Minutes
of
63rd PCC meeting

Date: 30.01.2018
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

MINUTES OF 63RD PROTECTION SUB-COMMITTEE MEETING HELD AT ERPC, KOLKATA ON 19.01.2018 (FRIDAY) AT 11:00 HOURS

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

ERLDC has placed the status of reporting of grid disturbances occurred in December 2017 as follows:

Sl No	Date	Time	S/S involved	Reporting
1	06-12-17	9:09	New Chanditala	DR received from WBSETCL
2	06-12-17	18:22	Madhepura	Detail report received from PG & BSPCL (DR was not generated due to non existence of fault)
3	09-12-17	10:57	Motihari	Detail report along with DR received from DMTCL
4	13-12-17	16:43	Sipara	Relay indication has been uploaded in PDMS by BSPTCL
5	13-12-17	17:19	Sipara	Yet to be received
6	15-12-17	6:01	Malda	DR received from both WBSETCL & PG
7	20-12-17	13:52	Hazipur	Detail report received from PG & BSPCL (DR was not generated due to non existence of fault)
8	22-12-17	10:49	Purnea	Detail report along with DR received from PG
9	22-12-17	17:10	Bodhgaya	Detail report along with DR has been received from BSPTCL (PDMS)

PART – A

ITEM NO. A.1: Confirmation of minutes of 62nd Protection sub-Committee Meeting held on 18th December, 2017 at ERPC, Kolkata.

The minutes of 62nd Protection Sub-Committee meeting held on 18.12.17 circulated vide letter dated 27.12.17.

Members may confirm the minutes of 62nd PCC meeting.

Deliberation in the meeting

Members confirmed the minutes of 62nd PCC meeting.

PART – B

ANALYSIS & DISCUSSION ON GRID INCIDENCES OCCURRED IN DECEMBER, 2017

ITEM NO. B.1: Disturbance at 400kV New Chanditala S/s on 06-12-17 at 09:09 hrs.

At 09:09 hrs due to operation of bus bar differential protection of both bus I & II at New Chanditala, all elements connected to New Chanditala tripped,

- 400 kV Jeerat - New Chanditala S/C
- 400 kV KTPP - New Chanditala S/C
- 400 kV New Chanditala - Kharagpur D/C
- both bus I& II
- 400/220 kV ICTs at New Chanditala

In PMU data Y-N fault has been observed at the time of the disturbance. Fault clearing time as per PMU data is less than 100 ms.

WBSETCL may explain.

Deliberation in the meeting

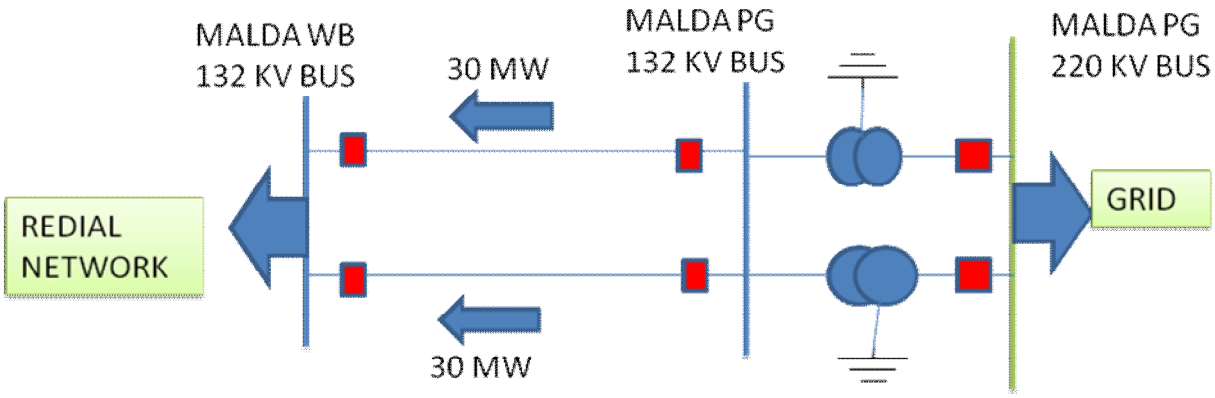
WBSETCL explained the disturbance as follows:

- *For availing the shutdown of 400 KV Main Bus#1 along with 400 KV New-Chanditala -Jeerat Bay at New Chanditala, 400 KV New-Chanditala –Jeerat line was first diverted to 400 KV Transfer bus bay.*
- *Feeders & transformers in 400 KV Main Bus#1 were diverted to 400 KV Main Bus#2 and 400 KV Bus Coupler was made off & isolated.*
- *During diversion of 400 KV New-Chanditala –Jeerat line from transfer bus huge flashing in Y phase Isolator was occurred due to failure of Y-ph CT of 400kV Transfer bus.*
- *As a result, all the feeders, transformers & reactors connected to 400 KV MB#2 tripped with Bus Zone differential protection.*

WBSETCL added that vendor M/s Siemens has been contacted for rectification/replacement of CT.

ITEM NO. B.2: Disturbance at 220/132 kV Malda(PG) and 132kV Malda (WB) on 15-12-17 at 06:01 hrs

At 06:01 hrs 132 kV Malda(WB) – Malda(PG) - II tripped from WB end only on zone 1 for a R_N fault in line-II. PG end identified the fault in zone 1 but CB failed to clear the fault. As a result, 132 kV Malda(WB) – Malda(PG) - I (R-B-N, 3.69 km from WB end) tripped from WB end on zone 2. 220/132 kV ATR I & II at Malda (PG) also tripped on operation of back up directional O/C relay.



Load loss 55 MW

Fault clearing time as per PMU data is 1050 ms.

WBSETCL and Powergrid may explain.

Deliberation in the meeting

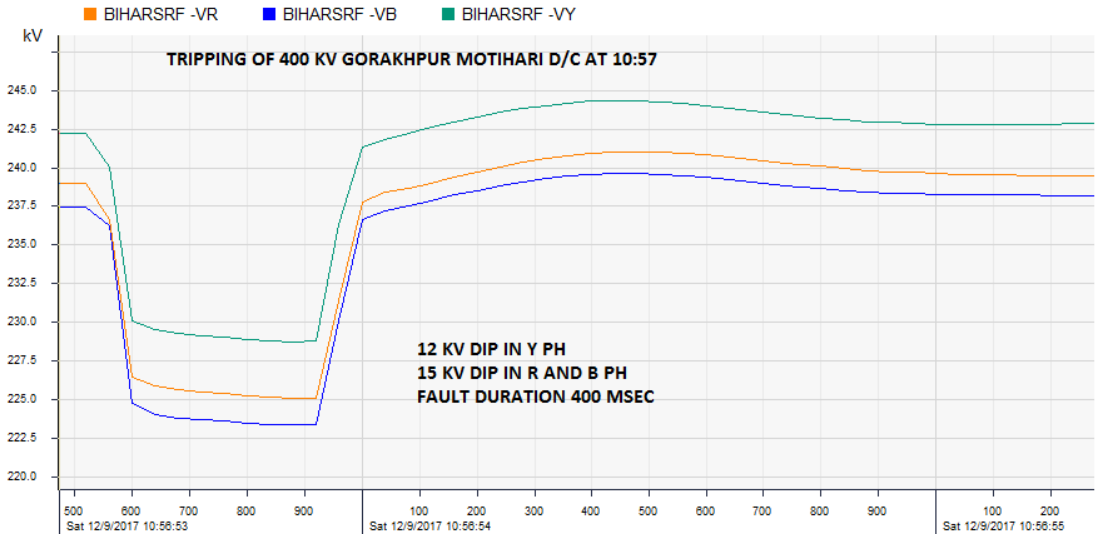
WBSETCL and Powergrid explained the disturbance as follows:

- *There was a R-N fault in 132kV Malda(WB)-Malda(PG) line-I and Malda(WB) end has cleared the fault on zone 1 distance protection. Malda(PG) end identified the fault in zone 1 but CB failed to clear the fault due to wiring problem at trip relay.*
- *As a result 132kV Malda(WB)-Malda(PG) line-II got tripped from Malda(WB) end on zone 2 distance protection in 350 ms and 220/132 kV ATR I & II at Malda (PG) tripped on operation of back up directional O/C relay in 1000 ms.*
- *On tripping of 132kV Malda(WB)-Malda(PG) line-II from Malda(WB) end on zone 2, WBSETCL explained that even though no other source was connected at Malda(WB), the zero sequence current found its path via 132/33 KV transformer at Malda(WB) then towards Malda (PG).*

Powergrid informed that wiring of trip relay at Malda (PG) of 132kV Malda(WB)-Malda(PG) line-I has been corrected. They are also planning to implement backup impedance protection for 220/132 kV ATR I & II at Malda (PG) for better coordination with line protection.

ITEM NO. B.3: Disturbance at 400/132 kV Motihari S/S on 09-12-17 at 10:57 hrs

At 10:57 hrs on 09-12-17, all lines connected to 400/132 kV Motihari S/S tipped due to operation of bus bar protection of both bus I & II. It was reported that motorized earth switch connected to main bay of 125 MVAr B/R I (connected to bus II) became grounded resulting operation of bus bar operation at both buses.



Load loss 174 MW

Fault clearing time as per PMU data is 400 ms.

DMTCL may explain the following points:

1. Reason for grounding of earth switch may be discussed. As there are more than one interlock present to avoid this type of operating mistakes.
2. Reason for operation of bus bar protection of both buses may be explained as fault was only at bus II

3. In PMU data, delayed clearance fault has been observed. In case of operation of bus bar protection, fault should be cleared instantaneously.

Deliberation in the meeting

DMTCL has submitted a detailed report wherein DMTCL explained that while taking shutting down of 400KV, 125MVR bus reactor, operator has closed 403-89BE earth switch instead of earth switch 403-89BRE which resulted in to bus bar – 2 earth fault. The busbar protection of bus – 2 was in block mode due to relay firmware problem. 400kV Gorakhpur-DMTCL line got tripped from Gorakhpur end on zone 2. As a result total power failed at DMTCL.

DMTCL added that the problem of blocking bus bar protection has been referred to OEM Siemens.

PCC felt that electrical interlock should not be bypassed to avoid such incidences and advised DMTCL to take care in future.

ITEM NO. B.4: Disturbance at 220/132 kV Purnea S/S on 22-12-17 at 10:49 hrs

220/132 kV ICT - II at Purnea (PG), 132 kV Purnea(PG) – Purnea(B) - II and 132 kV Purnea(PG) - Kishangunj were under shutdown.

At 10:49 hrs, 220/132 kV Purnea S/S became dead due to tripping of 132 kV Purnea(PG) – Purnea(B) - I (Relay indication 67N & 86 at PG end) and 220/132 kV ICT - I & III at Purnea (PG) (Relay indication 67N & 86 for ICT III and O/C & 86 IB = 4.2 kA for ICT I).

Load loss 90 MW

Fault clearing time as per PMU data is 350 ms.

Powergrid and BSPTCL may explain.

Deliberation in the meeting

Powergrid informed that 132 kV Purnea(PG) – Purnea(B) – I & III tripped from Purnea(PG) end on directional over current E/F protection and 220/132 kV ICT - I & III at Purnea (PG) tripped on directional over current E/F protection.

Powergrid explained that fault may be in the downstream network of Bihar system and BSPTCL end failed to clear the fault.

BSPTCL informed that there no fault in their system and no relay has operated at their end.

PCC advised Powergrid to submit the DRs of 132 kV Purnea(PG) – Purnea(B) – I & III tripping.

ITEM NO. B.5: Tripping of 220 kV Madhepura - Purnea D/C line on 06-12-17 at 18:22 hrs.

At 18:22 hrs, total power failure occurred at 220/132 kV Madhepura S/S due to tripping of 220 kV Madhepura - Purnea D/C resulting interruption of supply at Supaul, Sonebarsa, Madhepura, Saharsa, Kushaha(Nepal) & Udaikashigunj. No load loss occurred at Kataiya & Phorbisganj as they were fed from Old Purnea.

Load loss 170 MW

No fault was observed in PMU data.

BSPTCL may explain.

Deliberation in the meeting

Powergrid explained that there was no fault in the line. 220 kV Madhepura - Purnea D/C lines were tripped from Purnea (PG) end because of DC mixing at Madhepura bays during DC segregation work at Purnea (PG).

ITEM NO. B.6: Total power failure at 220/132 kV Bodhgaya S/S on 22-12-17 at 17:10 hrs

220 kV Gaya - Bodhgaya D/C were under shutdown. 220 kV Biharshariff - Khijasarai - II tripped from both ends (BSF end: Y-N, Z-I, 1.6 km, 18 kA; Khijasarai end: Y-N, 36.4 km) due to Y phase jumper snapping at location no 237. At the same time, 220 kV Biharshariff - Khijasarai - I tripped from the both ends (BSF end: Y-N, O/C, fault duration: 18.39 ms; Khijasarai end: E/F) and 220/132 kV ATR - II at Biharshariff tripped due to operation of differential relay (Fault duration 73 ms). As Bodhgaya was radially fed through 220 kV Biharshariff - Khijasarai - Bodhgaya D/C, total power failure occurred at 220/132 kV Bodhgaya S/S after tripping of 220 kV Biharshariff - Khijasarai D/C.

Load loss 135 MW

Fault clearing time as per PMU data is less than 100 ms.

BSPTCL may explain.

Deliberation in the meeting

BSPTCL informed that there was a Y-N fault in 220 kV Biharshariff - Khijasarai line – II due to Y phase jumper snapping at location no 237. Both ends successfully cleared the fault on zone 1 distance protection.

But 220 kV Biharshariff - Khijasarai - I tripped from Biharshariff end on Y-N, O/C protection within 18.39 ms and 220/132 kV ATR - II at Biharshariff tripped due to operation of REF (Fault duration 73 ms).

PCC felt that 220 kV Biharshariff - Khijasarai – I and 220/132 kV ATR - II at Biharshariff should not be tripped in this case as the fault was already cleared from both ends of the line.

PCC advised BSPTCL to check the relay settings of 220 kV Biharshariff - Khijasarai - I at Biharshariff end. PCC advised to verify the stabilizing resistor of the 220/132 kV ATR - II REF protection and to test the REF protection.

PCC advised BSPTCL to submit the report to ERPC and ERLDC after the testing.

ITEM NO. B.7: Total power failure at 220/132kV Sipara S/S on 13-12-17 at 16:43 hrs & 17:19 hrs

1. **At 16:43 hrs on 13-12-2017**

220 kV Patna - Sipara D/C and 220 kV Khagul Sipara S/C tripped due to spurious bus bar protection operation at Sipara S/S resulting total power failure at Sipara S/S.

Load loss 226 MW

Fault clearing time as per PMU data is less than 100 ms.

2. **At 17:19 hrs on 13-12-2017**

After the initial disturbance at Sipara at 16:43 hrs, during restoration 220 kV Patna Sipara D/C tipped again at 17:19 hrs while extending power to Khagul and supply to Sipara S/S got interrupted again.

Load loss 100 MW

Fault clearing time as per PMU data is less than 100 ms.

BSPTCL may explain.

Deliberation in the meeting

Powergrid and BSPTCL informed that 220kV Patna-Sipara D/c line tripped on line differential protection on both the occasions due to DC grounding at Sipara. Patna end received DT from Sipara.

BSPTCL informed that DC grounding at Sipara has been rectified.

ITEM NO. B.8: Disturbance at 220kV Hazipur on 20-12-17 at 13:52 hrs

220 kV Muzaffarpur - Hazipur - I was under shut down.

At 13:52 hrs 220 kV Muzaffarpur - Hazipur - II tripped in Y-B-N fault resulting total power loss at Hazipur, Siwan, Chapra & Amnour.

Load loss 130 MW

Fault clearing time as per PMU data is less than 100 ms.

BSPTCL may explain.

Deliberation in the meeting

PLCC system maloperated and sent DT to Muzzaffarpur during PLCC testing at Hazipur.

Minor voltage dip observed in the PMU plot.

BSPTCL informed that PLCC system at Hazipur is not working properly they are checking the PLCC system.

Powergrid informed that they will revise the zone 2 time setting from 350 ms to 150 ms till PLCC system is in order to minimize the impact of the fault.

PCC advised BSPTCL to inform the status of PLCC system to ERPC and Powergrid. Powergrid may review zone 2 time setting accordingly.

ITEM NO. B.9: Multiple tripping around Talcher during Pole shutdown on 09-01-2018

Pole 2 of Talcher HVDC was taken into planned shutdown at 07:36 hrs on 09/01/18. Before shutdown 600 MW generations back down SPS for JITPL, GMR and Sterlite in case of bipole tripping was bypassed and SPS 1000 was taken in to service at Talcher. At 07:51 hrs following tripping took place:

1. 400 KV Talcher-Rourkella D/C- Tripped from Talcher end only
2. A/R of 400 KV Rengali-Indravati---- Successful
3. A/R of Talcher-Meramundali ----Succcessful
4. Talcher HVDC pole 1

After tripping of above elements, high loading observed in 400 KV Talcher-Meramundali (approx. 700 MW) and 400 KV Talcher-Angul (Approx 530 MW). Further any N-1 contingency of any of the

above two line would have caused blackout of south odisha system along with total generation loss of TSTPP. That in turn could have other serious security threat on the overall National Grid. Immidite action taken by system operators like manual backing down action together with tripping of TSTPP unit IV 08:05 Hrs due to furnace pressure high, bring the system out of the emergency state.

Difficulty faced in restoration:

1. Non receipt of relay indication of Rourkela substation from RTAMC ER2
2. Wrong information from NTPC Talcher(i.e tripping of line due to DT receipt , whereas originally DT was not received) and delayed Reporting of successful A/R of Talcher-Meramundali by NTPC Talcher.

Due to above reasons restoration was delayed which lead to running the system with very narrow reliability margin for longer duration of time.

After analyzing the event, following discrepancy observed in the relay indication provided by POWERGRID and Talcher NTPC:

1. Why Rourkella send Carrier in zone 2 even though their Permissive over reach scheme is now replaced with permissive under reach scheme.
2. Why Talcher end relay tripped in Zone 1 during A/R in other line.
3. Now as per information received A/R took place in both 400 KV Talcher-Meramundali and 400 KV Rengali-Indravati around that time. But in PMU at 07:51 Hrs only one Fault is seen. Is it a mere coincidence or any relation is there needs to be studied
4. Also if both the A/R is simultaneous then for which fault Rourkella Zone-2 pickup happened need to be studied. Zone 2 setting of 400 KV Talcher-Rourkella D/C at Rourkella need to be checked.

Powergrid Odisha Project and NTPC, Talcher may kindly deliberate the incidence in detail.

Deliberation in the meeting

NTPC explained the disturbance with a detailed presentation. Presentation is enclosed at Annexure-B9. NTPC explained that the following incidences occurred during HVDC Talcher – Kolar link pole-1 blocked at 07:51 hrs on 09/01/18

- *Y-ph fault appeared in 400kV Talcher-Meramundali line at a distance of 3.7 km from Talcher end. The line was successfully autoreclosed from both the ends. But Tie CB(1752) at Talcher end got tripped on Pole Discrepancy. Severe voltage dip in Yph-E (12kV) was observed for approx 60 ms.*
- *Due to Y-ph fault in 400kV Talcher-Meramundali line, Talcher end Main 2 distance relay of 400kV Talcher-Rourkela-1&2 got started, all zones initiated and tripped on receipt of carrier from Rourkela end. Delayed opening of 400kV Talcher-Rourkela line-1 main B-ph CB(652) by 2.3 sec was observed at Talcher.*
- *Talcher Unit 4 tripped due to low voltage*

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.

Powergrid explained that due to Fixed Series Compensation(FSC) of 400 KV Rengali-Indravati(PG) line, the distance protection at Indravati (PG) end has over reached and initiated autorecloser without any fault in the line. The autorecloser was successful at both ends.

Powergrid added that 100 ms delay has been included in zone 1 to avoid such unwanted operation of distance protection.

PCC advised NTPC to take the following corrective actions:

- *400kV Talcher-Rourkela line-1 &2 main-2 distance relay(P437) settings at Talcher end needed to be checked and the reason for initiating all zones for a fault in reverse zone should be explained.*
- *Delayed opening of B-Ph CB(652) of 400kV Kaniha-Rourkela line-1 at Talcher should be addressed.*
- *Tripping of tie CB (1752) of 400kV Talcher-Meramandali line at Talcher on Pole Discrepancy should be attended.*

In 141st OCC Meeting it was informed that on 08/01/18 HVDC Talcher-Kolar Pole-I was taken under shut down for maintenance activities.

To prevent any unwarranted backing down/tripping at JITPL/GMR, SPS was by-passed on a temporary basis at the respective generator ends, just prior to availing of the shutdown. However, after the shutdown was availed, 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. It was reported that the continuous backing down signal could not be disabled at HVDC, Talcher end.

PCC decided that 5 min timer may be incorporated at Talcher end to avoid continuous generation of SPS signal. PCC advised Powergrid to implement the timer as agreed in 110th OCC Meeting.

PCC felt that line flows should also be included in the SPS decision process for reliable operation of SPS.

Talcher, NTPC has raised several issues related to SPS at Talcher.

PCC decided to discuss the SPS related issues in a special meeting with NLDC, ERLDC, NTPC and Powergrid. PCC advised Talcher, NTPC to send the issues to ERLDC and ERPC.

ITEM NO. B.10: Tripping incidences in the month of December, 2017

Other tripping incidences occurred in the month of December 2017 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.

In 61st and 62nd PCC, DVC informed that RTPS end is receiving DT from Ranchi end for any fault in 400kV Ranchi-New Ranchi line. The issue was discussed in last two PCC meetings.

PCC advised Powergrid to resolve the issue immediately as the 400kV RTPS-Ranchi line is tripping unnecessarily without any fault in the line.

Powergrid may update. Members may discuss.

Deliberation in the meeting

Members explained the tripping incidences. Updated status is enclosed at **Annexure-B10***.*

Powergrid informed that the issue of RTPS end was receiving DT from Ranchi for any fault in 400kV Ranchi-New Ranchi line has been resolved.

ITEM NO. B.11: Third Phase of MiP-PSCT Training Program by PRDC

In continuation to previous two training programs, 3rd Phase of MiP-PSCT Training Program is scheduled to be held from 5th to 9th February 2018 at ERPC Conference Hall, Kolkata. Constituents may nominate the members for training preferably the members who attended the previous two training programs.

Members may note.

Deliberation in the meeting

PCC advised all the constituents to nominate the members for the training.

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: Total power failure at 220/132 kV Patratu S/S on 23-11-17 at 11:56 hrs

220 kV main bus II at Patratu was under shutdown hence all elements were connected to main bus I.

At 11:55 hrs 220 kV TVNL - Patratu S/C and 220 kV Hatia - Patratu D/C tripped due to R-Y-N fault at 220kV PTPS switchyard resulting total loss of power supply at 220/132 kV Patratu S/S. 132 kV Hatia I-Kanke line also tripped from Hatia end.

220 kV Hatia - Patratu D/C line tripped from Hatia end within 350 ms on zone 2.

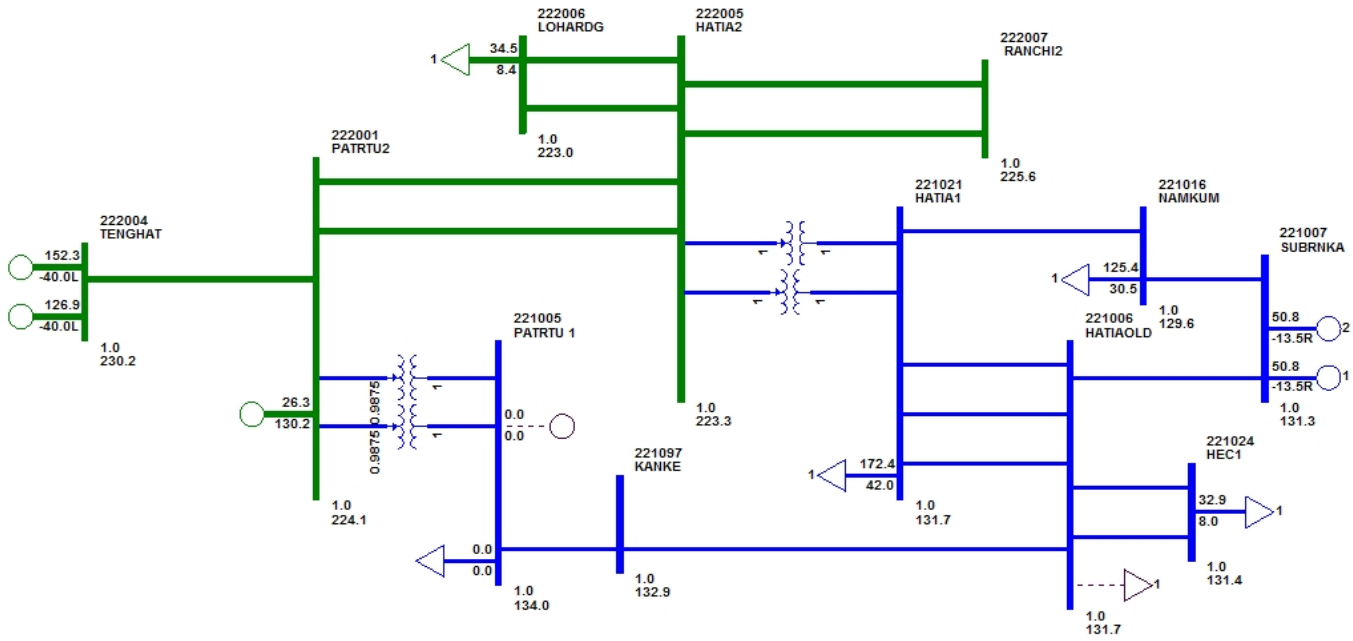
During restoration both units at TVNL were tripped at 12:52 hrs. Voltage fluctuation was reported at TVNL bus.

Relay indications:

Sl.No.	Name of Bay / Line	Local End Relay Indications
1	220 kV Hatia - Patratu line 1	Z-2, RYN fault, Tripped with in 350 ms
2	220 kV Hatia - Patratu line 2	Z-2, RYN fault, Tripped with in 350 ms
3	132 kV Hatia I-Kanke	Hatia end tripped on zone 1, Ia=981.1 A, Ib=777.3 A, Ic= 251.8 A

Load loss 145 MW

Fault clearing time as per PMU data is 900 ms.



From the DR plots of Hatia S/s, it was understood that Double Line to Ground Fault (RY-N) occurred near to 220kV bus at Patratu substation. The fault was not cleared from 220kV Patratu S/s. Hence, 220 kV Hatia - Patratu D/C tripped from Hatia end on zone 2. 220kV TVNL-Patratu line tripped from TVNL end on O/C, E/F protection. After tripping of the 220kV lines, 132 kV Hatia-Kanke line got tripped from Hatia end on zone 1.

In 62nd PCC, It was felt that fault in 220kV Patratu S/s should be cleared by Busbar protection but no protection relay has operated including 220/132kV ATRs at 220kV Patratu S/s. Hence the fault got cleared from 220kV Hatia, 220kV TVNL and 132kV Hatia old.

PCC advised NTPC to collect the details from Patratu and explain the reason for non-operation of any protection system at 220kV Patratu S/s in next PCC meeting.

NTPC may update.

Deliberation in the meeting

NTPC informed that busbar protection is not available at Patratu. Line protection and ICT protection relays are also not operating properly.

NTPC added that they have handed over 220/132kV Patratu S/s to JUSNL on 26th December 2017.

ITEM NO. C.2: Total power failure at 132/66 kV Melli S/S and its surrounding area on 29-11-17 at 05:52 hrs

Due to flashing of PG clamp of line bay of 66 kV Kalimpong - Melli S/C, 132 KV Sagbari-Melli S/C, 132 KV Siliguri-Melli S/C and 132 KV Rangpo-Melli S/C were switched off resulting total power failure at 132/66 kV Melli S/S and its surrounding area.

Status of reporting: Not submitted any report, relay indications and DR.

In 62nd PCC, it was informed that 132 KV Sagbari-Melli S/C, 132 KV Siliguri-Melli S/C and 132 KV Rangpo-Melli S/C were switched off manually.

Sikkim may explain.

Deliberation in the meeting

Sikkim representative was not available in the meeting.

ITEM NO. C.3: 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.

OPTCL may update.

Deliberation in the meeting

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.

ITEM NO. C.4: Disturbance at 400 kV Teesta-V S/s on 12-10-17 at 12:55 hrs

At 12:55 hrs, heavy sound was observed in the vicinity of 400kV Teesta V and 400 kV Teesta - Rangpo - II tripped on zone 2, Y-N fault from Rangpo end. Teesta end distance protection not observed any fault in the line. Carrier received at Teesta end and Auto reclose operation of 400 kV Teesta - Rangpo - II was successful at Teesta end. In the mean time, B/C at Teesta tripped on O/C, E/F protection, high set stage II resulting tripping of unit III due to loss of evacuation path.

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.

NHPC may update.

Deliberation in the meeting

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.

ITEM NO. C.5: Disturbance at 220 kV Chandaka(OPTCL) on 17-10-17 at 10:23 hrs

220 kV Mendasal - Chandaka Q/C line tripped due to fault in 220 kV Mendasal - Chandaka - I resulting total power failure at Chandaka end. Power was extended to Chandaka by charging circuit II.

Load loss 230 MW. Fault clearing time as per PMU data is 1000 ms.

OPTCL may explain with the relay indications and DR.

In 61st PCC, OPTCL informed that there was a R-N fault in 220 kV Mendasal - Chandaka – III at 15 km from Mendhasal end. Mendhasal end cleared the fault on zone 1 but Chandaka end failed to clear the fault as a result other three 220kV lines of 220 kV Mendasal – Chandaka tripped from Mendhasal end on back up over current relay on high set feature.

PCC advised OPTCL to take the following corrective actions:

- Chandaka end distance protection of 220 kV Mendasal - Chandaka – III should be tested.
- Back over current protection relays at Mendhasal and Chandaka are to be properly coordinated

OPTCL may update.

Deliberation in the meeting

OPTCL updated the status as follows:

i) The defective relay of 220 kV Mendasal - Chandaka – III at Chandaka has been replaced.
ii) The High set feature in O/C Back up relays of for 220kV feeders has been disabled, only directional IDMT feature with relay coordination has been adopted.

ITEM NO. C.6: BSPTCL may update the latest status of following PCC recommendations

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

ITEM NO. C.7: 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.

Powergrid may update.

Deliberation in the meeting

Powergrid submitted the report which is enclosed at Annexure-C7.

ITEM NO. C.8: 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	38	64.41
JUSNL	34	16	47.06
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 observations at the earliest.

ITEM NO. C.9: 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	03.08.16	Y-N FAULT	WBPDCL	WBSETCL		1 ckt resolved
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		
29	220 KV RAMCHANDRAPUR - CHANDIL	22.09.16	B-N FAULT	JUSNL	JUNSL		
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	*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

Members may update the status.

Deliberation in the meeting

Members updated the status as mentioned in above table.

PCC advised all the respective constituents to take appropriate action to restore PLCC system and Auto reclose function.

ITEM NO. C.10: Non-commissioning / non-functional status of bus-bar protection at important 220 kV Sub-stations.

It has been observed that at many 220 kV substations particularly that of STU, bus-bar protection is either not commissioned or non-functional. The non-availability / non-functionality of bus bar protection, results in delayed, multiple and uncoordinated tripping, in the event of a bus fault.This in turn not only results in partial local black out but also jeopardises the security of interconnected national grid as a whole. The matter was also pointed out during the third party protection audit which is being carried out regularly. Constituents are required to meet the audit compliance and commission or made bus –bar protection functional where ever it is not available. A list of such important 220 kV sub-stations as per the first third party audit is placed in the meeting.

In 34th TCC, members updated the status as follows:

Bus Bar Protection not available (record as per third party protection audit)

Bihar				
Sl No	**Name of Substation**	**Bus Bar protection status**	**Date of audit**	**Present Status**
1	220 kV Bodhgaya	Not available	28-Dec-12	*Single bus and there is no space available for busbar protection*

Jharkhand				
1	220 kV Chandil	Not available	29-Jan-13	*LBB available*
2	220 kV Tenughat	Not available	12-Apr-13	
DVC				
1	220 kV Jamsedpur	Not available	10-Apr-13	*Single bus. Bus bar will be commissioned under PSDF.*
West Bengal				
1	220 kV Arambah	Not available	24-Jan-13	*Available in alarm mode. Planning to replace with numerical relay*
2	220 kV Jeerat	Not available	20-Dec-12	*Relays have been received at site. Installation is in progress.*

TCC further advised all the constituents to give the latest status of Bus Bar protection of other 220KV S/S under respective control area.

TCC advised to review the status of above in lower forums report back in next TCC.

58th PCC advised DVC to install numerical bus bar protection at 220kV Bokaro, Kalyaneswari, Chandrapura and Durgapur S/s to improve the reliability.

In 36th TCC, DVC informed that they have already covered the upgradation of busbar protection for 220kV Kalyaneswari and Durgapur in PSDF proposal. They will place their action plan for 220kV Bokaro and Chandrapura in upcoming PCC meeting.

Members may update.

Deliberation in the meeting

Members noted for compliance.

ITEM NO. C.11: Overvoltage tripping of 400 KV lines from Biharshariff --ERLDC

Overvoltage tripping of lines and healthy phase voltage rise at Biharshariff PMU during nearby SLG fault have become very frequent. In the month of September and august there are frequent such tripping. There are also some discrepancies like high harmonic content, sudden loss of one phase voltage with other two phase voltage rising even when there is no fault etc. In few cases of SLG fault serious high voltage is captured in Biharshariff PMU and in almost all cases of SLG fault near Biharshariff Voltage rise of other phases is very common suggesting that Z0/Z1 ratio at Biharshariff looking into the fault is very high. List of such tripping are as follows:

400KV NEW PURNEA-BIHARSARIFF-II	05-08-17	13:44	05-08-17	20:44	Tripped on O/v from Biharsharif end (Mal-operation, voltage at Biharsharif-410KV).DT received at New Purnea
400KV NEW PURNEA-BIHARSARIFF-II	11-08-17	17:52	11-08-17	18:17	DT RECEIVED AT PURNEA END
400KV BIHARSARIFF-LAKHISARAI-II	16-09-17	16:11	16-09-17	22:01	O/V AT BSF (MAL-OPERATION)
400KV BIHARSARIFF-LAKHISARAI-II	16-09-17	22:46	17-09-17	2:37	Faulty O/V Relay Oprtd
Disturbance at Biharshariff on 25-09-17 at 09:32 hrs (Serious voltage of healthy phases)					

In 60th PCC, ERLDC informed that 400KV NEW PURNEA-BIHARSARIFF-II has been tripped on over voltage but no over voltage condition was observed as per PMU data.

Powergrid informed that line CVTs at Biharshariff end was faulty. The CVT has been replaced.

ERLDC added that they have observed severe voltage rise in healthy phases of 400kV Biharshariff PMU data during single phase to ground faults.

PCC advised Powergrid to take appropriate action to reduce voltage rise in healthy phases during SLG faults.

In 61st PCC, Powergrid informed that they are suspecting earthing problem at Biharshariff S/s. Earthing audit has been done and the audit team will submit the report.

In 62nd PCC, Powergrid informed that they are implementing recommendations of Earthing audit team. The issue would be resolved after implementation of the recommendations.

POWERGRID may update.

Deliberation in the meeting

Powergrid informed that they are implementing the Earthing Audit recommendations.

ITEM NO. C.12: 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-C12**.

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

Constituents may update.

Deliberation in the meeting

Members noted for compliance.

ITEM NO. C.13: Any other issues.

1. Installation of Check/Standby meter at 220kV Subashgram (WB)

In 141st OCC held on yesterday, Powergrid informed that SEM is available at Subashgram (PG), the meter is to be collected by WBSETCL and to be put in service.

WBSETCL representative informed that their testing team is having some reservations on installation of SEM at 220kV Subashgram (WB) and he advised to discuss the issue in PCC meeting.

Deliberation in the meeting

PCC clarified that any tie line should have main meter one end and check/stand-by meter at other end. It is the responsibility of the respective constituent to install SEM at their end.

WBSETCL agreed to collect the SEM from Powergrid and agreed to install.

****

Annexure-A

Participants in 63rd PCC Meeting of ERPC

Venue: ERPC Conference Room, Kolkata Time: 11:00 hrs Date: 19.01.2018 (Friday)

Sl No	Name	Designation/ Organization	Contact Number	Email	Signature
1	J. Bandyopadhyay	Member Secretary			
2	G. MITRA	DGM / ERLDC	9831297392		
3	S BANERJEE	DGM, ERLDC	9433041823	surajit.banerjee@powergrid.co.in	
4	S.K. SAHU	CM (AM/IT) POWERGRID, BRK	9078883643	SKsahu@powergridindia.com	
5	S. MAITI	S.D.E(E), DVC	7545567453	sudiptamtm@gmail.com	
6	A.N. Ekka	Manager (EMD) PVUNL, Patratu	9431600479	anekka@ntpc.co.in	
7	S K. Rai	Sr. Mgr (OS) ERLHQ	9473400272	SKrai.02@ntpc.co.in	
8	S.K. MISHRA	DGM (OS) NTPC, ER-II	9438233207	SKmishra05@ntpc.co.in	
9	S. K. SUAR	AGM (ENGG) NTPC/Kanti	9437042781	Ksuar@ntpc.co.in	
10	S. P. RATH	MGR. (E) TEESTA-V PS/ NHPC	8170005662	Sakti1975@gmail.com	
11	S. K. Das	Mgr (E) NHPC, CO.	9717786721	Sdas_nhpc@yahoo.co.in	
12	V. Deepak	PRDC	9966912284	deepak.v@pdcinfotech.com	
13	RAJ PROTIM	Sr Engr, ERLDC	9903329591	rayprotim@posoco.in	
14	SAIBAL GHOSH	Engineer, ERLDC	8584071071	Saibal@posoco.in	
15	D P Bhargava	TUL	9958833995	dpbhargava@teestavurja.com	
16	Sk Sariful Islam	Teesta-III	7719359966	Sk.intekhabalam@gmail.com	
17	Neelesh Gupta	Teesta III	9816805252	neelesh.gupta@andritz.com	
18	Ugyen Tshering	Manager/BPSO BPC	+975 17613039	Ugyentshering17@bpc.bt	
19	Cheten Tshering	Manager BPC	17121481	cheten.tshering@bpc.bt	
20	Sudeep Kumar	Dy. Mgr, POWERGRID	9431820338	Sudeepkumar@powergridindia.com	

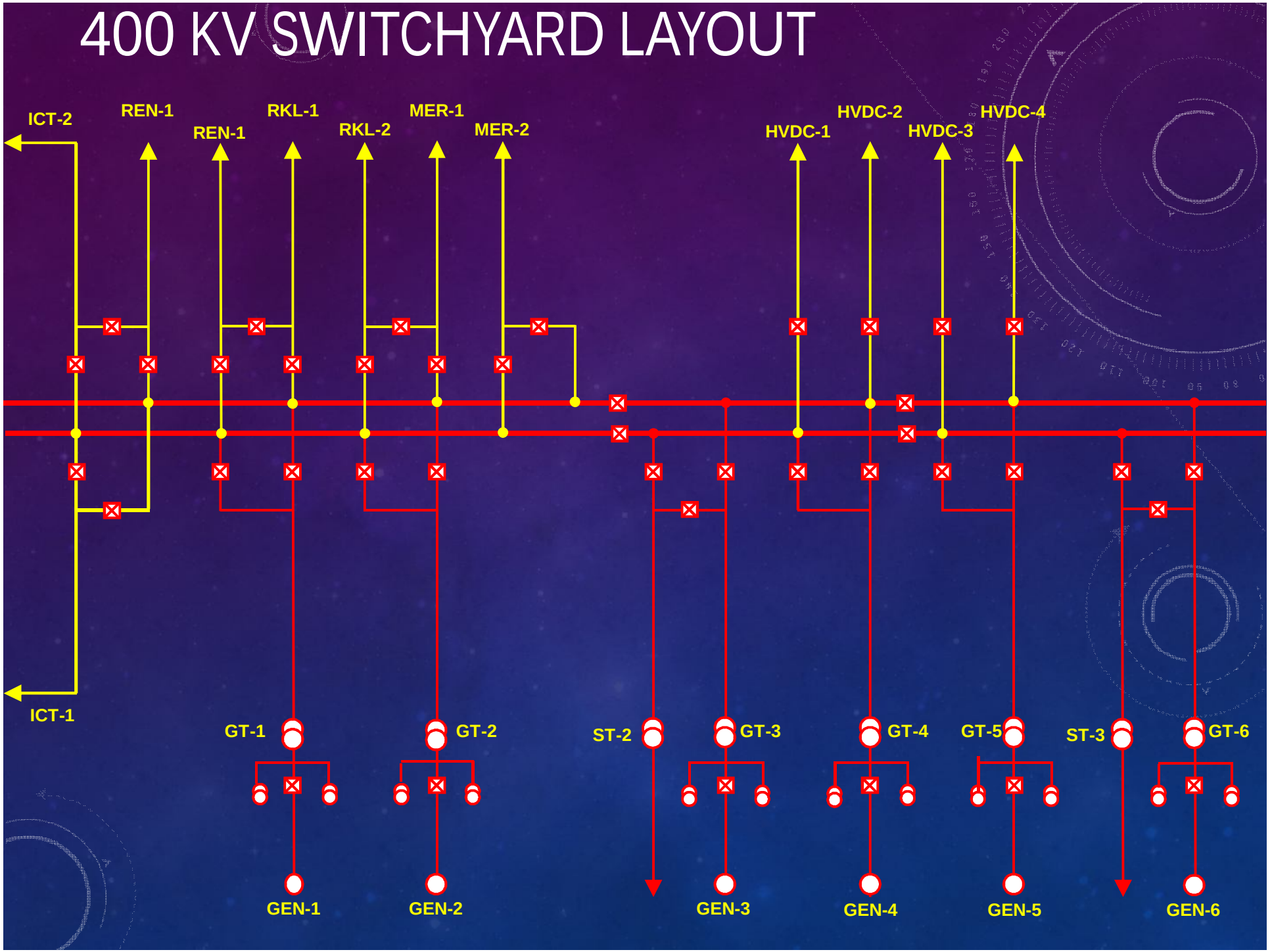
"Coming together is a beginning, staying together is progress, and working together is success." –Henry Ford

Participants in 63rd PCC Meeting of ERPC

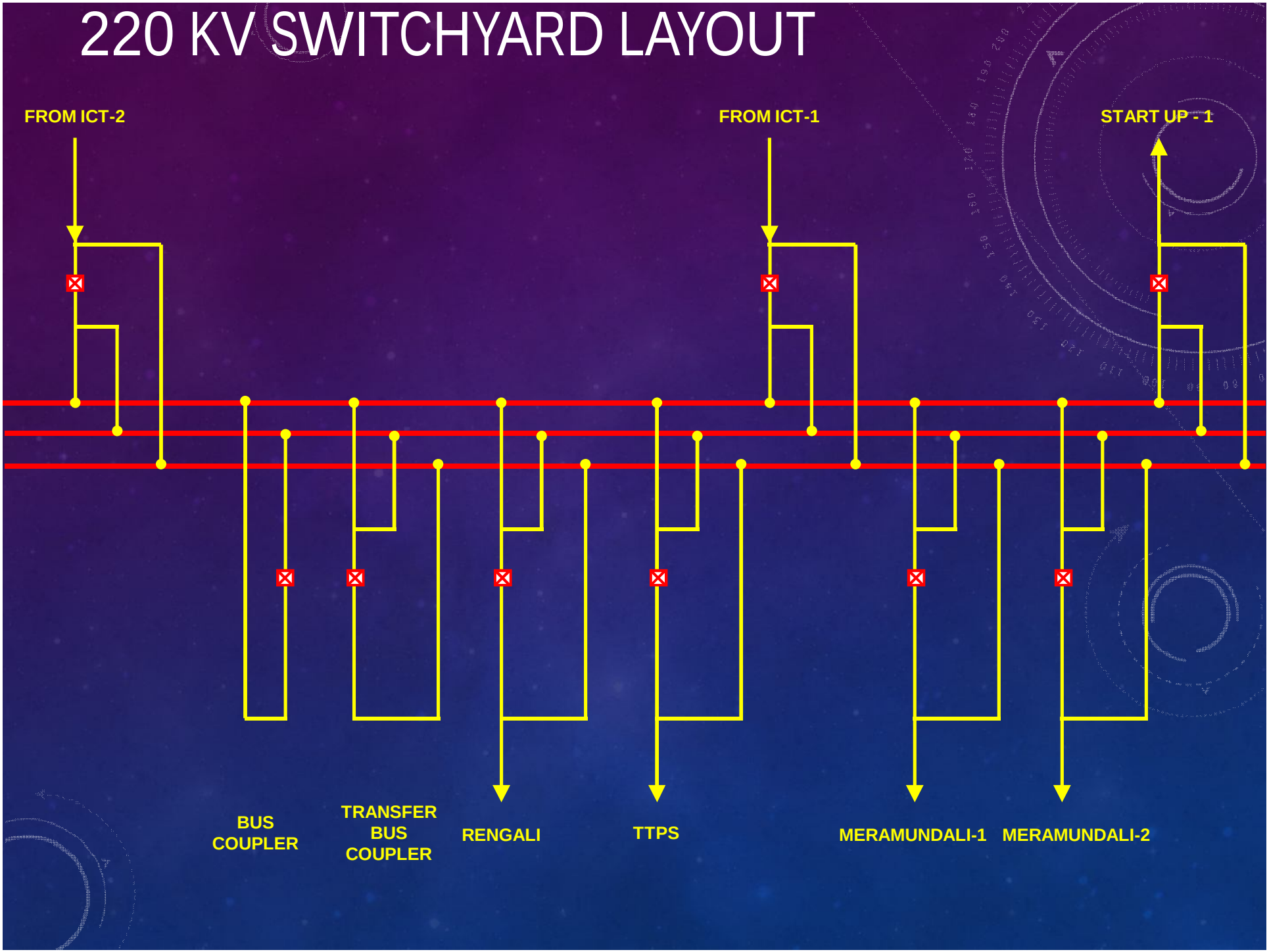
Venue: ERPC Conference Room, Kolkata Time: 11:00 hrs Date: 19.01.2018 (Friday)

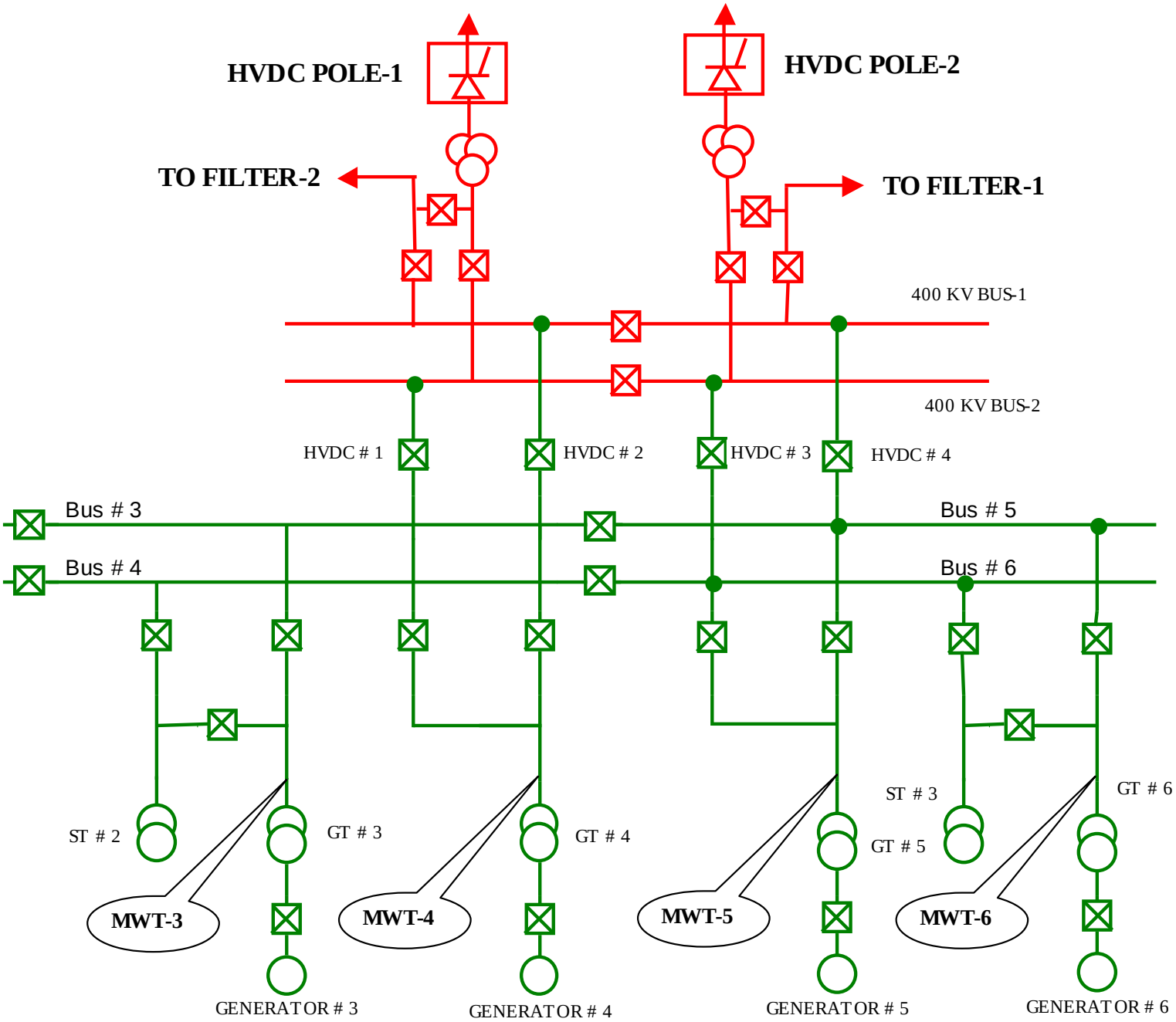
Sl No	Name	Designation/ Organization	Contact Number	Email	Signature
21	P. Ghosh	ER-II	94347 48263	partha.ghosh@powergridindia.com	P. Ghosh
22	D. K. Bauri	EE, ERPC	9883617236	eeerpc@gmail.com	
23	J. G. Rao	EE, ERPC	9547891353	eseb_cea@yahoo.co.in	
24	P. P. Jena	AEE, ERPC	9776198991	ppjena.erpc@gov.in	
25	PRASHANT KR.	AEE/CRITL/BSPTCL	7763818080	prashantkumarsahay@yahoo.com	
26	K. Reddy	AEE/CRITL	7033091481	purushandhu@gmail.com	K. Reddy
27	DEEPAK KUMAR	AEE/CRITL	7053713709	deepakraj5200@gmail.com	
28	Shiv Shankar Mardi	AEE/CRITL	7053795864	imtheshiv@gmail.com	
29	DILIP KR. DAS	ACE / WBSETCL	9434910544	cectd.wbsetcl@gmail.com dilip.das@wbsetcl.in	
30	Shouvik Banerjee	SE(E)/SLDC/WBSETCL	9434910171	svkbanerjee@yahoo.com	
31	A. Sen Adhan	SE(E), SLDC, DVC	9932719986	aditi.senpradhan@dvc.gov.in	
32	Sudipta Ghosh	Mgr-(PS), UBPDCL	8336917005	sghosh04@ubpdcl.co.in	S. Ghosh
33	Hemanta K. Ghosh	LO. GRIDCO KOLKATA	9238688492	hemanta62@gmail.com	
34	P. K. Mishra	SGM(PS), SLDC Bbsr.	9438907402	sgm.ps@sldcorissa.org.in	
35	Umakanta Sahoo	GM, SLDC Odisha	9438907403	uksbbsr@yahoo.com	
36	S. S. Nanda	DGM(El) ER&MR Divn. I. Road, OPTCL	9438907803	ele.ssnanda@optcl.co.in	
37	H. P. Mahapatra	AGM(El), OHPC	7320884015	hpm.ohpc@gmail.	
38	D. N Guru	Sr Mgr OPGC	9338715934	dhirendra.guru@opgc.co.in	
39					
40					

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


400 KV SWITCHYARD LAYOUT
ICT-2
REN-1
REN-1
RKL-1
RKL-2
MER-1
MER-2
HVDC-1
HVDC-2
HVDC-3
HVDC-4
ICT-1
GT-1
GT-2
ST-2
GT-3
GT-4
GT-5
ST-3
GT-6
GEN-1
GEN-2
GEN-3
GEN-4
GEN-5
GEN-6

220 KV SWITCHYARD LAYOUT





STAGE-II POWER FLOW SINGLE LINE DIAGRAM

POWER EVACUATION CORRIDER

- ✓ 400 KV D/C LINE TO RKL PGCIL : 180 KM
- ✓ 400 KV D/C LINE TO RGL PGCIL : 45 KM
- ✓ 400 KV D/C LINE TO MERA GRIDCO : 45 KM
- ✓ 04 NOS 400 KV LINES TO HVDC PGCIL : 0.5 KM
- ✓ 220 KV D/C LINES TO MERA GRIDCO : 45 KM
- ✓ 220 KV S/C LINE TO TTPS NTPC : 30 KM
- ✓ 220 KV S/C LINE TO RGL GRIDCO : 45 KM
- ✓ 02 NOS 315 MVA 400/220 KV ICT

INTRODUCTION

- HVDC Talcher – Kolar link was shut down for maintenance as per approved schedule.
  - Bi-pole Shut down

    Pole – 1 from 06.01.2018, 06:00 hrs to 07.01.2018, 21:04 hrs

    Pole – 2 from 06.01.2018, 06:03 hrs to 07.01.2018, 06:56 hrs
  - Single-pole Shut down

    Pole – 1 from 08.01.2018, 06:55 hrs to 08.01.2018, 18:00 hrs

    (Pole – 1 blocked at 19:06 hrs on 08.01.18/deblocked at 00:54 hrs on 09.01.18)

    Pole – 2 from 09.01.2018, 07:37 hrs to 07.01.2018, 06:56 hrs

    (Pole – 1 blocked at 07:51 hrs on 09.01.18/deblocked at 09:04 hrs on 09.01.18)

    (Pole – 2 deblocked at 14:54 hrs on 09.01.18)

BRIEF REPORT OF THE INCIDENT

- Due to single phase to earth fault in Y-ph on the 400kV Meramandali line, 400kV Rourkela-1&2 distance relay zone got started and on received of Carrier from Rourkela end, 400kV Rourkela-1&2 Circuit got tripped on Main-2 Distance protection at Kaniha end.
- Successful auto-reclosure of Y-ph of 400kV Meramandali line due to Single phase to earth fault on Y-ph at distance of 3.7 km from Kaniha end.

DETAILS OF THE INCIDENT

- There was all zone start of 400kV rourkela-1&2 main-2 distance relay(P437,Make:Schneider) at time 7:51:45.568 AM & 07:51:45.563 AM followed by carrier received from Rourkela end leading to operation of Main-2 distance protection at time 7:51:45.593 AM & 07:51:45.595 AM respectively. These lead to tripping of Main CB (652) & Tie CB(552) of Rourkela-1.There was delayed of 2.3 sec in opening of B-ph of 652 CB.
- Similarly in Rourkela-2, there was opening of Main CB(752) & Tie CB (852).

DETAILS OF THE INCIDENT

- Due to Y-ph fault in the of 400kV Meramandali line, there was successful auto-reclosure of Y-ph. Meramandali Line Yph protection operated(Main-2 Relay,7SA522,Simens make) at 07:51:45.629 AM & Y-ph CB (1852) opened at 07:51:45.641 AM and CB got closed at 07:51:46.823 AM. But Tie CB(1752) got tripped on Pole Discrepancy at 07:51:49.619 AM.
- It was also observed that there was severe voltage dip in Yph-E (12kV) persisting for approx 60 ms.
- HVDC Pole-1 got blocked at 07:51:46.074 AM and restored at 09:04:33.345 AM by Power grid.

DETAILS OF THE INCIDENT

- Restoration of Rourkela-1 & 2 lines was at 08:19:34.719 AM & 08:13:27.218 AM respectively after getting charging code from ERLDC.

PROBLEM

- There was a Y-ph single phase to ground fault in 400kV Meramandali line at 3.7 km from kaniha end.Due to this fault , 400kV rourkela-1 &2 Circuits main-2 distance relay all zone got started.
- Carrier received from Rourkela end even though there was no line tripping at Rourkela end.
- Delayed opening of 400kV Rourkela-1 main CB(652) B-ph by 2.3 sec.
- 400kV Meramandali tie CB (1752) tripped in PD instead successful autoreclosure.

SUGGESTED REMEDIAL MEASURES

- 400kV rourkela-1 &2 Circuits main-2 distance relay(P437) settings is under review by NTPC.
- Power grid, Rourkela may investigate the cause of sending of Carrier.
- Presently 400kV Kaniha-Rourkela-1 is under shut down for annual maintenance job and the problem(Delayed opening of B-Ph CB) will be resolved in this period.
- Problem of 400kV Meramandali tie CB (1752) tripped in PD will be attended on opportunity shut down.

Annexure-B10

List of important transmission lines in ER which tripped in December-2017

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	Remarks
	Multiple tripping at the same time										
1	400KV KISHANGANJ-NEW PURNEA-II	17/12/2017	2:01	17/12/2017	3:20	NO DT RECEIVED AT KISHANGANJ	O/V RELAY MALOPERATION AT PURNEA	O/V RELAY MALOPERATION AT PURNEA	< 100 msec		Stage 2 over voltage operated
2	400KV MALDA-NEW PURNEA-I	17/12/2017	2:01	17/12/2017	3:24	B-N/Z-1/FD 70KM/FC 4.319KA,1ST TIME A/R SUCCESSFUL THEN AGAIN TRIPPED@MALDA	B-N/FD 71.3KM/FC 4.02KA	B-N Fault	< 100 msec		A/R successfull at both ends and Y-ph voltage shoot up at Purnea. Purnea end sent DT to malda.
3	220KV TASHIDING-RANGPO-I	20/12/2017	9:50	20/12/2017	11:08	Tripped from Tashiding end only	No Relay indication	Tripped from Tashiding end only			Tasheding end is sending DT instead of carrier due to wrong wiring
4	220KV NEW MELLI-TASHIDING-I	20/12/2017	9:50	20/12/2017	10:57	No relay indication	Tripped from Tashiding end only	Tripped from Tashiding end only			
5	400KV MALDA-NEW PURNEA-II	30/12/2017	11:14	30/12/2017	11:56	Y-N Fault	Y_N,Z-1,3.25 KA,110.4 KM	Y-N Fault	< 100 msec		Fault was in line reactor
6	400KV MALDA-NEW PURNEA-I	30/12/2017	11:14	30/12/2017	11:24	Y-N,2.372KA,132 .5 KA FROM PURNEA	Y-N,A/R SUCCESSFUL	Y-N Fault	< 100 msec	No A/R operation at Purnea	A/R not successfull at Purnea due to PD problem. Problem has been resolved.
	No Autoreclose operation observed in PMU data										
7	400KV NEW CHANDITALA-KHARAGPUR-I	03/12/2017	17:19	04/12/2017	15:29	R-N,Z1,DIST=48.66Km,FC=5.71KA,ARLO.	Direct trip received.	R-N Fault	< 100 msec	No Auto Reclose operation observed in PMU	Tripped on SOTF
8	220KV GAYA-SONENAGAR-II	08/12/2017	12:08	08/12/2017	12:53	B-N Fault, Auto reclosed		B-N Fault	< 100 msec	No Auto Reclose operation observed in PMU	A/R problem at Sonenagar end.
9	220KV BARIPADA-BALASORE-II	18/12/2017	19:47	20/12/2017	0:40	Z-1,Y-N, 8.067KA, 10KM	Z2, Y-N, 0.48KA	Y-N Fault	< 100 msec	No Auto Reclose operation observed in PMU	A/R is OFF and OPTCL property
10	400KV PATNA-BALIA-III	26/12/2017	4:45	26/12/2017	5:01	A/R SUCCESSFUL	Y-N , 5 KA , 77 KM	Y-N Fault	< 100 msec	No Auto Reclose operation observed in PMU	Balia end details not available
11	765KV FATEHPUR-PUSAULI-I	29/12/2017	4:14	29/12/2017	16:30	FATEHPUR- R-N FAULT,250 KM ,2.34KA	R-N FAULT , FAULT CURRENT 2.4 KA, DISTANCE 58.7 KM	R-N Fault	< 100 msec	No Auto Reclose operation observed in PMU	DT recieved at Pasuali
12	220KV DEHRI-GAYA-I	29/12/2017	23:56	30/12/2017	0:30		Y-N, 16.2Km, 7.4KA	Y-N Fault	< 100 msec	No Auto Reclose operation observed in PMU	A/R commissioned but not operated at Dehri
13	400KV PUSAULI(PG)-VARANASI-1	30/12/2017	1:21	30/12/2017	1:46	R-N, 9.6Km, 1.518KA		R-N Fault	< 100 msec	No Auto Reclose operation observed in PMU	3-ph tripping is not successfull at Pasauli
14	400KV PATNA-BALIA-III	31/12/2017	3:13	31/12/2017	5:05	R_N, F.D. 133.3 KM, 3.68 kA		R-N Fault	< 100 msec	No Auto Reclose operation observed in PMU	Balia end details not available
	Miscellaneous: Tripping on DT, No reason furnished										
15	400KV GORAKHPUR-MOTIHARI-I	09/12/2017	13:17	09/12/2017	14:53		Relay maloperation	Relay maloperation	300 msec		R-N Fault observed in PMU

16	315MVA ICT-1 AT INDRAVATI (PH)	09/12/2017	21:47	10/12/2017	2:43	Bus differential operated at 220 kv side		Bus differential operated at 220 kv side			OHPC was advised to submit the report
17	132KV KhSTPP, NTPC-Lalmatia-I	12/12/2017	11:20	12/12/2017	11:55	R_N Fault, 5.70 KM from KHSTPP		R-N Fault			Fault in the line
18	400KV GMR-ANGUL-I	15/12/2017	13:00	15/12/2017	14:55	Tripped from GMR end	No Relay indication	Tripped from GMR end			No fault observed in PMU
19	315MVA ICT-1 AT JEYPORE	22/12/2017	21:42	23/12/2017	22:26			No reason furnished			220kV side overflux relay maloperated. The relay has been replaced.
20	220KV JODA-RAMCHANDRAPUR-SC	28/12/2017	19:27	28/12/2017	20:01	Didn't tripped from joda end	No relay provided from RCP	Tripped only from RCP end			PLCC problem at Joda end
21	400KV RANCHI-RAGHUNATHPUR-III	28/12/2017	20:22	28/12/2017	21:01	Didn't Tripped from Ranchi end	DT received at RTPS end due to mal operation	DT received at RTPS end due to mal operation			Issue has been resolved.
22	400KV RANCHI-RAGHUNATHPUR-III	28/12/2017	22:32	28/12/2017	23:03	Did not tripped from Ranchi end	DT received at RTPS end due to mal operation	DT received at RTPS end due to mal operation			
23	765KV MAIN BUS-II AT GAYA	29/12/2017	23:33	30/12/2017	0:30	Tripped during A/R of 765kV Gaya Balia line		Tripped during A/R of 765kV Gaya Balia line			During A/R MCU-II bus bar protection maloperated. Issue referred to OEM.
24	400KV ALIPURDUAR-BONGAIGAON-II	30/12/2017	21:42	30/12/2017	22:21			No reason furnished			No fault observed in PMU
	Tripping of HVDC Sasaram										
25	HVDC PUSAULI	22/12/2017	2:54	23/12/2017	18:55	SYSTEM FAILURE ALARM		SYSTEM FAILURE ALARM			
26	HVDC PUSAULI	23/12/2017	21:07	23/12/2017	21:59	SYSTEM FAILURE ALARM		SYSTEM FAILURE ALARM			
27	HVDC PUSAULI	24/12/2017	11:11	24/12/2017	15:00	SYSTEM FAILURE ALARM		SYSTEM FAILURE ALARM			
28	HVDC PUSAULI	25/12/2017	3:05	25/12/2017	8:13	SYSTEM FAILURE ALARM		SYSTEM FAILURE ALARM			
29	HVDC PUSAULI	25/12/2017	10:18	25/12/2017	16:03	No Reason furnished		No Reason furnished			
30	HVDC PUSAULI	26/12/2017	3:40	26/12/2017	5:47	SYSTEM FAILURE ALARM		SYSTEM FAILURE ALARM			
31	HVDC PUSAULI	27/12/2017	7:15	27/12/2017	19:57	SYSTEM FAILURE ALARM		SYSTEM FAILURE ALARM			
32	HVDC PUSAULI	29/12/2017	0:30	29/12/2017	2:17	SYSTEM FAILURE ALARM		SYSTEM FAILURE ALARM			
	Multiple times tripping of same element										
33	315MVA ICT-3 AT JAMSHEDPUR	09/12/2017	22:00			tripped due to LV overflux stage-1 (110% setting) after a delay of 6000 second at 22:54 hrs	Since at no load and 220kV cable (length around 350 meter), no load CVT voltage at line side CVT in 212 bay was high, around 112 % at night time, the LV overflux stage-1 setting (110 %) operated.	Overflux relay operated			During charging over flux relay operated. Settings have been corrected.
34	315MVA ICT-3 AT JAMSHEDPUR	11/12/2017	21:46	12/12/2017	12:47	LV side Over flux protection operated		Overflux relay operated			
35	315MVA ICT-3 AT JAMSHEDPUR	12/12/2017	17:17	12/12/2017	20:22	Residual o/V		Residual o/V			
36	315MVA ICT-3 AT JAMSHEDPUR	13/12/2017	2:59	14/12/2017	16:11	Over flux protection operated on 220 KV side		Over flux protection operated on 220 KV side			
37	220KV ATRI-PANDIABILI-II	20/12/2017	10:35	20/12/2017	11:11	No Relay indication at ATRI	DT RECIEVED AT PANDIABILI	DT RECIEVED AT PANDIABILI			DT sent while checking PLCC at Atri
38	220KV ATRI-PANDIABILI-II	20/12/2017	12:17	21/12/2017	13:03		DT recieved at Pandiabili	DT recieved at Pandiabili			
39	220KV ATRI-PANDIABILI-II	27/12/2017	15:00	27/12/2017	15:38	Master relay 86A	Didn't Tripped	Master relay 86A operated at Atri end	800 msec		

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.

345

	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: