Minutes
of
65th PCC meeting

Date: 13.04.2018
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

MINUTES OF 65TH PROTECTION SUB-COMMITTEE MEETING HELD AT ERPC, KOLKATA ON 28.03.2018 (WEDNESDAY) AT 11:00 HOURS

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

PART – A

ITEM NO. A.1: Confirmation of minutes of 64th Protection sub-Committee Meeting held on 22nd February, 2018 at ERPC, Kolkata.

The minutes of 64th Protection Sub-Committee meeting held on 22.02.18 circulated vide letter dated 12.03.18.

Members may confirm the minutes of 64th PCC meeting.

Deliberation in the meeting

Members confirmed the minutes of 64th PCC meeting.

PART – B

ANALYSIS & DISCUSSION ON GRID INCIDENCES OCCURRED IN FEBRUARY, 2018

ITEM NO. B.1: Disturbance at 220 kV Mejia S/s on 19-02-2018 at 18:12 hrs

At 8.10 Hrs LBB protection operated during synchronization of U#4 through Main Bus-1. All the Bays connected to Main Bus-1 and Bus section 1-3 Breaker tripped through 96 Lock-out Relays. With the failure of Main Bus-1, SST –A tripped which was supplying power to the Reserve Boards of U#1 and 2. This initiated a Class-A tripping for U#2 which was on the other Bus i.e Main Bus-2. Y and B-Pole of the GT#2 Breaker got stuck which initiated LBB protection of GT#2. 96 Lock-out Relays of all the bays of Main Bus #2 and Bus Section 2-4 operated. However, Bus section 2-4 Breaker failed to trip. In this Breaker also Y & B-pole got stuck, it initiated LBB protection of Bus Section 2-4 which resulted in tripping of all the bays associated with Main Bus-4 and Tie Breaker of Bus-3 and Bus-4. The following elements tripped:

- 220 KV Mejia-Kalyaneshwari T/c
- 220 KV Mejia-Burnpur
- 220 KV Mejia-Barjora D/c
- 220 KV Mejia-Durgapur (DVC)-I
- 220 KV Mejia-Waria D/c
- Unit-2,3 and 6
- Bus 1,2 and 4

Load loss 288MW

Generation loss 630 MW

No major voltage dip is observed in PMU

DVC may explain.

Deliberation in the meeting

*DVC explained the disturbance with a detailed presentation. Presentation is enclosed at **Annexure-B1**. DVC explained the sequence of events as follow:*

- *During closing of GCB of U#4, one particular coil assembly of 186 A Lock-out Relays out of 5 coil assemblies had operated an initiated the LBB protection of 220kV Bus-I at Mejia S/s.*
- *With the failure of Main Bus-1, SST – A which was connected to bus-1 got tripped and led to failure of Emergency Boards of U # 2. It caused failure of AVR Thyristor cooling fan. This initiated Class-A tripping for U#2 which was on Main Bus-2.*
- *At MTPS, there are two SSTs available for Unit#1, 2 &3. Emergency Board of U#1 &2 are connected from SST#A and Emergency Board of U#3 is connected from SST#B. Hence Unit#2 tripping was initiated with the tripping of SST#A.*
- *With operation of Class-A Lock-out of U#2, trip pulse was issued to GT#2 Breaker. But GT#2 LBB operated as GT CB Y and B-Pole had delayed opening.*
- *With the initiation of GT#2 LBB protection, 96 Lock-out Relays of all the bays of Main Bus #2 and Bus Section 2-4 has also operated.*
- *However, Bus section 2-4 Breaker failed to trip due to non operation of Y pole which initiated LBB protection of Bus Section 2-4 and resulted in tripping of all the bays associated with Main Bus-4.*
- *This ultimately results in failure of Main Bus-1, 2 and 4 causing outage of U # 2, 3 and 6.*

On enquiry, DVC informed that the LBB protection installed at 220kV Mejia is numerical relay and operation LBB protection was in order.

PCC advised DVC to test the healthiness of the CBs.

DVC informed that overhauling of six CBs is in progress by BHEL.

DVC added that Bus I & II breakers are 20 years old and they are planning for phase wise replacement.

ERPC and ERLDC opined that alternate source of supply may be provided for Emergency Boards of the unit to avoid such unwanted unit tripping.

Members from Generating stations informed that no such provision is available as per the OEM and providing parallel supply would increase the fault current level.

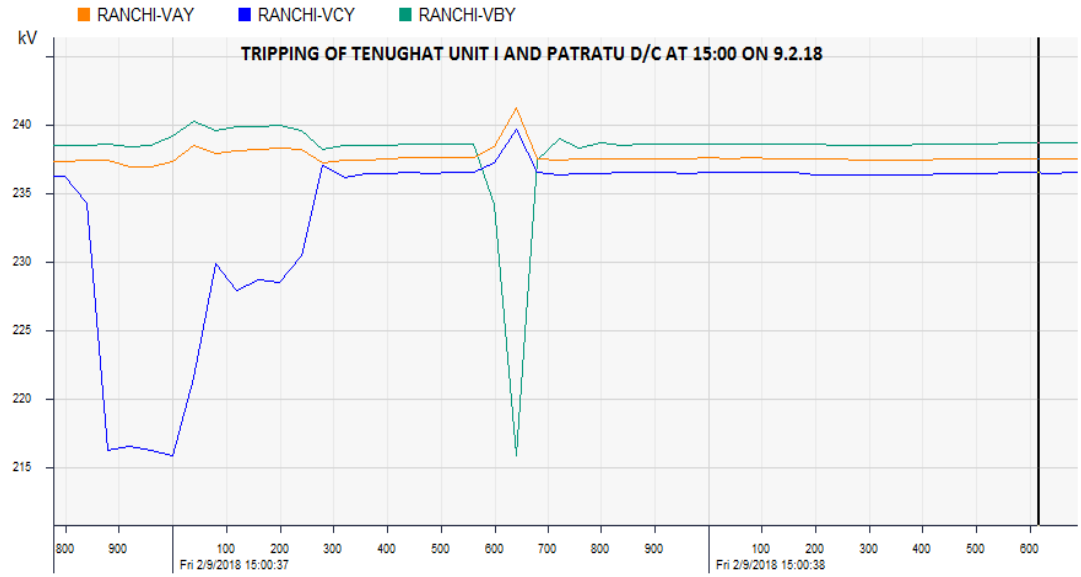
ITEM NO. B.2: Disturbance at 220/132 kV Patratu S/S on 09-02-2018 at 15:00 hrs

There was a fault at 220 KV Patratu-Hatia ckt II as jumper and insulator disc puncture has been found in this circuit. As per PMU data, fault was not cleared within the specified time which may results in cascaded tripping in nearby region.

Relay indications are as follows:

Name of the elements	Relay Indication	
220 kV TVNL - Patratu S/C	B-N, Zone - None, IB = 1.53 Ka at TVNL end	R/I yet to be received from Patratu end
220 kV Patratu - Hatia - I	R/I yet to be received from Patratu end	Did not trip from Hatia end
220 kV Patratu - Hatia - II	Did not trip from Patratu end	R/I yet to be received from Hatia end
132 kV Hatia - Hatia T/C	R/I yet to be received from any end	
132 kV Namkum - Hatia S/C	R/I yet to be received from any end	
220/132 kV ICT - I at Patratu	R/I yet to be received from any end	
Unit I at TVNL		

Analysis of PMU plots:



In PMU data, two faults have been observed. First fault was in B phase at 15:00:36.800 hrs which was cleared in 500 ms. 300 ms after clearing the first fault, another fault was observed in Y phase which was cleared within 100 ms.

Load loss 200MW

Generation loss 180 MW

JUSNL and TVNL may explain.

Deliberation in the meeting

JUSNL explained the disturbance with a detailed presentation. Presentation is enclosed at ***Annexure-B2****. JUSNL explained the sequence of events as follows:*

There was a B-N fault in 220 KV Patratu-Hatia ckt II line and Patratu end relays including 220/132kV ATR protection relays failed to clear the fault. Hence the fault got cleared from remote end. The relay indications are as follows:

Name of the elements	Relay Indication	
220 kV TVNL - Patratu S/C	Zone 1, B-N fault	Did not trip from Patratu end
220 kV Patratu - Hatia - I	Did not trip from Patratu end	Zone 1, B-N fault
220 kV Patratu - Hatia - II	Did not trip from Patratu end	Zone 1, B-N fault
132 kV Hatia I – Hatia II T/C	Did not trip	O/C, E/F
132 kV Namkum - Hatia I S/C	R/I yet to be received from any end	O/C, E/F
220/132 kV ICT - I at Patratu	O/C, E/F	
132 kV Hatia I – Patratu	O/C, E/F	Did not trip
132 kV Hatia I – Sikidri	O/C, E/F	Did not trip
50 MVA Transformer I & II at Hatia-I	O/C, E/F	

PCC opined that protection system at 220/132kV Patratu S/s had failed to clear the fault and Kanke end relay of 132kV Patratu-Kanke line was also failed to clear the fault in this case. Therefore, the fault was extended to Hatia II, Namkum and Sikidri S/s.

JUSNL informed that at 16:39 hrs, one more fault was occurred in 220kV Patratu-Hatia line-II and Patratu end identified the fault in zone 1. TVNL informed that 220kV Patratu-TVNL line tripped from TVNL on Dir. O/C, E/F in 1.5 sec.

JUSNL was advised to submit the details to ERPC and ERLDC.

After detailed deliberation, PCC advised JUSNL to take the following measures:

- *Check the healthiness of the DC system including end to end cables at 220/132kV Patratu S/s*
- *Check the healthiness of all Circuit Breakers at 220/132kV Patratu S/s*
- *Check the healthiness of all the relays installed at 220/132kV Patratu S/s including 220/132kV ATRs*
- *Check Kanke end relay and CB of 132kV Patratu-Kanke line*
- *Check the Directional feature of 132 kV Hatia I – Sikidri and 132 kV Namkum - Hatia I line relays at Hatia-I*

PCC advised TVNL to verify the zone 1 reach of 220kV Patratu-TVNL line as TVNL end should trip on zone 2 in this case.

JUSNL informed that the switchyard at Patratu would be upgraded to 400kV level and 220/132kV Patratu S/s may not be in service during the construction work.

PCC opined that TVNL generation would not be available in this case and JUSNL should plan some alternative arrangement to meet the demand in around Hatia.

PCC decided to refer this issue to OCC Meeting and advised JUSNL to submit their action plan in next OCC meeting.

ITEM NO. B.3: Tripping of 132 kV Birpara(PG) – Birpara(WB) D/C line on 13-02-2018 at 17:53 hrs

132 kV NJP – Moinaguri S/C and 132 kV NJP - Chalsa - Moinaguri link were out of service. At 17:53 hrs 132 kV Birpara - Birpara D/C tripped from PG end resulting load loss at Birpara, Moinaguri, Alipurduar and their surrounding areas.

WBSETCL may explain.

Deliberation in the meeting

Powergrid informed that 132 kV Birpara(PG) - Birpara D/C tripped from PG on overcurrent protection due to overload.

Powergrid informed that settings at PG end have been implemented as per the data received from WBSETCL end.

WBSETCL informed that CT ratio at PG end has to be changed according to present loading of the line.

PCC advised Powergrid and WBSETCL to coordinate and review the CT ratio/relay settings to avoid unwanted tripping.

ITEM NO. B.4: Tripping of 132 KV Rangpo-Melli S/C and 132 KV Melli-Siliguri S/c lines on 14-02-2018 at 16:29 hrs

132 kV Melli - Sagbari S/C was under shutdown. 132 kV Rangpo - Melli S/C and 132 kV Melli - Siliguri S/C tripped at 16:29 hrs due to R-Y-N fault resulting load loss at Melli and its surrounding area.

Powergrid and Sikkim may explain.

Deliberation in the meeting

Powergrid informed that there was R-Y-N fault in 132 kV Rangpo - Melli S/C line and the Melli end CB was failed to clear the fault. As a result 132 kV Melli - Siliguri S/C line got tripped from Siliguri end.

PCC advised Sikkim to check Melli end CB of 132 kV Rangpo - Melli S/C line.

ITEM NO. B.5: Disturbance at 220/132 kV Baripada S/S on 23-02-2018 at 08:54 hrs

220 kV Baripada - Balasore - II was under shutdown. At 08:54 hrs all elements connected to 220 kV bus along with ICTs tripped from 220 kV side due to bus bar protection of 220 kV bus at Baripada. During restoration all elements connected to 132 kV bus at Baripada (PG) were hand tripped at 09:32 hrs from 132 kV side. There was no tripping at 400 kV level at Baripada. Detailed report enclosed at Annexure-B5.

Powergrid may explain.

Deliberation in the meeting

Powergrid informed that there was no fault in the system. The bus bar protection of 220 kV bus at Baripada operated during NTAMC work.

ITEM NO. B.6: Disturbance at 220/132 kV Purnea S/S on 25-02-2018 at 10:51 hrs

220/132 kV ATR - III at Purnea is under shutdown. At 10:51 hrs 220/132 kV ATR - I & II at Purnea tripped due to B phase O/C. After the tripping of ICT'S nearby area's load is supplied by 132 kV Kishangunj - Purnea S/C which tripped due to overload.

Powergrid and BSPTCL may explain.

Deliberation in the meeting

Powergrid informed that there was a B-N fault in downstream network of the BSPTCL and 220/132 kV ATR - I & II at Purnea(PG) tripped on overcurrent protection.

BSPTCL informed that there was no fault observed in their network. BSPTCL added that SEL relays at Purna(Bihar) end have been tested recently to ensure the healthiness.

PCC opined that the line protection of 132kV lines at Purnea(PG) should should also pickup in case of any fault in BSPTCL network and advised Powergrid to found out the source of fault.

Powergrid informed that line differential protection of 132kV Purnea(PG)-Purnea(Bihar) is in operation from 23rd February 2018.

ITEM NO. B.7: Total Power failure at RHP, Darjeeling & Kurseong S/s on 11.03.2018 at 15:05 hrs

132kV NBU-Darjeeling and NBU-Rammam line tripped due to zone 1 operation. But 132kV bus of RHP got dead due to tripping of 132kV Rammam-Rangit line from Rangit(NHPC) end. At the same time, 132kV Siliguri(PG)-Kurseong line tripped from PG end causing total power failure at Kurseong S/s.

Members may discuss.

Deliberation in the meeting

WBSETCL and Powergrid informed that due to severe thunder storms in around Darjeeling, Siliguri and NBU, multiple faults were occurred in 132kV NBU-Darjeeling, 132kV NBU-Rammam and 132kV Siliguri(PG)-Kurseong lines.

WBSETCL informed that faults in 132kV NBU-Darjeeling and 132kV NBU-Rammam lines were successfully cleared from both ends on zone 1 distance protection.

Powergrid informed that 132kV Siliguri(PG)-Kurseong line tripped from PG end on high set overcurrent protection. This resulted in total power failure at 132kV Kurseong.

It was informed that 132kV Rammam-Rangit line was also tripped from Rangit(NHPC) end resulted in total power failure at Rammam. Details from Rangit are yet to be received.

PCC decided to discuss the disturbance in detail in next PCC Meeting and advised all the concern constituents to submit the details to ERPC and ERLDC.

ITEM NO. B.8: Issues related to Rangpo SPS operation

In 54th PCC, Powergrid informed that the scheme was implemented using PLC and there may be minor errors in MW transducers. This problem would be resolved when the SPS scheme implemented through BCU and SAS which is under the awarding stage. The implementation would take 3 to 4 months.

PCC felt that the time delay between SPS 1 and II may be reviewed till the SPS scheme implemented through SAS. PCC decided to review the time delay in next PCC meeting.

SPS operation Date	Issue
27-07-17	Time delay for SPS-2 more than 500 ms
10-01-18	Time delay of SPS-2 less than 500 ms aft
21-02-18	SPS-1 operated even though the flow did not cross 850 MW after tripping of one line

Members may discuss.

Deliberation in the meeting

It was informed that the issue will be discussed in a separate meeting scheduled to be held at ERPC, Kolkata on 6th April 2018.

It was informed that 400kV Rangpo-Dikchu line would be commissioned within 10 days.

ITEM NO. B.9: Issues of SPS associated with tripping of any pole of HVDC Talcher-Kolar

During synchronization of NEW grid with SR grid, to limit the surplus power likely to be wheeled to SR through ER and WR, in the event of single or bi-pole outage of 500 kV Talcher-Kolar HVDC, arrangement for 600 MW generation reduction in ER (200 MW each at SEL, GMR and JITPL) by sending digital signals from Talcher STPS was made, apart from the pre-existing reduction/tripping of TSTPS-II generation.

To implement this SPS, signal is transmitted from Talcher to the concerned generating stations.

The SPS needs to be reviewed in view of the following:

A. **Availability of new high capacity AC transmission elements in ER, SR and WR:** A number of new high capacity transmission elements have been commissioned in ER, SR and WR after implementation of the SPS. Since 765kV Angul-Srikakulam D/c line is available, the chances of wheeling of surplus power from ER to SR via WR are limited.
B. **Sending SPS signal to Vedanta (SEL):** after removing LILO of Rourkela-Jharsuguda at SEL, this link is no more available. In view of removal of 400kV Rourkela-Jharsuguda LILO at SEL, PLCC link for sending SPS signal to Vedanta/Sterlite may be re-established either via Jharsuguda or via Meramandali or via Angul.
C. **Continuous receipt of generation back down signal on shutdown of HVDC Talcher-Kolar single pole:** The SPS could not be taken back into service as there was continuous receipt of backing down signal at the respective generator ends. Hence, the SPS had to be kept by-passed throughout the shutdown period even though Pole-II was in service.

37th TCC advised Member Secretary, ERPC to convene a separate meeting with the concerned stakeholders to have a review of the existing 600 MW generation reduction SPS in ER.

Members may decide.

Deliberation in the meeting

It was informed that the issue will be discussed in a separate meeting scheduled to be held at ERPC, Kolkata on 6th April 2018.

ITEM NO. B.10: Tripping incidences in the month of February, 2018

Other tripping incidences occurred in the month of February 2018 which needs explanation from constituents of either of the end is given at **Annexure- B10**.

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-B10***.*

PART- C:: OTHER ITEMS

FOLLOW-UP OF DECISIONS OF THE PREVIOUS PROTECTION SUB-COMMITTEE MEETING(S)

(The status on the follow up actions is to be furnished by respective constituents)

ITEM NO. C.1: Multiple tripping around Talcher during Pole shutdown on 09-01-2018

Regarding sending of carrier signal from Rourkela to Talcher, Powergrid informed that they have tested the scheme on 17th January 2018 and the issue has been referred to OEM(Alstom) for rectification.

Tripping of tie CB (1752) of 400kV Talcher-Meramandali line at Talcher on Pole Discrepancy would be attended in March 2018 during shutdown.

Powergrid Odisha Project and NTPC, Talcher may update.

Deliberation in the meeting

NTPC informed that tripping of tie CB (1752) of 400kV Talcher-Meramandali line at Talcher on Pole Discrepancy has been attended on 7th March 2018. Problem in control circuit has been rectified.

ITEM NO. C.2: Disturbance at 220 kV Budhipadar S/s on 01-10-17 at 09:25 hrs

In 62nd PCC, OPTCL informed that Busbar protection maloperated and tripped all the elements connected 220kV bus 1 at Budhipadar.

OPTCL added that the issue has been referred to OEM (Siemens) for rectification.

In 63rd PCC, OPTCL informed that OEM (SIEMENS) visited the Substation on 29th December'2017 and taken the data (i.e. Trip Log, Even Log & DR) for analysis.

In 64th PCC, OPTCL informed that OEM, Siemens has recommended for updating of 7SS52_MCU device firmware version to V4.73 or higher to resolve the restart automatic problems. Accordingly, Siemens will upgrade the firmware.

OPTCL may update.

Deliberation in the meeting

OPTCL informed that the firmware would be updated by April 2018.

ITEM NO. C.3: Disturbance at 400 kV Teesta-V S/s on 12-10-17 at 12:55 hrs

In 61st PCC, Powergrid explained that there was a high resistance Y-N fault in 400 kV Teesta - Rangpo – II close to Teesta V bus. Initially the fault was seen in zone 3 characteristics of distance protection at Rangpo end. Later the fault was evolved into zone 2 characteristics. Since it was an evolving fault the Autorecloser was not initiated at Rangpo end as per the scheme and 400 kV Teesta - Rangpo – II tripped from Rangpo end. DT was sent to Teesta-V end.

PCC advised NHPC to take the following measures:

- Any one (Main I or II) distance protection should have quadrilateral characteristics to accommodate arc resistance of the fault. The zone settings and starter settings should be modified accordingly in coordination with Rangpo, Powergrid.

- The 400kV bus coupler overcurrent setting should be properly coordinated with the distance protection of transmission lines. Otherwise bus coupler will trip for the faults in transmission line. Since busbar protection is available for 400kV bus at Teesta-V, the over current setting of bus coupler can be reviewed and time setting should be coordinated at least with zone 2 time of the transmission line protection.

PCC opined that since length of 400 kV Teesta - Rangpo D/C line is 12 km and it is in high resistance fault prone area, PCC recommended for differential protection using OPGW to improve the reliability.

In 62nd PCC, NHPC informed that 400kV bus coupler overcurrent setting has been revised. The settings of transmission line relays will be revised during line shutdown.

In 63rd PCC, Powergrid informed that the revised settings of 400 kV Teesta - Rangpo D/C line at Teesta have been forwarded to their corporate office. The settings will be incorporated after approval from their corporate office.

NHPC may update.

Deliberation in the meeting

Powergrid informed that they are yet to receive the approved settings.

ITEM NO. C.4: Tripping of 220 KV Darbhanga-Motipur D/C and 220 KV Muzaffarpur (MTPS)-Motipur D/C on 02-11-17 at 13:18 hrs

In 62nd PCC, it was opined that the busbar protection should not operate in this case.

BSPTCL informed that the issue of maloperation of busbar protection at 220kV Motipur has been communicated to OEM (GE) for rectification.

BSPTCL may update.

Deliberation in the meeting

BSPTCL informed that GIS work is in progress. The busbar protection would be tested by OEM within 2 months.

ITEM NO. C.5: Third Party Protection Audit

1. Status of 1st 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	27	39.71
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 update.

Deliberation in the meeting

PCC advised all the constituents to comply the pending observations.

ITEM NO. C.6: Repeated pole blocking at HVDC Sasaram

S. No.	Tripping Date	Tripping Time	Brief Reason/Relay Indication	Restoration Date	Restoration Time	Duration
1	17-07-17	5:41	System failure alarm	17-07-17	6:38	0:57
2	17-07-17	16:35	System failure alarm	17-07-17	17:34	1:00:00
3	20-07-17	8:29	System failure alarm	20-07-17	9:25	0:56
4	31-07-17	18:34	System failure alarm	31-07-17	19:45	1:11:00
5	29-05-17	00:15	System failure alarm	29-05-17	01:24	1:09:00
6	25-04-17	06:03	Auxiliary supply failure	25-04-17	07:14	1:11:00
7	01-04-17	09:15	Tripped due to Valve cooling system problem	01-04-17	12:56	3:41:00
8	11-04-17	23:32	System failure alarm	12-04-17	00:17	0:45:00
9	30-04-17	03:24	Due to tripping of filters on eastern side	30-04-17	16:13	12:49:00
10	12-01-17	13:36	Blocked due to unbalanced auxiliary system	12-01-17	15:06	1:30:00
11	14-01-17	05:03	Tripped due to system failure alarm	14-01-17	08:57	3:54:00
12	10-01-17	13:23	Filter problem at Sasaram	12-01-17	11:24	46:01:00
13	03-01-17	11:00	To take pole in service in HVDC mode	10-01-17	07:42	164:42:00
14	03-12-16	12:15	Converter control protection operated	03-12-16	13:22	1:07:00
15	06-12-16	19:12	Tripped due to CCP east side M1, M2 major alarm and observed sys fail in East side	06-12-16	20:55	1:43:00
16	19-12-16	12:43	Due to tripping of 400 kv Biharshariff-Sasaram-II	19-12-16	13:35	0:52:00
17	05-11-16	04:51	System fail alarm	05-11-16	06:57	2:06:00
18	22-11-16	12:12	CCP Main-2 major alarm	22-11-16	13:35	1:23:00
19	26-11-16	09:36	CB filter bank burst	27-11-16	11:31	25:55:00

Regarding pole block on 25-05-17, there is back up in the station in the following form:

132/33 KV Pusauli	315 MVA ICT-2 tertiary	01 No. DG set of 1500 KVA	Battery available for valve cooling system only. It can provide auxiliary supply for at max 2 minutes.

In 56th PCC, Powergrid was advised to submit the details to ERLDC and ERPC.

In 36th TCC, Powergrid informed that pole blocking at HVDC Sasaram system is being initiated on system failure alarm. They have contacted OEM and OEM is also failing to conclude and rectify the issue.

Powergrid added that since the HVDC control system is quite old and it is not operating satisfactorily the HVDC control system at Sasaram needs to be upgraded. Powergrid requested TCC to consider.

TCC felt that Powergrid has not placed any report in the PCC meeting and advised Powergrid to take the issue seriously.

TCC opined that system upgradation needs detailed discussion in lower forums and advised Powergrid to place the details in forthcoming PCC meeting scheduled to be held on 20th September 2017.

In 59th PCC, Powergrid informed that the issue has been referred to their corporate office and they will submit the report soon.

In 61st PCC, Powergrid informed that M/s Alstom has inspected the site and collected all the details. They will submit the report.

In 62nd PCC, Powergrid informed that M/s Alstom has submitted the report.

PCC advised Powergrid to send the report to ERPC and ERLDC.

In 63rd PCC, Powergrid submitted the report which is enclosed at **Annexure-C6**.

In 64th PCC, Powergrid informed that they are implementing the observations. PCC advised Powergrid update the status in monthly PCC Meetings.

Powergrid may update.

Deliberation in the meeting

Powergrid informed that as per OEM recommendation they have to install air condition system to minimize the temperature of the control panels.

PCC advised Powergrid to submit the details to ERPC and ERLDC.

ITEM NO. C.7: 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	
19	400 KV KOLAGHAT-KHARAGPUR-II	03.08.16	Y-N FAULT	WBPDCL	WBSETCL		
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		
32	220KV Bidhannagar-Waria-II			WBSETCL	DVC		
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
2. 220 kV Biharshariff- Begusarai line

} *Work is in progress expected to be commissioned*

3.	220 kV Biharshariff- Bodhgaya line	*by December 2017.*
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

Members may update the status.

Deliberation in the meeting

Members noted for compliance.

ITEM NO. C.8: 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-C8**.

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

Constituents may note.

Deliberation in the meeting

PCC advised all constituents to submit the checklist on monthly bases in every OCC/PCC meetings.

ITEM NO. C.9: Any other issues.

1. **Low Frequency Oscillation (LFO) observed in Pan India grid on 17th March 2018 from 02:43 Hrs. to 02:48 Hrs.**

Low frequency oscillation of 0.37 Hz was observed in the pan-India grid on 17th March 2018 from 02:43 hrs. to 02:48 hrs. Based on the synchrophasor data analysis for the Indian grid, it is noted that oscillation was more prominent in the Eastern region near Farakka STPS. Oscillationsof Farakka bus voltage as recorded by thePMU installed thereis given in the figure below. Based on analysis of all India SCADA data, it was found that there were large variations in the MW and MVAR generation of the Kahalagaon Unit 6 during the same time period. On inquiry with KhSTPS, it was reported that there was some issue with the Kahalgaon unit 6 turbine Electro-hydraulic governor (EHG) due to which its control valves oscillated causing Unit generation to fluctuate from 40 MW to 470 MW, as can be seen from the MW and MVAR plot received from NTPC. The time of LFO initiation in the grid as recorded byPMUs, and that of KahalgaonMW/MVAR fluctuations matched with each other. Further, on examining the all India SCADA data of generating units obtained from NLDC it was observed that no other unit has experienced such severe oscillation in its MW/MVArduring the period. So, it can be inferred from the analysis that oscillation was excited in the grid due to the malfunctioning of turbine EHG of Kahalgaon Unit 6.

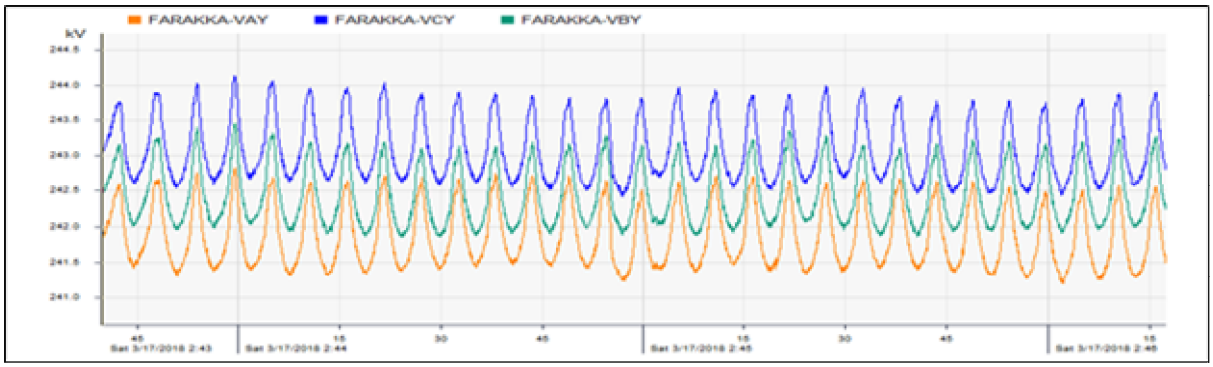


Fig 1: Farakka Bus Voltage from PMU.

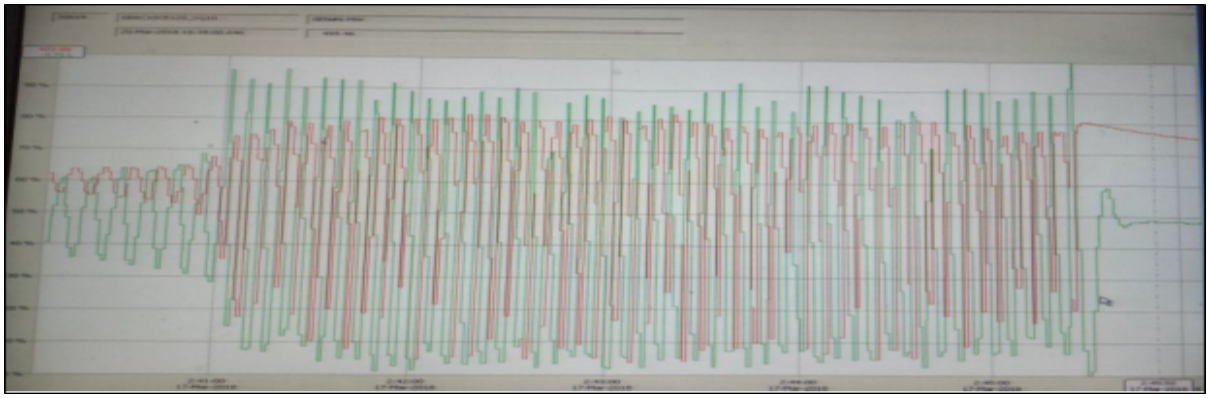


Fig 2: MW and MVAR of Kahalgaon Unit 6 received from NTPC.

In view of the above incident, it is desired that:

1. NTPC Kahalgaon may kindly explain the issue with the turbine EHG governor of their U-6 and the remedial action taken so that such event does not reappear in near future as these have an adverse impact on the entire the Indian Grid.
2. Further, it is desirable that all generating units immediately share the details of MW/MVAR of their units in Excel/.CSV format to ERLDC as soon as they receive communication from ERLDC control Room or ERLDC Protection team for analysis of such event. The resolution of such data should be 1 second or better as available from the DCS of the power plant. In case of generators within the state, the respective SLDC should collect the data and submit to ERLDC/ERPC for analysis.
3. PSS tuning of all the units in the Eastern region above 100 MW may kindly be ensured as per the relevant regulation of CERC and CEA and their tuning reports may be shared with ERLDC/ERPC.

PCC may discuss.

Deliberation in the meeting

NTPC informed that ESTS analog input card was faulty as a result the unit was operated under hydraulic governor control. NTPC added that they are preparing detailed report.

PCC advised NTPC to submit the report along with relevant information to ERPC and ERLDC.

PCC advised NTPC to give a presentation on the findings in next OCC Meeting.

2. Need of Flexibility in the Web Portal Protection Suite of ERPC

During usage of the protection suite of ERPC, following challenges have been encountered which need to be addressed immediately for better utilization of this software and consequentimprovement ofsystem reliability and security:

1. Automatic Intimation to the respective utility by Email/SMS alert when an Event is created for submission of details.
2. Flexibility for downloading overvoltage setting, Distance protection setting and any other setting of all 220 kV and above lines from both ends.
3. Database of Event Reporting suite is not integrated with the rest of the system database. This is resulting in taking a large amount of time in filling the details of elements tripped by configuring them one by one.
4. Intimation to all during maintenance activity and its restoration

PCC may discuss.

Deliberation in the meeting

ERLDC informed that the disturbance reporting system may be linked with the protection database to make it more convenient in filling the disturbance report. Query based reports could be generated for a particular setting.

It was informed that a separate meeting PRDC developing team would be arranged at ERPC, Kolkata for detailed discussion.

3. Interim Arrangement for substations that are not having bus bar protection In Eastern region

There may be 400 kV or 220 kV substations where either the bus bar is kept out of service for planned shutdown or bus bar protection is not available due to various reasons. Further, the older substations having static busbar scheme would also undergo replacement activity witha numerical scheme for which the bus bar protection will again be required to be withdrawn for a considerable time. Under such scenario, there is need of a mechanism to reduce the bus fault clearance time as the non-availability of bus bar protection can result in delayed fault clearance.In case of any issue of the protection system at remote substations,there may bea widespread outage.

In view of this, it is proposed to adhere to the following philosophy whenever the bus bar protection is kept out or is not available for a considerable amount of time at any 765/400/220 kV substation:

1. Zone 4 (Reverse Zone) timing of all the Lines to be reduced to 300 ms. The LBB should have a high priority or the reverse zone time should be set at least equal to LBB time setting.
2. Healthiness of the carrier protection of all lines is to be ensured.
3. Zone 4 timer reset should be checked in all the relays, as its function needs to be flawless.
4. DMT high set available in the numerical backup Overcurrent (O/C) relays of all the ICTs be properly set to clear the bus fault immediately. The backup O/C protection is coordinated with the upstream and downstream elements;therefore, it would not be possible to make it sensitive as suggested.
5. Bus Coupler overcurrent protection setting to be made lower. Whenever the Bus Bar protection is out the Buses should be operated in split bus mode, to have isolation of the elements on other Buses from feeding the Bus fault.
6. Re-trip feature if available in LBB should also be enabled to take one more attempt of breaker opening.
7. Healthiness of all Protection i.e. both Main and Backup shall be ensured.
8. All the Other Utilities at the remote ends be informed about the Bus Bar protection outage through ERLDC/respective SLDCs

In the case where two separate bus bar protections schemes are available at the substation as Main 1 and Main 2, then the above will not be applicable in the case of the outage of any one of the bus bar protection scheme.

PCC may like to discuss.

Deliberation in the meeting

PCC advised all the constituents to send their comments to ERPC and ERLDC.

4. Status of Busbar protection Implementation at 132 kV substations in Eastern region.

Presently Eastern region Protection coordination Committee (PC) forum monitors the availability of bus bar protection at 220 kV and above substations on regular basis. In this regard it may be noted that asper **CEA Regulation on "Measures relating to Safety and Electric Supply 2010",**

Quote

45.2.VII*"High-SpeedBus bar differential protection along with local breaker backup shall be commissioned and shall always be available at all 132 kV and above voltage substations and switching substations and generating substations connected with the grid.*

Provided that in the respect for 132 kv substations and switching stations having more than one incoming feeders , the high speedbus bar differential protection along with local breaker backup protection, shall be commissioned and shall always be in service."

Unquote

In view of the above, it is proposed that the PCC forum may also monitor the 132 kV Busbar protection along with LBB protection availability at all 132 kV substations in the Eastern regional grid. For this, the details of the availability of bus bar protection and LBB protection may kindly be submitted by all the utilities to ERLDC/ERPC. In case of non-availability of bus bar protection and LBB, the utility may also kindly submit their action plan with a timeline for ensuring the compliance for enhancing the reliability and security of the grid.

PCC may discuss.

Deliberation in the meeting

Constituents informed that as per IEGC, bus bar protection is mandatory for 220kV and above substations. For implementation of bus bar protection the all the CTs have to be replaced which would require huge investment.

After detailed deliberation, it was decided to communicate the issue to CEA.

5. Ensuring the availability and healthiness of Auto-reclosure on all 220 kV and above lines in Eastern region.

In the recent past, there were several occasions when the Auto-reclosure of the 765 kV, 400 kV and 220 kV lines did not operate from one end or both ends. The non-operation of A/R is being monitored by ERLDC based on PMU data and DR/EL being provided by utilities and is being provided as an agenda item on regular basis to Eastern region PCC forum for monitoring and discussion. While some improvement has been observed in the auto-reclosure on transmission lines, there are some lines where Auto-reclosure has not operated on more than one occasion like **400 kV Rourkela-Chaibasa 1** (05-02-18, 07-10-17) , **765 kV Fatehpur-Sasaram S/C** (13-02-18, 29-12-17), **400 kV Meramundali-Sterlite 1** (19-03-18,4-10-17,6-10-17,25-10-17,29-10-17), **400 kV Meramundali-Sterlite 2** (01-10-17,09-10-17), **400 kV Patna-Ballia 3** (25-12-17,26-12-17), **400 kV Meramundali-Mendashal S/C** (09-10-17,21-10-17) etc.

The single-phase auto-reclosure on 220 kV and above circuits has to be in service per the regulation 43(4) (c) of CEA Technical standards for construction of electric plants and electric lines 2010. Any line tripping on a single-phase transient fault without attempting auto-reclosure reduces their availability and further impacts the security and reliability of Indian grid under adverse weather condition.

In view of the above, it is desirable to:

1. Verify the auto-reclosure status for all 765/400 kV Lines in Eastern region. All Constituents(ISGS/IPPs/State ISGS and IPPs /ISTS licensee /State ISTS licensee are requested to provide the A/R status of all the 765 and 400 kV Lines.

2. Immediately Submit the details of the reason of non-functioning of single phase A/R function on any of the 765/400 kV line to ERLDC/ERPC.
3. Take immediate measures by the concerned utility for ensuring auto-reclosure healthiness whenever it did not operate, by analyzing its cause and the same shall be reported to ERLDC/ERPC.

Deliberation in the meeting

Powergrid informed that they will replace the Autorecloser relay of 400 kV Rourkela-Chaibasa 1 and 400 kV Meramundali-Sterlite 1 & 2 by April 2018.

6. Follow Up action on Disturbance at 400kV Koderma and 400kV Bokaro-A on 30-01-18 at 10:46 Hrs

- **DVC to check the neutral earthing of line CVTs:** Status of CVT earthing checking at the substation may be informed by DVC
- **Root cause:** If any root cause for this event has been found then may kindly be shared with ER PCM forum

Deliberation in the meeting

DVC informed that the earthing audit is in progress and agreed to submit the latest status to ERPC and ERLDC.

7. Disturbance in North Bengal on 22.03.18 at 11:23hr

On 22.03.18 at 11:23hr, generators running at Rammam and TCF HEP got tripped due to overcurrent protection causing generation loss of 10MW and 19MW. WBSETCL sub-stns. at NBU, Ujanu, Siliguri, Darjeeling, Kurseung and NJP experienced momentary blackout at that moment though no tripping of any line occurred at any S/S. UFR relays operated at 11:23hr tripping 33kv feeders at NJP, NBU and Siliguri sub-stn. At NJP, the only 160MVA TR#2 which was in service has tripped on both HV & LV side due to operation of relay 86 (Master Trip). It was presumed that some transient fault occurred at 132kv network associated with 220/132kv Siliguri(PGCIL) S/S at 11:23hr on 22.03.18 causing voltage dip at associated WBSETCL S/S.

PGCIL may be requested to comment on this disturbance with PMU data of Binaguri S/S.

Deliberation in the meeting

WBSETCL informed that no transmission line was tripped from their end.

PCC advised Powergrid to verify and submit all the relevant details to ERPC and ERLDC for further analysis and detailed discussion in next PCC Meeting.

Meeting ended with vote of thanks to the chair.

****

Annexure-A

Participants in 65th PCC Meeting of ERPC

Venue: ERPC Conference Room, Kolkata Time: 11:00 hrs Date: 28.03.2018 (Wednesday)

Sl No	Name	Designation/ Organization	Contact Number	Email	Signature
1	J. Bandyopadhyay	Member Secretary ERPC	9432326351	mserpc-power@gov.in	[signature]
2	P. Mukhopadhyay	ED, ERLDC	9869438073	pmukhopadhyay@posoco.in	[signature]
3	G. MITRA	DGM, ERLDC	9831297392	gopalmitra@posoco.in	[signature]
4	SURAJIT BANERJEE	DGM, ERLDC	9433041823	surajit.banerjee@posoco.in	[signature]
5	S.K. HAZRA	DGM, PowerGrid	9433041809	skhazra@powergridindia.com	[signature]
6	D. Tripathi	DVC, SE(CRITL)	9434745955	dharmadas.tripathi@dvc.gov.in	[signature]
7	S. MAITI	DVC, S.D.E(E)	7545867453	sudiptam77m@gmail.com	[signature]
8	A.K. Sril	Manager NTPC ER-I	9470001670	ashokntpc1@rediffmail	[signature]
9	ANURAG ROY	Dy. Mgr NTPC ER-I	9434028245	anuragroy@ntpc.co.in	[signature]
10	S.K. MISHRA	DGM(OS) NTPC, ER-II HQ	9438233207	skmishraos@ntpc.co.in	[signature]
11	S.K. SAHU	CM CAM/IT) POWERGRID, BBSR	9078883643	sksahu@powergridindia.com	[signature]
12	Sudeep Kumar	Dy. Mgr (AM) POWERGRID, Patna	9431820338	sudeepkumar@powergridindia.com	[signature]
13	Santosh Pandey	EE DVC	9438692926	santosh90pande@gmail.com	[signature]
14	SAIBAL GHOSH	ERLDC / Engineer	8584071079	saibalghosh@gmail.com	[signature]
15	CHANDAN KUMAR	ERLDC Sr. Engineer	9869251460	chandan@posoco.in	[signature]
16	Ashoke Kumar Basak	ERLDC (Engineer)	9007059569	akbasak@posoco.in	[signature]
17	RAJ PROTIM	ERLDC Sr. Engr.	9903329591	rajprotim@posoco.in	[signature]
18	Deepak kumar	AEE, CRITL JUSNL	7053913700	deepakraj520@gmail.com	[signature]
19	Vinod Kr. Bhoi	AEE / JUSNL	7488284956	ceecritl.jusnl@rediffmail.com	[signature]
20	J. G. Rao	EE, ERPC	9547891353	ereb_cea@yahoo.co.in	[signature]

"Coming together is a beginning, staying together is progress, and working together is success." –Henry Ford

Participants in 65th PCC Meeting of ERPC

Venue: ERPC Conference Room, Kolkata   Time: 11:00 hrs   Date: 28.03.2018 (Wednesday)

Sl No	Name	Designation/ Organization	Contact Number	Email	Signature
21	D. K. Bauri	EE, ERPC	9883617236	ceeo.erpc@gov.in	[signature]
22	S. P. Datta.	AGM, ERPC	9433067022	spdatta@rediffmail.com	[signature]
23	PRASHANT KUMAR	AEXE, BSPTCL	7763818080	prashantkumarsahay@yahoo.com	[signature]
24	K. P. Reddy	A-Ex-E, BSPTCL	7033091481	purusnandhu@gmail.com	K P Reddy
25	Rajendra Pd	A. EE. TVNL	9031049936	rp.ttps@gmail.com	[signature]
26	G. NAYAK	SE(E), WBSETCL	9434910547	gautam.nayak@wbsetcl.in	[signature]
27	C. K. Haldar	ACE, WB-SLDC	9434910379	ckhaldar@yahoo.co.in	[signature]
28	P. K. Gupta	DGM (OS) WBPDCL	8336903960	pgupta@wbpdcl.co.in	[signature]
29	S. S. Nanda	DGM (Elect) ELMR Dvn. Burla OPTCL	9438907803	ele.ssnanda@optcl.co.in	[signature] 28/3/18
30	M. R. Das	AGM (Elect) SLDC	9438908043	ele.mrdas@optcl.co.in	[signature]
31	Sumanta Padhi	Team Member, Teesta Urja Ltd.	9816601260	sumanta.padhi@andritz.com	[signature]
32	Lenin B	AEE/ ERPC	8335890573	lenin.cea@gov.in	[signature]
33	Rupam Das	P.R.D. CKOL	7278883832	rupam.das@prdcinfotech.com	[signature]
34	J. DUTTA.	DCE. DVC	9431515717	jduttadvc@gmail.com	[signature]
35	S. Ghosh	Mgr., WBPDCL	8336917005	sghosh04@wbpdcl.co.in	S Ghosh
36	Madhu. M. K	Proj. Eng.	9611980566	madhu.mk@prdcinfotech.com	[signature]
37					
38					
39					
40					

"Coming together is a beginning, staying together is progress, and working together is success." –Henry Ford

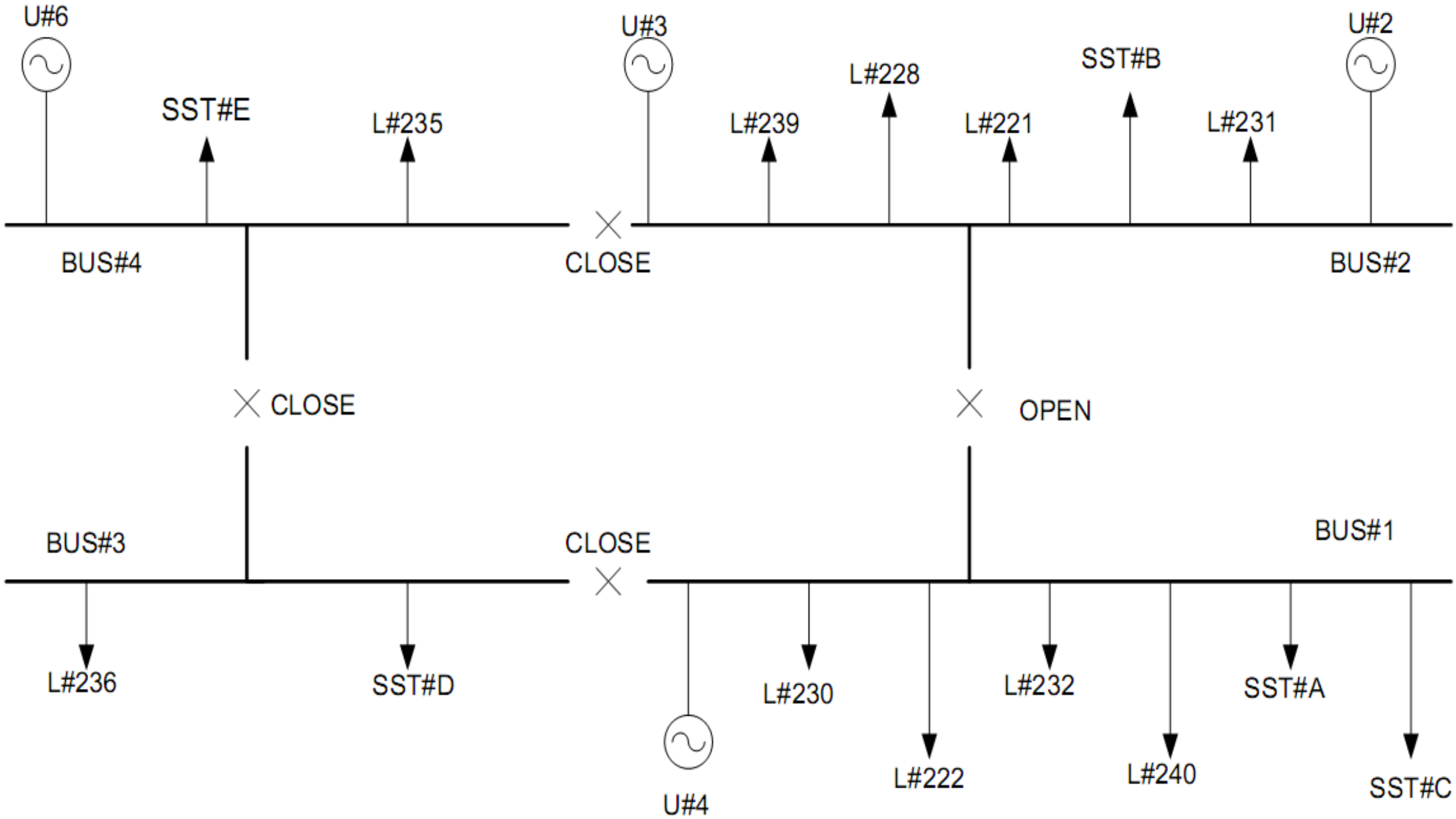
Participants in 65th PCC Meeting of ERPC

Venue: ERPC Conference Room, Kolkata Time: 11:00 hrs Date: 28.03.2018 (Wednesday)

Sl No	Name	Designation/ Organization	Contact Number	Email	Signature
41	Madhu M K	Proj. Engr	9611980586	madhu.mk@pride-infotech.com	
42					
43					
44					
45					
46					
47					
48					
49					
50					
51					
52					
53					
54					
55					
56					
57					
58					
59					
60					

"Coming together is a beginning, staying together is progress, and working together is success." –Henry Ford

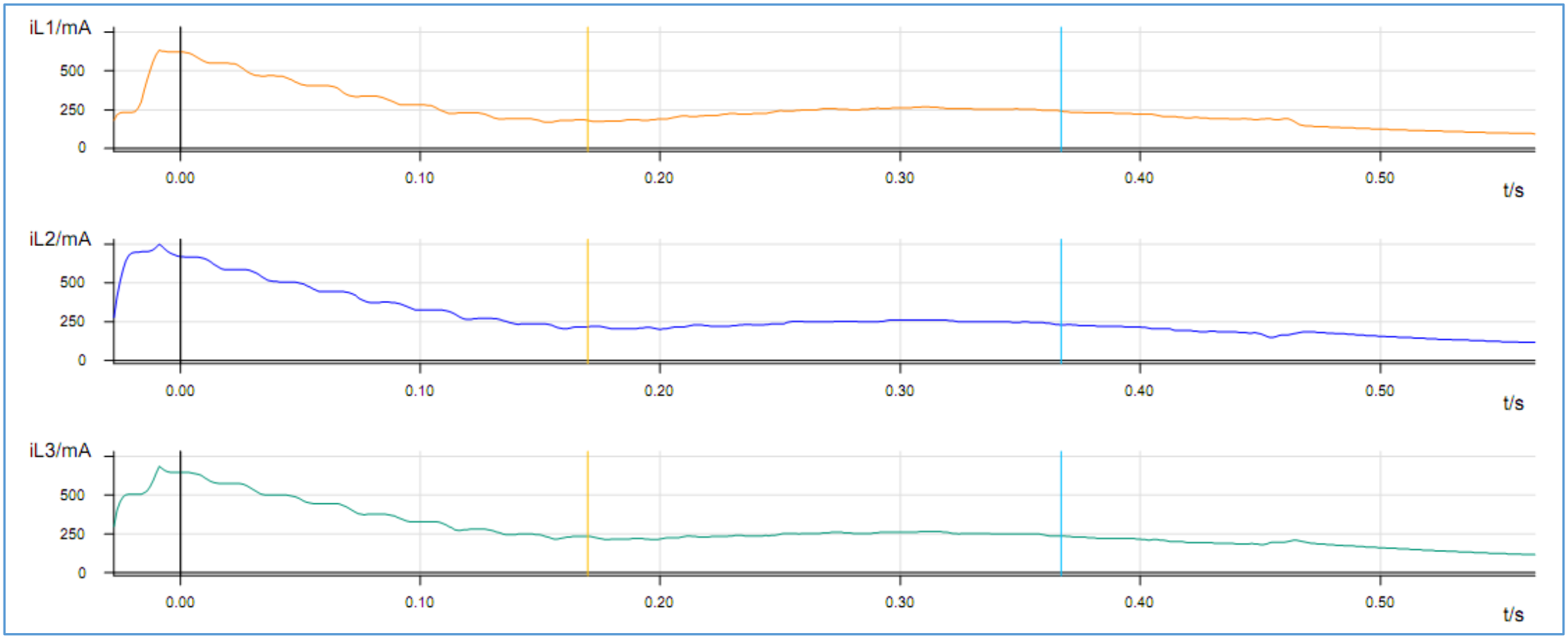
MTPS BUS 1, 2 AND 4 FAILURE ON 19.02.18 AT ABOUT 18:10HRS

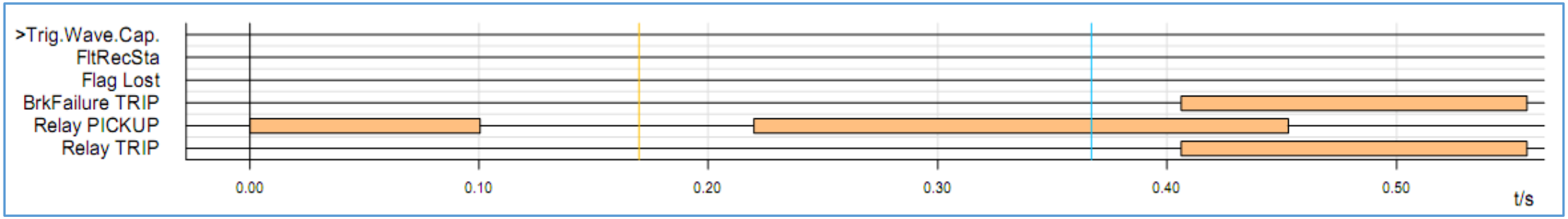

U#6
SST#E
L#235
BUS#4
CLOSE
U#3
L#239
L#228
L#221
SST#B
L#231
U#2
CLOSE
BUS#2
CLOSE
OPEN
BUS#3
L#236
SST#D
CLOSE
BUS#1
U#4
L#230
L#222
L#232
L#240
SST#A
SST#C

EVENTS

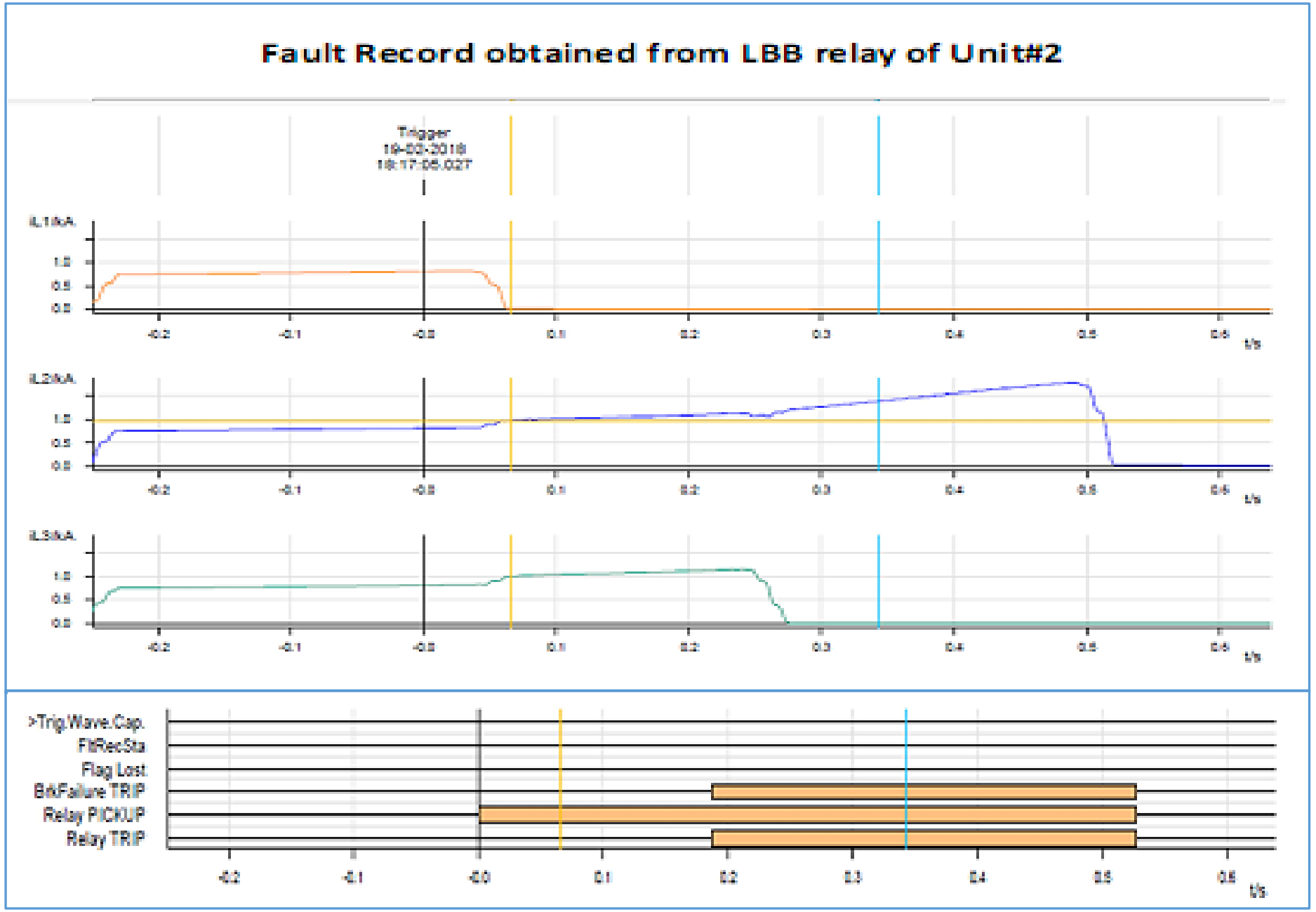
- On 19.02.18 at around 18.10 Hrs U#4 was going to be synchronised through Main Bus-1. But, as soon as the Breaker Close pulse was provided, LBB protection operated and all the Bays connected to Main Bus-1 and Bus Section 1-3 Breaker tripped through 96 Relays.
- With the failure of Main Bus-1, SST – A tripped leading to failure of Emergency Boards of U # 2 which caused failure of AVR Thyristor cooling fan. This initiated a Class-A tripping for U#2 which was on Main Bus-2.
- With operation of Class-A Lock-out of U#2, trip pulse was issued to GT#2 Breaker. But GT#2 LBB operated as Y and B-Pole had delayed opening.

UNIT # 4 LBB DR


iL1/mA
500
250
0
0.00
0.10
0.20
0.30
0.40
0.50
t/s
iL2/mA
500
250
0
0.00
0.10
0.20
0.30
0.40
0.50
t/s
iL3/mA
500
250
0
0.00
0.10
0.20
0.30
0.40
0.50
t/s


>Trig.Wave.Cap.
FltRecSta
Flag Lost
BrkFailure TRIP
Relay PICKUP
Relay TRIP
0.00
0.10
0.20
0.30
0.40
0.50
t/s

LBB UNIT # 2 DR


Fault Record obtained from LBB relay of Unit#2
Trigger
IL1/kA
IL2/kA
IL3/kA
>Trig.Wave.Cap.
FltRecSta
Flag Lost
BrkFailure TRIP
Relay PICKUP
Relay TRIP
t/s

EVENTS

- With the initiation of GT#2 LBB protection, 96 Lock-out Relays of all the bays of Main Bus #2 and Bus Section 2-4 operated.
- However, Bus section 2-4 Breaker failed to trip . In this Breaker Y pole got stuck and initiated LBB protection of Bus Section 2-4 which resulted in tripping of all the bays associated with Main Bus-4.
- This ultimately results in failure of Main Bus-1, 2 and 4 causing outage of U # 2, 3 and 6.

CHRONOLY OF FIRST LBB

Sl. No.	Time	Signal
1.	18.10.33.377	GT CB Closed
2.	18.10.33.430	Only two contacts out of 16 contacts of 186A operates; One is for LBB initiation, one to DAS.
3.	18.10.33.829	GT LBB Trip
4.	18.10.33.870	96 Trip
5.	18.10.33..879	GT CB Open
6.	18.10.33.904	Class C and A operate

ANALYSIS OF EVENTS

- During closing of GCB of U#4, one particular coil assembly of 186 A Lock-out Relays out of 5 coil assemblies operated. This unit had 2 contacts – one going to Generator LBB initiation and another going to DAS. With initiation of lockout and current, LBB relay of Unit#4 operates and gives trip command to all bays of Bus # 1.
- SOE also confirms mal-operation of contact of 186 A Lock-out Relay. Actual lockout operated only after LBB tripping and subsequent 96 Relay operation. Generator field breaker also tripped after the actual operation of Class-C/A Lock-out Relays.
- In MTPS we have 2 SST forUnit#1, 2 &3. Emergency Board of U#1 &2 are from SST#A and Emergency Board of U#3 is from SST#B, Tripping of SST#A leads to tripping of Unit#2

TESTS DONE

- Both 186A Relays were tested thoroughly including physical observation of the contacts to identify any problem with the Lock-out Relay contacts which may justify the event but no problem was observed.
- Last CB testing Dates: Test were satisfactory.
  - GT # 2: 06.04.2017
  - Bus Section 2-4: 03.12.2017

.

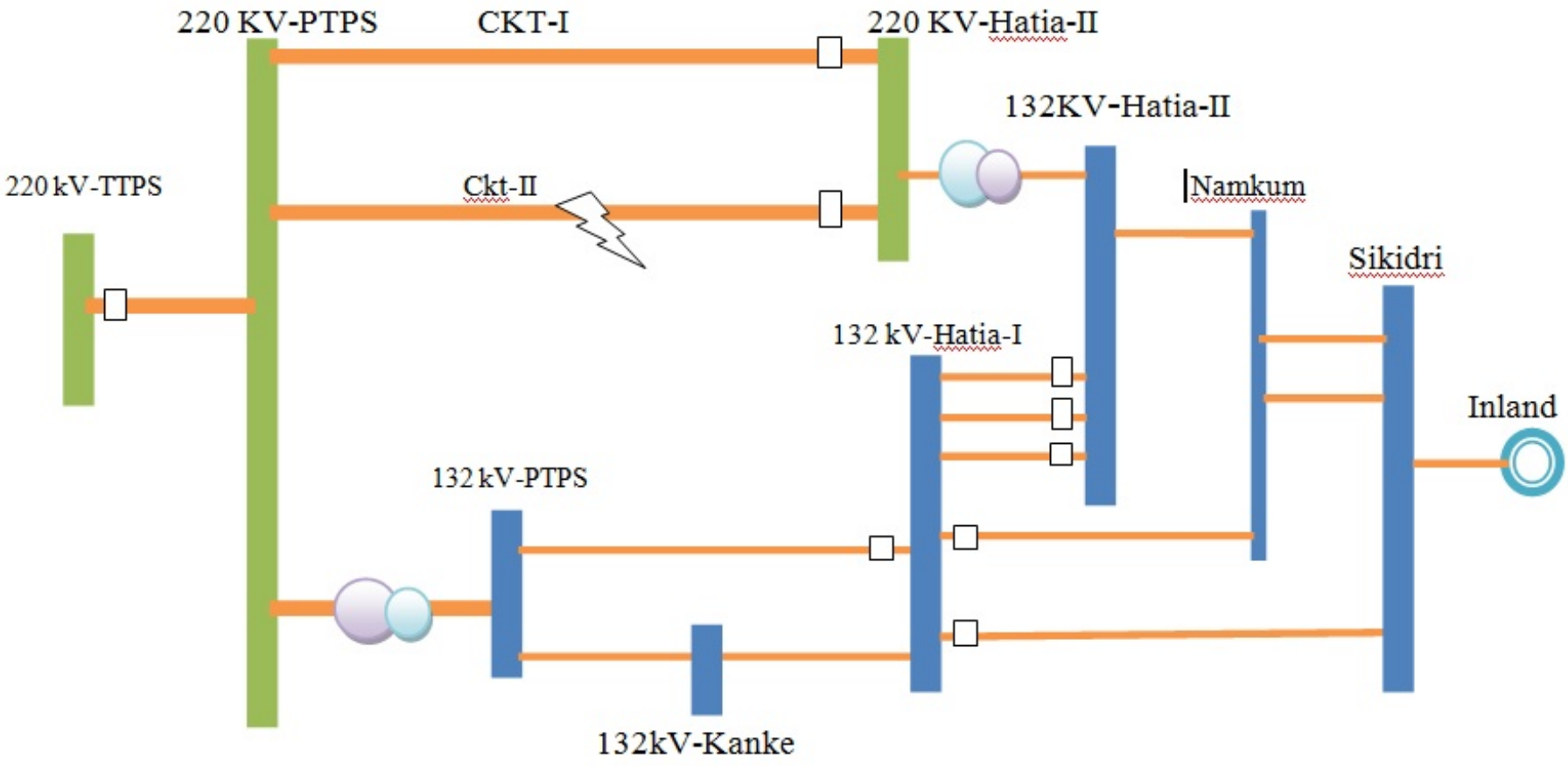
REMEDIAL MEASURES

- Visual checking of contact positions of all L/O relays prior to synchronisation has been recommended.
- In order to reduce the d.c voltage drop in trip circuit, we are introducing parallel cable in d.c tripping path.

SEQUENCE OF RESTORATION

- MB#2 Charged through L#239 at 18:35hrs. MB#1 Charged through L#240 at 19:05hrs. MB#4 Charged through L#235 at 19:30hrs.
- SST#B : 18:40hrs, SST#A : 19:10hrs, SST#C : 19:15hrs, SST#E :19:32hrs.
- 80MVA TRF#2: 18:45, 80MVA TRF#1: 19:45hrs
- L#231 : 18:55hrs .
- Line #221,222,228,232 at 19:40hrs, 19:42hrs, 19:35hrs & 19:37 hrs respectively.

Analysis of Total power failure at 220/132 kV GSS Patratu on 09/02/18 at 15:00 Hrs



□ - Breaker operated at the respective end

Relay appeared at Hatia-II end

Relay appeared at Hatia-II GSS

	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
FEEDER :- 220 KV PTPS-I	09.02.18	15:03	15:28	00:25	F	Active Group 1, Started Phase BN, Tripped Phase ABC, Start Element Distance, O/C Start I>12 Distance Trip Z-1, AR Lock Out Shot, System Frequency 50.03 Hz , Fault Duration 64.96 ms Relay Trip Time 1.01 ms, Fault Location 6.260 Km ,IA – 16.20 A ,IB – 5.321 KA,IC – 18.56 A VAN – 134.3 KV, VBN – 32.23 KV,VCN – 148.8KV,Fault Resistance-3.865Ω, Fault in Zone 1.	Due to line Fault

	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
FEEDER :- 220 KV PTPS-II	09.02.18	15:03	15:28	00:25	F	Active Group 1, Started Phase BN, Tripped Phase ABC, Start Element Distance, O/C Start I>12 ,E/F IN 1 2,E/F Trip IN 1, Distance Trip Z-1, AR Lock Out Shot, System Frequency 50.03 Hz , Fault Duration 64.96 ms Relay Trip Time 1.01 ms, Fault Location 6.260 Km , Fault in Zone 1.	Due to line Fault
	09.02.18	16:39	13:36 on 11.02.18	44:57		VT Fail Alarm ,cos Alarm, Sys. Freq. -50.00 HZ, Fault Duration-173.3 ms, Relay Trip Time-96.67 ms, Fault in Zone None	Conductor snapped

	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
220/132KV 150 MVA ICT-III	09.02.18	15:03	15:26	00:23	F	Trip Relay Gr.-A86 A 1, A 86 A2, B86 B1, B86 B2,Traffo Diff. Protn. -87 Trip Mult. Relay 86 AX, 86 Bx, Master Trip Relay Gr. A & Gr. B, **IN MICOM** Start Ph –BC, Trip PH-Poc Start -2, Restricted E/F, Active Gr. -1,Sys. Freq.-50.03 HZ,IA-Mag.-303.9A, IB Mag.- 620.4A, Ic Mag.-657.4A, IB2 Mag. -2.044A, Ic2 Mag.-1.626A, IA3 Mag.- 210.4A, IB3 Mag.- 619.9A, Ic3 Mag. -688.2A, IA HV Mag.-303.9A, IB Hv Mag.- 620.4A, Ic HV Mag.-657.4A, IA LV Mag. -210.4A, IB LV MAg.-619.9A, IC LV Mag.-688.2A, I2 HV Mag.- 113.7A, I2 LV Mag.- 197.88A, In Hv measd 235.68A, IN LV MAg, IA Diff. -0.026 PU, IB Diff. -0.010 PU, IC Diff. 0.016 Pu, IA Bias-0.668 PU, IB Bias-0.266 PU, IC Bias- 0.420 PU, REF HV LOZ Diff. -1.785 KA, REF HV OZ Bias-446.5A, **HV Dir. O/F & E/FIB-608.9A, IC**-624.2A, VAB- 221.0 KV, VBC- 153.4 KV, VCA-132.1KV, IN meads -1.500 KA, IN Derived -1.502 KA, VAN-125.8 KV, vbn- 130.7 KV, VCN- 27.18 KV, VN Measd-0.000 V	Due to line Fault

Feeder :- 132KV Hatia-I	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
	09.02.18	15:03	17:11	02:08	F	Ie> 1/5 , Ie >> 2/5, tIe >> 3/3, Latch Relay 4/5 Trip, Latch Relay 5/5	Due to line Fault

Feeder :- 132KV Hatia-II	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
	09.02.18	15:03	16:16 (24.02.18)	361:13	F/S/D	Ie> 1/3 , Ie >> 2/3, tIe >> 3/3	Due to line Fault & S/D

Feeder :- 132KVHatia-III	Date	Time of tripping	Time of closing	Duration	Cause	Relay	Remarks
	09.02.18	15:03	15:16	00:13	F	TC 2 CKT Supvn. -295, Ie> 1/4 , Ie >> 2/4, I > 3/4 PH L3,tIe>> 4/4	Due to line Fault

Relay Operated at 220 KV PTPS end

Relay appeared in Hatia-II line

- Fault record active group –I
- Started phase A&C
- TOC start
- Fault duration-643 ms
- Relay trip time-96.74 ms

Relay appeared in Auto-transformer- O/C, E/F, Differential

Relay operated at TTPS end

RECORDS OF MiCOM RELAY AT TTPS END FOR P.T.P.S. FEEDER	
MAIN-I	**MAIN-II**
FAULT RECORD ACTIVE GROUP 1	FAULT RECORD ACTIVE GROUP 1
TRIPPED PHASE : ABC	TRIPPED PHASE : ABC
START ELEMENT DISTANCE	START ELEMENT DISTANCE
OVER CURRENT STARTS I>1	OVER CURRENT STARTS I>1
EARTH FAULT STARTS IN 1	EARTH FAULT STARTS IN 1
TRIPPED FAULT STARTS IN 1	TRIPPED FAULT STARTS IN 1
DISTANCE TRIP Z1	DISTANCE TRIP Z1
09 FEB-2018 ,14:59:52.00	09 FEB-2018 , 15:00:27.359
FAULT ALARMS NO	
SYSTEM FREQUENCY- 50 Hz	SYSTEM FREQUENCY-50.01 Hz
FAULT DURATION- 1.559 s	FAULT DURATION-1.559 s
RELAY TRIP TIME - 80.00 Ms	RELAY TRIP TIME -79.99 ms
FAULT LOCATION XY-74.53 KM	FAULT LOCATION XY-74.53 KM
IA - 300.6 A	
IB-644.3 A	
IC - 1.532 KA	
V_{AN} - 122.4 kV	
V_{BN} - 123.8kV	
V_{CN} - 89.48kV	
FAULT RESISTANCE 5.53 ohms	FAULT RESISTANCE 5.53 ohms
Fault in zone-NONE	Fault in zone-NONE

Relay operated at Hatia-I end

Date	Name of Feeder	Trip Time	Close Time/Normalised	Duration	Relay at GSS, Hatia-I End	Relay at Far End	Remarks
09-02-18	Hatia II Ckt-III	15:00	15:16	0:16	No Bay at GSS Hatia-I		No Bay at GSS Hatia-I
	Hatia II Ckt-I	15:00	17:11	2:11	Not Tripped		Tripped at Hatia II End
	Hatia II Ckt -II	15:00	Till Date now OFF condition		Not Tripped		E/F & O/C Relay indication operated but Breaker didnotTripped at Hatia I End.Breaker tripped at Hatia II end.
	132KV Kanke	15:00	15:16	0:16	Not Tripped		
	50MVA Power Transformer No-I	15:00	15:16	0:16	86,D/R E/F	*******	Interrupted due to TPF
	50MVA Power Transformer No-II	15:00	15:54	0:54	REF,64R HV,D/R E/F protection 50/51N, DIFFL, 86, 87	*******	Interrupted due to TPF
	50MVA Power Transformer No-III	15:00	15:16	0:16	Not Tripped	*******	Interrupted due to TPF
	50MVA Power Transformer No-IV	15:00	15:16	0:16	Not Tripped	*******	Interrupted due to TPF
	132KV Hec 8C	15:00	15:29	0:29	Direction Earth Fault	Not Tripped	Interrupted due to TPF
	132KV Hec 9C	15:00	15:16	0:16	Not Tripped	Not Tripped	Interrupted due to TPF
	132KV Sikidiri	15:00	15:24	0:24	In MICOM- RYandB-Ph SOTF, COS Alarm, Active Group 1,Started Phase CN, Tripped phase ABC, over current start I>1, SOTF TOR Trip, Fault Duration 123.3ms, Relay Trip time 116.6ms, Fault Location 15.47km, IA-54.34A, IB- 61.28A,IC-560.1A, VAN-66.51KV,VBN-69.75KV,VCN-26.77KV,Fault Resistance 3.328ohm, Fault in zone Zone p	Not Tripped	DR attached
	132KV Namkum	15:00	15:24	0:24	Not Tripped	Not Tripped	Interrupted due to TPF
	132KV PTPS	15:00	15:55	0:55	Directional Earth Fault PROTN-OPTD, IDMT EF Relay-67	Tripped	DR attached

Relay appeared at Namkum end

Date	Name of Feeder	Trip Time	Close Time/Normalised Time	Duration	Relay at GSS, Hatia-I End	Relay at Far End	Remarks
9/2/2018	Hatia II						Under Shutdown
	132KV Sikidiri ckt I &Sikidiri ckt II	15:01Hrs	15:24Hrs	23 Min	Not Tripped	Not tripped	Not tripped from any end.
	132KV Hatia I	15:01Hrs	15:24Hrs	23 Min	Tripped Phase ABC, E/F, In-1,2, Fault Duration-83.38ms, Ia-139.6A, Ib-124.4A, Ic-386.3A, Van-64.85KV, Vbn-67.59KV, Vcn- 41.28KV, Fault Zone-None	******	TPF at GSS Namkum.
	50MVA Power Transformer No-I	15:01Hrs	15:24Hrs	23 Min	Not Tripped	*******	Interrupted due to TPF
	50MVA Power Transformer No-II	15:01Hrs	15:24Hrs	23 Min	Not Tripped	*******	Interrupted due to TPF
	50MVA Power Transformer No-III	15:01Hrs	15:24Hrs	23 Min	Not Tripped	*******	Interrupted due to TPF
	50MVA Power Transformer No-IV	15:01Hrs	15:24Hrs	23 Min	Not Tripped	*******	Interrupted due to TPF
	132KV Railway Ckt I	15:01Hrs	15:24Hrs	23 Min	Not Tripped	*******	Interrupted due to TPF
	132KV UML	15:01Hrs	15:24Hrs	23 Min	Not Tripped	*******	Interrupted due to TPF

POWER SYSTEM OPERATION CORPORATION LIMITED
EASTERN REGIONAL LOAD DESPATCH CENTRE
14, GOLF CLUB ROAD, TOLLYGUNGE
KOLKATA – 700033
Flash Report

1. Date and time of the Incident: 08:54 Hrs, 23.02.18

2. Antecedent Conditions:

   i. Frequency: Pre incidence: 50.03 Hz
   Post Incidence: 50.03 Hz

Sl. No.	Area/ Region	LOSS OF LOAD(MW)	LOSS OF GENERATION(MW)
1	Baripada, Bangriposi /Rairangpur, Jaleswar & Bograi	100	NIL

3. Lines/Bus under shutdown: 220 kV Baripada – Balasore ckt # 2 was under planned s/d
4. Details of tripping:

At 08:54 hrs All elements connected through 220 KV Bus tripped on mal operation of Bus Bar Protection as reported by RTAMC,Kolkata.

Following elements connected to 220 KV Bus tripped:

1. 400/220 kV 315 MVA ICT I (Tripped from LV side)
2. 400/220 kV 315 MVA ICT II (Tripped from HV and LV side)
3. 400/220 kV 315 MVA ICT III (Tripped from LV side)
4. 220 kV Baripada – Balasore # I
5. 220/132 kV ICT I & II (Tripped from HV side)

During restoration of above elements all elements connected from 132 KV Bus at Baripada (PG) were hand tripped at 09:32 hrs.

Following elements connected from 132 KV Bus at Baripada (PG) were hand tripped.

1. 220/132 kV ICT I & II (Hand Tripped from LV side)
2. 132 kV Baripada – Baripada
3. 132 kV Baripada – Bogra
4. 132 kV Baripada – Jaleswar
5. 132 kV Baripada – Rairangpur

Due to above tripping Total power failure occurred at 132 kV Baripada, Bangriposi /Rairangpur, Jaleswar & Bograi (Orissa System). Total loss of load as reported by OPTCL is 100 MW and the breakup of which is Baripada:55 MW, Banriposi (Rairangpur): 20 MW and 25 MW at Jaleswar & Bogra.

5. Current Status:

Sl. No.	Element/Line Name	Charging Code	Charging Time	Remarks
01.	220 kV Main Bus-I	1043	09:32 Hrs	This was charged by closing 220 kV side CB of 315 MVA ICT-I
02.	220 kV Main Bus-II charged Via 220 kV BC	1043	09:40 Hrs	

03.	220 kV Side of 315 MVA ICT-II	1043	09:42 hrs	
04.	220 kV Balasore Line-I	1046	09:44 Hrs	
05.	220/132 kV 160 MVA ICT-I	1047	09:49 Hrs	220 kV Side charged
06.	220/132 kV 160 MVA ICT-II	1048	09:50 Hrs	220 kV Side charged
07.	132 kV Main Bus	1047	09:52 Hrs	Charged via 132 kV side CB of 160 MVA ICT-I
08.	132 kV Side of 160 MVA ICT-II	1048	09:54 Hrs	
09.	132 kV Baripada-Baripada OPTCL Line	1050	09:56 Hrs	
10.	132 kV Baripada-Bangriposi OPTCL Line	1052	1001 Hrs	
11.	132 kV Baripada-Bhograi OPTCL Line	1054	10:06 Hrs	
12.	132 kV Baripada-Jaleswar OPTCL Line	1051	10:51 Hrs Hrs	Delayed due to problem at Jaleswar end

6. : Action Taken Co-ordinated with RTAMC,Kolkata and SLDC Odisha .

Detail reports are awaited from with RTAMC,Kolkata.

Copy to : MS, ERPC
SCE, NLDC

SCE/ERLDC

List of important transmission lines in ER which tripped in February 2018

S.NO	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	Deliberation in the meeting
	Multiple tripping at the same time												
1	220KV ATRI-PANDIABILI-I	12-02-2018	1:35	12-02-2018	3:06	B-N, Z-I, F/D 3KA		B-N FAULT	<100	No autoreclose operation observed in PMU data			*It was informed that whenever 220kV Pandiabil_Samangara line was tripping 220KV Atri-Pandiabil was also getting tripping command. The relay settings of 220KV Atri-Pandiabil have been changed on 10.03.2018 and the issue has been resolved.*
2	220KV PANDIABILI-SAMANGARA-I	12-02-2018	1:35	12-02-2018	3:05	B-N FAULT		B-N FAULT	<100	No autoreclose operation observed in PMU data			
3	220KV ATRI-PANDIABILI-II	17-02-2018	4:49	17-02-2018	5:28	B-N FAULT		B-N FAULT	<100	No autoreclose operation observed in PMU data			
4	220KV PANDIABILI-SAMANGARA-II	17-02-2018	4:49	17-02-2018	5:30	B-N FAULT		B-N FAULT	<100	No autoreclose operation observed in PMU data			
5	220KV PANDIABILI-SAMANGARA-II	18-02-2018	5:32	18-02-2018	6:17	B-N,4.1 KM, 1.3 KA	B-N,2.98 KA	B-N FAULT	<100	--			
6	220KV ATRI-PANDIABILI-II	18-02-2018	5:32	18-02-2018	6:29	B-N, 1.409 KA	Did not trip	B-N FAULT	<100	--			
7	220KV ATRI-PANDIABILI-II	22-02-2018	14:05	22-02-2018	14:42		Did not trip	TRIPPED ONLY FROM ATRI DUE TO OPERATION OF MASTER TRIP RELAY	<100	--			
8	220KV PANDIABILI-SAMANGARA-I	22-02-2018	14:05	22-02-2018	14:38	R-N, F/C 2.8KA, 45.5 KM	R-N, Z-I, 15.4 KM, 2.14 KA	R-N FAULT	<100	No autoreclose operation observed in PMU data			
	Miscellaneous: Tripping on DT, No reason furnished												
9	HVDC PUSAULI	01-02-2018	8:48	01-02-2018	9:56	SYSTEM FAILURE ALARM		SYSTEM FAILURE ALARM					
10	400KV PATNA-KISHANGANJ-I	06-02-2018	18:33	06-02-2018	19:10	DT received		DT RECEIVED AT PATNA	--	--	--	--	*It was due to PLCC malfunction. The same has been rectified.*
11	400KV BINAGURI-NEW PURNEA-I	09-02-2018	15:59	09-02-2018	16:19	DT Received		DT RECEIVED AT BINAGURI	--	--			*Overvoltage relay operated and sent DT while replacing CVT fuse at New Purnea.*
12	400KV TSTPP-ROURKELA-I	09-02-2018	16:51	09-02-2018	17:04	Did not trip	DT received	LINE TRIPPED ONLY FROM ROURKELA ON DT RECEIPT	--	--		Yes	*NTPC informed that DT was not initiated from Talcher end. PCC advised PG to check at Rourkela.*
13	220KV ATRI-PANDIABILI-II	10-02-2018	18:25	10-02-2018	18:59			CARRIER RECEIVED AT ATRI	--	--			*During synchronization, relay maloperated. Settings have beem revised.*

S.NO	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	Deliberation in the meeting
14	220KV NEW MELLI-TASHIDING-SC	17-02-2018	19:02	17-02-2018	19:57	DT received	Did not trip	DT RECEIVED AT NEW MELLI	--	--			*It was informed that Tasheding has communicated the issue to OEM.*
15	220KV NEW MELLI-TASHIDING-SC	19-02-2018	9:10	19-02-2018	9:46	DT received		DT RECEIVED AT NEW MELLI	--	--			
16	400KV NEW DUBURI-MEERAMUNDALI-I	19-02-2018	14:13	19-02-2018	14:38	DT received		DT RECEIVD AT N. DUBURI	--	--			*DT initiated due to control cable issues at Meramundali. The same has been rectified.*
17	400KV FSTPP-GOKARNO-II	20-02-2018	15:32	20-02-2018	15:56	DT Received		DT RECEIVED AT FSTPP	--	--			*DT initiated from Gokharno end. Rectification is in progress.*
18	400KV PUSAULI-NABINAGAR-I	24-02-2018	22:11	25-02-2018	23:48	DT received		DT RECEIVED AT SASARAM	--	--			Fault not observed in PMU data
19	400KV RENGALI-INDRAVATI-SC	26-02-2018	10:25	26-02-2018	10:41	DT received		DT RECEIVED AT INDRAVATI	--				*PLCC work is in progress. PLCC maloperated*
	No Autoreclose operation observed in PMU data												
20	400KV ROURKELA-CHAIBASA-I	05-02-2018	17:06	06-02-2018	14:06	B-N, 37.44 KM, 6.687 KA	B-N, 85.211 KM, 3.661 KA	B-N FAULT	<100	No autoreclose operation observed in PMU data			No autoreclose operation observed in PMU data
21	765KV FATEHPUR-PUSAULI-I	13-02-2018	4:06	13-02-2018	4:59	B-N , 150 KM , 3.5 KA	B-N	B-N FAULT	<100	No autoreclose operation observed in PMU data			No autoreclose operation observed in PMU data
22	220KV TENUGHAT-BIHARSARIFF-I	24-02-2018	13:07	24-02-2018	14:05	Y-N, Z-I, 114.6 km	Y-N, Z-I, 1.485 kA, 103 km	Y-N FAULT	<100	No autoreclose operation observed in PMU data	Yes		*It was a transient fault. No autorecloser is available at TVNL end.*
23	400KV KODERMA-BOKARO-I	25-02-2018	20:57	25-02-2018	22:04	B-N, Z-I, 18.5 km, 11.61 Ka	B-n, z2, 80 km	B-N FAULT	<100	No autoreclose operation observed in PMU data			*Koderma end A/R was not successfull.*

MINUTES OF MEETING BETWEEN POWERGRID (HVDC SASARAM) AND GE T&D INDIA LTD.

Date: 14/10/17

Members Present:

GE T&D INDIA LTD.

Mr. Sunil Joshi

POWERGRID

Mr. Sunit Kumar Singh

Mr. D.S. Karthik

Mr. Aman Kumar

M/s GE T&D repersentative reported at Sasaram site on 11.10.2017 to analyse the long pending issues related to HVDC Back to back to Station.

SL NO	ISSUE	Comment
1	**Converter control and Protection: Software issues** a. Control System SYS fail, Independent booting, frequent failure of compact flash cards, Profibus signals updating problems are still persisting. The problem is yet to be resolved. b. Spurious tripping of HVDC pole showing switchyard connectivity lost during opening of any bay connected to HVDC system. c. All AC harmonic filters/ Line reactors become unavailable after resetting of lane inspite of availability of same. d. Only one APEX PC is running, need stand by APEX PC available	a. GE to analyse sysfail logs and revert. b. Switchyard connectivity tripping test done and found that HVDC is blocking upon opening of CWD50Q50 breaker. GE to check the logs and revert. Scheme generally blocks after any breaker open command. c. GE to check the logs and revert. d. New Apex PC has been configured. Issue resolved.
2	**Supply of Spare Control and Protection card as per modified hardware architecture.** The card supplied as spare is for old type of installed cards architecture, which has been modified by GE. So spares cards for C&P panel should be changed as per new modified card architecture. 04 nos. Cards (02 nos. CIBS, 01no. Pentium and 01 no. PMC251) taken by GE in April-2014 for repairing is yet to be returned. Required spare configured compact flash cards as the rate of card corruption is very high (Once in a two month).	GE to check and update the status of cards taken in 2014. Spare cards urgently required at site. Failure rate of compact flash card is very high (15 card fail/year on an average). GE to urgently provide 10 no. pre-configured compact flash cards and procedure to configure new flash card.
3	**HVDC controls and Protection Lane-1 is out of order since long time.** Both the Lane has never worked simultaneously since commissioning and HVDC block is running only through Lane-2	One PMC card found defective on Side B Lane-1 M2 subrack (L1SBM2). Card has been replaced with spare PMC card and Lane is now not having any sys fail and VBE protection also reset.

	Both the Lane has never worked simultaneously since commissioning and HVDC block is running only through Lane-2 from April-2014 without any redundancy. Also in Lane-2 intermittent problems are observed during running and at the time of re-start corruption of compact flash cards. M/s GE has done many up gradation of software but system is not yet satisfactory.	has been replaced with spare PMC card and Lane is now not having any sys fail and VBE protection also reset. One Pentium card(VMIC 7740) found defective on Side A Lane-1 control subrack(L1SACP1). The P1 of control (Side A Lane-1) is also showing "Interrupt VME bus coupler error" inspite of replacing faulty card with healthy card from M1 subrack. subrackSpare card is not available at site. Lane redundancy test can only be done after replacing Side A Lane-1 control subrack VMIC 7740 card.
4	**Malfunctioning/failure of VBE cards** Problem persisting since commissioning. GE is yet to provide the solution.	S5004 is getting failed very frequently(2 card failure/year). GE to check and revert.
5	**Converter Transformer issue** None of the Hydran transformer gas monitoring system and Drycol breather in operation condition. Matter taken up with GE from 2006 and matter not resolved. Converter transformer WTI/OTI unit is not working properly. GE to provide compatible replacement.	GE to check and revert.
6	**Pending contractual tests:** Auto reclose test on inverter side with both line available, and one line available and system isolation test with one line available at inverter side. It was committed during September 2010 that AREVA shall conduct these tests in 3 months but still pending	GE to check and revert.
7	**Long term spares** AREVA has been requested to give quotation for long term spares but the quotation is yet to be received.	GE to check and revert.
8	**Valve cooling PLC B problem** Reported to M/s AREVA on 18.07.2011. Alarm from PLC B of Valve cooling is continuously being reflected in SCADA. The alarms are "Valve cooling PLC B Fuse failed", "Valve cooling PLC B operation error". GE committed in MOM dtd 13.12.11 to provide the same, not provided. PLC software has not been provided by M/s GE.	GE to provide PLC software application of valve cooling system.

9	**Addition of newly commissioned line in Eastern Side to HVDC system** Earlier HVDC Back to back system is connected through only two 400 KV transmission lines namely Biharshariff-I &II in Eastern Side. Now the connectivity in eastern bus is extended with 1500 MVA, 765/400 KV ICT, 400 Kv S/c Varanasi and one D/C 400Kv Line Nabinagar-I &II. Integrated for last feeder protection to be done.	Details have been provided to GE by PGCIL. GE to check and revert.
10	**Breaking of System Docking Station (RTU) from their base unit due to brittleness of material used** The SDS is breaking from their base plate due to the excessive brittleness of fibre/ plastic installed in Bay Interface Outstations (BIOS) panels.	Defective RTU can not be repaired. RTU upgrade is required.
11	**Failure of DC-DC converters** All 12 nos. 220 V, DC-DC converters and 02 nos. 48 V DC-DC converters have been failed.	Power supply to be replaced with new power supply.

POWERGRID raised their concern to resolve the above long pending issues and requested to take necessary action for rectification of converter control and protection issues immediately.

POWERGRID also requested to assign single contact person to discuss technical issues in the intermittent period till the final resolution of aforesaid problems.

GE to check all above-mentioned issues and revert detailed plan within 3 weeks.

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: