL ROOM

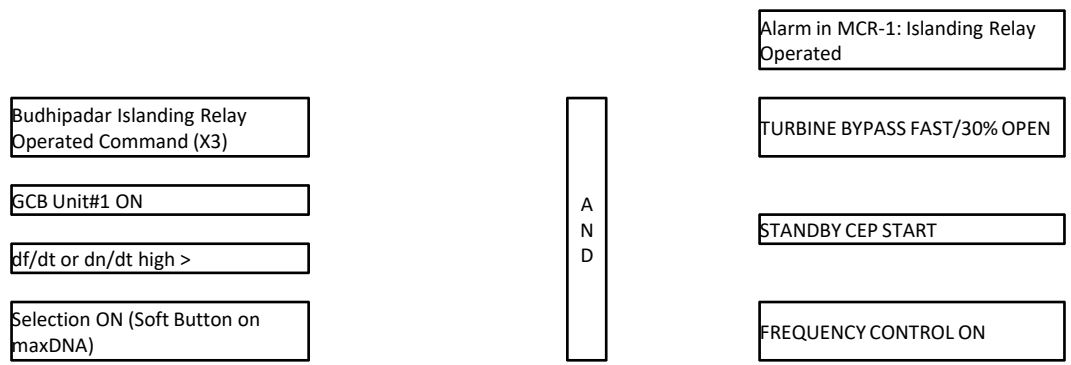


PRIORITY TRIPPING SCHEME CONFIGURED IN GRP-1 NUMERIC RELAY

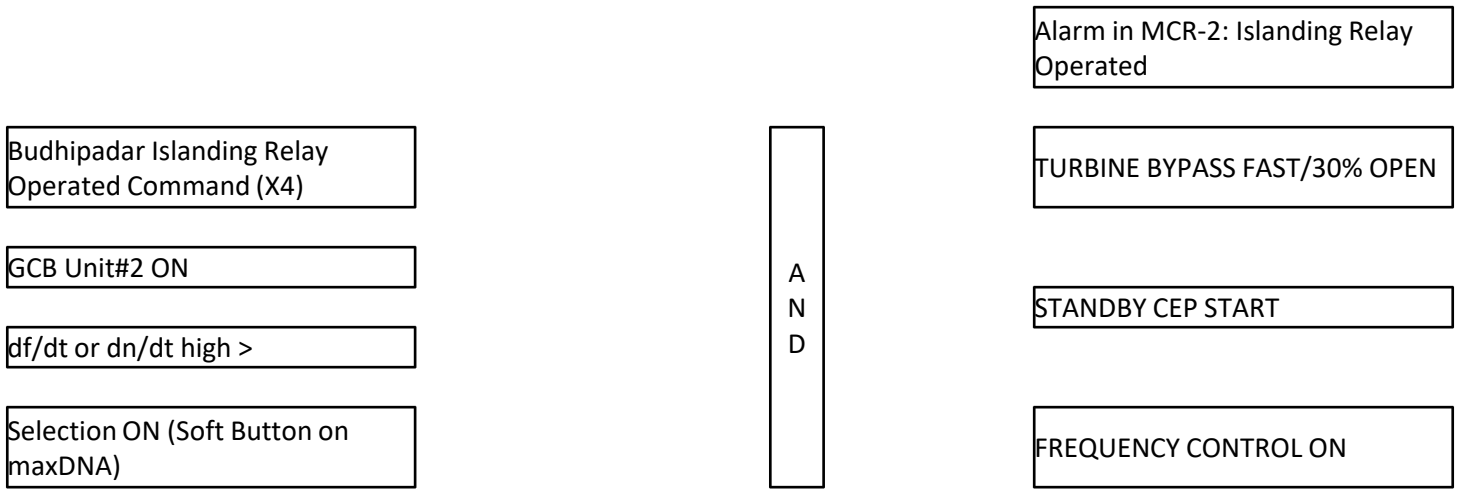


*Hardware single selection switch (3 position: I, OFF, II) for both units installed on one GRP.

PRIORITY TRIPPING SCHEME CONFIGURED IN GRP-2 NUMERIC RELAY



LOAD-GENERATION BALANCE SCHEME CONFIGURED IN UNIT#1 MAXDNA CONTROL SYSTEM



LOAD-GENERATION BALANCE SCHEME CONFIGURED IN UNIT#2 MAXDNA CONTROL SYSTEM

NOTES ON INTERCONNECTING RELAY FUNCTION.

Over voltage protection

An over voltage condition could arise when a generator is running but not connected to a power system, or where a generator is providing power to an islanded power system. Such an over voltage could arise in the event of a fault with automatic voltage regulating equipment or if the voltage regulator is set for manual control and an operator error is made. Over voltage protection should be set to prevent possible damage to generator insulation, prolonged over-fluxing of the generating plant, or damage to power system loads.

Under frequency protection

Under frequency operation of a generator will occur when the power system load exceeds the prime mover capability of an islanded generator or group of generators. Power system overloading can arise when a power system becomes split, with load left connected to a set of 'islanded' generators that is in excess of their capacity. Automatic load shedding could compensate for such events. In this case, under frequency operation would be a transient condition. This characteristic makes under frequency protection a simple form of "Loss of Mains" protection on system where it is expected that the islanded load attached to the machine when the grid connection fails exceeds the generator capacity.

Over frequency protection function

Over frequency running of a generator arises when the mechanical power input to the alternator is in excess of the electrical load and mechanical losses. The most common occurrence of over frequency is after substantial loss of load. When a rise in running speed occurs, the governor should quickly respond to reduce the mechanical input power, so that normal running speed is quickly regained.

Rate of Change of Frequency Protection (81R)

The two main applications for df/dt protection are network decoupling (loss of mains/loss of grid) and load shedding. During severe disturbances, the frequency of the system oscillates as various generators try to synchronize on to a common frequency. The frequency decay needs to be monitored over a longer period of time and time delayed df/dt can be used to make the correct decision for load shedding or provide early warning to the operator on a developing frequency problem.

Voltage Vector Shift Protection (ΔVθ)

The Voltage Vector Shift protection element measures the change in voltage angle over successive power system half-cycles. The element operates by measuring the time between zero crossings on the voltage waveforms. A measurement is taken every half cycle for each phase voltage. Over a power system cycle this produces 6 results, a trip is issued if 5 of the 6 calculations for the last power system cycle are above the set threshold. Checking all three phases makes the element less susceptible to incorrect operation due to harmonic distortion or interference in the measured voltage waveform.

The fast operation of this vector shift function renders it to operate at the instant of a disturbance rather than during a gradual change caused by a gradual change of power flow. Operation can occur at the instant of inception of the fault,at fault clearance or following non-synchronized reclosure, which affords additional protection to the embedded generator.


Thank
you

AnnexureC1.a

ISLANDING SCHEME FOR OPGCL






By

ODISHA POWER GENERATION CORPORATION LTD.

Objective:

Formation of proposed island shall achieve the following objectives:-

i) Prevention from total black out by avoiding effect of cascade tripping of the Power System.

ii) Fast restoration of supply.

Present Status:

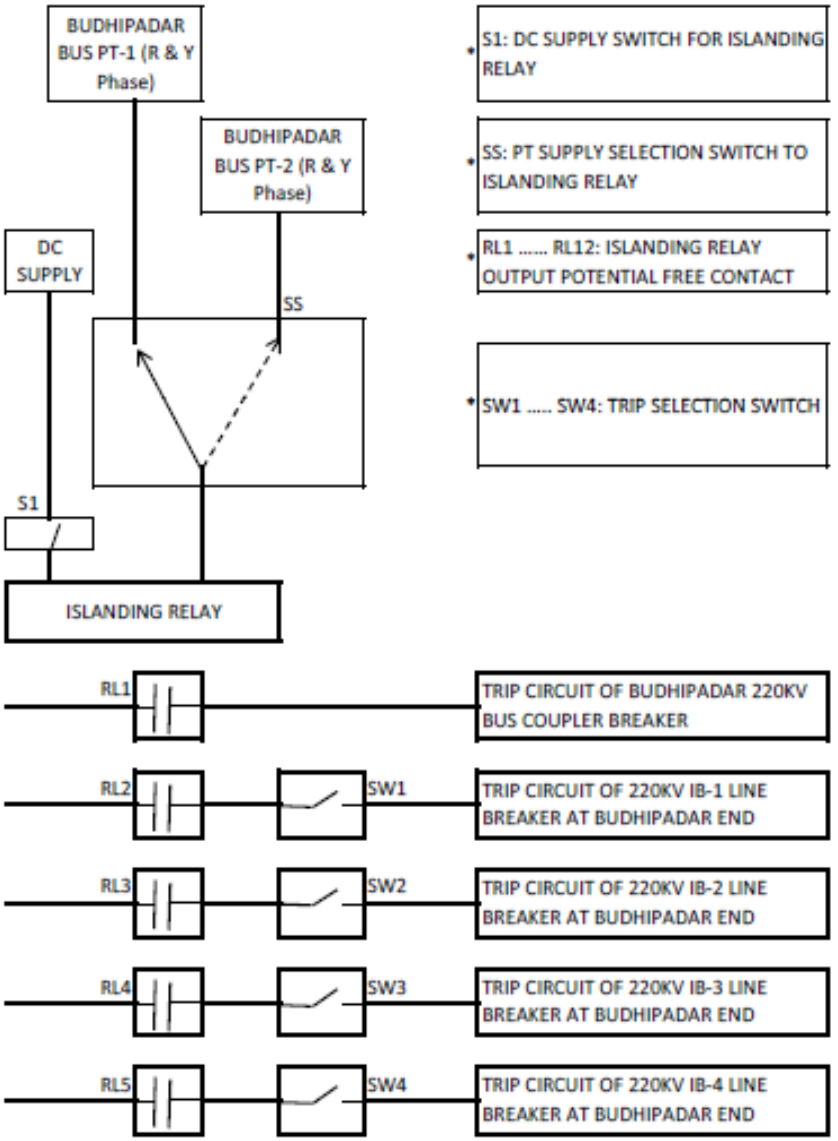
Presently there is no islanding scheme in operation in OPGCL.

Methodology of Proposed Islanding Scheme:

The methodology adopted for the proposed Islanding scheme is as under :-

- Islanding relay out put trip command extended to 220KV budhipadar bus coupler breaker and 220KV IB Line breakers at Budhipadar connected to non islanded Bus.
- Islanding relay output command extended to IBTPS through OPGW link for load – generation balance by fast governor/HPBP operation.
- Further two IB line(out of four) should always be connected to Islanded Bus and the radial Load should be maintained with in 185MW.

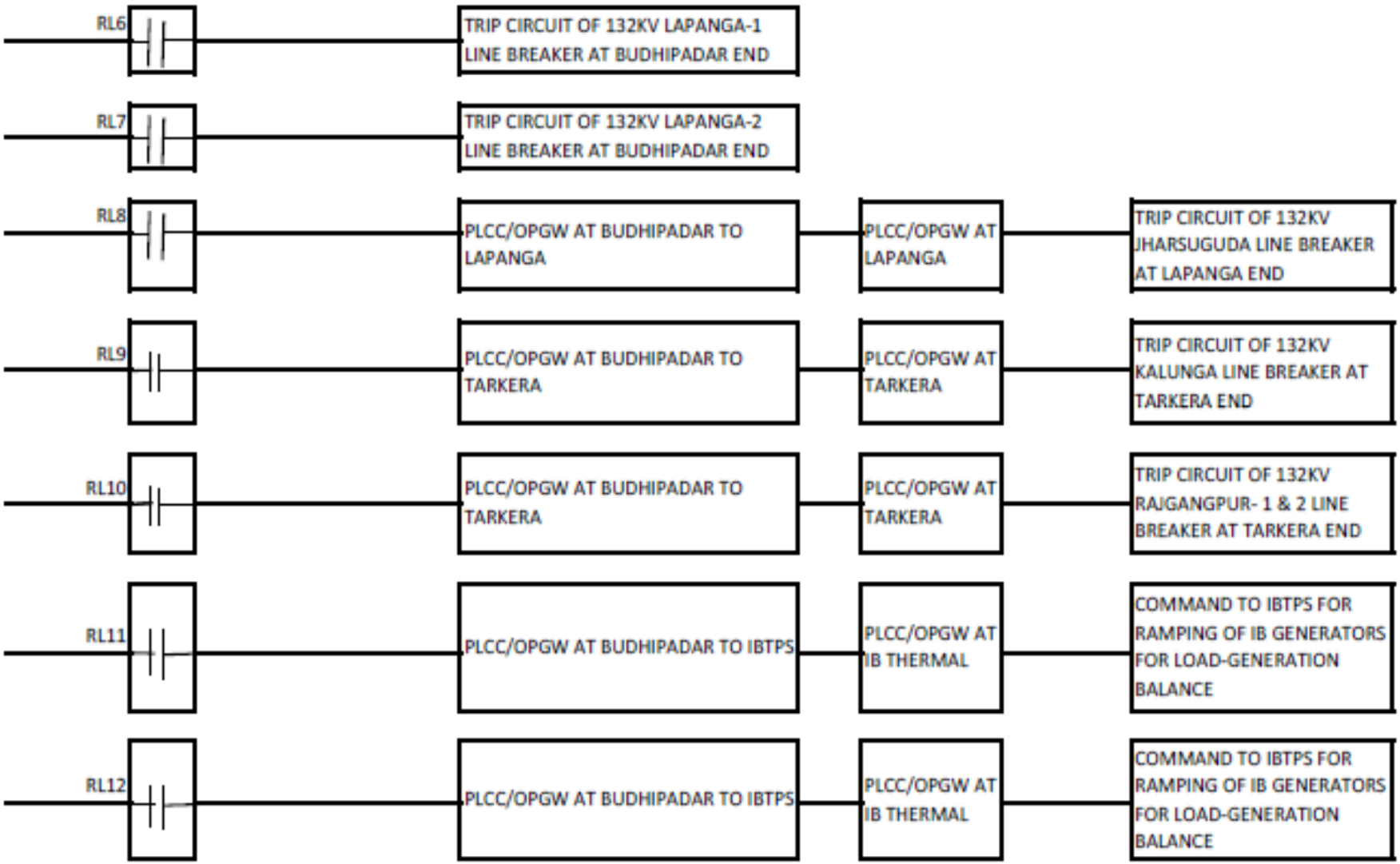
ISLANDING SCHEME OF IBTPS AT BUDHIPADAR

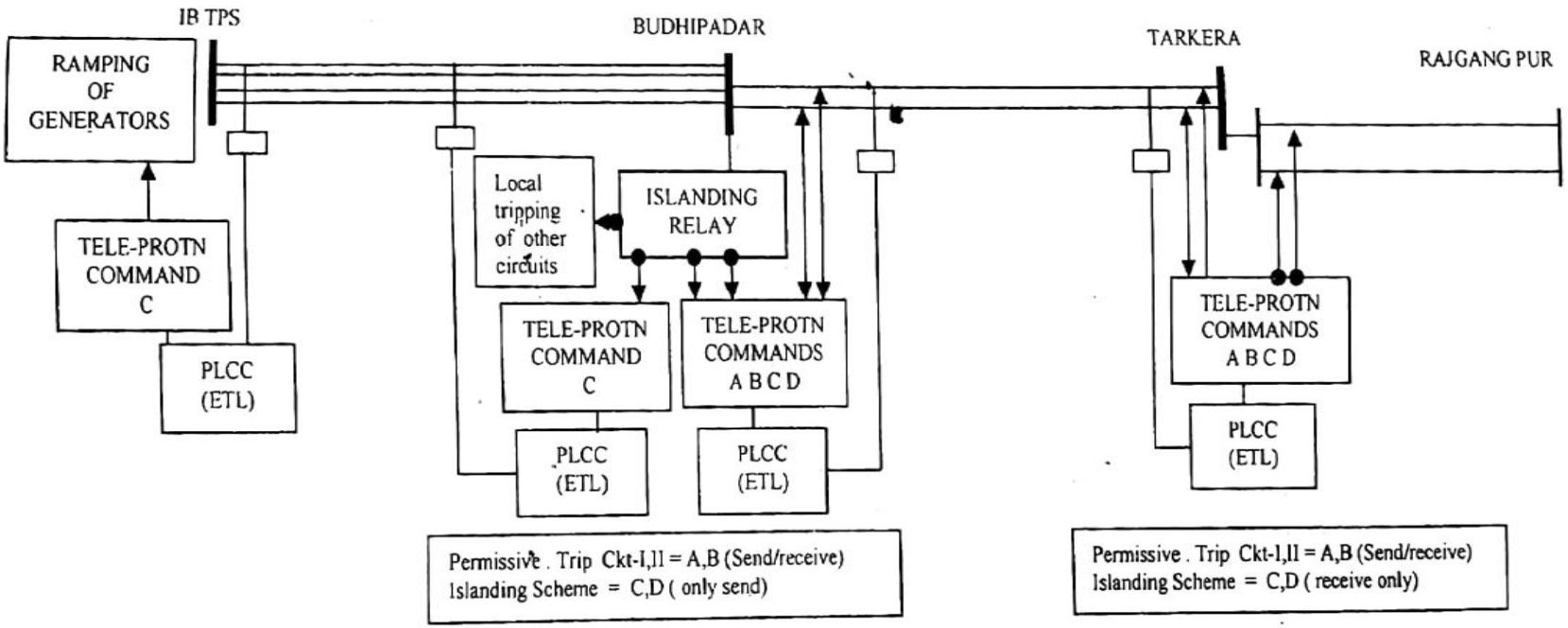


At Budhipadar grid, one 220KV BUS (**Islanding BUS**) shall be connected with local loads (AT 1 & 2, SPS/Concast, Basundhara) and two circuits of IBTPS. Other 220KV BUS (**Other BUS**) shall be connected with AAL, Vedanta, Tarkera, Korba, Raigarh, Bhusan, Lapanga and balance two ciccuits of IBTPS. Both 220KV BUS shall be interconnected through BUS Coupler Breaker. PT supply of **Islanding Bus** shall be fed to Islanding Relay through PT Supply Selection Switch (SS). In case of Islanding Relay operation, the **Islanding BUS** will get isolated with local load & IBTPS generation after tripping the Bus Coupler breaker (220KV) at Budhipadar, selected 132KV line Breakers and IBTPS line Breakers (220KV) connected to Other BUS at Budhipadar through respective Trip Selection Switch (SW1.....SW4).

132KV Local Loads for Islanding System- Budhipadar
132/33KV station load, MCL, MSP, Sundergarh, Jharsuguda, Brajrajnagar, Kalunga, Rajgangpur (with Kuchinda)

Minimum two nos. IBTPS circuits shall be kept connected to **Islanding BUS.** Respective Trip Selection Switch (SW1.....SW4) of remaining two nos. IBTPS circuits connected to **Other BUS** shall be kept ON and get tripped in case of Islanding Relay operation. **NEVER KEEP THE TRIP SELECTION SWITCH OF ANY IBTPS LINE CONNECTED TO "ISLANDING BUS" IN "ON" CONDITION.**


RL6
TRIP CIRCUIT OF 132KV LAPANGA-1 LINE BREAKER AT BUDHIPADAR END
RL7
TRIP CIRCUIT OF 132KV LAPANGA-2 LINE BREAKER AT BUDHIPADAR END
RL8
PLCC/OPGW AT BUDHIPADAR TO LAPANGA
PLCC/OPGW AT LAPANGA
TRIP CIRCUIT OF 132KV JHARSUGUDA LINE BREAKER AT LAPANGA END
RL9
PLCC/OPGW AT BUDHIPADAR TO TARKERA
PLCC/OPGW AT TARKERA
TRIP CIRCUIT OF 132KV KALUNGA LINE BREAKER AT TARKERA END
RL10
PLCC/OPGW AT BUDHIPADAR TO TARKERA
PLCC/OPGW AT TARKERA
TRIP CIRCUIT OF 132KV RAJGANGPUR- 1 & 2 LINE BREAKER AT TARKERA END
RL11
PLCC/OPGW AT BUDHIPADAR TO IBTPS
PLCC/OPGW AT IB THERMAL
COMMAND TO IBTPS FOR RAMPING OF IB GENERATORS FOR LOAD-GENERATION BALANCE
RL12
PLCC/OPGW AT BUDHIPADAR TO IBTPS
PLCC/OPGW AT IB THERMAL
COMMAND TO IBTPS FOR RAMPING OF IB GENERATORS FOR LOAD-GENERATION BALANCE



Note: (1) At Tarkera, teleprotection command- C (receive) shall be used for direct tripping of 132kV Tarkera – Rajgangpur- Ckt-I.

(2) At Tarkera, teleprotection command-D (receive) shall be used for direct tripping of 132 kV Tarkera – Rajgangpur-II.

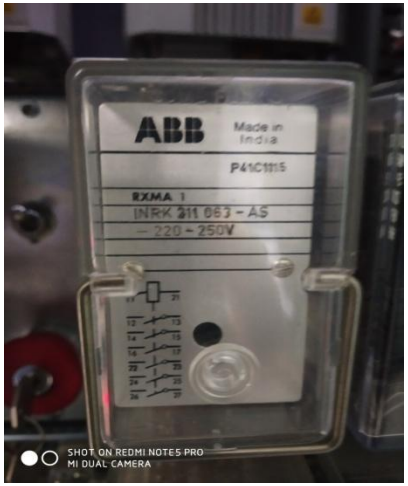
(3) At IB Thermal, Tele-protection command C shall be used for triggering ramping circuits of generators at IB TPS.

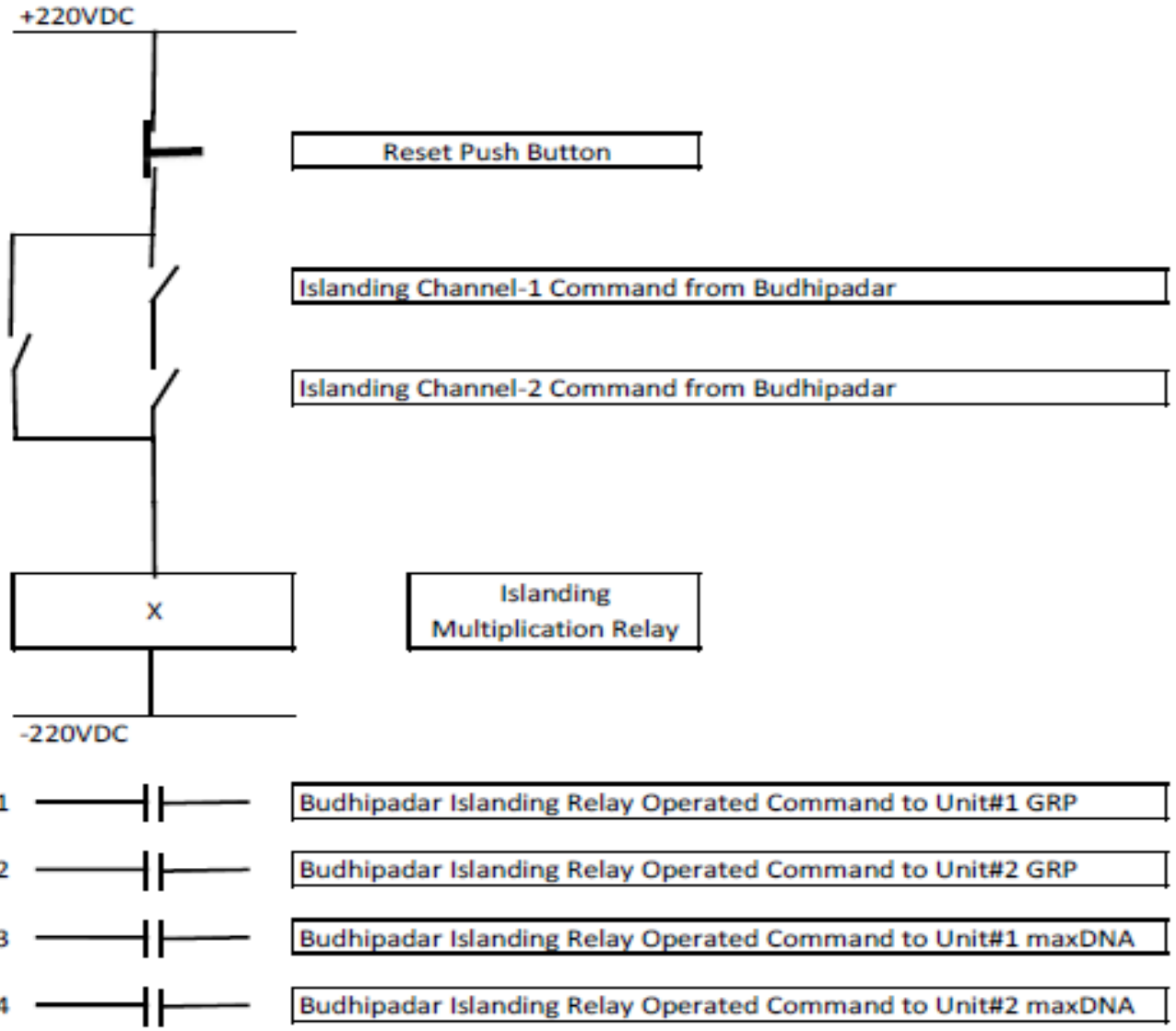
(4)Presently , as existing all the four circuits to IB thermal will work without carrier back up protection, it shall be provided as soon as digital protection coupler are procured very soon.

OFFICE OF THE GENERAL MANAGER		
Telecommunication Circle, OPTCL, Meramandali		
Drg No	Date	Apvd by
05	27.6.15	

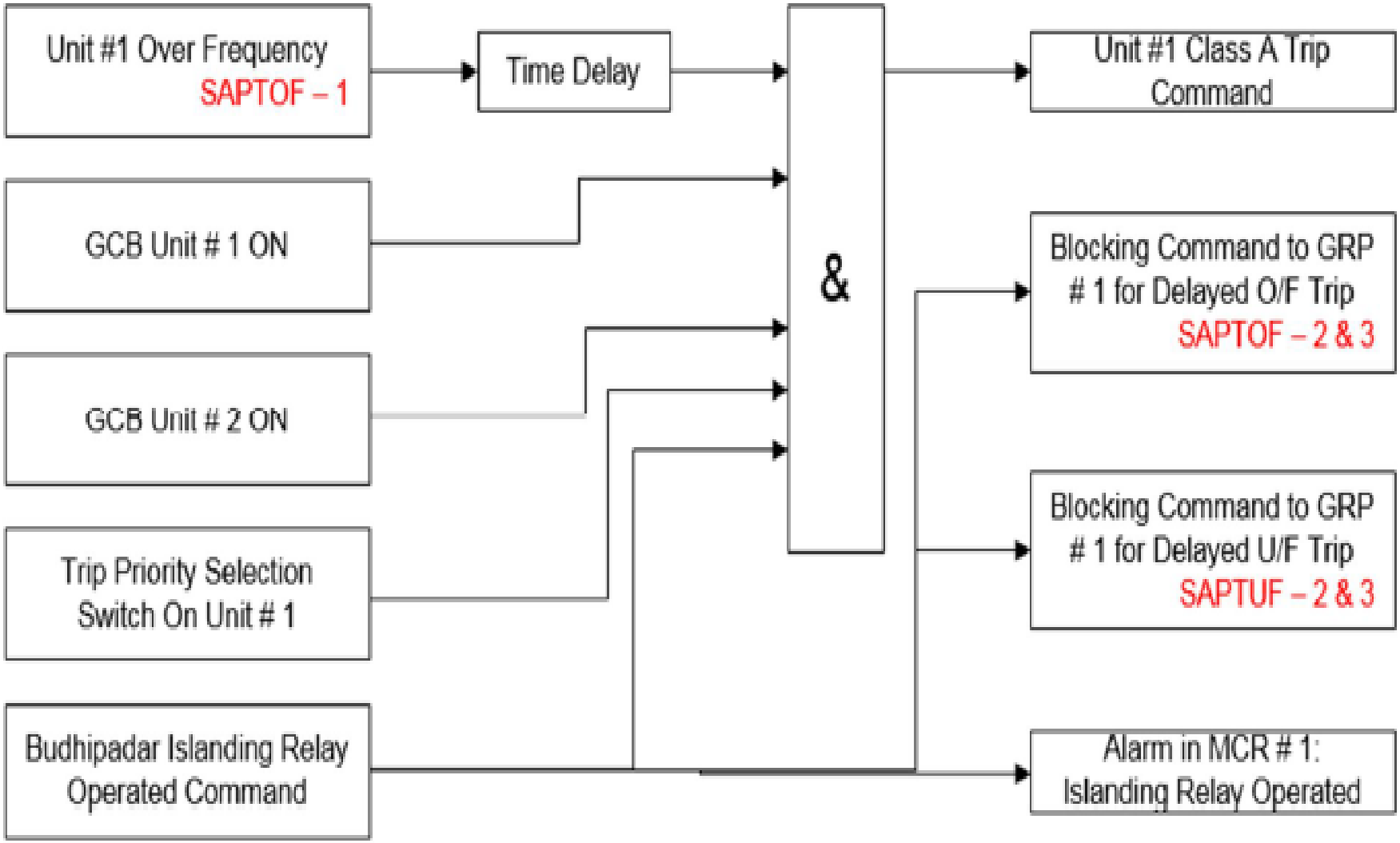
ISLANDING MULTIPLICATION RELAY CONFIGURED IN IBTPS SWITCHYARD CONTROL ROOM

Hold ON Contact of X Relay

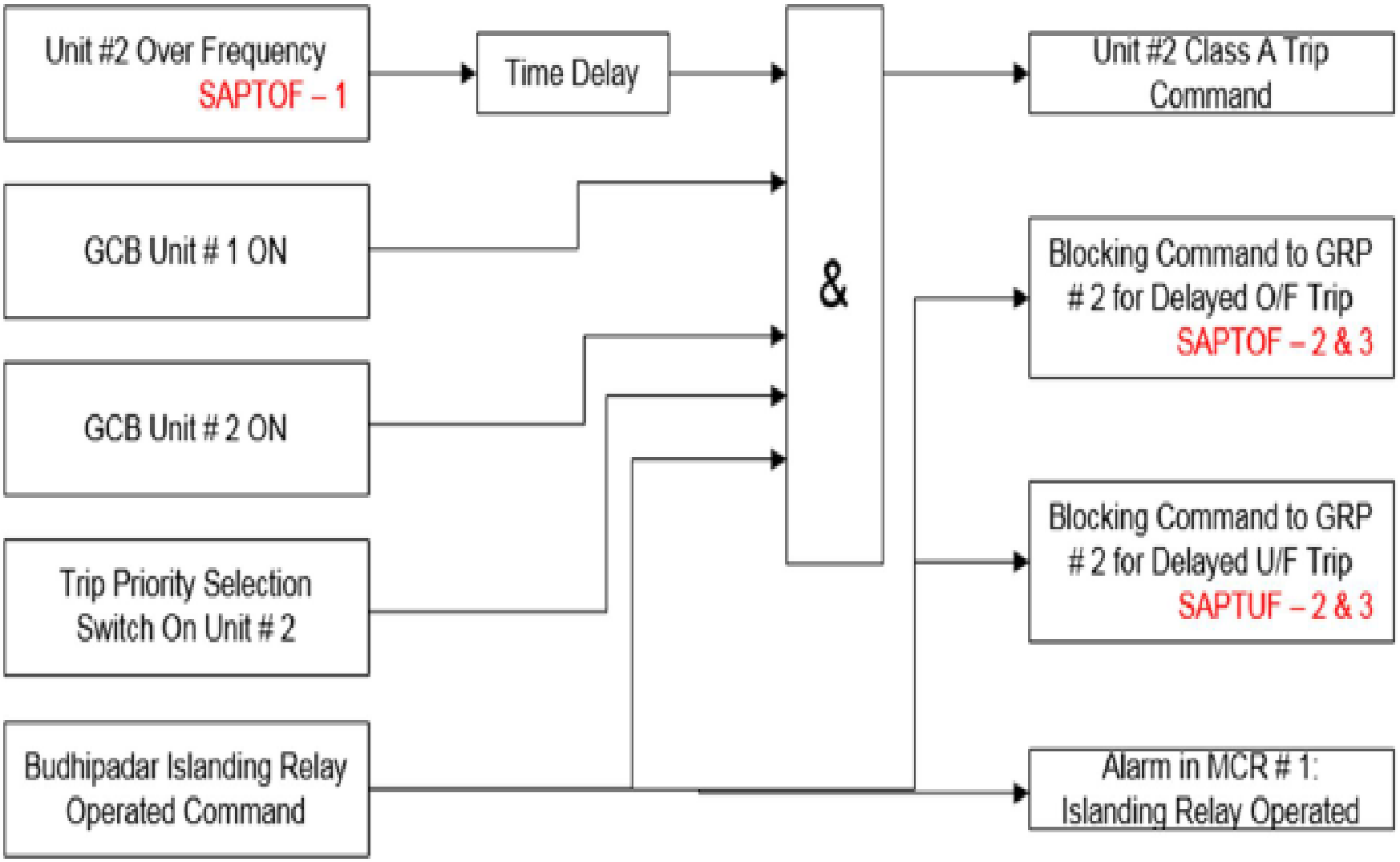




Logic configured in REG670 Relay for Islanding of Unit-I Generator



Logic configured in REG670 Relay for Islanding of Unit- 2 Generator

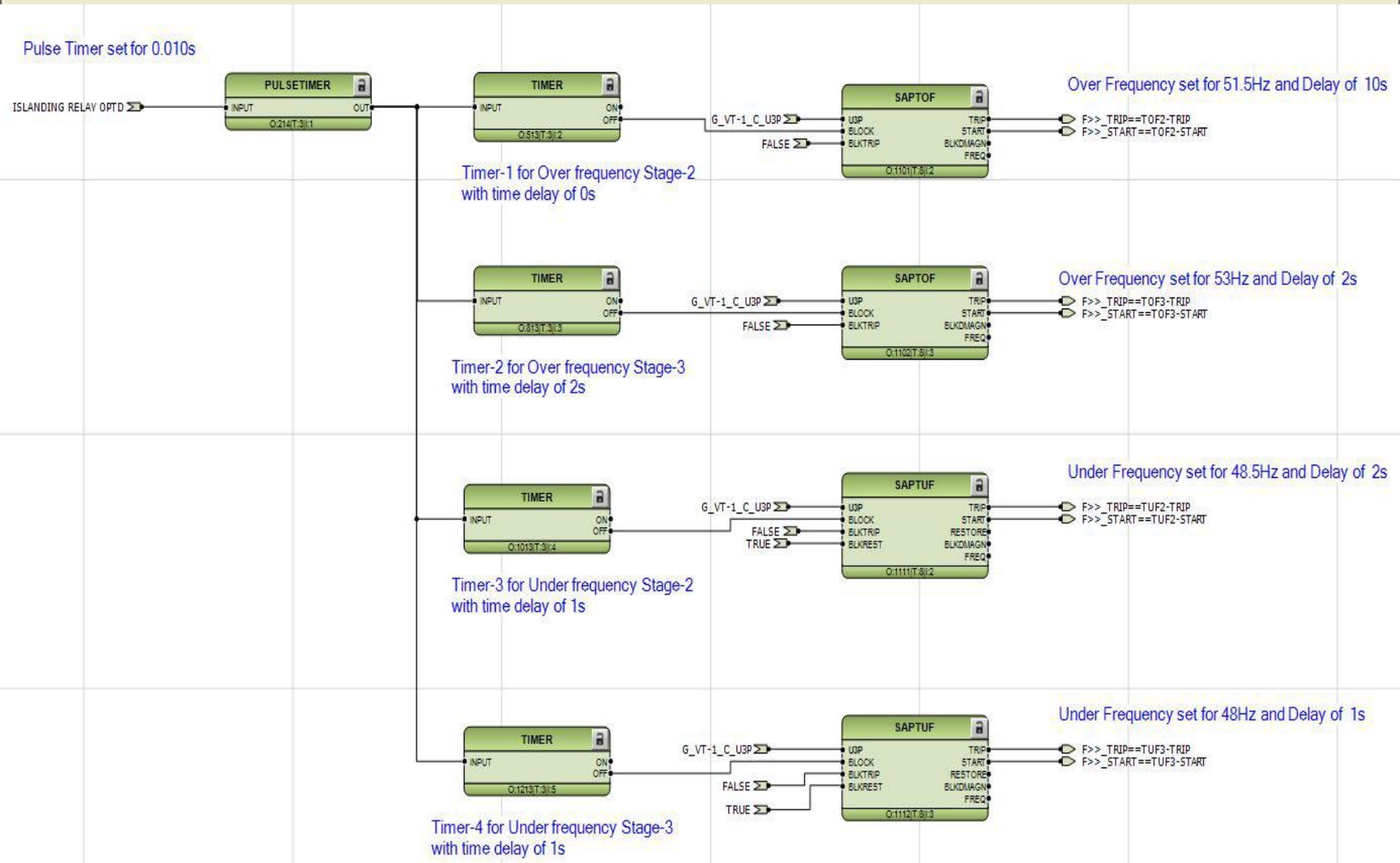


- The over – frequency protection is achieved using SAPTOF function block in Generator Protection relay REG670. There are 3 instances of SAPTOF function in REG670 relay, in which the 1st is used to confirm the disturbance in the system frequency (As shown in above figure- red colored), 2nd and 3rd instance is used for delayed operation of the over- frequency function in line with the logic shown above.

- Function Block and Parameter Settings of Over - Frequency Protection-1st Instance:

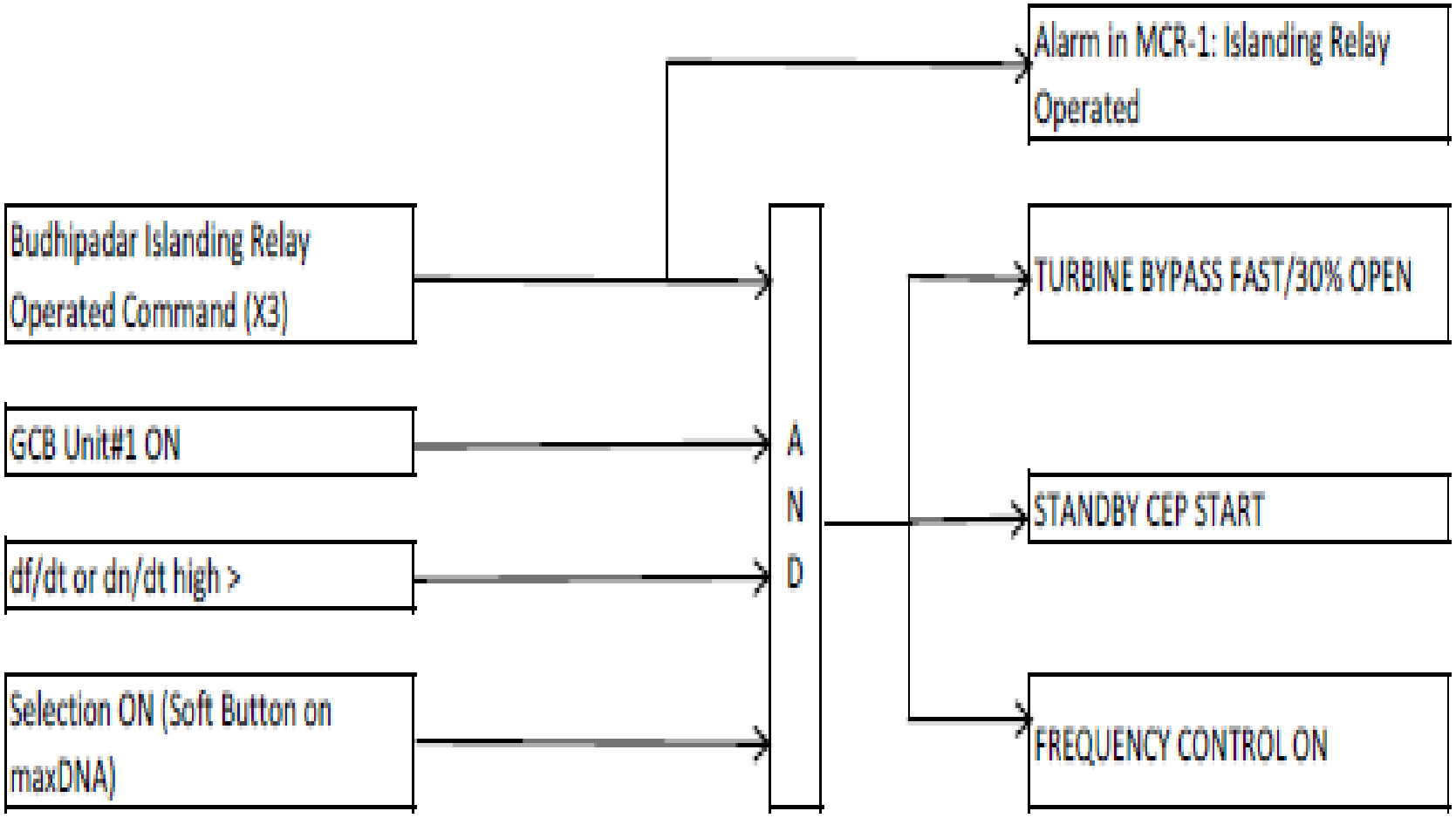
SAPTOF: 1				
Setting Group1				
Operation	On			
UBase	15.75	kV	0.05	2000.00
StartFrequency	51.50	Hz	35.00	75.00
IntBlockLevel	50	%UB	0	100
TimeDlyOperate	1.000	s	0.000	60.000
TimeDlyReset	0.050	s	0.000	60.000

Configuration of Delayed Over Frequency and Under Frequency Function

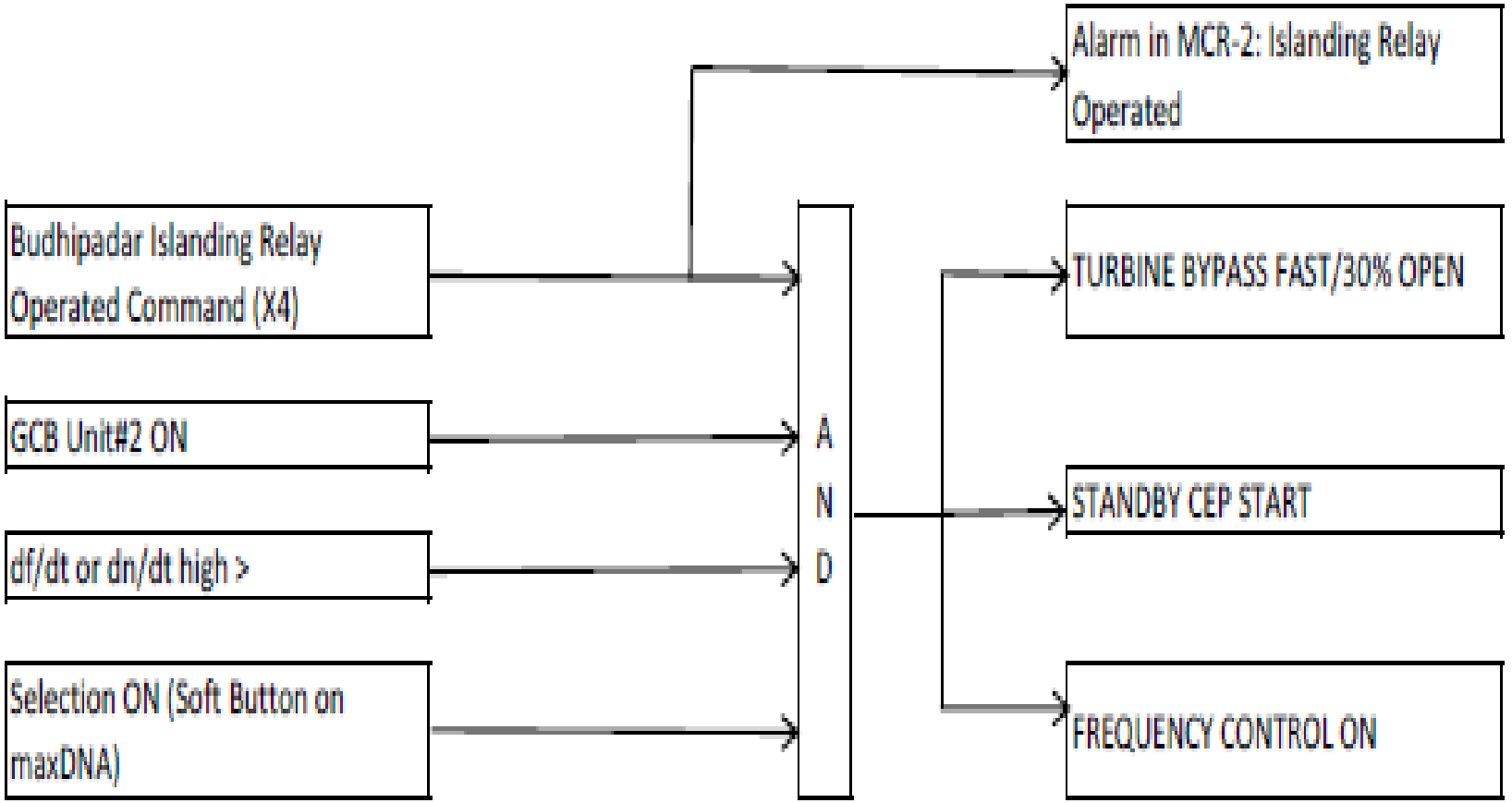


- Above timers are settable and can be adjusted as per requirement. If there is no trip from islanding relay, over and under frequency protections will operate as per the times shown without external timers (timer-1 to 4).
- If there is a trip from Islanding relay, over and under frequency protections are blocked till the time set in corresponding timers as per the above shown configuration. Hence total tripping time delay will be corresponding timer delay + over and under frequency protection function set time delay.

LOAD-GENERATION BALANCE SCHEME CONFIGURATION IN UNIT#1 MAXDNA CONTROL SYSTEM



LOAD-GENERATION BALANCE SCHEME CONFIGURATION IN UNIT#2 MAXDNA CONTROL SYSTEM



Islanding Operation	After islanding operation, IBTPS Generators shall cater to the demand of connected islanded load and maintain the frequency. In case of further extension of power to other loads if required, it may be done with close coordination of SLDC, IBTPS & Budhipadar S/S so that the islanded system shall not collapse and able to maintain at the desired frequency.
Normalisation / Resynchronisation	After system stabilization, islanded system may be synchronised with main grid at IBTPS end. Ensure that unloaded 220KV IB-Budhipadar lines are disconnected from both (IBTPS & Budhipadar) sides. Charge one of same lines from Budhipadar 220KV Other BUS connected to main system. The same line may be synchronized at IBTPS end after acheiving synchronisation permissive then connecting both systems. After this Budhipadar 220KV Bus Coupler breaker can be closed for normilazation. Alternatively both systems may be synnchronized through 220KV Budhipadar Bus Coupler breaker after acheiving required synnchronisation permissive.

THANK YOU

Annexure-C.2

MONTHLY INTERRUPTION REPORT FOR THE MONTH OF *JULY 2018*

TRANSMISSION SUB DIVISION HATIA-II

FEEDER :- 220KV PGCIL-I

Sl. No.	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
1.	03.07.18	16:56	18:02	01:06	F	Active Gr.-1,Started Ph –BCN,Trip Ph- C, Start Elts Distn. O/C Start I > 1 2,E/F Start IN 1 2,Distn. Trip Zone-1, Sys Freq.- 50.01 HZ, FAul Duration -4.999 ms, Relay Trip Time -79.98 ms, Fault Location -15.35KM, IA -482.1A, IB- 2.456 KA, IC – 4.522 KA, VAN -103.2 KV,VBN – 63.34 KV, VCN – 47.88KV, Fault Resistance -13.23Ω,Fault in Zone-1	
2.	20.07.18	08:46	09:38	00:52	F	Active Gr.-1,Started Ph –BCN,Trip Ph- C, Start Elts Distn. O/C Start I > 1 2,E/F Start IN 1 2,Distn. Trip Zone-1, Sys Freq.- 49.99 HZ, FAult Duration -0.00 ms, Relay Trip Time -80.01ms, Fault Location -1.664KM, IA -602.4A, IB- 1.176 KA, IC – 6.075 KA, VAN -131.8 KV,VBN – 111.7 KV, VCN – 54.63KV, Fault Resistance -9.223Ω,Fault in Zone-1	
3.	20.07.18	09:45	17:27	07:42	F	MICOM RELAY-Active Gr.-1,Started Ph –BCN,Tripped Ph- C, Start Elts Distn. O/C Start I > 1 2,E/F Start IN 1 2,Distn. Trip Zone-1, Sys Freq.- 50.00 HZ, FAult Duration -71.58 ms, Relay Trip Time -79.91ms, Fault Location -3.836KM, IA -876.08A, IB- 1.657 KA, IC – 2.532KA, VAN -128.3 KV,VBN – 113.7 KV, VCN – 46.16KV, Fault Resistance -29.51Ω,Fault in Zone-1 DC Supply SUPVN.Source -1 80A & 80B,,TC1 Ckt SUPVN. Y-Ph-195Y , B-Ph -195B, R- Ph-195R, TC2 ckt SUPVN Y-PH -295Y ,R-Ph-295R, **FACIA RELAY**-Protection DC Fail MCB Tripp OFF,Carrier Face /out of Service ,M1/M2 Protection In Operative /DC Fail.	

FEEDER :- 220 KV PGCIL -II

Sl. No.	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
1	03.07.18	16:56	17:49	00:53	F	Active Gr.-1,Started Ph –BCN,Trip Ph-ABC, Start Elts Distn. O/C Start I > 1 2,E/F Start IN 1 2,Distn. Trip Zone-1,AR Lockout Shot >, Sys Freq.- 50.01 HZ, FAul Duration -4.999 ms, Relay Trip Time -78.98 ms, Fault Location -10:80ms, IA -638.11A, IB- 404.65 K, IC – 1.828 KA, VAN -103.7 KV,VBN – 59.81 KV, VCN – 52.52KV, Fault Resistance -9.764Ω,Fault in Zone-1	
2.	20.07.18	9:27	10:24	00:57	F	Active Gr.-1, ,Started Ph –ACN,Trip Ph-ABC, Start Elts Distn. O/C Start I > 1 2,E/F Start IN 1 2, O/V Start IN 1 2,Distn. Start V>1, Distn. Trip Zone-1, Sys Freq.- 49.99 HZ, FAul Duration -451.7 ms, Relay Trip Time -80.09 ms, Fault Location -3.886KM, IA -11.76A, IB- 11.78 A, IC – 4.997 KA, VAN -155.0 KV,VBN – 155.34 KV, VCN – 6.33KV, Fault Resistance XY -5.427Ω,Fault in Zone-1 TC1 ckt SUPVN R-Ph-195R,195RC,Y-Ph-195Y,195YC,B-Ph-195B,195BC,DC Supply SUPVN. Source-1, 80A,TC2 ckt R-Ph-295R,Y-Ph-295Y,B-Ph-295B	
3.	20.07.18	12:16	16:52	04:36	F	Active Gr.-1, ,Started Ph –BCN,Trip Ph-ABC, Start Elts Distn. O/C Start I > 1 2,E/F Start IN 1 2,Distn Tripped 2, Distn. Trip Zone-1,AR Lockout Shot >, Sys Freq.- 50.03 HZ, FAul Duration – 61.63ms, Relay Trip Time -79.95 ms, Fault Location -9.035KM IA -793.4A, IB- 1.538K A, IC – 3.785 KA, VAN -128.4 KV,VBN – 98.88KV, VCN – 68.62KV, Fault Resistance - 19.8Ω,Fault in Zone-1	

FEEDER :- 220 KV PTPS-I

Sl. No.	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
1.	04.07.18	13:15	18:44	05:29	S/D		
2.	12.07.18	16:16	18:30	02:14	S/D		
3.	19.07.18	10:45	14:01	03:16	S/D		
4.	20.07.18	10:08	17:34	07:26	F	**Facia**- TC1 SUPVN,R-PH-195R Active Gr.-1, Started Ph –BC,O/V Start V>1, ,Sys. Freq.-50.06 HZ, Fault duration-783.0 ms, Relay trip Time -0.00s,fault in Zone none.	
5.	30.07.18	12:33	13:15	00:42	M		

FEEDER :- 220 KV PTPS-II

Sl. No.	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
1.	19.07.18	14:07	17:45	03:38	S/D		
2.	20.07.18	09:47	10:24	00:37	F	Active Gr.-1, ,Started Ph –BCN, Start Elts Distn. O/C Start I > 2,E/F Start IN 1 2, O/V Start V>1,Distn. Trip Zone-4,Sys Freq.- 50.06 HZ, FAul Duration – 1.217s, Relay Trip Time -0.00 s, Fault Location -3.458KM IA -254.6A, IB-119.5 A, IC – 1.179 KA, VAN -124.2 KV,VBN – 132.7KV, VCN – 26.95KV, Fault Resistance - 5.576Ω,Fault in Zone-4	

FEEDER :- 132KV Hatia-I

Sl. No.	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
1	04.07.18	12:49	13:45	00:56	M		
2	20.07.18	09:47	10:38	00:51	M		Made off due to all transformer was tripped
3.	20.07.18	18:12	18:35	00:23	F	Started Ph-ABC, Tripped Ph-A, O/C Start I> 1,O/C Trip I> 1, Active GR.-1, Sys. Freq.-50.08HZ, Fault Duration – 47.24ms, CB Operate time – 55.00ms, Relay trip time – 4.664s, IN Measd – 504.6ma, IN Derived – 505.4ma, VAN – 57.97V, VBN – 57.42V, VCN – 57.96V, UN Derived -955.7mv,	
4.	20.07.18	18:51	18:58	00:07	F	Started Ph-ABC, Tripped Ph-A, O/C Start I> 1,O/C Trip I> 1, Active GR.-1, Sys. Freq.-50.03HZ, Fault Duration – 5.399s, CB Operate time – 55.00ms, Relay trip time – 5.339s, Fault location -15.27mi,IA-1.586A,IB-1.069A, IC- 1.0784,VAB -98.66V,VBC- 99.76V, VCA- 98.57V,IN Measd – 473.8ma, IN Derived – 481.2ma, VAN – 57.01V, VBN – 57.10V, VCN – 57.96V, UN Derived -1.042v,	
5.	20.07.18	19:20	19:24	00:04	F	Started Ph-ABC, Tripped Ph-A, O/C Start I> 1,O/C Trip I> 1, Active GR.-1, Sys. Freq.-50.01HZ, Fault Duration – 5.091s, CB Operate time – 55.00ms, Relay trip time –5.0315 s,Fault location -14.36mi,IA-1.620A,IB -1.074A, IC- 1.049A,VAB -101.0V,VBC -102.2V, VCA -101.3V, IN Measd – 492.4ma, IN Derived – 499.5ma, VAN – 57.97V, VBN – 57.42V, VCN – 57.96V, UN Derived -939.1mv,	

FEEDER :- 132KV Hatia-II

Sl. No.	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
1	05.07.18	14:38	16:28	01:50	M		
2.	20.07.18	09:47	10:39	00:52	M		Made off due to all transformer was tripped
3.	20.07.18	18:12	18:35	00:23	F	Started ph –ABC,Tripped ph-C,O/C start I>1,O/C Trip I>1,Actie Gr.-1,Sys Freq-50.07 Hz,Fault duration-7.490s,Fault Location-36.81 Mi,IA-350.5A,IB-618.2A,IC-638.7A,VAB-119.7KV,VBC-120.3KV,VCA-120.3KV,IN Measured-292.6A,In Derived-297.1A,In Sensitive-0A,VAN-69.41KV,VBN-69.18KV,VCN-69.39KV,VN Derived-683.3V	
4.	20.07.18	18:51	18:57	00:06	F	Started ph –ABC,Tripped ph-C,O/C start I>1,O/C Trip I>1,Actie Gr.-1,Sys Freq-50.02 Hz,Fault duration- 8.687s,CB Operatr time-55.00ms,Relay trip time -8.627S,Fault Location-29.52 Mi,IA-333.0A,IB-567.7A,IC-626.4A,VAB-118.3KV,VBC-119.7KV,VCA-118.3KV,IN Measured-275.9A,In Derived -277.8A,In Sensitive-0A,VAN-68.08KV,VBN-68.83KV,VCN-68.81KV,VN Derived-0.00V	
5.	20.07.18	19:20	19:25	00:05	F	Started ph –ABC,Tripped ph-C,O/C start I>1,O/C Trip I>1,Actie Gr.-1,Sys Freq-50.01 Hz,Fault duration- 8.290s,CB Operatr time-55.00ms,Relay trip time -8.230S,Fault Location-31.17Mi,IA-338.1A,IB-566.1A,IC-603.7A,VAB-121.1KV,VBC-122.7KV,VCA-121.6KV,IN Measured-277.1A,In Derived -275.9A,In Sensitive-0A,VAN-69.94KV,VBN-70.38KV,VCN-70.67KV,VN Derived379.2V	

FEEDER:- 132KV Hatia-III

Sl. No.	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
1.	18.07.18	15:05	15:25	00:20	F	Started Ph ACN, triped Ph-N, O/C start I > 12, E/F -2,Start In2>12,E/F-2,Start IN 2>12 ,E/F -2 Trip phase IN 2 >2 , Super vision VTS , Active Gr.-1, Sys. Freq. – 50.02 Hz, Fault Duration -170.0ms, CB Operation Time – 55.00 ms, Relay trip time-110.0 ms, Fault Location - 6.490ms, IA – 4.457KA, IB –426.1A, IC – 868.4A, VAB – 80.78KV,VBC-67.10KV,VCA-34.59KV IN –Measurd -3.218KA, IN Drived – 3.241A, VAN -34.52KV, VBN – 67.16KV, VCN – 0.000V,VN Drived - 69.86KV.	

2.	20.07.18	08:46	09:19	00:33	F	Started Ph N, triped Ph-N, O/C start I > 1, E/F -2, trip IN 2 > 2,E/F -2 Trip IN 2 > 2, E/F -2, Start Trip IN 2> 2, Super vision VTS F/R, Active Gr.-1, Sys. Freq. – 50.04 Hz, Fault Duration -310.0ms, CB Operation – 55.00 ms, Relay trip time- 250.0 ms, Fault Location - -36.62mi, IA – 217.0A, IB –37.2A, IC – 452.2A, VAB – 121.1KV, VBN - 68.13 KV, VCA – 66.58 , IN –Measurd -908.2A ,IN Drived – 900.4A,IN Sensitive – 0.00A, VAN -66.55 K V, VBN – 68.12KV, VCN – 0.000V,VN Drived - 58.93 KV.	
3.	20.07.18	18:12	18:16	00:04	F	Started Ph AB, triped Ph-A, O/C start I > 1,O/C Trip I>1, Super vision VTS , Active Gr.-1, Sys. Freq. – 50.08Hz, Fault Duration -271.1s, CB Operation – 55.00 ms, Relay trip time- 271.1 s, Fault Location - -60.53mi, IA – 898.5A, IB –795.4A, IC – 817.7A, VAB – 118.2KV, VBC -68.49 KV, VCA – 68.03 , IN –Measurd -45.22A ,IN Drived – 41.82A,IN Sensitive – 0.00A, VAN -68.00 K V, VBN – 68.50KV, VCN – 0.00V,VN Drived - 68.30 KV.	
4.	20.07.18	18:51	18:59	00:08	F	Started Ph-AC , triped Ph-A, O/C start I > 1, O/C Trip I>1, Super vision VTS Active Gr.-1, Sys. Freq. – 50.01 Hz, Fault Duration -271.1s, CB Operation – 55.00 ms, Relay trip time – 27.1 s, Fault Location - -60.53mi, IA – 908.9A, IB –810.2A, IC – 882.8A, VAB – 118.0KV, VBC -68.80 KV, VCA – 67.39 , IN –Measurd -36.87A ,IN Derived – 34.31A,IN Sensitive – 0.00A, VAN -67.36 K V, VBN – 68.81KV, VCN – 0.000V,VN Derived - 67.93 KV.	
5.	20.07.18	19:20	19:26	00:06	F	Started Ph-AC , triped Ph-A, O/C start I > 1, O/C Trip I>1, Super vision VTS Active Gr.-1, Sys. Freq. – 49.93Hz, Fault Duration -161.9s, CB Operation – 56.00 ms, Relay trip time – 161.9 S, Fault Location - -58.68mi, IA – 899.0A, IB –825.4A, IC – 798.9A, VAB – 120.5KV, VBC -69.70 KV, VCA – 69.50 , IN –Measurd -31.84A ,IN Derived – 32.57A,IN Sensitive – 0.00A, VAN -69.47 K V, VBN – 69.71KV, VCN – 0.000V,VN Derived - 69.71 KV.	

FEEDER :- 132KV Lohardaga-I

Sl. No.	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
1.	04.07.18	15:45	15:54	00:09	F	Active Group-1,Trip phase ABC,E/F started in ,E/F Trip in-2,Fault Alarm-No,System Frequency-49.95Hz,Fault duration-2.062ms,Relay Trip Time-80.08ms,IA-546.4A,IB-74.56A,IC-108.8A,VAN-74.01KV,VBN-75.16KV, VCN-73.25KV,Fault in zone-None	
2.	20.07.18	09:47	10:32	00:45	M		Made off Due to all transformer tripped
3.	20.07.18	12:16	13:18	01:02	M		

FEEDER:- 132KV Lohardaga-II

Sl. No.	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
1.	04.07.18	15:45	15:55	00:10	F	Trip Relay-86,Dir E/F Protection-67N	
2.	20.07.18	09:47	10:32	00:45	M		Made off Due to all transformer
3.	20.07.18	12:16	17:15	04:59	M		Made off Due to Restricted Power.

FEEDER :- 132KV Namkum

Sl. No.	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
1	20.07.18	09:47	10:29	00:42	M		Made off Due to all transformer tripped
2	20.07.18	18:51	19:24	00:33	O/C	Started Phase ABC ,Tripped phase ABC,Over current start-I>1,Over current trip-I>1 Active Group-1,VT faid Alarm,System frequency-49.96Hz,Fault duration-266.9ms,Relay trip time-80.06ms,IA-1.385KA,IB-1.393KA,IC-1.400KA,VAN-28.53KV,VBN-67.74KV,VCN-66.33KV,Fault time zone None.	
3	23.07.18	10:52	11:01	00:09	O/C	**Facia -**Main PROTN OPTD E/F-Axu Distance PROTN 21X **Micom-**Active Group-1,Started Phase ABC,Tripping Phase ABC,O/Current- I>1,O/C Trip I>1,system frequency 49.75Hz,F/Duration 213.8ms,Relay Trip Time -80.36ms,IA-256.3A,IB-245.3A,IC-251.8A,VAN-69.38KV,VBN-73.78KV,VCN-72.93KV,Fault in zone none.	
4	23.07.18	14:32	15:40	01:08	S/D		
5	30.07.18	13:01	15:34	02:33	S/D		

220/132KV 150 MVA ICT-I

Sl. No.	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
1.	20.07.18	08:46	09:00	00:14	F	Dir E/F Protn. Gr A -86A2,Gr. B-86B1,Trip relay 86	

220/132KV 150 MVA ICT-II

Sl. No.	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
1	20.07.18	08:46	09:02	00:16	F	Trip relay Gr.A 86 A, Trip relay Gr. A & B 86 A2,86B1 & 86B2,Traffo Diff Protn 87	
2	20.07.18	09:45	10:30	00:45	F	Trip relay Gr. 86 A, Trip relay Gr. A & B 86 A2 & 86B2,Traffo Diff Protn 87,Trip relay 86	

220/132KV 150 MVA ICT-III

Sl. No.	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
1.	20.07.18	08:46	09:24	00:38	F	86A X & 86 BX Trip (Multi pilation), GR.- A & GR.- B Master Trip Relay 86A & 86B,, Started PH-BC, Tripped Ph-poc,Start 2 Restricted E/F Start REF > HV, Restricted E/F Trip REF > HV Active Gr. 1, Sys Freq. 50.00HZ, I.A. – I Mag. 371.1A, IB- I Mag-790.0A, IC – I Mag- 564.7A, IA – 2 Mag. – 0.000A, IB – 2 Mag – 0.000A, IC- 2 Mag.– 0.000A, IA- 3 Mag. – 434.2A, IB-3 Mag.– 909.5A, IC.-3 Mag.-519.8A, IA – HV Mag.- 371.1A , IB – HV Mag. – 790.0A, IC – HV Mag. – 564.7A, IA – LV Mag- 434.2A, IB- LV Mag.- 909.5A, IC- LV – 519.8A , I 2 – HV mag -130.0A, I 2 – LV –mag – 226.4A, IN- HV meased mag – 232.2A , IN – LV meased mag- 0.000A,VX mag – 226.4KV, IA Diff – 0.013PV, IB Diff. – 0.014PV, IC Diff. – 0.07PV, 1A BIAS – 0.305PV, 1B BIAS – 0.272PV, IC BIAS – 0.142PV, REF. HV L 0Z Diff – 1.745K A,REF HV LOZ BIAS – 464.8A.	

Assistant Executive Engineer
Transmission Subdivision, Hatia-II

Annexure-C.3

Sl No.	Name of the incidence	PCC Recommendation	Latest status
72nd PCC Meeting			
1.	Repeated disturbances at 220/132 kV Purnea(PGCIL) & 132 kV Purnea(BSPTCL) substation.	PCC advised Powergrid to properly coordinate the relay settings from 400kV side to 132kV side at Purnea(PGCIL). PCC also advised Powergrid to verify 220 kV New Purnea-Purnea (PGCIL) D/C line on DEF at 15:38 hrs.	
2.	Disturbance at Tenughat (TVNL)S/s on 27.09.18 at 13:14 hrs.	PCC advised TVNL to change the timer settings of O/C and E/F relay at TTPS end as per IEC curve in order to have a proper coordination among the stations.	
3.	Repeated tripping of 220 kV Jorethang-New Melli D/C and Tashiding-N. Melli S/C	PCC advised DANS energy to review the relay settings for both the lines.	
71st PCC Meeting			
1.	Disturbance at 220/132 kV Chandil S/s on 08.08.18 at 05:49 hrs.	PCC advised JUSNL to check the details of tripping of 220kV Chandil – STPS S/C and also to review the zone-4 timer settings for all the lines as per PCC recommendations.	
2.	Disturbance at 220/132 kV Motipur(BSPTCL) S/s on 15.08.18 at 13:00 hrs.	PCC advised BSPTCL to check the disturbance recorders of all the lines in 220 kV Motipur S/s and communicate the findings to ERPC/ERLDC at the earliest.	
3.	Disturbance at 400 kV Farakka S/s on 19.08.18 at 15:26 hrs.	PCC advised NTPC to replace/divert Micom P437 relay to avoid unwanted tripping of such important transmission line. PCC also advised to check the reason for not sending carrier from Farakka to Kahalgaon and non-operation of Autorecloser.	

4.	Disturbance at 400 kV MPL S/s on 19.08.18 at 15:47 hrs.	PCC advised Powergrid to share the procedure/directives regarding implementation of the POP scheme with ERPC/ERLDC.	
5.	Disturbance at 400/132 kV Motihari(DMTCL) S/s on 22.08.18 at 14:59 hrs.	PCC observed that there is a need of SPS implementation to avoid the overloading of other ICT, in case of one ICT tripped. PCC advised Bihar to formulate a draft scheme of SPS and submit it to ERLDC/ERPC for further discussion.	The agenda will be discussed in the next TCC meeting to be held on 16.11.2018.
70th PCC Meeting			
1.	Tripping incidences in 400 kV Rangpo-Binaguri D/C line and subsequent operation of SPS-II on 10.07.18 & 30.07.18	PCC once again advised Dansenergy to review the relay settings at Dikchu end to avoid unwanted tripping. .	Dikchu informed that the issue can be attributed to saturation of HV side CT in Generating Transformer. Dikchu added that they are going to test the CT very soon and if required, it will be replaced with a new one.
3.	Repeated Grid Disturbances at 220kV Madhepura (BSPTCL) S/s on 19.07.18 at 13:31 hrs.	PCC advised BSPTCL to check healthiness of PLCC and enable the autoreclosure setting as well as the carrier tripping settings for both the lines and report to ERPC and ERLDC.	BSPTCL informed that the PLCC was in healthy condition. Regarding autoreclosure and carrier tripping scheme, they informed that they are under process of implementing the same.
69th PCC Meeting:			
5.	Total power failure at 220/132 kV Sipara S/s (BSPTCL) on 15.06.2018 at 10:58 hrs.	PCC advised BSPTCL to check & analyse the disturbance recorders of all the feeders along with the timing of relay operation and Circuit breaker opening time in order to ascertain the	BSPTCL informed that the busbar protection is now out of service for Sipara S/s. A new busbar

		cause of busbar relay operation.	protection system is under implementation.
68th PCC Meeting			
7.	Issues related with Generation Backing down during Talcher-Kolar SPS operation on 16th May 2018.	PCC advised Powergrid to explore for inclusion of pole block with ground return mode signal in the SPS logic. PCC advised NTPC, GMR and JITPL to ensure the generation reduction as per the SPS logic. PCC advised NTPC also to explore for inclusion of pole block with ground return mode signal in the SPS logic.	Regarding inclusion of pole block with ground return mode signal in the SPS logic, Powergrid informed that the issue was referred to OEM.
8.	Issue of Protection Coordination Observed during Blackout of Tala on 23rd May 2018.	PCC advised Bhutan representatives to submit a detailed report on the above disturbance to ERPC and ERLDC at the earliest.	
9.	Non-Operation of 400 kV Binaguri-Rangpo D/C SPS on 9th May 2018	PCC advised Powergrid to ensure the relevant data availability of SPS operation to ERLDC through SCADA.	Regarding implementation of SPS through SAS, Powergrid informed that the installation and testing work have already been completed. The SPS through SAS will be in service after availing the next shutdown.
10.	Disturbance at 400/220 kV Biharshariff S/s on 28-03-2018 at 18:43 hrs and 19-03-2018 at 02:02 hrs.	PCC advised BSPTCL and Powergrid to ensure proper relay coordination between 400kV and 220 kV system including ICTs at Biharshariff S/s. 71st PCC advised BSPTCL to configure the zone-2 timings as 250-300 msec for the lines which do not have PLCC operational so that a proper relay coordination will be ensured between ICTs and the lines.	BSPTCL informed that they are in the process of implementing the revised settings.

Checklist for Submission of new transmission elements for updation in Protection Database

NAME OF ORGANISATION:
FOR THE MONTH OF:

SUBSTATION DETAIL:

Sl No	DETAILS OF ELEMENTS	DATA TYPE	Status of Submission (Y/N)	Remarks
1	TRANSMISSION LINE	LINE LENGTH, CONDUCTOR TYPE, VOLTAGE GRADE		
2	POWER TRANSFORMER	NAMEPLATE DETAILS		
3	GENERATOR	TECHNICAL PARAMETERS		
4	CURRENT TRANSFORMER	NAMEPLATE DETAILS		
5	VOLTAGE TRANSFORMER	NAMEPLATE DETAILS		
6	RELAY DATA	MAKE, MODEL and FEEDER NAME		
7	RELAY SETTINGS	NUMERICAL RELAYS: CSV or XML file extracted from Relay ELECTROMECHANICAL RELAYS: SNAPSHOT of RELAY		
8	REACTOR	NAMEPLATE DETAILS		
9	CAPACITOR	NAMEPLATE DETAILS		
9	UPDATED SLD			

SIGNATURE:
NAME OF REPRESENTATIVE:
DESIGNATION:
CONTACT:
E-MAIL ID: