Minutes
of
73rd PCC Meeting

Date: 11.12.2018
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

MINUTES OF 73RD PROTECTION SUB-COMMITTEE MEETING HELD AT ERPC, KOLKATA ON 29.11.2018 (THURSDAY) AT 10:30 HOURS

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

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.

Deliberation in the meeting

ERLDC requested for amendment in the deliberations recorded against agenda item no. C.12 as follows:

"PCC advised POWERGRID to submit TFR triggering criteria and TFR signal list for all HVDC station of Eastern region to ERLDC."

Members approved the minutes of 72nd PCC meeting with the above amendment.

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.

Deliberation in the meeting

Powergrid informed that there was a high resistive fault in 400kV Rangpo-Binaguri circuit- I close to Rangpo end. Rangpo end cleared the fault on DEF protection whereas Binaguri end tripped on receipt of DT signal from Rangpo end. Powergrid explained that due high arc resistance Binaguri end failed to identify the fault.

The SPS-I signal initiated after the above tripping and operated correctly.

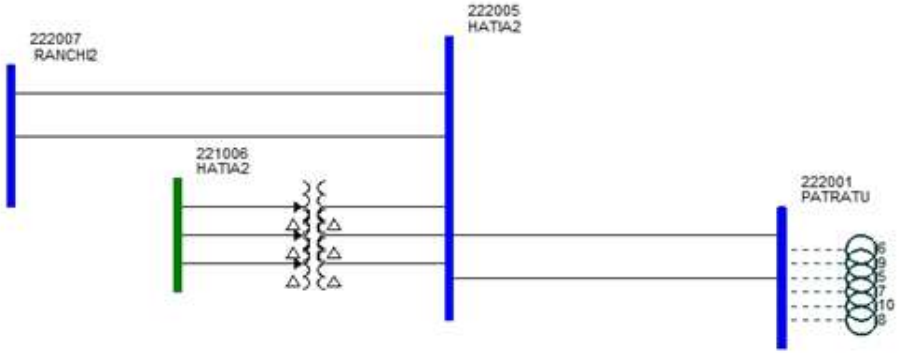
Powergrid added that they have increased the sensitivity of E/F settings for 400kV Rangpo-Binaguri D/C lines for better detection of high resistance faults.

PCC advised powergrid to configure In>1 pick up in DR output at Rangpo and Binaguri end.

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.

Deliberation in the meeting

JUSNL informed that there was no fault in the substation and the above incidences occurred during the shifting of PTPS bays to new bus at Hatia Substation. They informed that during closing of isolator of main bus for charging of the bay, the switching relay burned leading to extention of DC supply to Busbar relay. This resulted in operation of LBB/busbar relay and tripped all the feeders connected to Hatia end.

JUSNL informed that the DRs and EL could not be retrieved as the relays are electromechanical type. PCC advised to install separate relay for DR generation wherever the electromechanical relays are present. JUSNL added that old EM type relay would be replaced with new numerical busbar relay by April' 19.

During discussion it was informed that, Ranchi end relay did not trip during the above busbar operation due to non-receipt of DT signal from Hatia end. It was also informed that DT signal was not sent from Hatia end in earlier instances also.

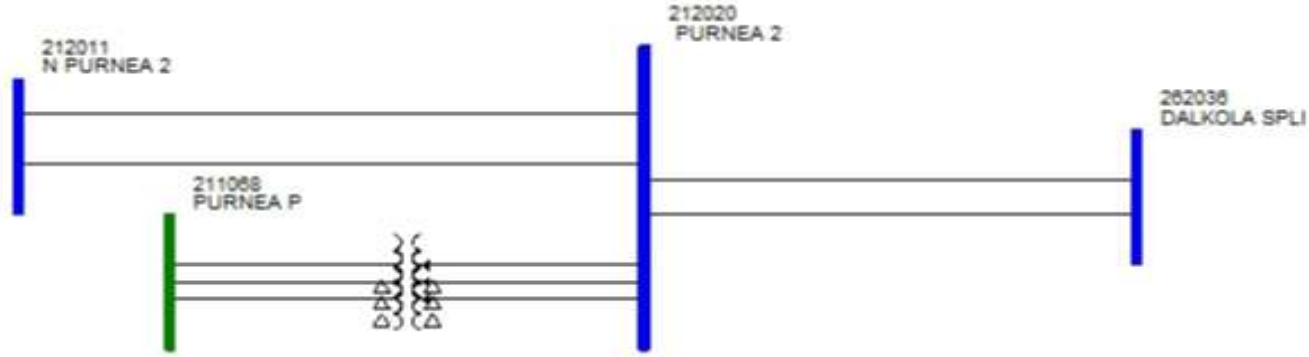
PCC advised JUSNL to test the Bus bar and LBB protection, PLCC and configuration of DT signal in the relay at Hatia end.

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.

<u>Deliberation in the meeting</u>

Powergrid informed that failure of Y-phase CVT of 220kV Purnea-New Purnea-I at Purnea end caused the operation of line differential protection for the line. New Purnea end tripped in line differential protection but the Purnea end circuit breaker did not open due to broken DC wire terminal in master trip relay. Powergrid added that they have rectified the problem after this incident.

As the fault was not cleared from Purnea end, 220kV New Purnea-Purnea-II and 220 kV Dalkhola-Purnea D/C tripped as per the relay indication given in the above table.

Regarding tripping of 220 kV Dalkhola-Purnea-I from purnea end in zone-4 protection, it was informed that Dalkhola end tripped in zone-II protection in 500msec time. Powergrid explained that the zone-II timer setting was inadvertently made to 500ms which they have now changed as per the protection philosophy.

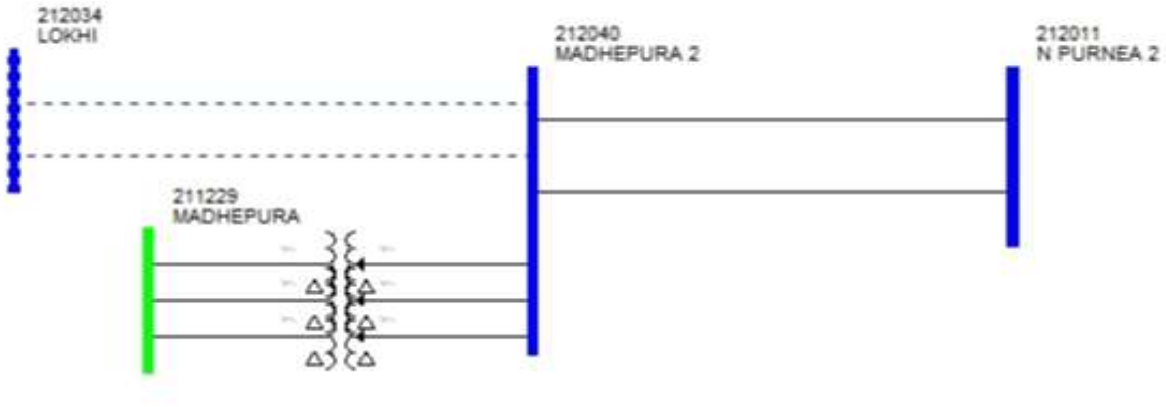
Regarding fault clearance from downstream network, BSPTCL informed that there was no tripping in their system and added that during the incidence, 132 kV Purnea(BSPTCL) was connected

radially from Purnea(Powergrid).

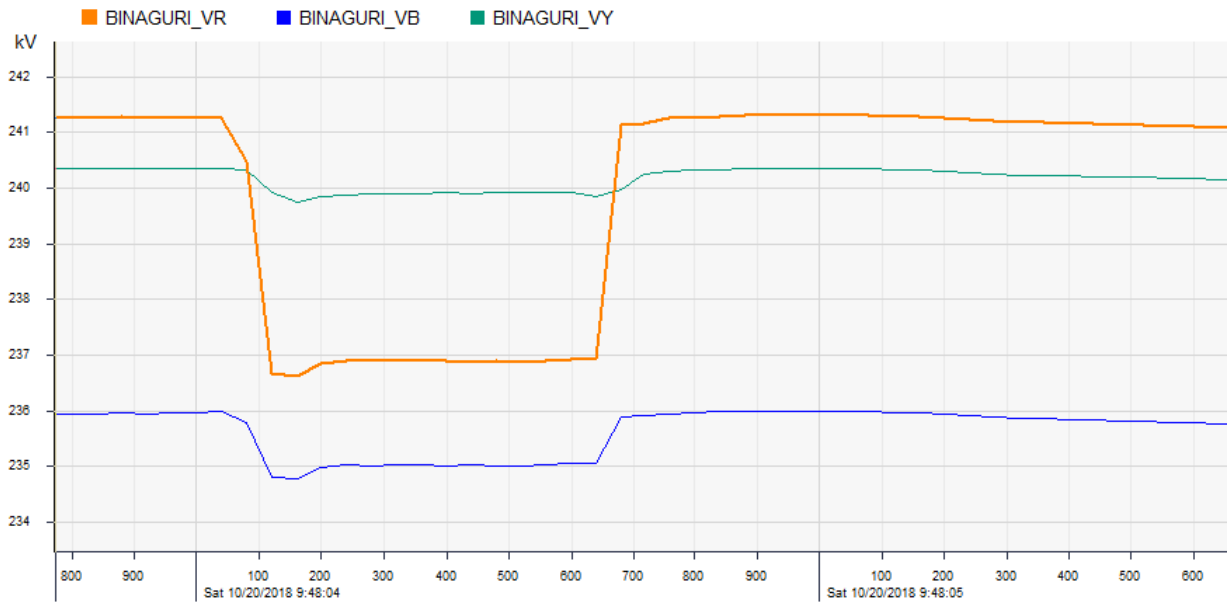
ITEM NO. B.4: Total Power failure at Madhepura(BSPTCL) S/s on 20.10.18 at 09:48 hrs.

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.

Deliberation in the meeting

BSPTCL informed that at the time of the incidence, 220 kV Purnea Madhepura – I and 220 kV Purnea-Lokhi D/C were manually kept off due to high voltage condition.

Powergrid informed that 220 kV New Purnea-Madhepura-II tripped from New Purnea end in zone-4 of distance protection. Powergrid further informed that the zone-4 of relay was erroneously activated and set for forward direction having reach more than 100 % with time delay of 500 msec. They informed that they have corrected the settings after this disturbance.

BSPTCL informed that there was no tripping at 220 kV Madhepura end as well as in 132 kV downstream network of Madhepura.

As zone-4 was set for 100% reach, PCC viewed that the fault location was in downstream of 220 kV Madhepura S/s. PCC advised BSPTCL to check for any trippings in downstream network.

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.

Deliberation in the meeting

WBSETCL informed that there was a Y-B fault in TLDP III – NJP – S/C near to TLDP-III S/s which was cleared from both the end in zone-I of distance protection.

NHPC informed that before tripping of above circuit, two units of TLDP-IV got tripped due to operation of GT neutral O/C protection. It was also seen from disturbance recorder that there was a high neutral current(i.e. 40 A) flowing in TLDP III – NJP – S/C for about 1 sec before the tripping of the circuit in Y-B fault.

PCC opined that tripping of generating units before the tripping of evacuating lines is not desirable and proper protection coordination between TLDP station and NJP station is required.

It was also came to notice that WBSETCL has used IDMT characteristics for E/F protection in NJP S/s whereas NHPC has definite time settings at TLDP.

PCC advised WBSETCL and NHPC to review the DEF settings for proper protection coordination between the transmission lines and generating station.

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.

Deliberation in the meeting

*Powergrid explained with a detailed presentation. Presentation is enclosed in **Annexure B.6.1**. It was informed that due to human error during wiring tightness, LBB initiation signal was wrongly sent to main bay of 765 kV Jarsuguda-Anugul-I resulting the operation of LBB and subsequent tripping of 765 kV Jarsuguda-Anugul-I and main bus#2.*

Powergrid informed that all the tie Breakers also got tripped and Direct trip was extended to the remote ends due to wrong masking in the output of busbar relay. As a result, Bus reactor 1 and 2 and Jharsuguda- Darlipali D/C tripped. They informed that they have rectified the wiring after consulting the OEM.

PCC advised Powergrid to configure all bay channels in output of Busbar DR for Bus-II at Jharsuguda substation.

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.

Deliberation in the meeting

*Members explained the tripping incidences. Updated status is enclosed at **Annexure-B7.***

PCC advised all the concern constituents to take necessary corrective actions to resolve the issues.

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.

Deliberation in the meeting

OPTCL and OPGC explained the scheme with a presentation. During presentation, number of queries were raised by the PCC forum.

After detailed delibetation, PCC decided to convene a separate meeting on 12.12.18 at ERPC secretariat in order to have a detailed deliberation on IBTPS islanding scheme. PCC advised OPTCL and OPGC to present the scheme along with the clarifications sought by PCC in the meeting scheduled on 12.12.18.

It was also decided to invite representatives of WBPDCL as special invitee to the above meeting on 12.12.18.

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.

Deliberation in the meeting

JUSNL could not explain the disturbance and PCC could not conclude the same.

PCC advised JUSNL to test the healthiness of the relays at 220kV Patratu and 220/132kV Hatia S/s.

JUSNL informed that CRITL team doesn't have any facilities to test the protection relays and they are doing the testing through third party agency which would take more time.

PCC took serious note of the issue and advised JUSNL to submit the details of procedure being followed for testing/verification of the relays.

PCC advised JUSNL to test the healthiness of the relays at 220kV Patratu and 220/132kV Hatia S/s on urgent basis.

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.

Deliberation in the meeting

The updated status was given in Annexure-C.3.

It was observed that latest status on the implementation of the previous PCC recommendations were not updated by the constituents regularly. PCC advised all the constituents to update the latest status of the recommendations as per the list given in Annexure.

PCC also advised ERPC secretariat to circulate the above annexure of follow up events along with the notice for PCC meeting among the constituents.

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.

Deliberation in the meeting

Powergrid ER-I had verified the settings. Powergrid ER-II and Powergrid odisha informed that they will verify the settings at the earliest.

DVC informed that they will verify the settings by next month.

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.

Deliberation in the meeting

Members noted.

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.

Deliberation in the meeting

Members noted.

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.

Deliberation in the meeting

It was decided that ERLDC, ERPC and PRDC would prepare a draft report on "settings for configuring disturbance recorders" and place the draft in next PCC Meeting.

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.

Deliberation in the meeting

Powergrid informed that testing has been completed.

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.

Deliberation in the meeting

Members noted.

Meeting ended with vote of thanks to the chair.

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Participants in 73rd PCC Meeting of ERPC

Venue: ERPC Conference Room, Kolkata Time: 10:30 hrs Date: 29.11.2018 (Thursday)

Sl No	Name	Designation/ Organization	Contact Number	Email	Signature
1	J. Bandyopadhyay	Member Secretary ERPC	9432326351	mserpc-power@gov.in	
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"Coming together is a beginning, staying together is progress, and working together is success." –Henry Ford

Participants in 73rd PCC Meeting of ERPC

Venue: ERPC Conference Room, Kolkata Time: 10:30 hrs Date: 29.11.2018 (Thursday)

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39					
40					

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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.

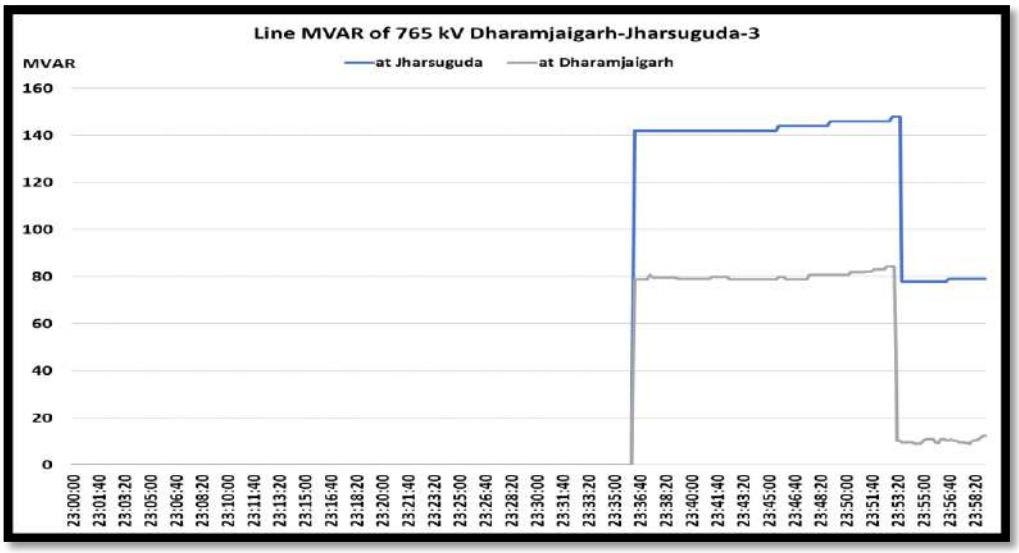


Fig 1:- Line MVAR of both ends of 765 kV Dharamjaigarh-Jharsuguda-3

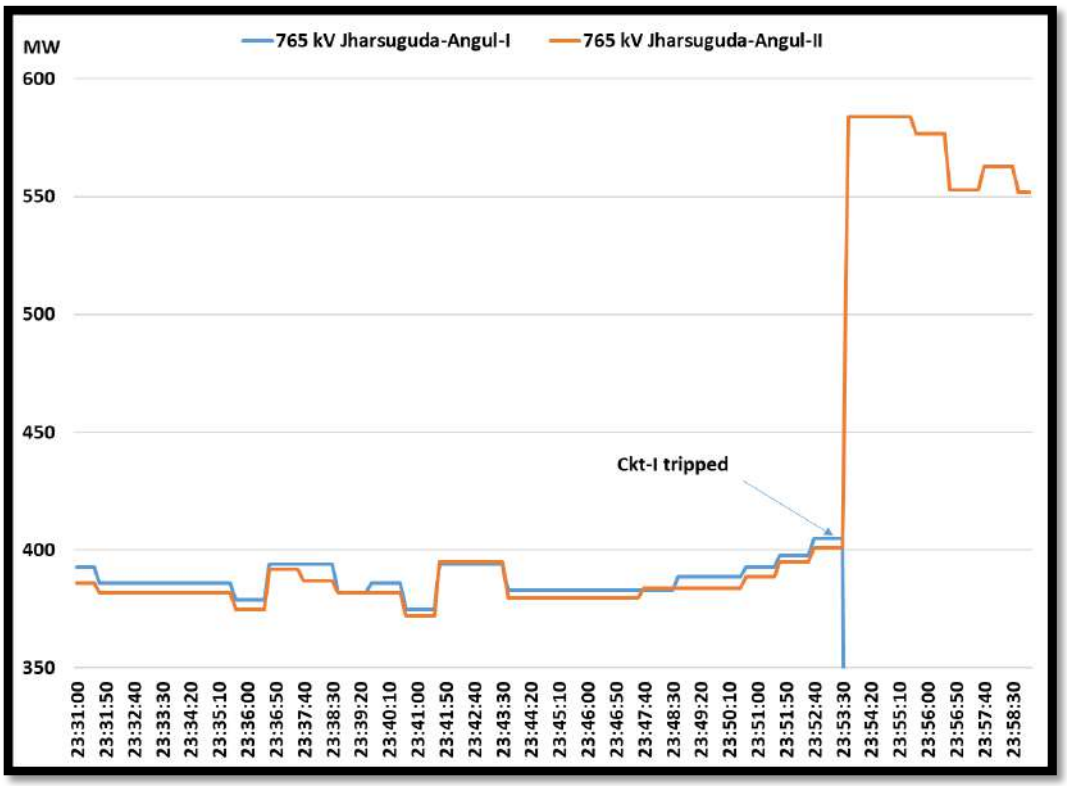


Fig 2: - Flow on 765KV Jharsuguda-Angul-D/C

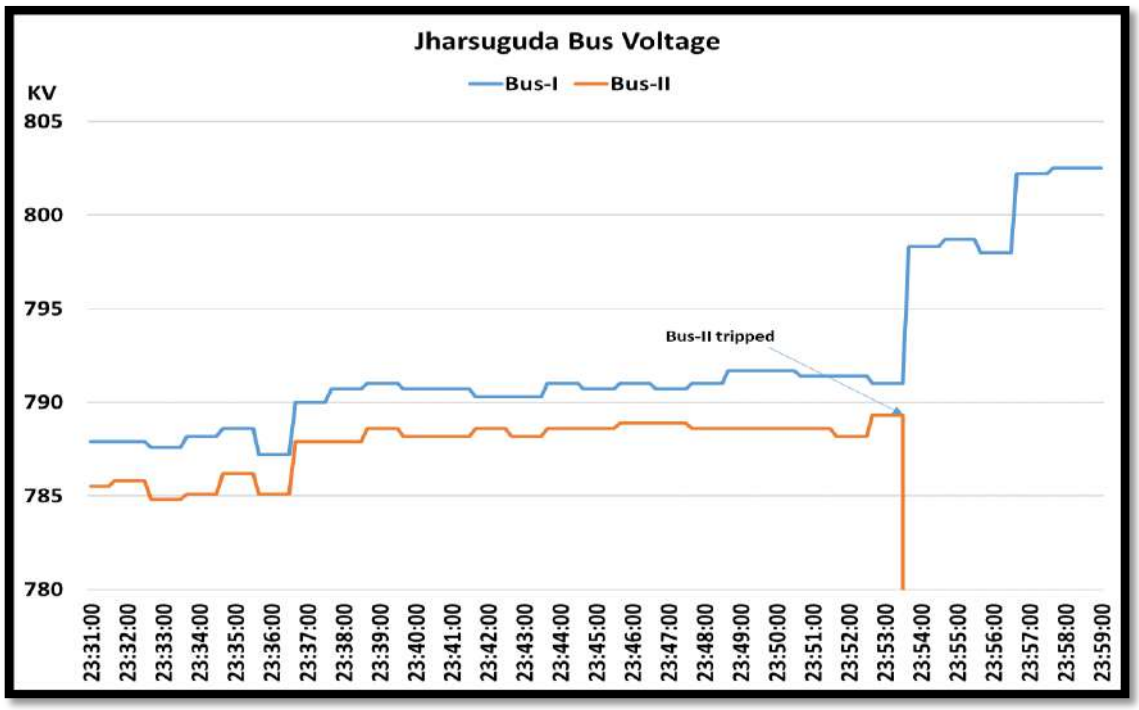


Fig 3: - Jharsuguda Bus Voltage

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: -

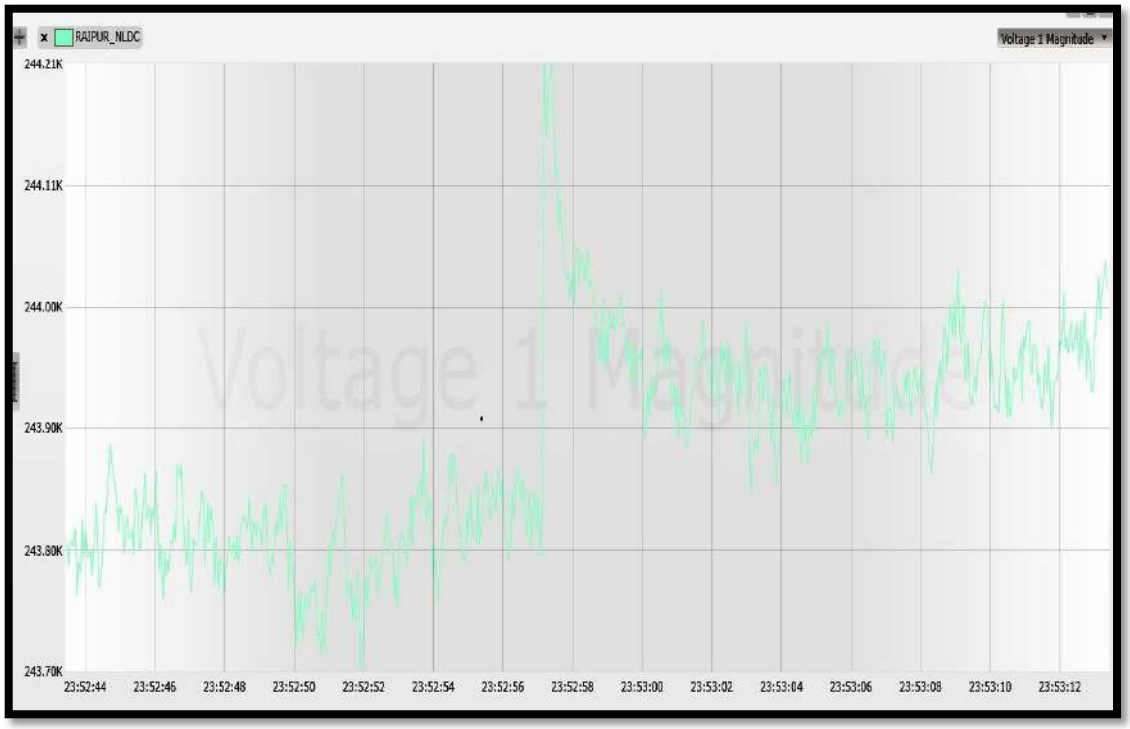


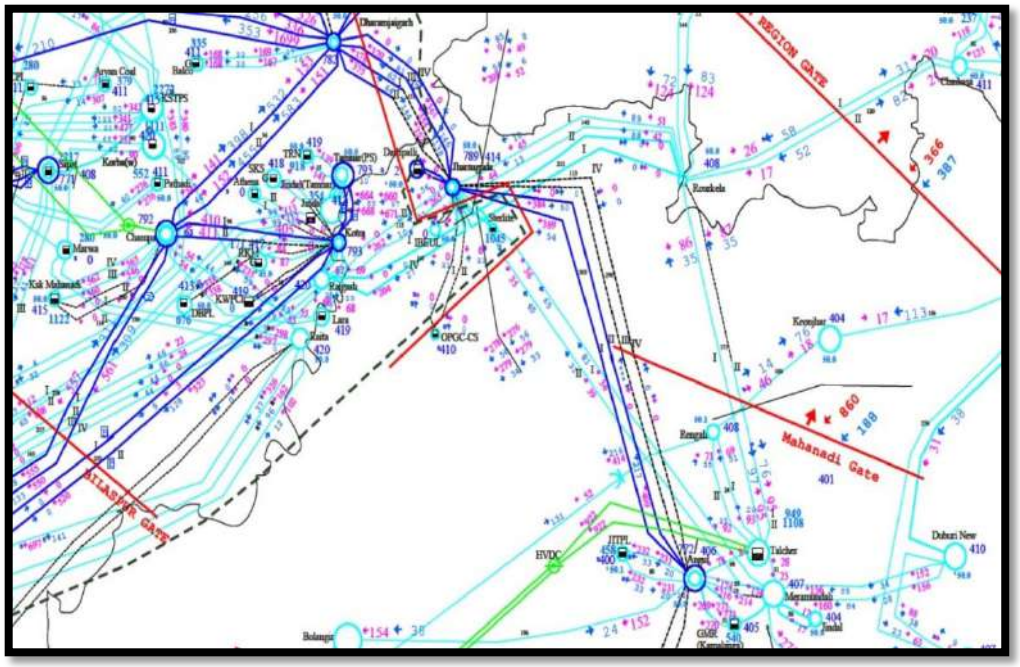
Fig 4: - Voltage PMU of Raipur

Points of concern: -

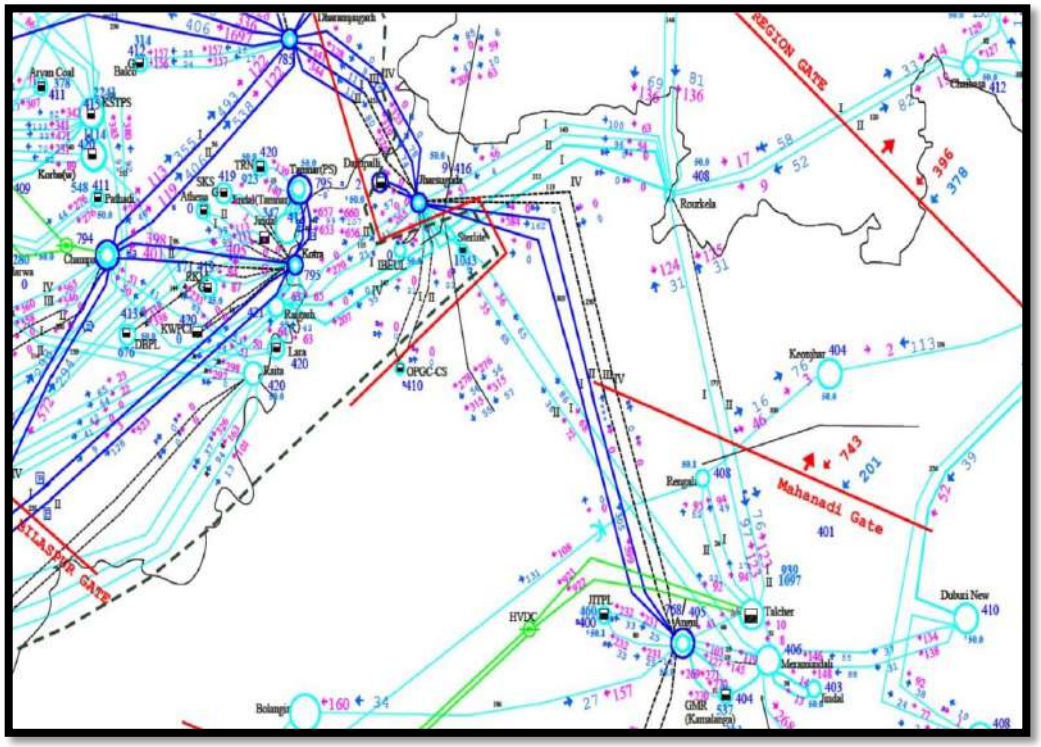
- Before commissioning of any new element, all the protection scheme need to be cross check again by protection engineer/ commissioning expert to avoid any issue of mal operation.

Annexure

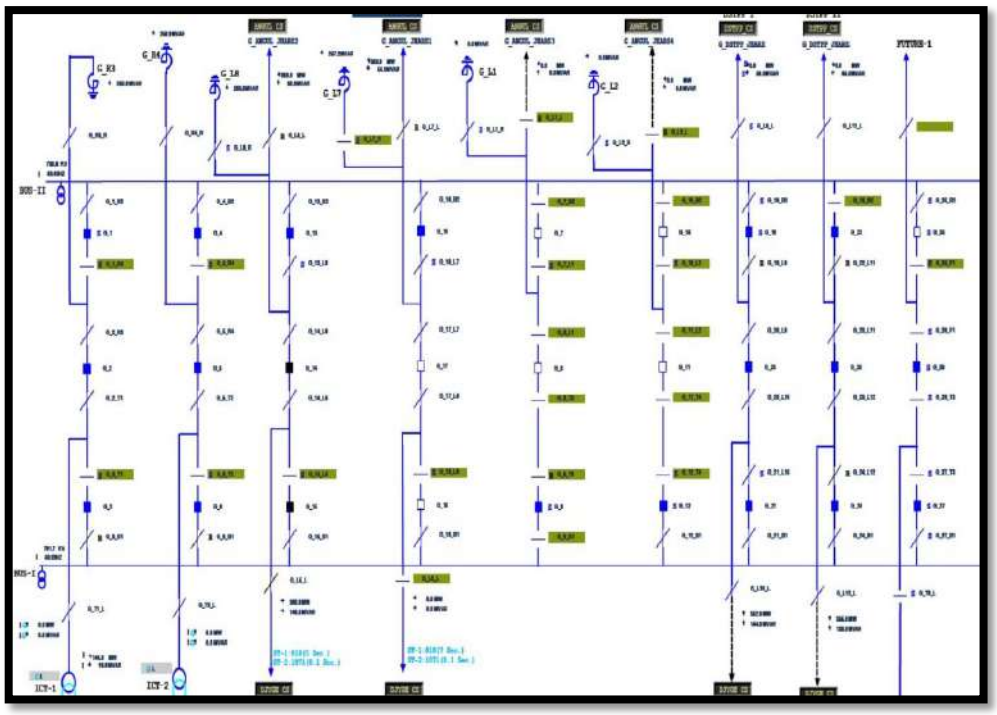
Annexure 1: - Jharsuguda region snapshot before the incident (at 23:50 Hrs).



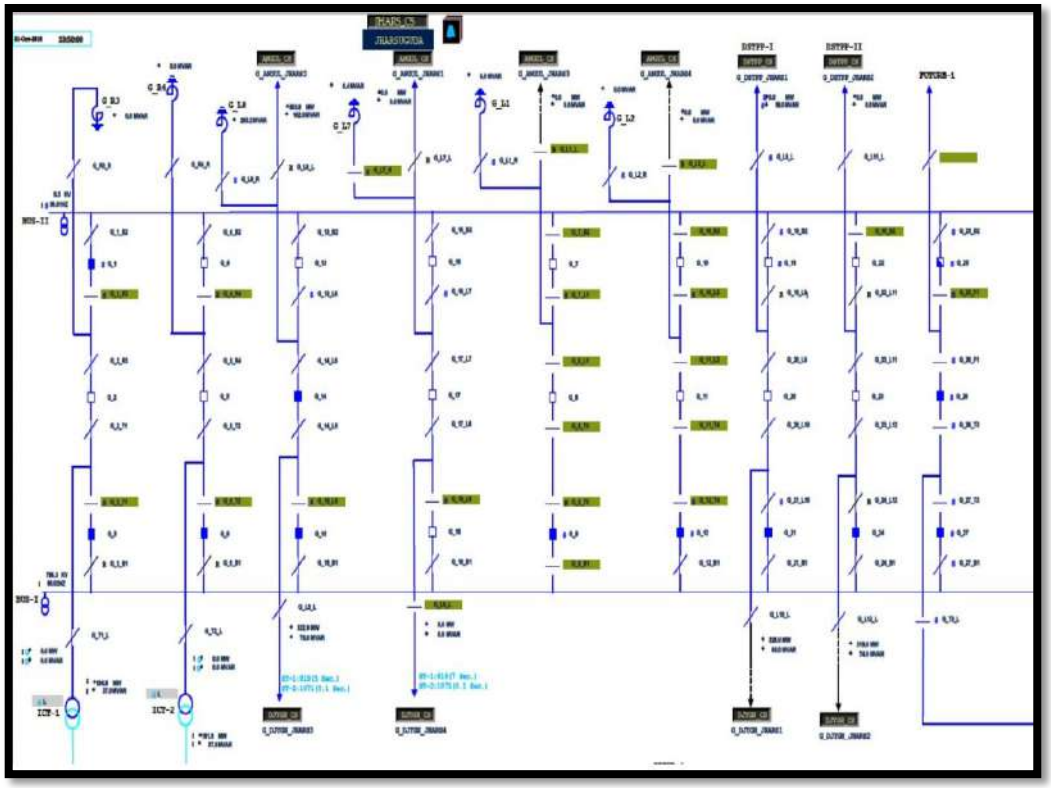
Annexure 2: - Jharsuguda region snapshot after the incident (at 23:54 Hrs).



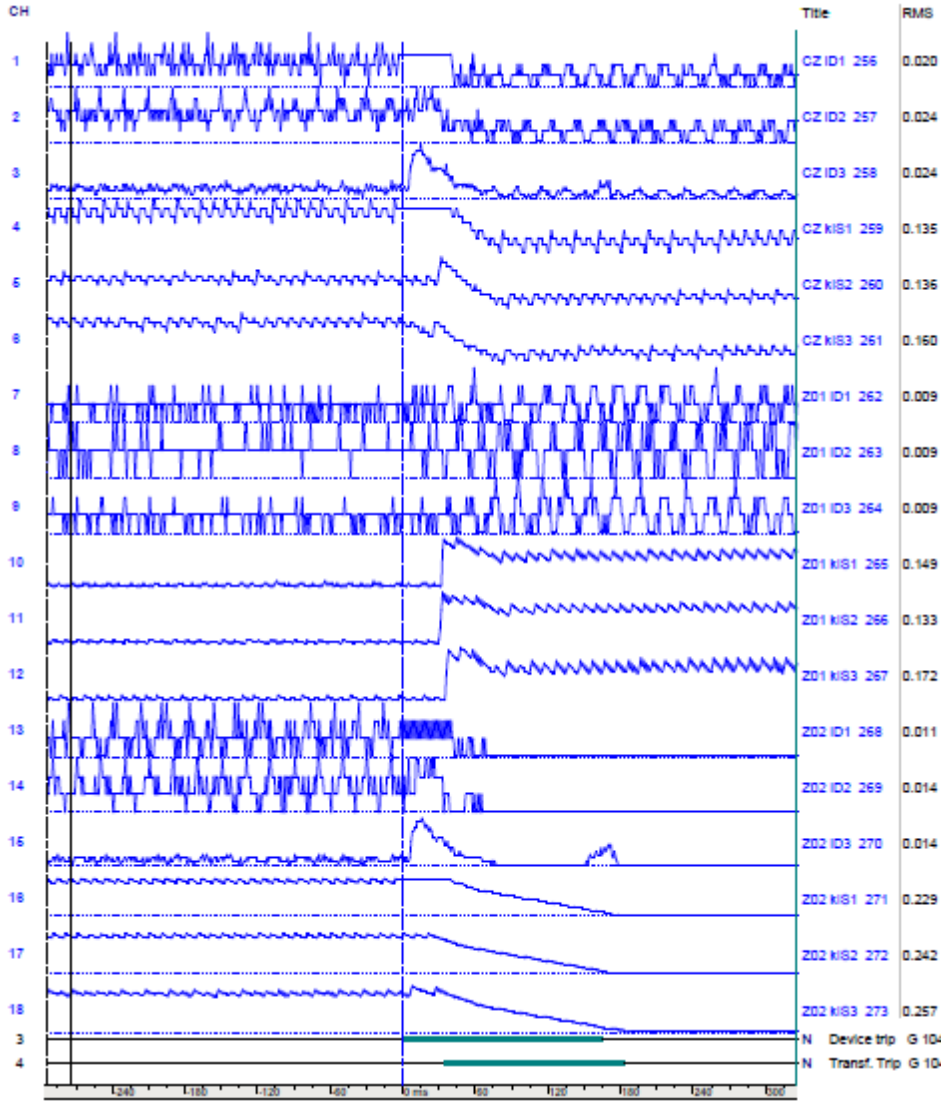
Annexure 3: - Jharsuguda SLD before the incident (at 23:50 Hrs).



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

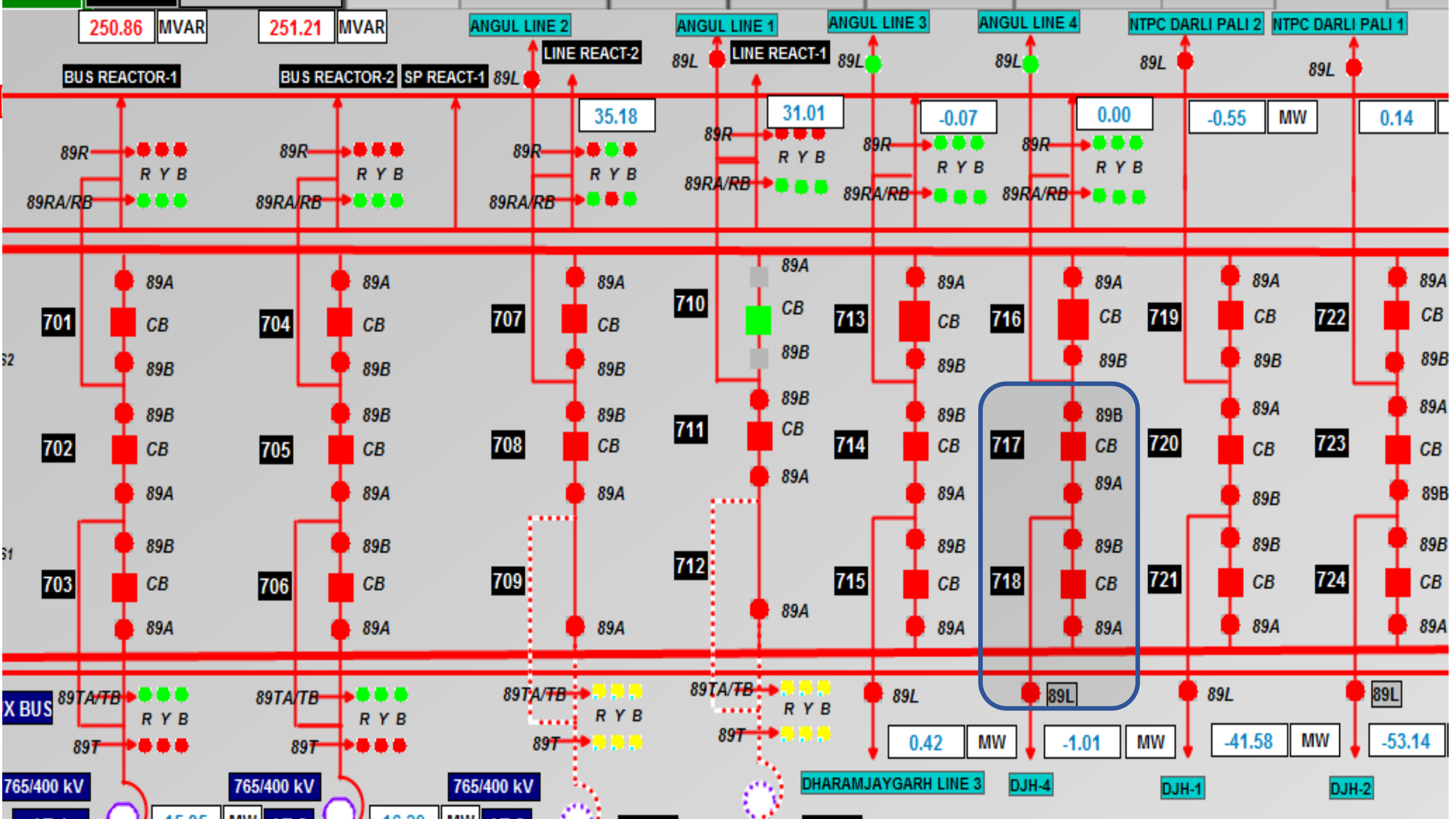


Annexure 5: - B/B DR received from POWERGRID



Annexure-B.6.1

Report on Tripping of 765kV Bus Bar#2 and Associated Elements at Sundargarh S/S on 30th Oct'18


250.86 MVAR
251.21 MVAR
BUS REACTOR-1
BUS REACTOR-2
SP REACT-1
LINE REACT-2
LINE REACT-1
ANGUL LINE 2
ANGUL LINE 1
ANGUL LINE 3
ANGUL LINE 4
NTPC DARLI PALI 2
NTPC DARLI PALI 1
89L
89R
89RA/RB
R Y B
35.18
31.01
-0.07
0.00
-0.55 MW
0.14
89A
89B
CB
701
702
703
704
705
706
707
708
709
710
711
712
713
714
715
716
717
718
719
720
721
722
723
724
89TA/TB
89T
X BUS
765/400 kV
0.42 MW
-1.01 MW
-41.58 MW
-53.14
DHARAMJAYGARH LINE 3
DJH-4
DJH-1
DJH-2

Bus Bar Trip at Sundargarh

- 765kV Sundargarh- Dharmajaygarh#4 & 765kV Sundargarh-Angul#1 Line are connected in same dia.

- 765kV Sundargarh- Dharmajaygarh#4 was about to be charged on 30/10/2018

- During wiring tightness of Tie Bay, LBB initiation wire was falsely touched and LBB initiation was sent to Main Bay of Angul#1 at 23:52 hrs 30/10/2018.
- This occurred due to human mistake during wiring tightness
- Since LBB initiation was received and current in the Main Bay of Angul#1 was above the threshold, LBB trip of Angul#1 Main Bay was issued and Bus #2 got tripped.

- This caused the tripping of Angul#1 Line & Bus #2.

Bus Bar Trip & Tie Trip at Sundargarh

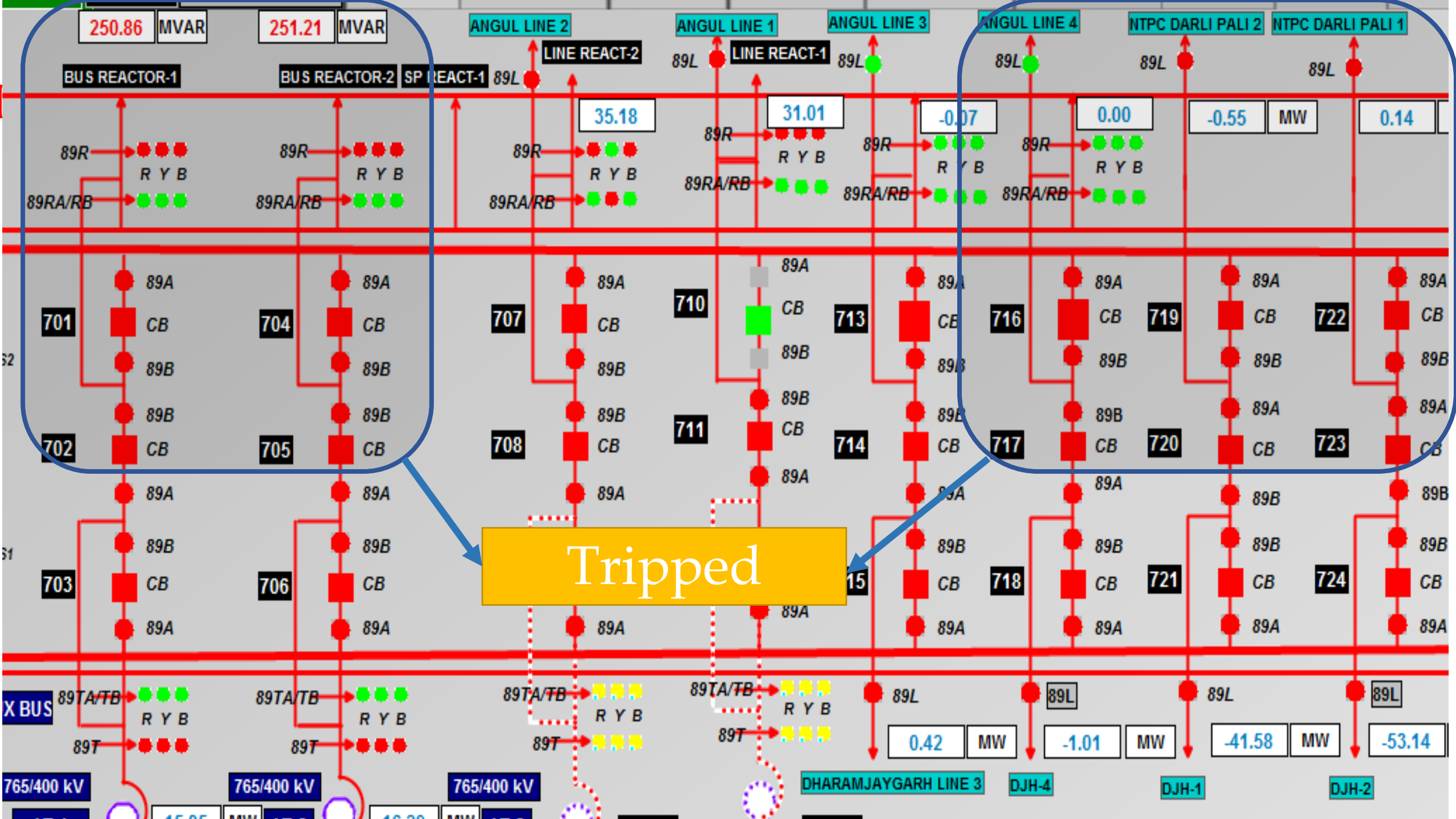
- However, all the tie Breakers also got tripped and Direct trip was extended to the remote ends. Due to which, Angul#1, NTPC#1&2, Bus Reactor#1&2 also got tripped.
- After detailed analysis, it was found that configuration was wrong in Bus Bar relay.
- Same was referred to OEM and they suggested for corrective action.
- New settings were then implemented as per OEM.

Power Interruption

- There was no power interruption as 765kV Sundargarh-Dharmajaygarh#1,2&3 , Angul#1 & ICT#1&2 were in service
- Power interruption occurred to NTPC #1 for auxiliary & start-up power for 40 mins

Power Flow

Name of Element	MW		MVAR	
1. 765KV SNG-Dharmajaygarh# I	-512	MW	-181	MVAr
2. 765 KV SNG-Dharmajaygarh# II	-503	MW	-175	MVAr
3. 765KV SNG-Dharmajaygarh # III	-507	MW	-178	MVAr
4. 765 KV SNG-Dharmajaygarh # IV	-	MW	-	MVAr
5. 765 KV SNG -ANGUL # I	575	MW	156	MVAr
6. 765 KV SNG -ANGUL # II	567	MW	151	MVAr
7. 765 KV SNG -NTPC Darlipali# I	.5	MW	-57	MVAr
8. 765 KV SNG -NTPC Darlipali# II	0.2	MW	-57	MVAr
9. 765/400KV 1500MVA ICT#I	199	MW	44	MVAr
10.. 765/400KV 1500MVA ICT#II	197	MW	43	MVAr


250.86
MVAR
251.21
MVAR
BUS REACTOR-1
BUS REACTOR-2
SP REACT-1
ANGUL LINE 2
LINE REACT-2
ANGUL LINE 1
LINE REACT-1
ANGUL LINE 3
ANGUL LINE 4
NTPC DARLI PALI 2
NTPC DARLI PALI 1
89L
89R
89RA/RB
R Y B
35.18
31.01
-0.07
0.00
-0.55
MW
0.14
89A
CB
89B
701
702
703
704
705
706
707
708
710
711
713
714
715
716
717
718
719
720
721
722
723
724
Tripped
89TA/TB
89T
X BUS
765/400 kV
0.42
MW
-1.01
MW
-41.58
MW
-53.14
DHARAMJAYGARH LINE 3
DJH-4
DJH-1
DJH-2

Thank You!

Annexure-B.7

List of Intra Regional line tripping in the month of October 2018 where violation of protection standard has been observed

LINE NAME	TRIP DATE	TRIP TIME	RESTORATION DATE	RESTORATION TIME	Relay Indication LOCAL END	Relay Indication REMOTE END	Reason	Fault Clearance time in msec	Auto Recloser status	DR/EL RECEIVED FROM LOCAL END	DR/EL RECEIVED FROM REMOTE END	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	No	No	OHPC to send the details of the tripping and setting of O/V at Indravati. SLDC GRIDCO to coordinate.
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 fault observed in PMU	No	Yes	Bhutan to be communicated by ERLDC for getting the details of the tripping.
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	--		No	No	Issue with Relay contacts at Angul end. It has been corrected as per PGCIL
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	No	No	Issue with Relay contacts at Angul end. It has been corrected as per PGCIL
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	No	No	High Resistance Fault.
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	No	No	Need of Revamping of carrier/PLCC scheme by OPTCL; OPTCL to provide a plan for upgradation.
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	Yes	Yes	PLCC Scheme to be checked at Alipurduar by PGCIL ERTS 2
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	No	No	Issue with A/R could not be identified at Kharagpur end . WBSETCL shifted A/R to Siprotec from Micom relay at Kharagpur end and now it is working fine.
400KV BARH-MOTIHARI-I	14-10-2018	10:32	14-10-2018	10:56	A/R successful at Barh End, Zone 2 ,Carrier Received. Y Phase to E/F	27.8 KM, YN, 3.3 KA	B-N Fault	< 100 msec	No A/R operation found in PMU	No	Yes	DMTCL to check the A/R at their end; from DR it is not clear. DMTCL to update.
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	No	No	Issue with A/R could not be identified at Kharagpur end . WBSETCL shifted A/R to Siprotec from Micom relay at Kharagpur end and now it is working fine.
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	No	No	Carrier is not in service at both ends. OPTCL and DVC to take action for implementation of carrier scheme. A detail plan of upgradation of carrier scheme to be given by OPTCL and DVC
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	No	No	PGCIL ERTS 1 to confirm whether A/R is in service at Pusauli end or not.
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	No	No	Need of Revamping of carrier/PLCC scheme by OPTCL; OPTCL to provide a plan for upgradation.
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	Yes	Yes	High Resistance Fault.
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	A/R successful from Tie Bay as Main Bay lockout .RN, 1.70 KA, Z2, 173.5 KM	R-N Fault	< 100 msec	No A/R operation found in PMU	No	No	Issue with A/R could not be identified at Kharagpur end . WBSETCL shifted A/R to Siprotec from Micom relay at Kharagpur end and now it is working fine.

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.

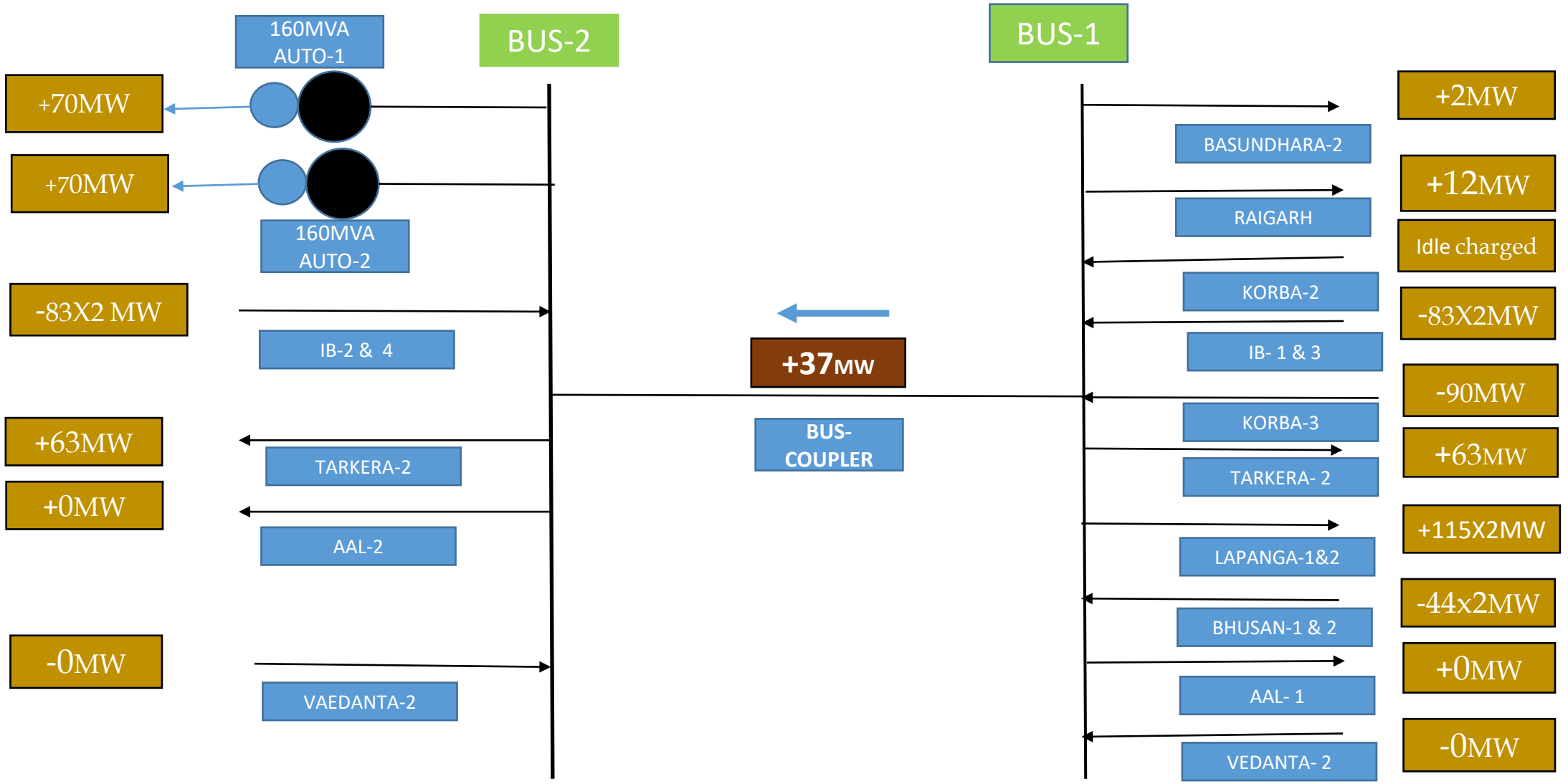
ISLANDING SCHEME DESCRIPTION

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

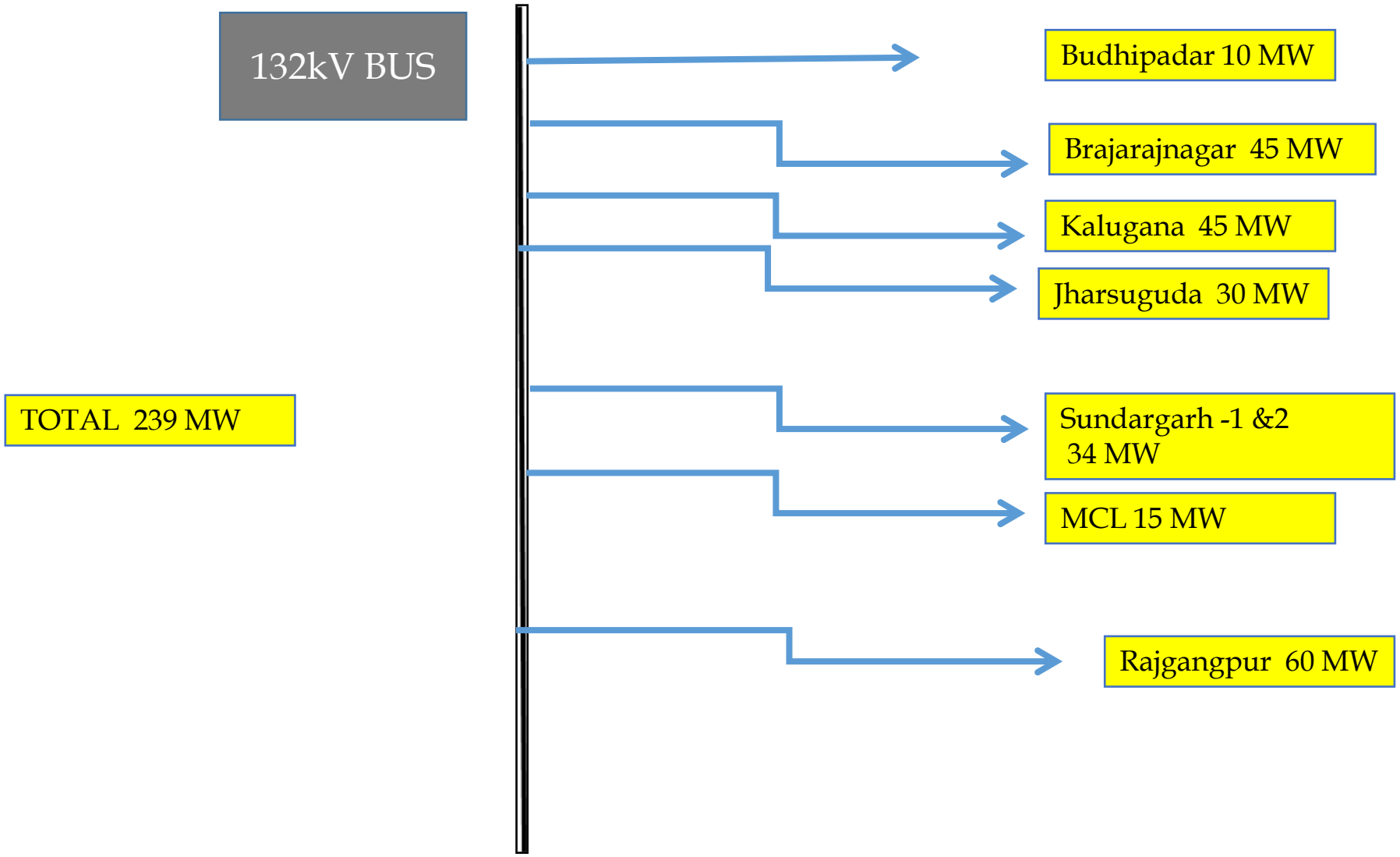
12. The general arrangement of 220kV feeder configuration, 132kV loads for islanding has shown in following slides.

POWER FLOW DETAILS OF 220KV SYSTEM

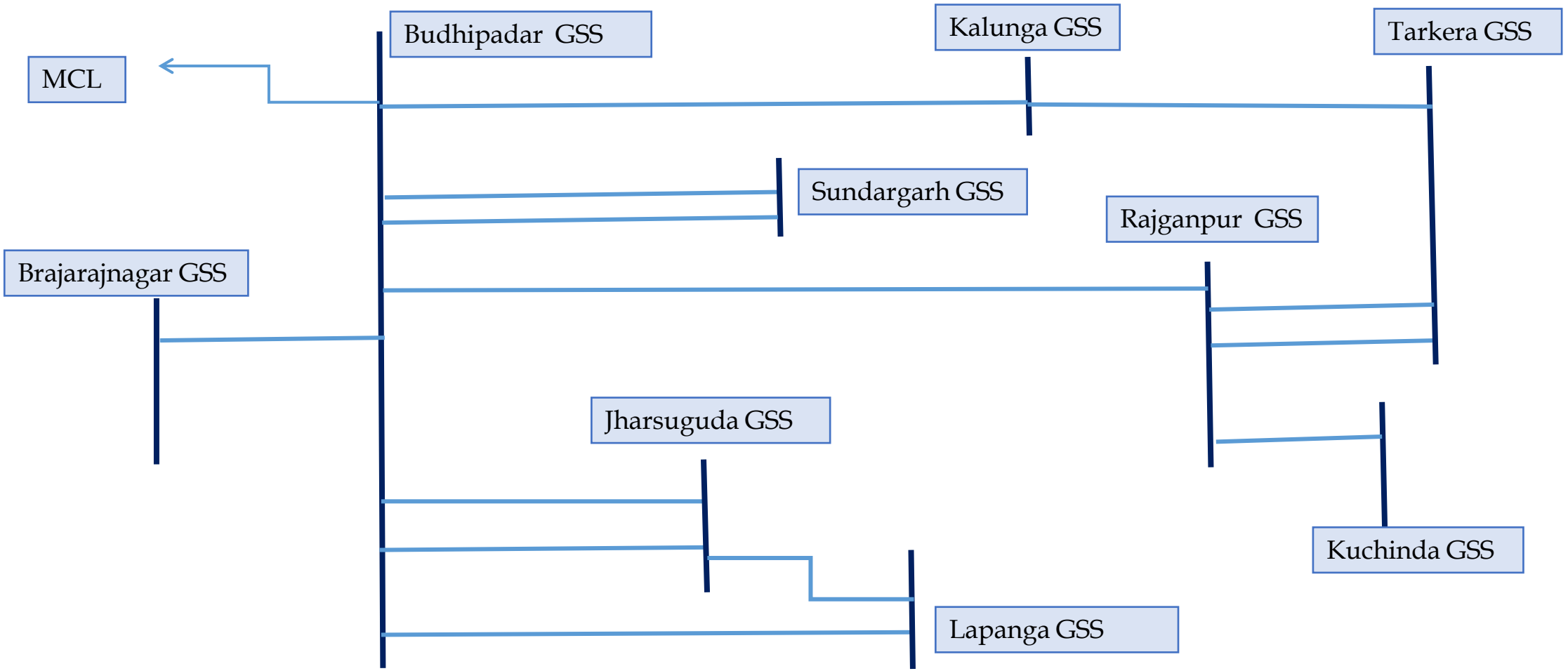
LOAD PATTERN OF DIFFERENT FEEDERS 12.07.2018 AT 12.00 HRS.

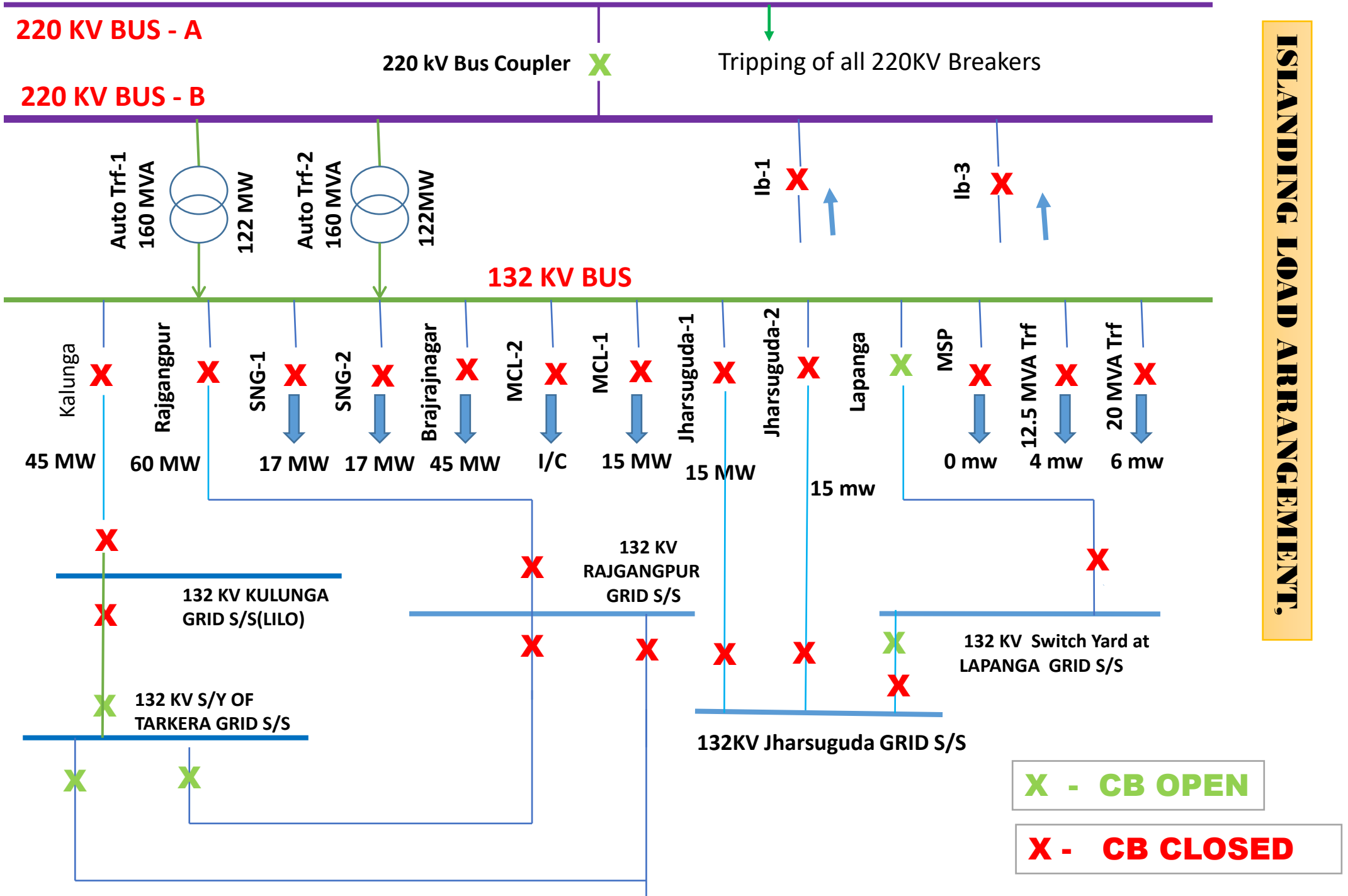


132kV RADIAL LOAD ARRANGEMENT FOR ISLAND SCHEME

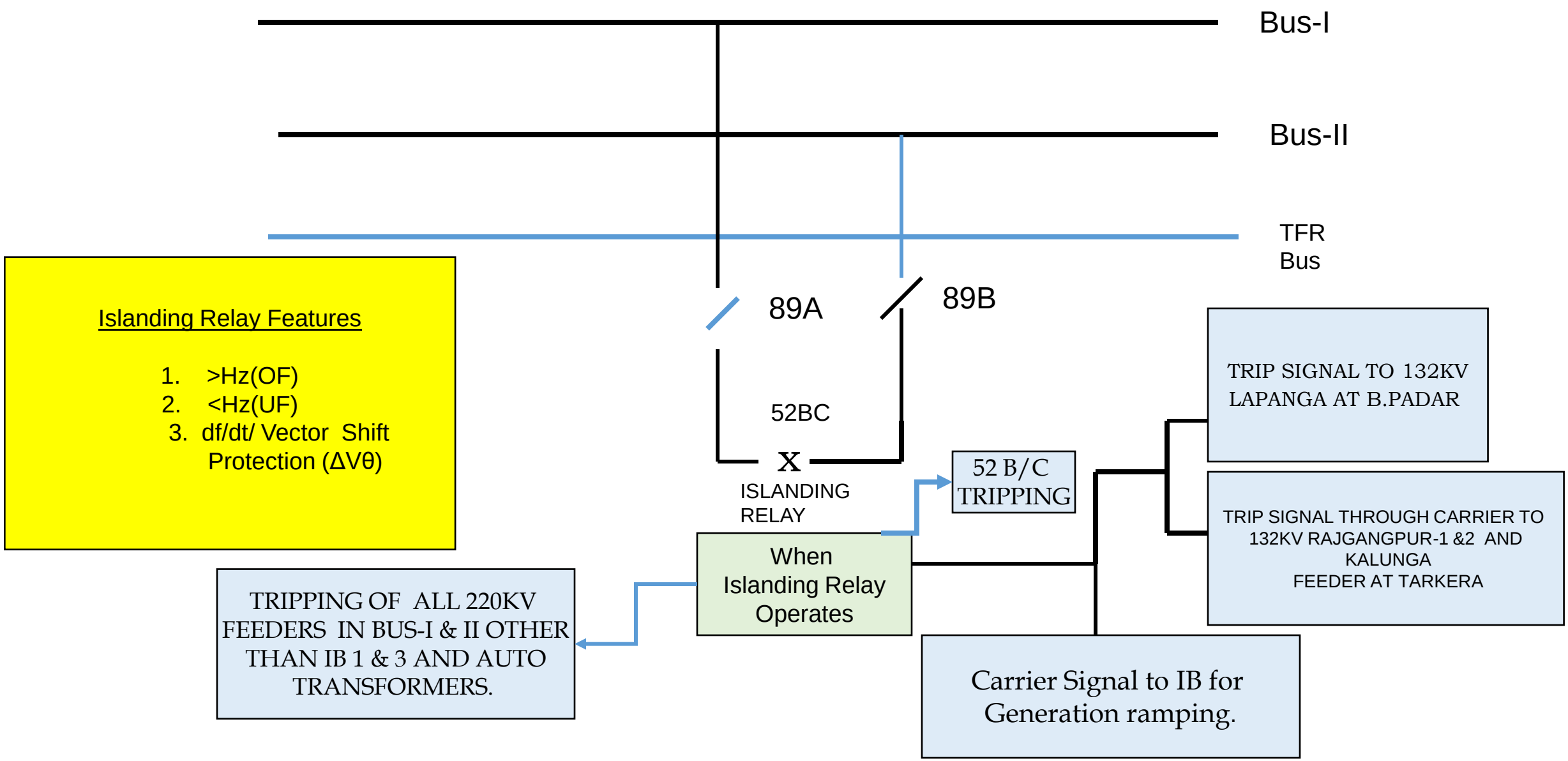


132KV Connectivity of Budhipadar GSS

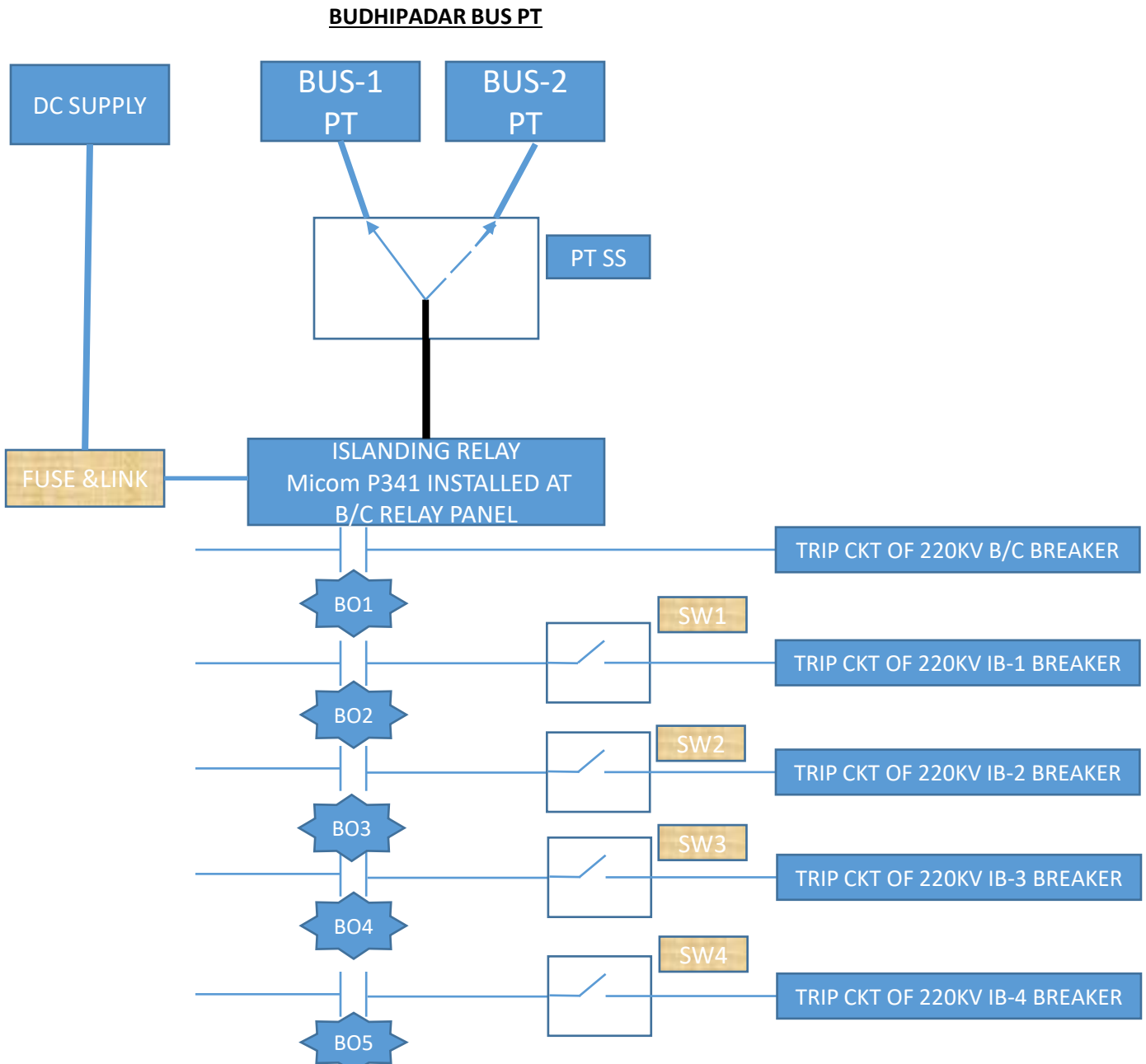


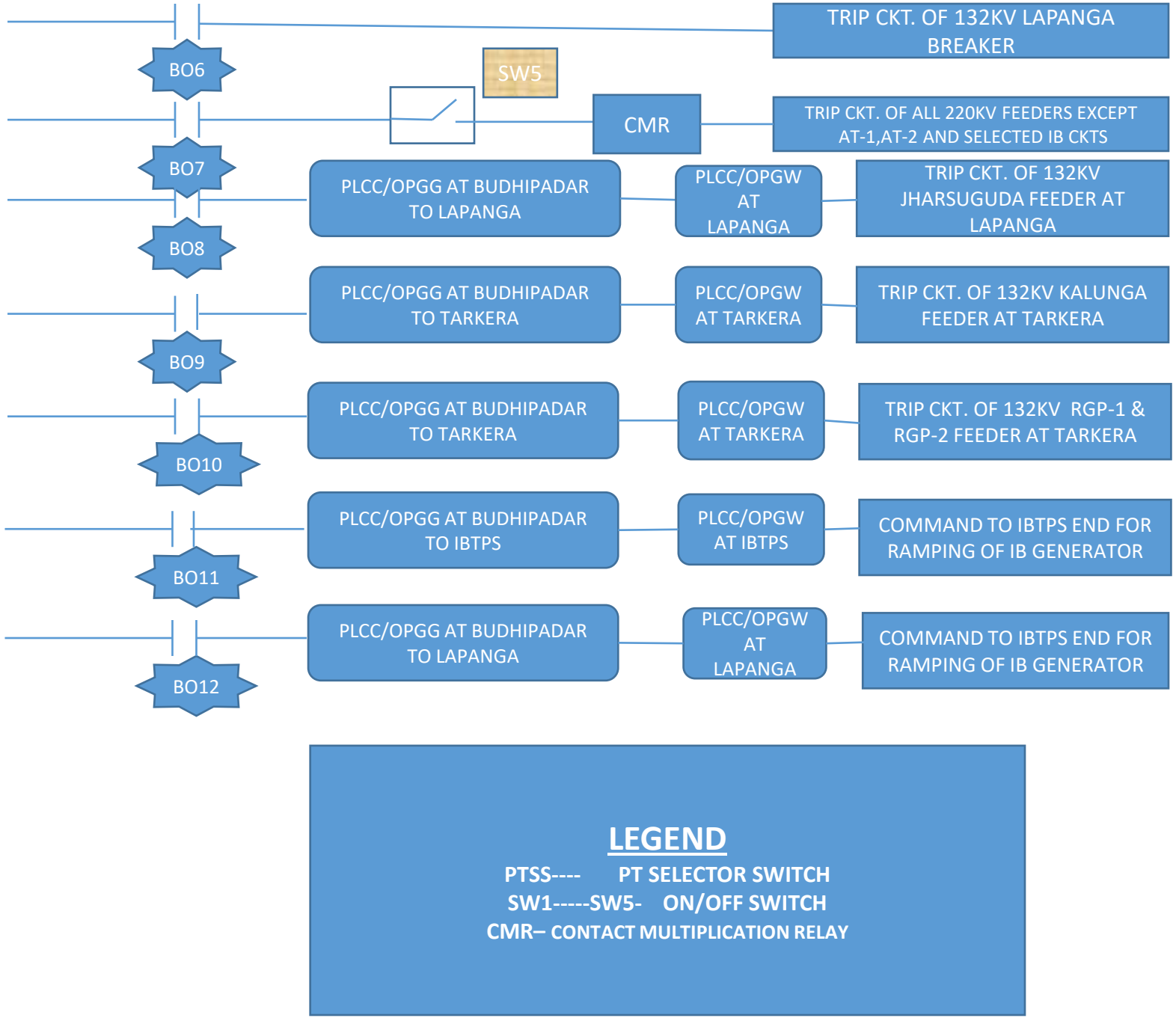

220 KV BUS - A
220 kV Bus Coupler
Tripping of all 220KV Breakers
220 KV BUS - B
Auto Trf-1
160 MVA
122 MW
Auto Trf-2
160 MVA
122MW
Ib-1
Ib-3
132 KV BUS
Kalunga
Rajgangpur
SNG-1
SNG-2
Brajrajnagar
MCL-2
MCL-1
Jharsuguda-1
Jharsuguda-2
Lapanga
MSP
12.5 MVA Trf
20 MVA Trf
45 MW
60 MW
17 MW
17 MW
45 MW
I/C
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

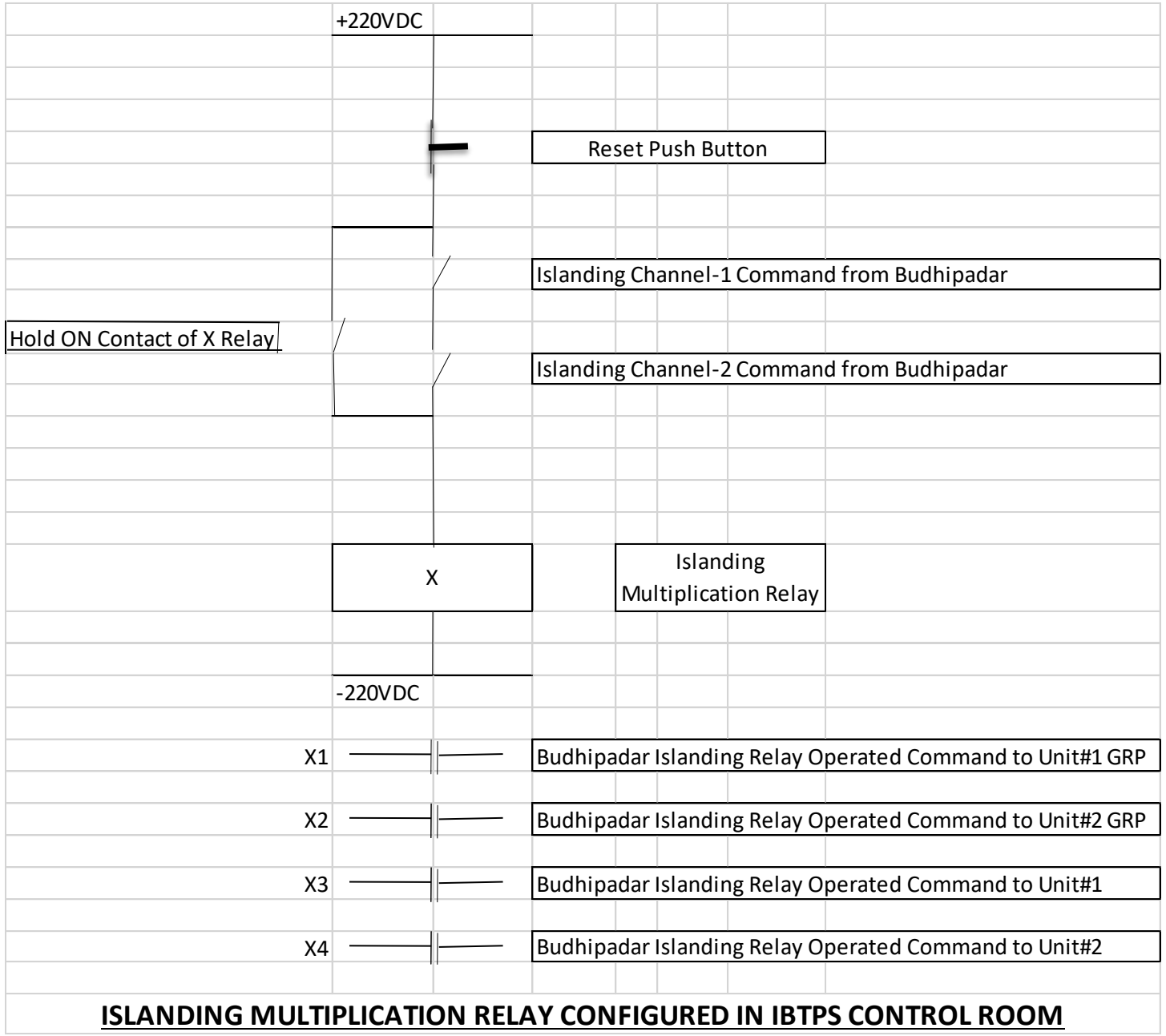
SCHEMATIC DRAWING OF ISLANDING RELAY INSTALLED IN B/C PANEL FOR TRIPPING OF DIFFERENT FEEDERS AT BUDHIPADAR GRID S/S.



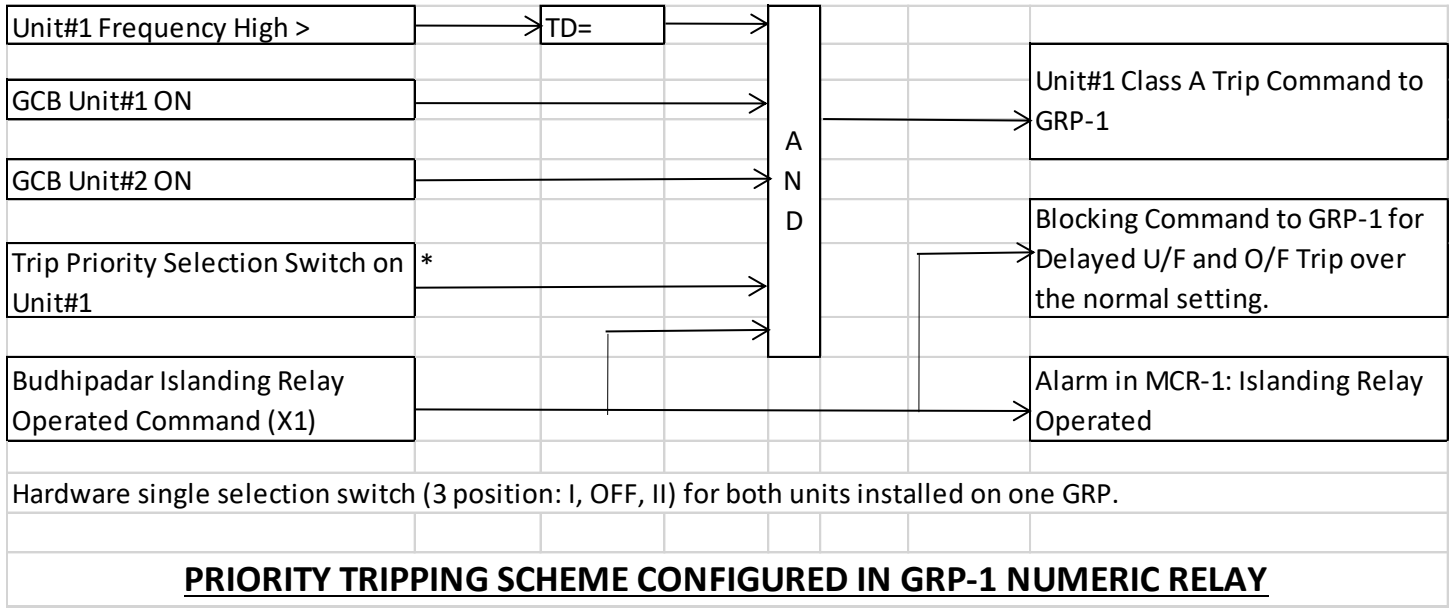
CONNECTION DIAGRAM OF ISLANDING RELAY (Micom P341) AT BUDHIPADAR SUB-STATION



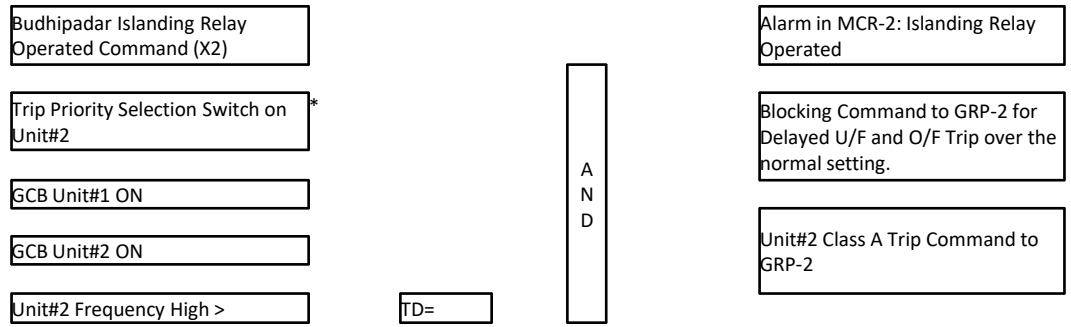

BO6
SW5
TRIP CKT. OF 132KV LAPANGA BREAKER
CMR
TRIP CKT. OF ALL 220KV FEEDERS EXCEPT AT-1,AT-2 AND SELECTED IB CKTS
BO7
PLCC/OPGG AT BUDHIPADAR TO LAPANGA
PLCC/OPGW AT LAPANGA
TRIP CKT. OF 132KV JHARSUGUDA FEEDER AT LAPANGA
BO8
BO9
PLCC/OPGG AT BUDHIPADAR TO TARKERA
PLCC/OPGW AT TARKERA
TRIP CKT. OF 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

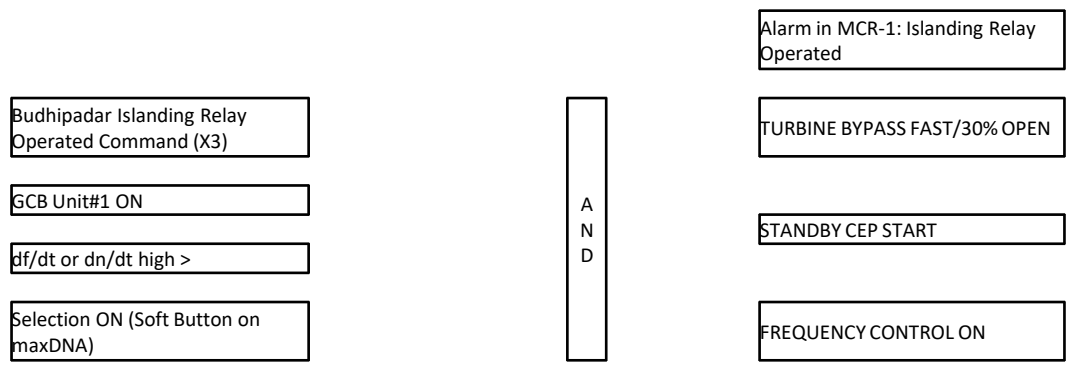


PRIORITY TRIPPING SCHEME CONFIGURED IN GRP-1 NUMERIC RELAY

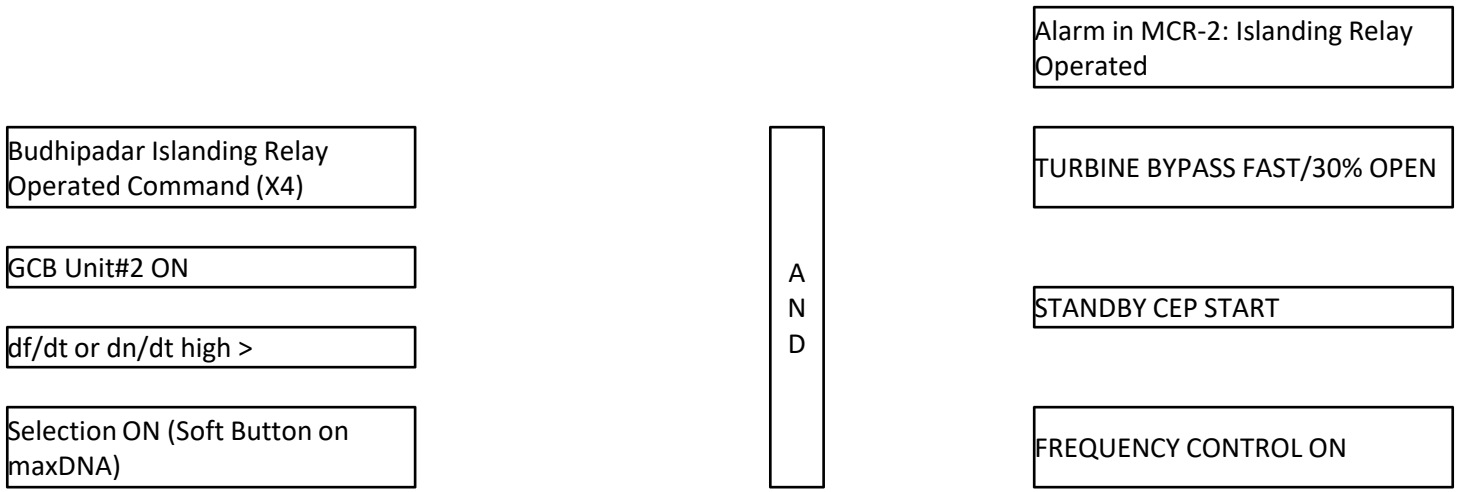


*Hardware single selection switch (3 position: I, OFF, II) for both units installed on one GRP.

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:

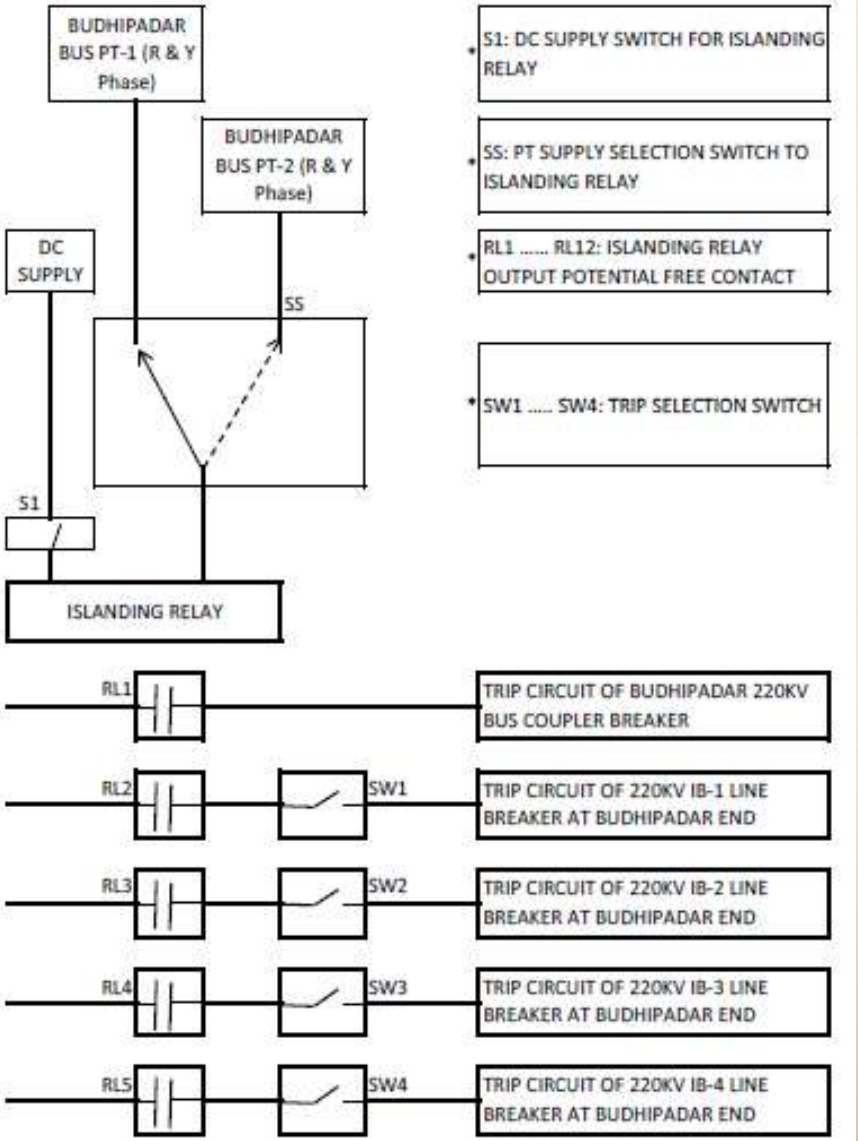
Presently there is no islanding scheme in operation in OPGCL.

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.

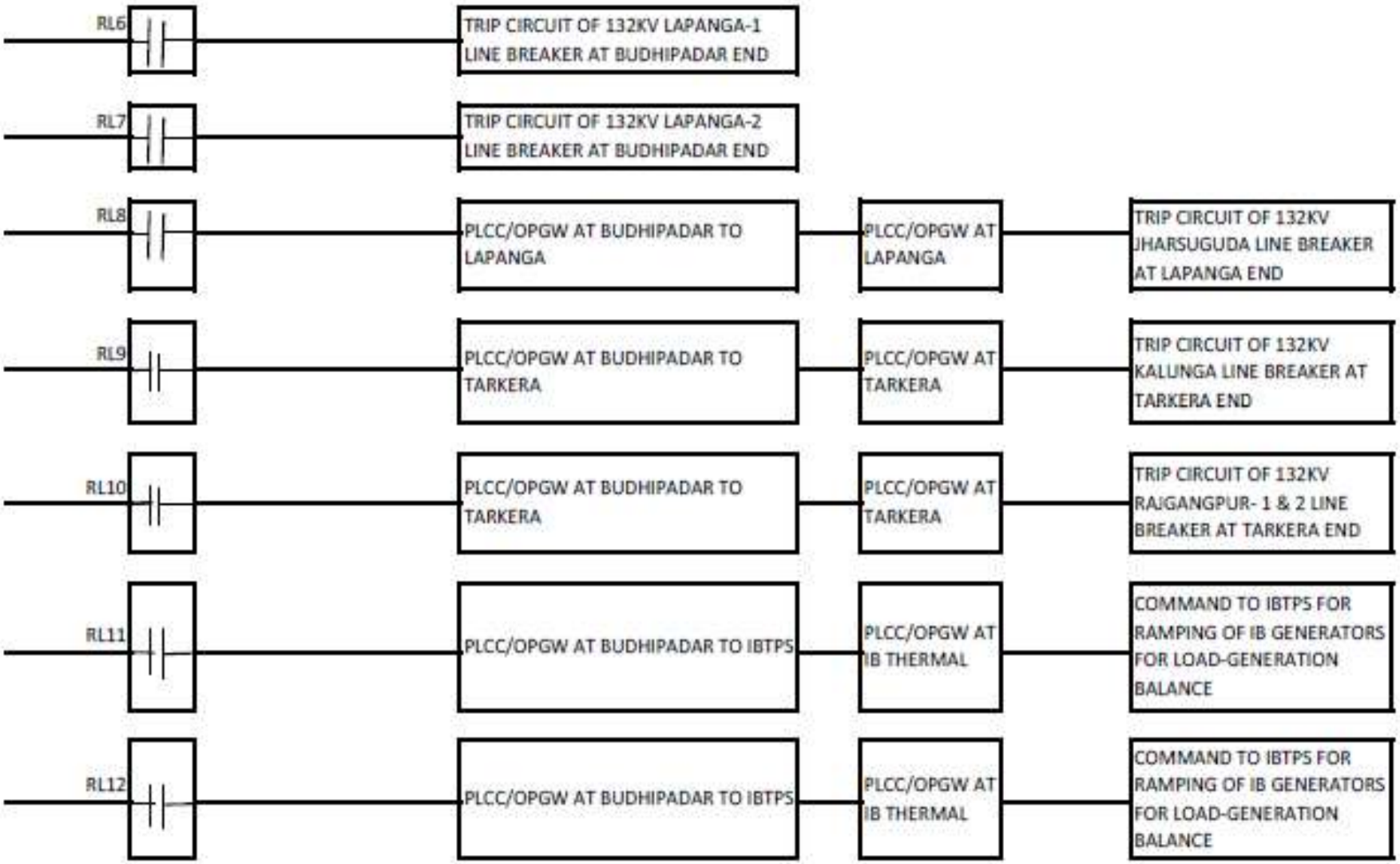
ISLANDING SCHEME OF IBTPS AT BUDHIPADAR

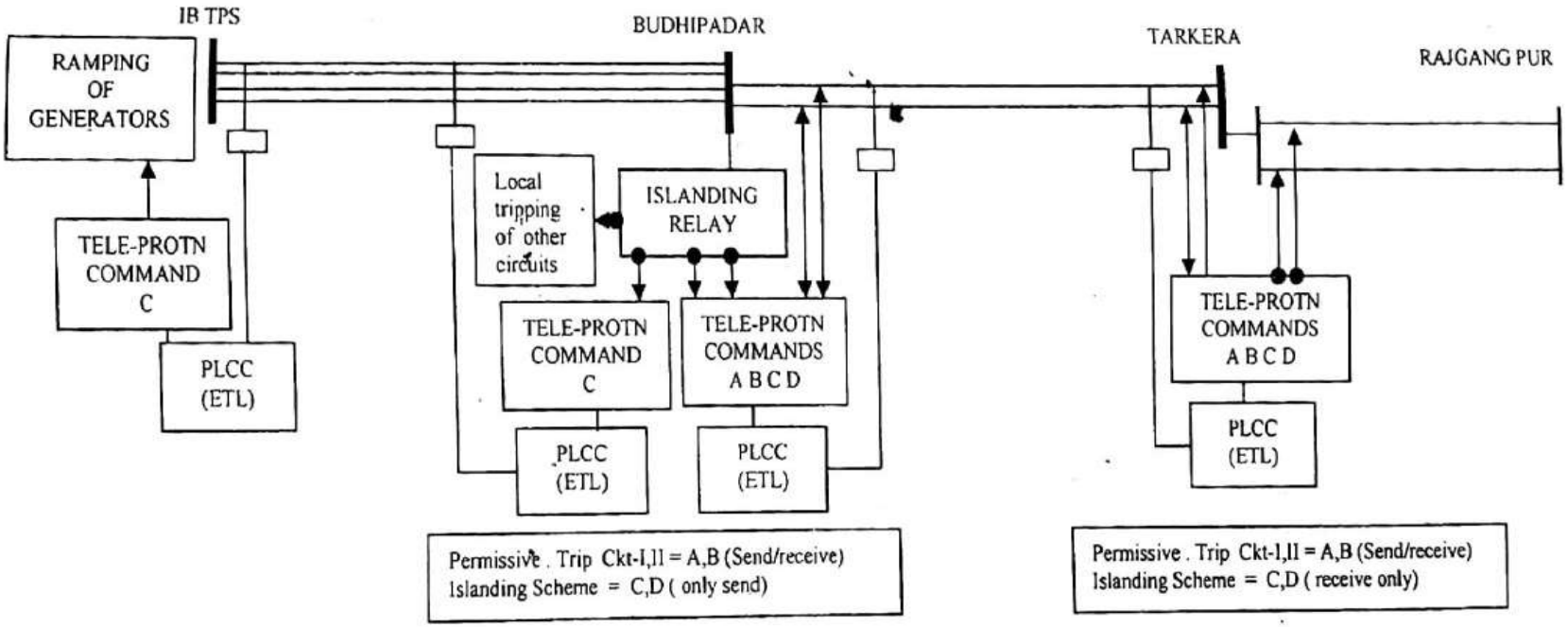


At Budhipadar grid, one 220KV BUS (**Islanding BUS**) shall be connected with local loads (AT 1 & 2, SPS/Concast, Basundhara) and two circuits of IBTPS. Other 220KV BUS (**Other BUS**) shall be connected with AAL, Vedanta, Tarkera, Korba, Raigarh, Bhusan, Lapanga and balance two ciccuits of IBTPS. Both 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 RAIGANGPUR- 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.

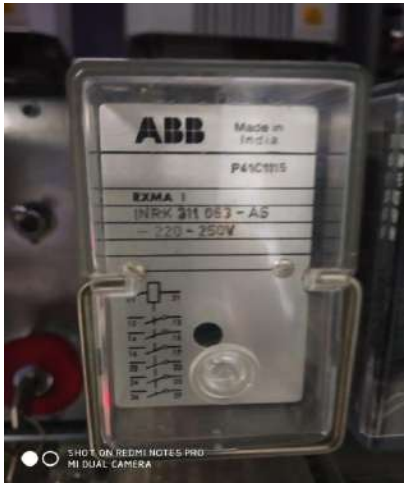
(3) At IB Thermal, Tele-protection command C shall be used for triggering ramping circuits of generators at IB TPS.

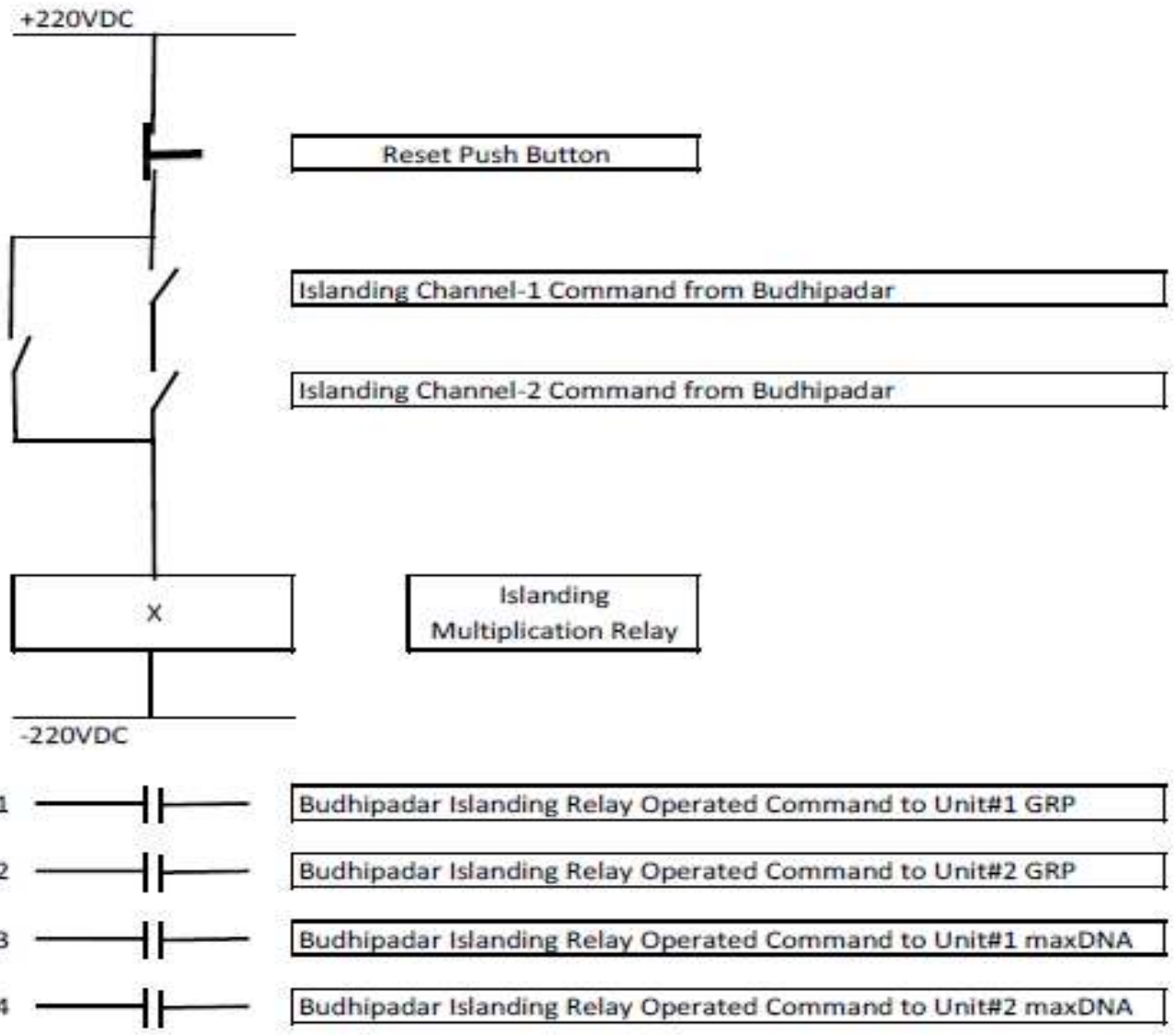
(4)Presently , as existing all the four circuits to IB thermal will work without carrier back up protection, it shall be provided as soon as digital protection coupler are procured very soon.

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

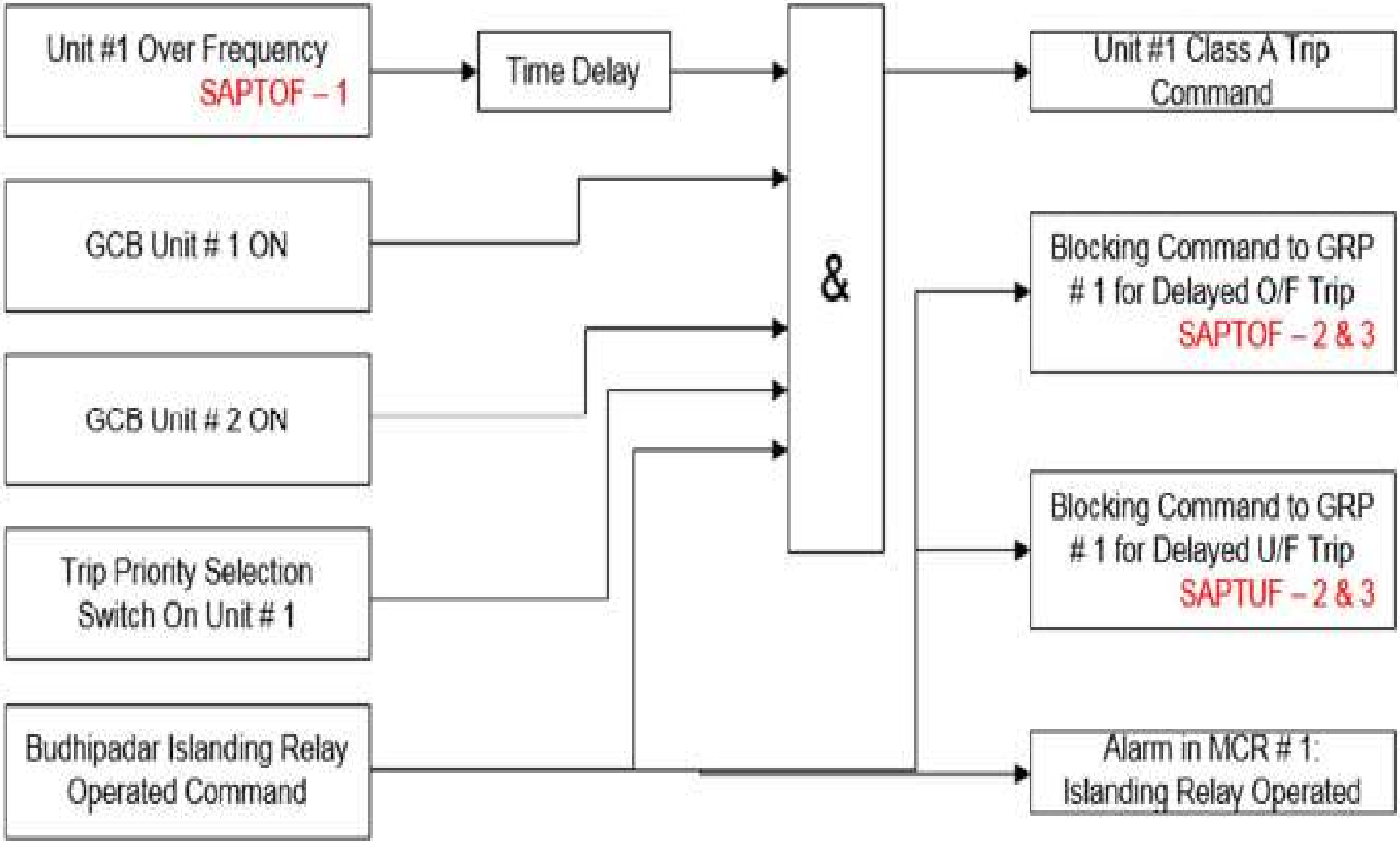
ISLANDING MULTIPLICATION RELAY CONFIGURED IN IBTPS SWITCHYARD CONTROL ROOM

Hold ON Contact of X Relay

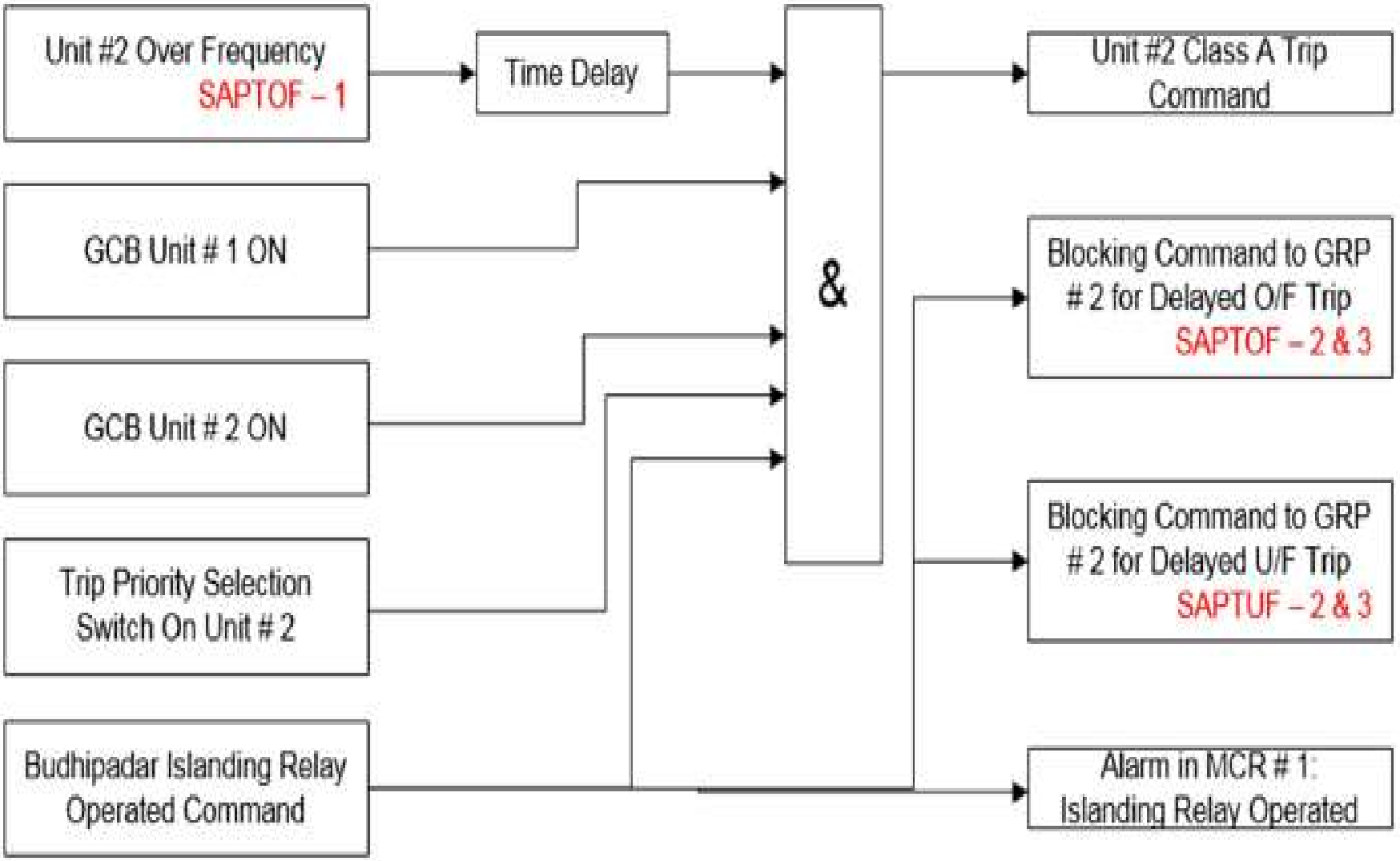




Logic configured in REG670 Relay for Islanding of Unit-I Generator



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

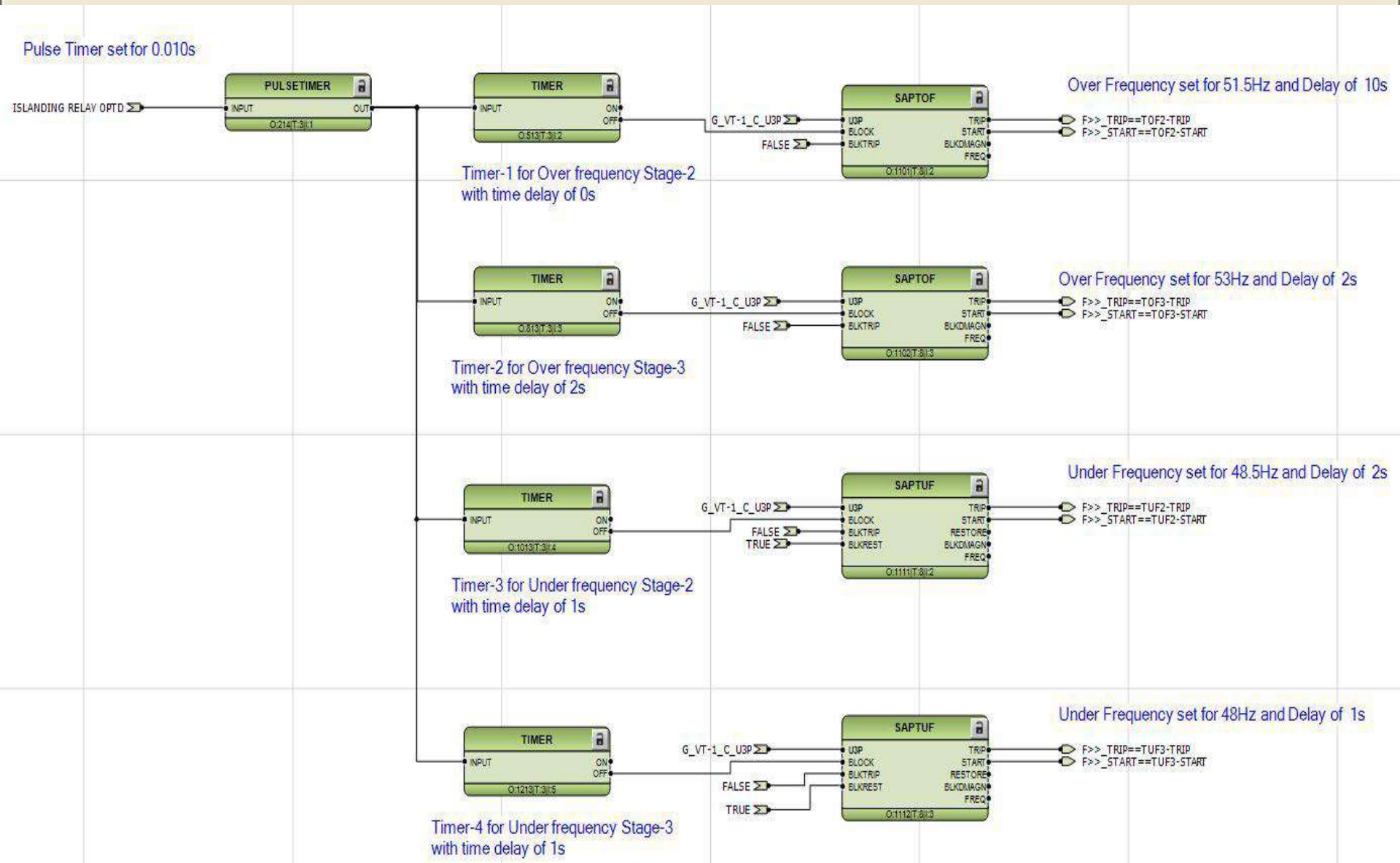


- The over – frequency protection is achieved using SAPTOF function block in Generator Protection relay REG670. There are 3 instances of SAPTOF function in REG670 relay, in which the 1st is used to confirm the disturbance in the system frequency (As shown in above figure- red colored), 2nd and 3rd instance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

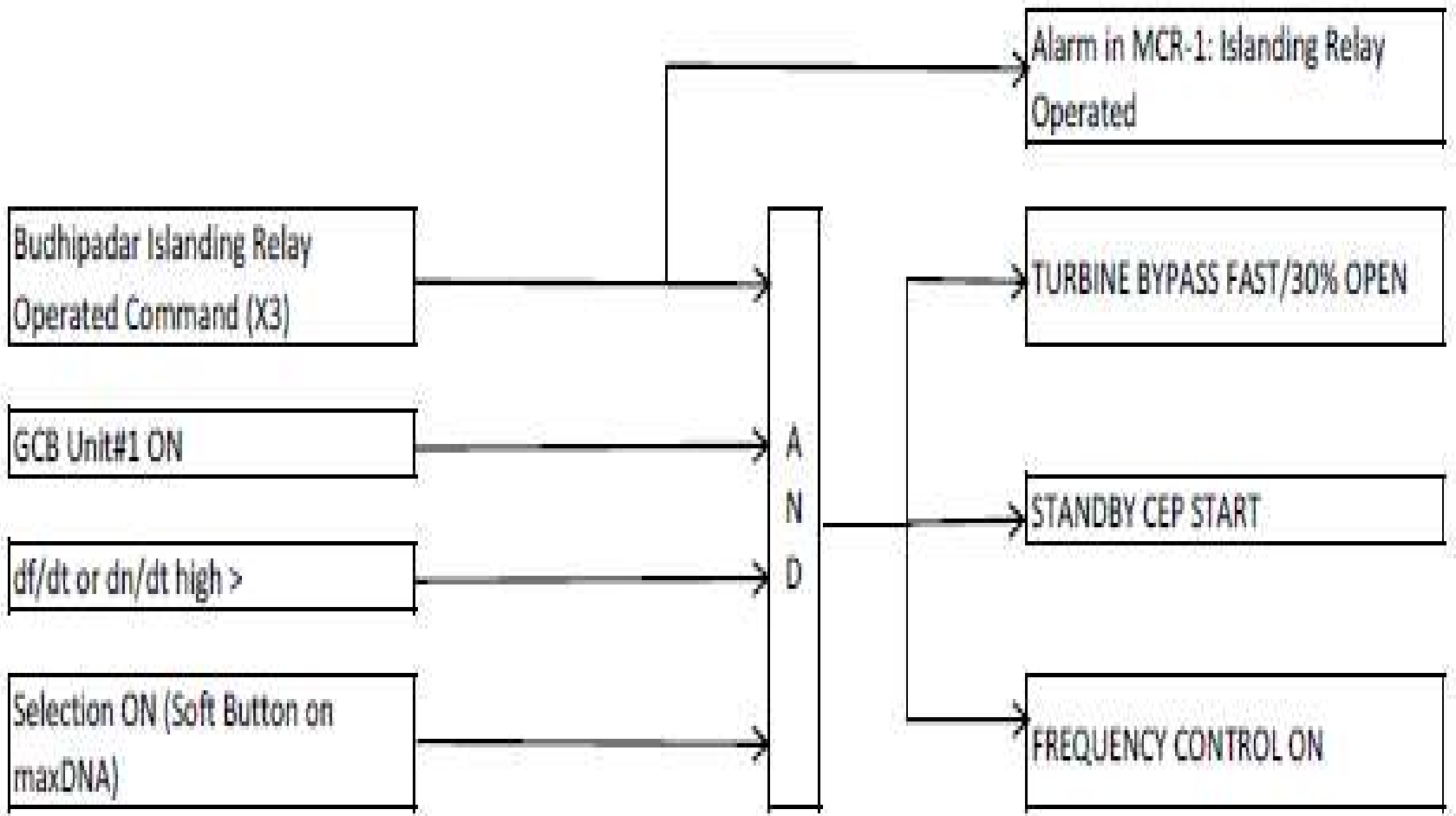
SAPTOF: 1				
Setting Group1				
Operation	On			
UBase	15.75	kV	0.05	2000.00
StartFrequency	51.50	Hz	35.00	75.00
IntBlockLevel	50	%UB	0	100
TimeDlyOperate	1.000	s	0.000	60.000
TimeDlyReset	0.050	s	0.000	60.000

Configuration of Delayed Over Frequency and Under Frequency Function

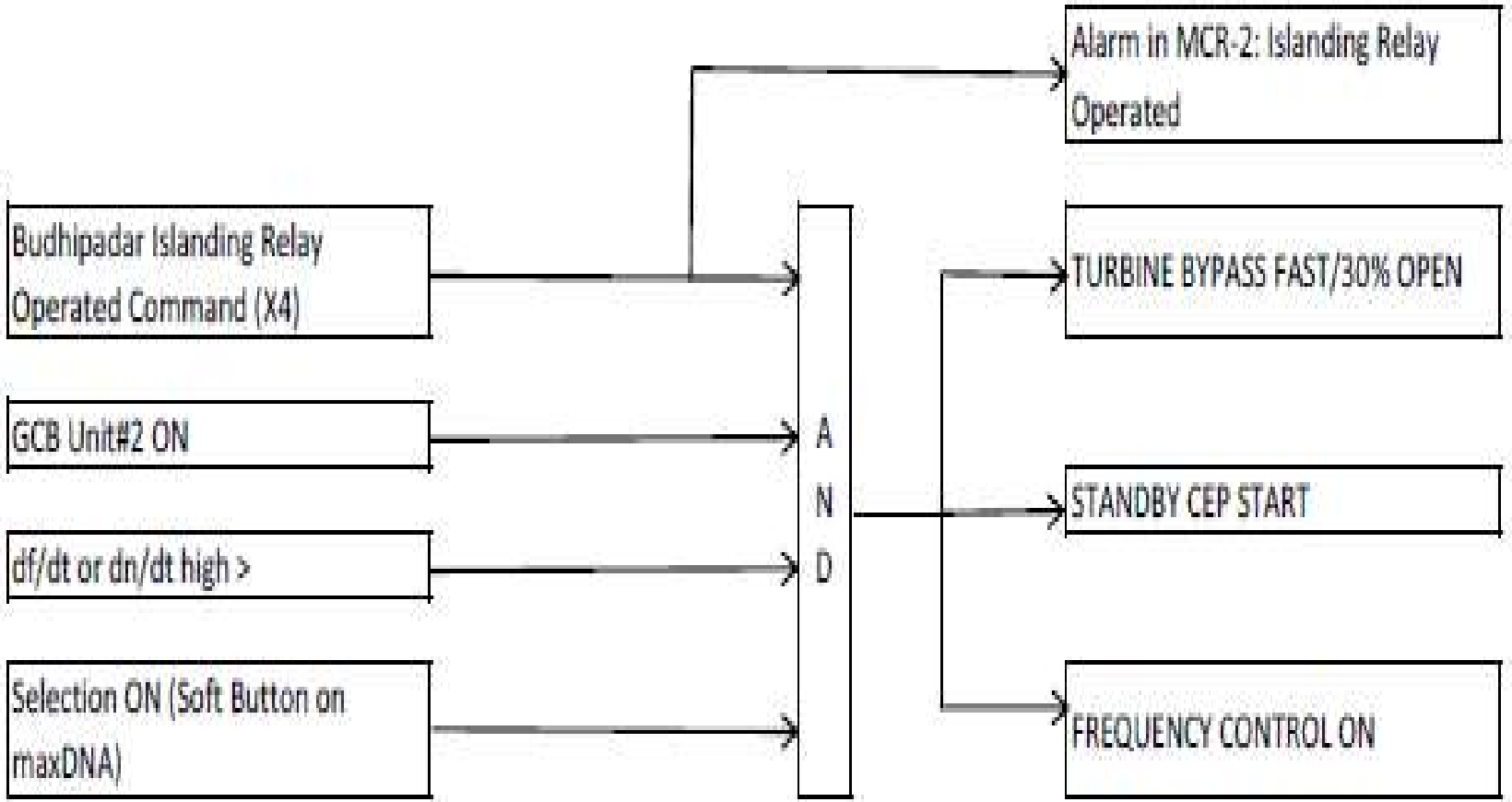


- Above timers are settable and can be adjusted as per requirement. If there is no trip from islanding relay, over and under frequency protections will operate as per the times shown without external timers (timer-1 to 4).
- If there is a trip from Islanding relay, over and under frequency protections 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

MONTHLY INTERRUPTION REPORT FOR THE MONTH OF*JULY2018*

TRANSMISSION SUB DIVISION HATIA-II

Annexure-C.2

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:- 132KVHatia-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:- 132KVLohardaga-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 :- 132KVNamkum

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.	Powergrid informed that relay settings has properly coordinated at all level.
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.	JUSNL informed that zone-4 timing was reviewed and set to 500 msec.
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

		cause of busbar relay operation.	busbarprotection 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: