Minutes
of
83rd PCC Meeting

Date: 15.10.2019
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

MINUTES OF 83RD PROTECTION SUB-COMMITTEE MEETING HELD AT ERPC, KOLKATA ON 27.09.2019 (FRIDAY) AT 11:00 HOURS

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

PART – A

ITEM NO. A.1: Confirmation of minutes of 82nd Protection sub-Committee Meeting held on 19th August, 2019 at ERPC, Kolkata.

The minutes of 82nd Protection Sub-Committee meeting held on 19.08.19 circulated vide letter dated 13.09.2019.

Members may confirm the minutes of 82nd PCC meeting.

Deliberation in the meeting

Members confirmed the minutes of 82nd PCC meeting.

PART – B

ANALYSIS & DISCUSSION ON GRID INCIDENCES OCCURRED IN AUGUST, 2019

ITEM NO. B.1: Tripping of 400 kV Rangpo-Dikchu Circuit on 21.08.2019 at 00:02 Hrs.

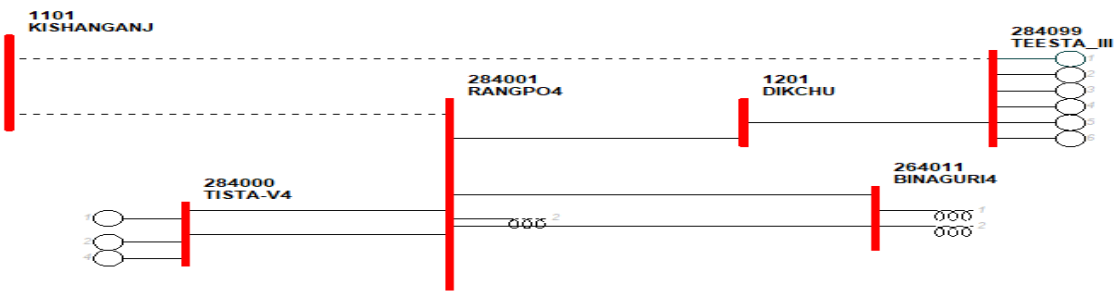
400 KV Teesta-III Kishangunj S/C and 400 kV Rangpo – Kishangunj S/C were out of service due to breakdown.

At 00:00 hrs, on 21-08-19, generation was increased at Dikchu and Teesta HEP. At 00:02 hrs, Directional O/C protection at Rangpo end of 400 kV Dikchu – Rangpo – S/C operated and tripped the line from Rangpo end. Before tripping of the line, the power flow through 400 kV Dikchu – Rangpo – S/C was 1365 MW.

After the tripping of 400 kV Dikchu – Rangpo – S/C, Teesta III and Dikchu HEP generators tripped due to loss of evacuation path. At same time, Overvoltage stage II protection occurred at Teesta III end for 400 kV Teesta III – Dikchu S/C and tripped the said line.

As per PMU data, no fault has been observed.

Generation Loss: 1364 MW



Relay indications are as follows:

Name of the elements	Relay Indication at end 1	Relay Indication at end 2
400 kV Dikchu – Rangpo – S/C	Did not trip	I>1 (main I relay remained picked up since before 00:01:40 hrs (Event occurred at 00:02:43 hrs) Current in three phases 1.9 kA)
400 kV Teesta III – Dikchu S/C	O/V stage II	DT received.
Dikchu unit I & II	Low forward power protection due to loss of evacuation path	
Teesta III unit I, II, III, IV, V & VI	Loss of evacuation path	

Discrepancies observed:

- Reason for Directional O/C protection at Rangpo end for 400 kV Dikchu – Rangpo S/C may be explained.
- During charging of 400 kV Dikchu-Rangpo S/C from Rangpo end, line did not hold. After few failed charging attempts, the line was finally charged from Rangpo end after disconnecting at breaker at Dikchu end.

Powergrid, Dikchu & TUL may explain.

Deliberation in the meeting

Powergrid informed that the directional overcurrent protection for 400 kV Rangpo-Dikchu line at Rangpo end was earlier enabled to check the current flow in the line for SPS monitoring. The trip logic was inadvertently enabled for the same. As a result the overcurrent protection operated and tripped the line on that day.

Powergrid added that they have disabled the overcurrent protection setting after this disturbance.

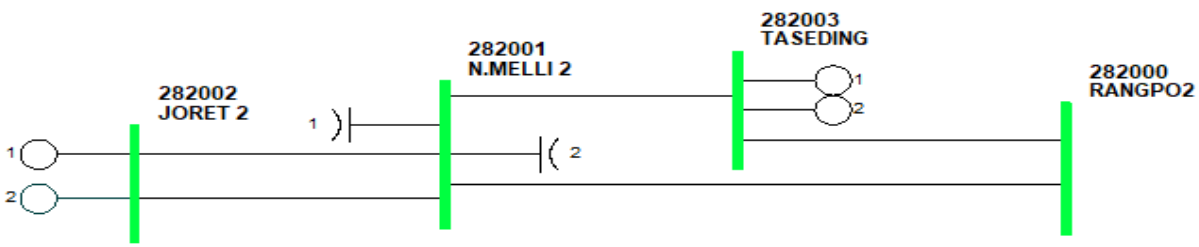
It was informed that during charging of 400 kV Dikchu-Rangpo S/C from Rangpo end, line did not hold for few attempts. Powergrid informed that due to some issue in the scheme remote reset of the concerned circuit breaker was not successful. The issue has been resolved now.

ITEM NO. B.2: Total power failure at 220 kV Jorethang S/s on 22.08.2019 at 12:22 Hrs.

At 12:17 hrs, all running units at Jorethang tripped due to loss of evacuation path after the tripping of 220 kV Jorethang – New Melli D/C. As per DR recorded at Jorethang end for 220 kV New Melli – I feeder, fault was cleared in Z-I from Jorethang end and breaker at New Melli end opened after 500 ms.

As per PMU data, fault was cleared after 500 ms.

Generation Loss: 91 MW



Relay indications are as follows:

Name of the elements	Relay Indication at end 1	Relay Indication at end 2
220 kV Jorethang – New Melli-I	B-N, Z-I, 4.7 km, F/C 0.118 kA	B-N, F/C 2.37 kA
220 kV Jorethang – New Melli-II	B-N, Z-I, 4.54 km, 0.586 kA.	Did not trip

Discrepancies observed:

- Reason for non-picking of any Distance protection at New Melli end.
- Reason for tripping of 220 kV JLHEP – New Melli – II at JLHEP end.

Powergrid & Jorethang may explain.

Deliberation in the meeting

Jorethang representative was not present in the meeting.

Powergrid informed that there was a high resistive fault in 220 kV Jorethang-New Melli circuit-I near to Jorethang end. Jorethang end cleared the fault in zone-I timing whereas New Melli end cleared the fault in zone-2 timing of distance protection.

Powergrid added that due to high resistive nature of fault, the zone-2 at New Melli end picked up after receipt of carrier from remote end. As a result autoreclosure did not operate for this line.

At the same time, 220 kV *Jorethang-New Melli circuit-II also got tripped from Jorethang end in zone-1 timing of distance protection.*

After detailed deliberation, PCC opined that tripping of 220 kV *Jorethang-New Melli circuit-II was not desirable and there may be overreaching issue for the distance protection relay for 220kV Jorethang-New Melli circuit-II at Jorethang end.*

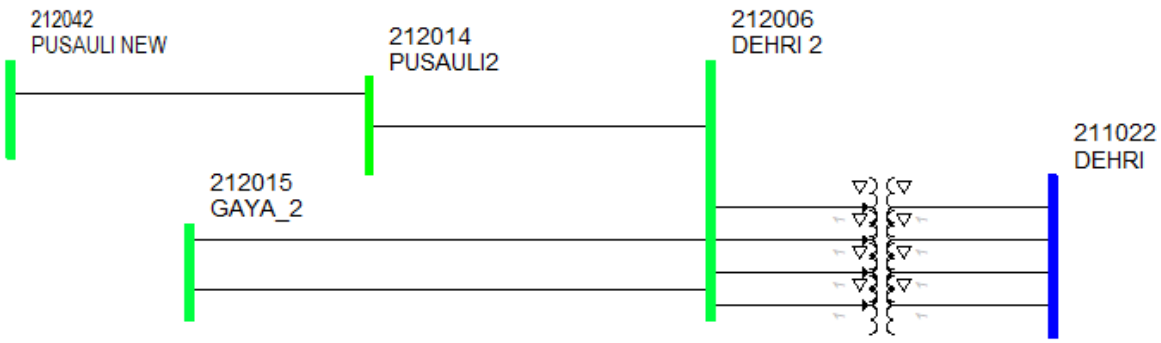
PCC advised Jorethang to review the distance protection settings at Jorethang end at the earliest.

ITEM NO. B.3: Total power failure at 220 kV Dehri S/s on 18.08.2019 at 17:24 Hrs.

At 17:24 hrs, 220 kV Dehri-Gaya D/C, 220 kV Dehri-Sasaram S/C and 220/132 kV ICTs at Dehri tripped resulting total power failure at Dehri. It was reported that the fault occurred due to the snapping of Y phase jumper on LV side of 220/132 kV ICT-IV at Dehri.

As per PMU data at Gaya, fault clearing time is 900 ms.

Load Loss: 217 MW



BSPTCL & Powergrid may explain.

Deliberation in the meeting

BSPTCL explained the following:

- *The disturbance occurred due to snapping of R-phase Jumper on LV side of 220/132 kV ICT-II at Dehri. Earthfault protection of LV side operated for ICT-II. However there was a delayed tripping of the breakers. There was no tripping from HV side.*

- *At the same time, another fault occurred in ICT-IV due to short circuit of OTI & WTI cable and AC cable. ICT-IV tripped instantaneously with relay indications of differential, earth fault, OTI, WTI operated.*

- *As three no. of 220/132 kV ICTs were in service at that time, ICT-III got tripped on overcurrent E/F protection subsequently.*

Powergrid informed that 220 kV Gaya-Dehri-I & II got tripped from Gaya end in zone-3 timing of distance protection.

After detailed deliberation PCC opined the following:

- *As there was delayed tripping of LV side breaker for ICT-II and no tripping from HV side, as a result 220 kV Gaya-Dehri D/C line got tripped in zone-3 protection from Gaya end.*
- *The reason for non operation any protection at 220 kV side for ICT-II could not be explained. Also the reason for delayed tripping at LV side was not explained.*
- *The reason for operation of differential protection for ICT-IV also could not be explained.*

PCC advised BSPTCL to submit the detailed report along with all the relevant DR & EL within a week for further analysis.

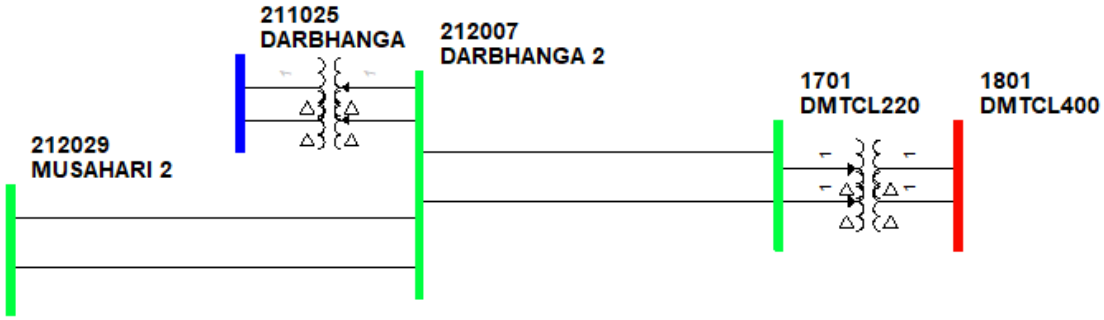
PCC advised Powergrid to configure the R-phase TBC status correctly in DR of 220 kV Gaya-Dehri-I and also to check for time synchronisation issue at Gaya end.

ITEM NO. B.4: Total power failure at 220 kV Darbhanga (BSPTCL) S/s on 16.08.2019 at 22:23 Hrs.

220 kV Darbhanga (DMTCL) – Darbhanga (BSPTCL) - II was not in service. At 22:23 Hrs, 220 kV Darbhanga (DMTCL) – Darbhanga (BSPTCL) - I tripped from DMTCL end on Y-N fault leading to load loss of around 186 MW at Darbhanga, Pupri, Madhubani, Pandual, Jhanjharpur area in Bihar system. At 23:15 Hrs, the line was charged from DMTCL end but again tripped at 23:17 hrs from Darbhanga(B) end.

No fault has been observed in PMU data.

Load Loss: 186 MW



Relay indications are as follows:

Name of the elements	Relay Indication at end 1	Relay Indication at end 2
220 kV Darbhanga (DMTCL) – Darbhanga (BSPTCL) - I	50/51 protection, F/C=0.62 and 0.87 KA in R & Y phases respectively	Not received.

DMTCL & BSPTCL may explain.

Deliberation in the meeting

BSPTCL informed that 220 kV Darbhanga (DMTCL)–Darbhanga (BSPTCL)–II was charged from DMTCL end on no load condition and 220 kV Darbhanga (DMTCL)–Darbhanga(BSPTCL)–I was radially connected from DMTCL end.

DMTCL informed that the due to jumper snapping at tower location no.8, 220 kV Darbhanga (DMTCL) – Darbhanga (BSPTCL) – I tripped on overcurrent earth fault protection from DMTCL end.

PCC observed that DR configuration at DMTCL end is not in order. PCC advised DMTCL to configure the DR settings as per the standard.

ERLDC informed that as per SCADA data recorded at ERLDC, 220 kV Darbhanga (DMTCL) – Darbhanga (BSPTCL) – I was out of service prior to the event and 220 kV Darbhanga (DMTCL) – Darbhanga (BSPTCL) – II tripped during the event.

PCC advised BSPTCL to check the SCADA data for 220 kV Darbhanga (DMTCL)–Darbhanga (BSPTCL) D/C lines at SLDC, Bihar.

ITEM NO. B.5: Total power failure at 220 kV EMSS (CESC) on 16.08.2019 at 16:22 Hrs.

220 kV EMSS was radially connected to Subhasgram via 220 kV Subhasgram – EMSS D/C. At 16:22 Hrs, 220 kV EMSS - Subhasgram - I tripped.

As per PMU data recorded at Subhasgram end, R-N fault occurred at 16:22:31.188 hrs followed by another fault in Y-phase at 16:22:31:688 hrs. Both the faults were cleared within 100 ms.

At 16:23:28 hrs 220 kV EMSS - Subhasgram – II tripped due to R-N fault resulting total power

failure at EMSS. As per DR received at Subhasgram end for 220 kV EMSS – I feeder, line tripped due to R-N fault after receiving DT from remote end and no A/R attempt taken place at Subhasgram end. Detailed report is enclosed at **Annexure-B5.**

Load Loss: 467 MW

Relay indications are as follows:

Name of the elements	Relay Indication at end 1	Relay Indication at end 2
220 kV EMSS - Subhasgram - I	R-Y, differential operated.	R-N, Z-I, F/C 19.1 kA, DT received; No A/R attempt
220 kV EMSS - Subhasgram - II	R-N differential operated, ID1 = 21 kA, IS1 = 1.7 Ka, 21.1 km	Not received

CESC & Powergrid may explain.

Deliberation in the meeting

CESC explained as following:

220 kV EMSS - Subhasgram – I

- *Initially there was an fault in R-phase of 220 kV EMSS-SGSS line -1 at 16:22:31.172 hrs. R-phase pole of Circuit breakers at both ends tripped through Line differential relay operation instantaneously.*
- *After 609 ms from fault inception point, another fault in Y-phase occurred on the same line. As the fault was within dead time(Dead Time setting 1.0 sec.) of the autoreclose relay, 3 phase tripping command was issued from both ends and the line got tripped.*

220 kV EMSS - Subhasgram – II

- *For 220 kV EMSS-SGSS line -2, there was an R-phase fault in the line at 16:23:28.222 hrs. R-pole of Circuit breakers got tripped from both ends through Line differential relay operation. Subsequently successful auto reclose occurred from both ends.*
- *After 1.86 sec from the first fault inception point, another fault occurred on R-Ph of 220 kV EMSS-SGSS line -2. As the second fault occurred within Reclaim time (25 sec), 3-Phase tripped command issued by auto reclose relay from both ends and the line got tripped.*

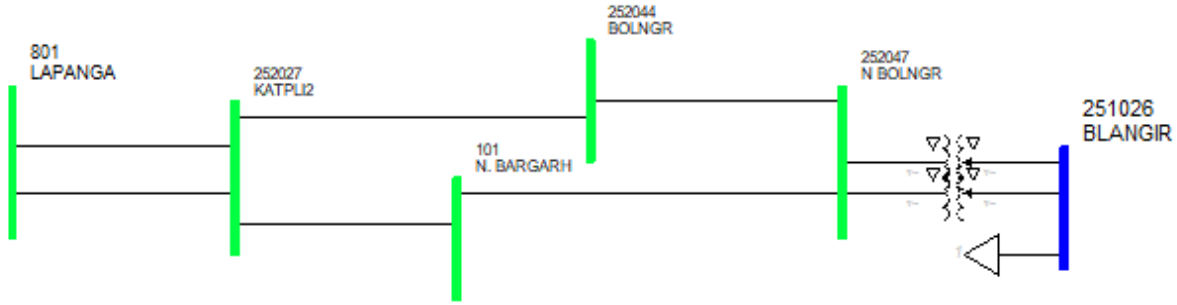
During DR analysis it was observed that time synchronization was not proper in DRs of Subhasgram end. PCC advised Powergrid to rectify the time synchronization issue.

ITEM NO. B.6: Disturbance at 220 kV New Bolangir(Sadaipalli) S/s on 13.08.2019 at 05:53 Hrs

At 05:18 hrs, 220 kV Bolangir (PG) – Sadaipalli S/C tripped from Sadaipalli end. At 05:53 hrs, 220 kV Bolangir (PG) – Katapalli S/C and 220 kV New Bargarh – Sadaipalli S/C tripped resulting total power failure at Sadaipalli (Bolangir New) and its surrounding connected areas.

Disturbance report submitted by OPTCL is enclosed at Annexure-B6.

Load Loss: 90 MW



Relay indications are as follows:

Name of the feeder	Relay Indication at End 1	Relay Indication at End 2
220 kV Bolangir (PG) – Sadaipalli S/C	Did not trip	Yet to be received
220 kV Bolangir (PG) – Katapalli S/C	R-N, F/C 2.91 KA, 14.2 km	R-N, Z-I, 1.59 kA, 87 km
220 kV New Bargarh – Sadaipalli S/C	R-Y, IR 1.2 KA, IY 5KA, 40 KM	Did not trip

OPTCL & Powergrid may explain.

Deliberation in the meeting

OPTCL informed that the weather was stormy with heavy rain and lightning. At 05:18 hrs, due to water ingress in 220 kV New Bolngir-Bolangir(PG) line breakers at New Bolangir end, DC earth fault occurred and tripped the breakers of that line from new bolangir end. At the same time, OSR relay of 220/132 kV ICT-II also operated due to water ingress in the OSR relay and tripped the ICT-II.

At 05:53 hrs, there was simultaneous R-N fault in 220 kV Bolangir (PG) – Katapalli S/C and in 220 kV New Bargarh – Sadaipalli S/C. For both the line the fault was cleared successfully from both ends in zone-I timing of distance protection. OPTCL added that both the circuits are on the same tower and the faults are due to the lightning.

On query, OPTCL informed that OSR relay has been changed and the breakers at New bolangir end would be replaced under PSDF scheme.

During analysis of DR, it was observed that one phase voltage was missing in DR of 220 kV Katapali- N.bolangir line at Katapali end. PCC advised OPTCL to configure the DR properly.

ITEM NO. B.7: Disturbance at 220 kV CTPS-B S/s on 08.08.2019 at 21:23 Hrs

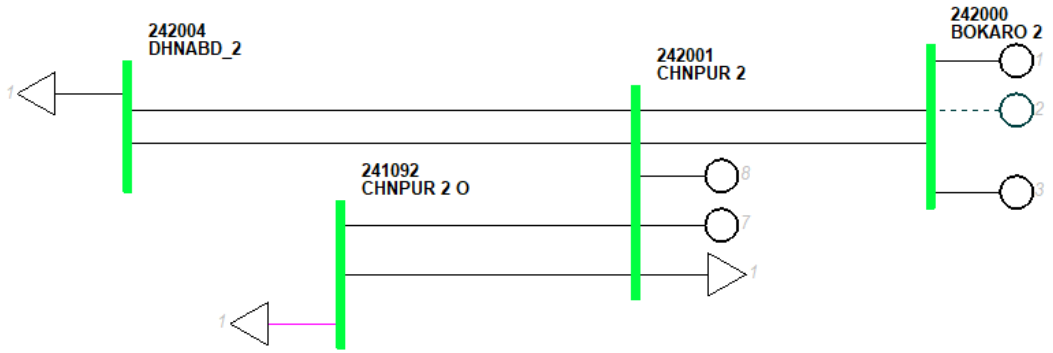
At 21:23 hrs, 220 kV CTPS B – Dhanbad – II (L#204) got tripped from both ends through Distance Zone 1 protection due to an R-N fault about 7 Km from CTPS End in that line.

Subsequently LBB protection of the Line operated at CTPS B end and tripped all the elements connected to 220 kV main bus-I. The following elements got tripped:

- 220kV CTPS-B-CTPS-A Tie Ckt-II(L#246),
- 220kV CTPS-B-Dhanbad Ckt-II (L#204),
- 220kV CTPS-B-BTPS-B Ckt-II (L#206)
- GT#8 & SST#8

Unit # 7(connected to bus II) also tripped due to auxiliary failure, resulting in a generation loss of 460 MW. Detail report is enclosed at **Annexure-B7**.

Generation Loss: 460 MW



Relay indications are as follows:

Name of the elements	Relay Indication at end 1	Relay Indication at end 2
220kV CTPS-B-Dhanbad -II	R-N, Z-I, distance 6.77 Km from CTPS B, F/C 11.8 kA. Finally tripped through LBB and 96 relay	R-N, Z-I
220kV CTPS-B-BTPS-B II	Tripped through 96	Yet to be received
220kV CTPS-B-CTPS-A Tie -II	Tripped through 96	Yet to be received
220kV CTPS-B-CTPS-A Tie -II	Tripped through 96	Yet to be received
GT # 8	Tripped through 96	
SST # 8	Tripped through 96	

DVC may explain.

Deliberation in the meeting

DVC informed that there was an R-N fault about 7 Km from CTPS End in 220 kV CTPS B – Dhanbad-II line. Both end of the line got tripped through Zone -1 of distance protection.

They added that during this fault the LBB relay of 220 kV CTPS B –Dhanbad-II at CTPS end sensed the fault and while measuring an high value of 'R Phase' current the relay went into hang condition.

As the LBB relay was in hung condition with high measuring current value, LBB trip command was issued by faulty DCD relay and tripped all elements connected to Main Bus # 2 including Bus Tie breaker through operation of respective 96 relays.

DVC informed that the faulty LBB relay has been replaced with Siemens make relay with retrip feature enabled. They added that all the DCD relay at CTPS station is being replaced with new relay.

Regarding tripping of Unit #7, DVC informed that on that day, due to certain fault in distribution transformers, the compressor drives of Unit#7 was connected to SST#8. When SST#8 got tripped the unit#7 also got tripped on auxiliary failure.

They informed that after the disturbance the issue has been resolved and all the distribution transformers were in operation. Also the DG set has also been in operation.

ITEM NO. B.8: Disturbance at 400 kV New Purnea S/s 29.08.2019 at 08:08 Hrs.

At 08:08 Hrs, the 400 KV Y-ph CT of 125MVAR bus reactor-1 main bay of New Purnea Sub-station had failed and caught fire. As the bay was in charge condition, 400kV busbar-2 protection operated and all the circuit breakers connected with 400kV bus-2 got tripped.

As the fault was persisting even after tripping of Busbar-2, all the connected feeders with bus-1 tripped on operation of Z-2 from remote end and Reverse zone from New Purnea end (except 400kV Kishangunj-I & II, whose main CB didn't trip as the line tripped from Kishangunj end in 350 msec in Z2). All the anti-theft charged line from New Purnea (Biharshar-1 &2 and Farakka) also tripped instantaneously. All the 220kV feeders were in service and power to Bihar STU was not interrupted.

Detail report is enclosed at **Annexure-B8.**

Generation/Load Loss: Nil

Powergrid may explain.

Deliberation in the meeting

Powergrid explained the disturbance with a presentation. The presentation is enclosed at Annexure-B8.1.

Powergrid informed that prior to disturbance the 125 MVAR Bus rector-1 connected to main bus-II was out of service though the corresponding bay was in charged condition.

At 08:08 hrs, Y-ph CT of main bay of the bus reactor-1 got failed and caught fire. The busbar protection operated for main bus-II and tripped all the main breakers connected to main bus-II.

However as the tie breaker of the faulty bay remain connected, the fault had not been cleared. As a result it leads to tripping of all elements from the healthy bus(main bus-I) on Zone-4 or by zone 2 of remote end.

Regarding non-operation of reactor differential protection for bus reactor-I, Powergrid stated that the operation of differential protection will be dependent upon the secondary current in differential core of Main CT and since this CT itself failed, its behaviour can't be summarized correctly.

However they explained that the fault location within CT may be towards bus side and outside of the reactor differential core. As a result, Differential Protection relay has not operated due to non-availability of differential current in the relay.

They added that the differential protection relay of Bus Reactor has been tested after the event and relay was operating satisfactorily on set value. The DRs of reactor differential protection were not available as the relay was of electromechanical type.

They further added that the differential protection relay of electromechanical type would be replaced by numerical relay at the earliest.

During DR analysis followings were observed:

- *The zone-3 protection of 132 kV Triveniganj-Purnea line at Tribeniganj has operated and tripped the line within 500 ms . PCC advised BSPTCL to review the reach settings as well as zone timings for distance protection relay at 132 kV Tribeniganj end.*
- *From the DRs submitted by BSPTCL, it was observed that the sampling frequency was set at 200 Hz which hampers in capturing the correct information. PCC advised BSPTCL to properly configure the DR settings as per the standard approved by PCC.*

ITEM NO. B.9: Disturbance at Talcher HVDC station on 05.08.2019 at 10:14 Hrs

At 10:14 hrs, pole-I of HVDC Talcher-Kolar blocked on operation of external protection trip operation. Prior to the blocking, power flow through HVDC link was 600 MW which did not change after the blocking of pole I. Due to SPS operation, generation at JITPL reduced from 540 MW to 490 MW.

Detail report received from Powergrid is enclosed at **Annexure-B9.**

Generation Loss: 50 MW

Powergrid may explain.

Deliberation in the meeting

Powergrid informed that due to controller issue, the cooling pump status for pump-2 got changed momentarily from On to Off and again to On condition. This momentary change in status of cooling pump operation caused the tripping of HVDC Talcher-Kolar pole-1.

They informed that the issue was referred to Siemens for further analysis.

ITEM NO. B.10: Multiple Tripping Incidents in the month of August' 19.-ERLDC

1. Multiple tripping event at Sipara on 05-08-19 at 08:35 Hrs.

At 08:35 Hrs, 220 KV Sipara-Khagul S/C tripped from both end in zone-1 of distance protection(A/R was successful at Khagul end). During the same time, '96' relay (Trip relay of LBB/Bus bar) Picked up at 220 kV Sipara end for this circuit and led to tripping of 220 KV Sipara-Patna -I ,220 KV Bus coupler at Sipara & 220 KV Sipara-Patna –III.

Discrepancies observed during this event are as following:

- As per PMU/DR data, fault on the circuit was cleared within 160 ms. The reason for tripping of 220 kV Patna – Sipara I & III and B/C at Sipara and operation of LBB may be explained. Even though LBB has operated, it has not resulted in complete one 220 kV bus tripping at Sipara as observed from the bus configuration submitted. (BSPTCL)
- The reason for breaker operation at Patna end for 220 kV Patna Sipara I circuit may be explained. (Powergrid)
- Whether the Bus Bar Protection at Sipara is in service need to be clarified.. In recent Visit of Protection Audit team to Sipara substation same has been found disabled. If the Bus bar is disabled then all lines should have zone 4 enabled with minimum time delay as advised in PCC forum of ERPC. Also, the directional feature were missing in 220 kV Patna-Sipara 1,2,3 Line Differential protection as voltage data from both ends were not integrated thus making it vulnerable to such faults. (BSPTCL)

BSPTCL & Powergrid may explain.

Deliberation in the meeting

BSPTCL informed that the fault was in 220 kV Sipara-Khagul S/C. The fault was cleared from both ends in zone-1 timing. At the same time due to obsolete busbar panel, the busbar relay malfunctioned and issued trip command which resulted in tripping of all the elements connected to main bus-2 including the 220 kV bus coupler.

They informed that the busbar protection was kept out of service after this incident.

Powergrid informed that 220 kV Patna-Sipara-I tripped from Patna end on receiving inter trip signal from Sipara end.

It was informed that protection audit of 220 kV Sipara substation was carried out by ERPC protection team on 23.08.2019. The audit report is attached at Annexure B10.1. PCC advised BSPTCL to comply the audit observations.

2. Multiple tripping event at Farakka at 16:40 Hrs on 16-08-19

At 16:40 hrs, R Phase to Earth fault occurred in 400 kV Farakka – Berhampur – circuit-I. A/R was successful at Farakka end (Relay Indication: R-N, F/C 5 kA). But line tripped at Berhampur with relay Indication of R-Y, Z-II, 84.44 KM, IR=2.18 IY=4.9 KA. At same time, Farakka unit 6 also got tripped on GT differential protection. Three phase voltage at Farakka PMU at the time of the event is shown below.

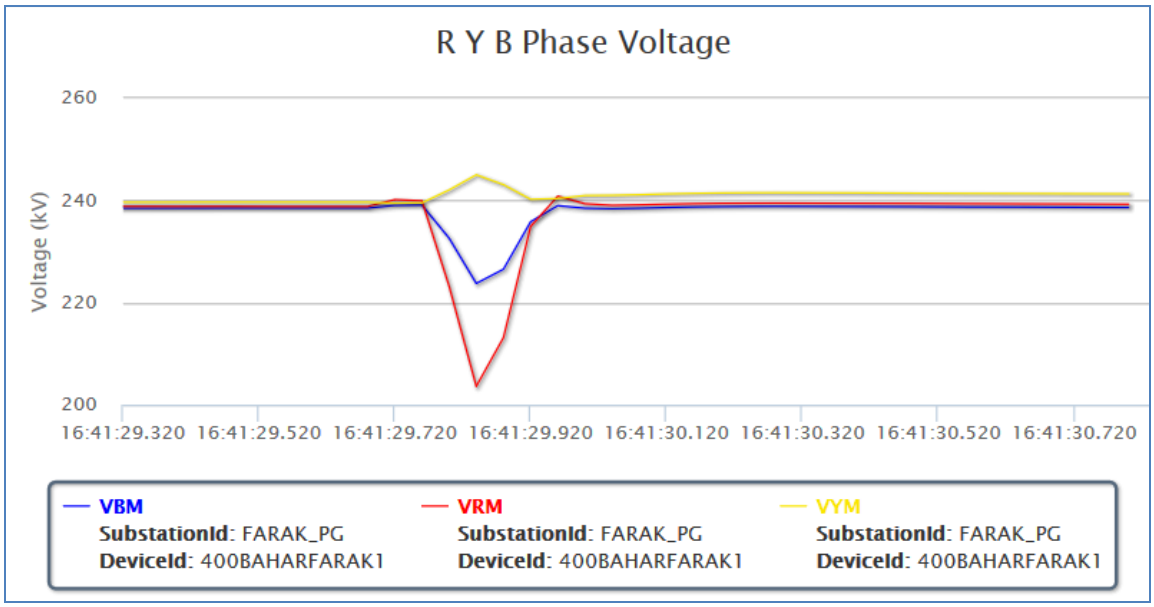


Figure 1: 400 kV Bus voltage of Farakka from PMU at the time of the event

In this tripping following issues has been observed:

1. Reason for tripping of Unit 6 on GT differential protection for external fault.
2. Reason for Phase to Phase fault detection at Berhampur end.

NTPC & Powergrid may explain.

Deliberation in the meeting

NTPC informed that differential protection of GT#6 operated as zero sequence current elimination setting was in 'OFF' condition in differential protection scheme. The same was enabled after the disturbance.

3. Multiple tripping event at Ranchi at 10:46 Hrs on 18-08-19

At 10:46 Hrs, 220 kV Ranchi-Hatia I and II got tripped due to R-Y-B fault. Simultaneously 400/220 kV ICT–II at 400/220 kV Ranchi substation also got tripped. Three phase voltage at Ranchi PMU at the time of the event is given in figure 2.

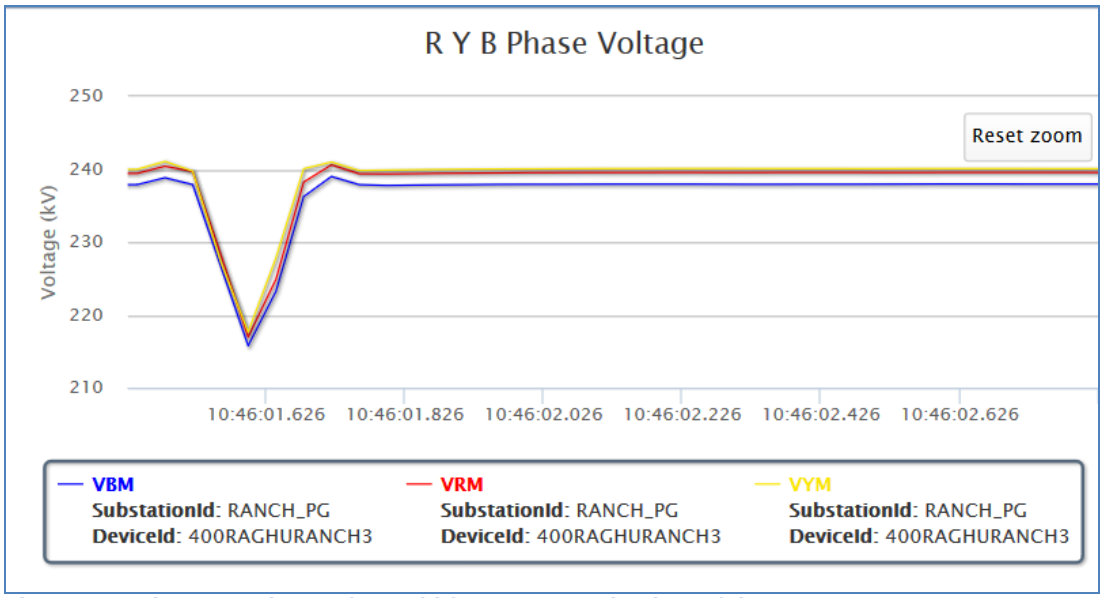


Figure 2:400 kV Bus voltage of Ranchi from PMU at the time of the event

Powergrid & JUSNL may explain.

Deliberation in the meeting

JUSNL informed that there was an R-Y-B-G fault in 220 kV Ranchi-Hatia-I line. Both the end cleared the fault in zone-1 timing of distance protection. Subsequently 220 kV Ranchi-Hatia-II tripped on overcurrent protection from Hatia end.

Powergrid informed that due to LLL-G nature of fault, heavy jerk was experienced in ICT as a result OSR relay operated and tripped the ICT.

4. Multiple tripping event at Biharshariff at 11:44 Hrs on 22-08-19

At 11:44 hrs, 400/220 kV ICT–II & III at 400/220 kV Biharshariff substation got tripped from 220 kV(BSPTCL) side along with tripping of 220 kV Biharshariff – Begusarai – II circuit.

As per DR received from Begusarai end, line tripped from Begusarai end on Distance Protection. As per 400 kV Bus voltage recorded at 400/220 kV Biharshariff substation and DR attached in the detailed report, fault was cleared within 100 ms.

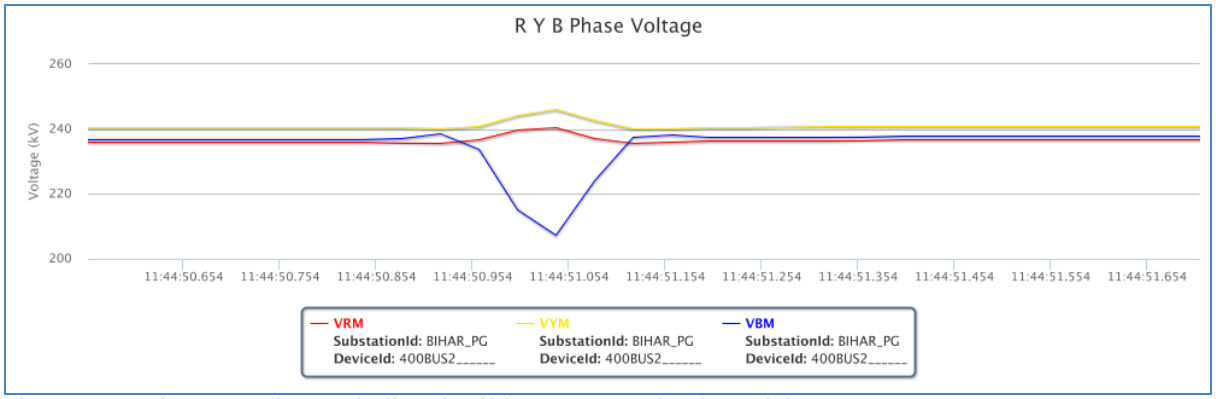


Figure 3: 400 kV Bus voltage of Biharsharif from PMU at the time of the event

BSPTCL and Powergrid may explain.

Deliberation in the meeting

BSPTCL informed that there was an B phase to ground fault in 220 kV Biharshariff – Begusarai – II circuit. Biharsharif end cleared the fault in zone-I of distance protection. However the tripping status at Begusarai end can not be explained by BSPTCL.

BSPTCL further informed that ICT-2 & ICT-3 also got tripped from LV side at the same time on operation of 86 relay.

After detailed deliberation, PCC opined that as the fault was cleared within 100 msec, the ICTs might have tripped on operation of highest protection.

BSPTCL informed that the no DR of ICT is available as relays at LV side of ICT are of electromechanical type.

PCC advised BSPTCL to check the tripping status of 220 kV Biharshariff – Begusarai – II circuit at Begusarai end.

PCC also advised BSPTCL to review the highest settings in ICT so that proper coordination can be achieved with respect to downstream line settings.

ITEM NO. B.11: Tripping Incidences in the month of August, 2019.

Other tripping incidences occurred in the month of August 2019 which needs explanation from constituents of either of the end is given in Annexure.

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 74th PCC, all the constituents were requested to submit the disturbance report along with DR through the new version of on-line portal which was implemented from 01st Jan. 2019.

Members may discuss.

Deliberation in the meeting

Members explained the tripping incidences. Updated status is enclosed at ***Annexure-B11.***

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

PART- C:: OTHER ITEMS

ITEM NO. C.1: Islanding Scheme at Kanti TPS- KBUNL

In 68th PCC Meeting, it was decided that the islanding of Kanti TPS would be implemented with the following scheme:

1. Stage II units (2x195 MW) of Kanti TPS will be islanded with station load of 40 MW and radial load of 150 MW (approx.) of 220kV Kanti TPS-Gopalganj D/C line.
2. Once the grid frequency falls to 48.2 Hz, the PLC at Kanti TPS would initiate the islanding process with 500 ms time delay.

In 78th PCC Meeting, NTPC suggested that a step wise islanding scheme may be planned considering different grid conditions and unit availability at Kanti TPS.

PCC advised NTPC to prepare a draft plan and submit to ERPC and ERLDC for detailed discussion in next PCC Meeting.

BSPTCL was advised to check the healthiness of PLCC system for all the BSPTCL lines connected to MTPS-II.

In 82nd PCC Meeting, NTPC submitted the revised islanding scheme for Kanti TPS. PCC decided to discuss the scheme in next PCC meeting.

Members may discuss.

Deliberation in the meeting

It was decided to convene a separate meeting through video conferencing with Bihar, NTPC, ERLDC & ERPC to discuss the islanding scheme.

ITEM NO. C.2: Implementation of differential protection for short distance lines in different substations connected to Powergrid ER-II.

In 40th ERPC &TCC Meeting, the implementation of differential protection for ten(10) no. of short distance lines has been approved and it was decided that the cost relating to implementation of fiber based differential protection scheme for both ends shall be borne by concerned utilities owning the line with Financial concurrence for Rs. 1,30,27,200/- (inclusive of GST).The list of the lines are as follows:

Sl. No.	Substation name	Name of the Line	Line length in km	Line owned by
1	Durgapur	220KV DGP (PG) - DVC Ckt.-I	1	DVC
2		220KV DGP (PG) - DVC Ckt.-II	1	DVC
3		400 kV DGP (PG) - Bidhan Nagar (WBSETCL) Ckt.-I	11	WBSETCL
4		400 kV DGP (PG) - Bidhan Nagar (WBSETCL) Ckt.-II	11	WBSETCL
5	Malda	132KV MLD (PG) - MLD (WBSETCL) Ckt.-I	5.94	WBSETCL
6		132KV MLD (PG) - MLD (WBSETCL) Ckt.-II	5.94	WBSETCL
7	Alipurduar	220KV ALPD (PG)- ALPD (WBSETCL) Ckt-I	6.377	WBSETCL
8		220KV ALPD (PG) - ALPD (WBSETCL) Ckt.-II	6.377	WBSETCL
9	Birpara	132KV BRP (PG) - BRP (WBSETCL) Ckt.-I	0.3	WBSETCL
10		132KV BRP (PG) - BRP (WBSETCL) Ckt.-II	0.3	WBSETCL

Powergrid vide mail informed that

"

As per the 40th decision of TCC & ERPC Meeting, balance procedures i.e. internal approval, budget allocation& other correspondences has been taken from concerned dept. and now we are in the verge of placing the NIT.

But, a mail received on dated: 28.06.2019 from M/s WBSETCL regarding similar type work executed by M/s GE ltd., Kolkata with a lower rate. Accordingly we had enquired from M/s GE for the same and they replied the relay supplied at WBSETCL and relay offered to POWERGRID are different models and hence rates are different. Details as follows:

To M/s WBSETCL: MICOM P643, 01 CT I/P, BI-16 & BO-14

To M/s POWERGRID: MICOM P646, 02 CT I/P, BI-24 & BO-32.

It may note that MICOM P646 model is approved model for POWERGRID Standard and recently we have placed order to M/s GE for fiber based line differential protection for POWERGRID 220KV Binaguri-Siliguri D/C line with same rate as they offered. ***Under these circumstances it is placed whether to proceed further for tendering / procurement as per the approval in the ERPC or WBSETCL shall do their own.***

"

Members may discuss.

Deliberation in the meeting

PCC advised Powergrid & WBSETCL to resolve the issue bilaterally.

ITEM NO. C.3: SPS at Rangpo for evacuation of power from Hydro stations in Sikkim-TUL

TUL vide mail informed that the 400 kV Rangpo-Binaguri D/C will be in shutdown from 14/10/19 to 04/11/19. In view of above, the modality of SPS at Rangpo need to be discussed.

Members may discuss.

Deliberation in the meeting

PCC decided that SPS which was earlier in place during shutdown of 400 kV Rangpo-Binaguri D/C in March-2019, would be implemented during proposed shutdown of 400 kV Rangpo-Binaguri D/C in the month of November-19. The said SPS was discussed and finalized in 155th OCC Meeting held at Newtown, Kolkata.

PCC advised TPTL to maintain the 400 kV Teesta III-Kishanganj line & 400 kV Rangpo-Kishanganj line in healthy condition during the shutdown of 400 kV Rangpo-Binaguri D/C so that unwanted tripping of the lines can be avoided.

ITEM NO. C.4: SPS operation of Talcher Kolar HVDC link on 05th and 6th August 2019.- ERLDC

On 05th August' 19 at 10:14 hrs, pole-I of HVDC Talcher-Kolar blocked on operation of external protection trip operation. Prior to the blocking, power flow through HVDC link was 600 MW which did not change after the blocking of pole-I. Due to SPS operation generation at JITPL reduced from 540 MW to 490 MW. Report, DOR, SER and TFR received from POWERGRID is attached.

On 06th August at 16:00 hrs, spurious SPS signal generated from HVDC Talcher and generation reduction occurred at Jindal and GMR.

NTPC & Powergrid may explain.

Deliberation in the meeting

With regard to tripping of pole-I, Powergrid informed that the issue has been rectified.

Regarding generation of spurious SPS signal, Powergrid informed that no such signals are being generated at Powergrid end.

GMR representative was not present in the meeting.

ITEM NO. C.5: Three phase tripping of tie breaker in case transient fault at Binaguri end of 400 kV Binaguri – Bongaigaon – I. -ERLDC

On 01st September'19 at 17:19 hrs, main breakers of 400 kV Binaguri–Bongaigaon–I successfully autoreclosed at Binaguri end for B-N fault. At the same time A/R operation started for tie breakers at Binaguri end. But all three poles of tie breakers tripped after 120 ms. Same observation has been observed at 04:25 am on 03rd September, 2019.

Powergrid may explain.

Deliberation in the meeting

Powergrid informed that the issue would be resolved in next available shutdown.

ITEM NO. C.6: Preparation of detailed report and flash report by SLDCs. - ERLDC

As per IEGC section 5.9, SLDC/STUs have to prepare flash report as well as detailed report for any GD/ GI/ grid events occurred in the intra state transmission networks. Format for the report is given in IEGC section 5.9.6. But any type of detailed report as well as flash report is yet to be received for many GD/GI/grid events which are discussed in PCC meetings. SLDCs may start prepare flash and detailed report for any GD/ GI/ grid events occurred in the intra state transmission networks.

Members may discuss.

Deliberation in the meeting

PCC advised all the SLDC/STUs to prepare and send flash report as well as detailed report for any GD/ GI/ grid events occurred at 132 kV and above level in their intra state transmission networks.

ITEM NO. C.7: FOLLOW-UP OF DECISIONS OF THE PREVIOUS PROTECTION SUB-COMMITTEE MEETING(S)

The decisions of previous PCC Meetings are given at Annexure.

In 73rd PCC, it was observed that latest status on the implementation of the previous PCC recommendations were not updated by the constituents regularly. All the constituents were advised to update the latest status of the recommendations as per the list given in Annexure.

Members may update the latest status.

Deliberation in the meeting

*Members updated the latest status which was enclosed at **Annexure-C7.***

ITEM NO. C.8: Schedule of training program to be conducted by PRDC

PRDC, as per the AMC, is going to conduct 2nd training programme on PDMS and PSCT in state utility premises of Eastern Region. The tentative schedule is given below:

Sl no.	State	Location	Date	Training
1.	West Bengal	NJP	**04.02.2019-05.02.2019**	**on PDMS**
		Durgapur	**07.02.2019-08.02.2019**	
2.	Bihar	North Bihar	**08.04.2019-09.04.2019**	
		South Bihar	**11.04.2019-12.04.2019**	
3.	Sikkim	-	**03.06.2019-04.06.2019**	
4.	Odisha	-	**08.07.2019-09.07.2019**	
5.	Jharkhand	-	**05.08.2019-06.08.2019**	
6.	For All States	ERPC	**02.09.2019-06.09.2019**	**on PSCT**

PRDC informed that the training programme on PDMS has already been completed in West Bengal, Bihar, Sikkim & Odisha as per the schedule.

Members may update.

Deliberation in the meeting

Members noted.

ITEM NO. C.9: Status of Third Party Protection Audit

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

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

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

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

In 77th PCC, BSPTCL has submitted the updated status.

In 79th & 80th PCC, BSPTCL was advised to submit the details of the compliance report.

BSPTCL may update.

Deliberation in the meeting

Members noted.

ITEM NO. C.10: Non-commissioning of PLCC / OPGW and non-implementation of carrier aided tripping in 220kV and above lines.

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

List of line where auto reclose facility is not available(Information based on PMU data analysis)

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

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

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

OPTCL:

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

BSPTCL:

Sl No.	***Lines***	***Status***
1	*220 kV Purnea(PG)-Madhepura*	*Protection through PLCC is working properly*
2	*220 kV Biharsharif-BTPS new*	*Commissioning of PLCC is under progress.*
3	*220 kV BTPS new- Begusarai*	*Commissioning of PLCC is under progress.*
4	*220 kV Biharshariff-Bodhgaya line LILO at Khizersarai*	*OPGW is present. Protection is done through DPC.*
5	*220kV MTPS-Motiari line*	*OPGW is installed.*
6	*220KV Madhepura-New Purnea D/C*	*Protection through PLCC is working properly*
7	*220KV Muzaffarpur-Hajipur D/C line*	*Protection through PLCC is working properly*
8	*220KV Patna-Khagaul-SC*	*PLCC Panel working properly.*
9	*220 kV DMTCL(Darbhanga)-Laukhi Circuit-I*	*PLCC Panel working properly*
10	*220 kV Tenughat-Biharsharif S/C*	*PLCC to be commissioned*
11	*220 kV Gaya-Sonenagar New circuit-I*	*Communication through OPGW*
12	*220 kV Pusauli-Dehri S/C*	*PLCC not working*
13	*220 kV Begusarai-Purnea(PG) D/C*	*PLCC working properly*
14	*220 kV DMTCL-Motipur ckt-II*	*PLCC to be commissioned.*
15	*220 kV Dehri- Gaya D/C*	*PLCC working properly*
16	*220 kV Kishanganj(PG)-Kishanganj(B)-II*	*PLCC working properly*

In 79th PCC, BSPTCL submitted PLCC status of some of the lines. The details have been updated in above table.

In 80th PCC meeting, BSPTCL was advised to rectify the PLCC & Autoreclose issues in coordination with their communication wing.

Members may update.

Deliberation in the meeting

Members noted.

ITEM NO. C.11: Additional Agenda

1. **Implementation of Differential Protection in 400 kV Indravati(PG)- Indravati(UIHEP) line. – Powergrid**

Powegrid Odisha vide letter dated 26.09.19 informed that due to tree infringement, repeated trippings were observed in 400 Indravati(PG)- Indravati(UIHEP) line.

As the line length is only 4 Km, Indravati(PG) end was sensing the fault in zone-3. As a result upstream lines i.e. 400 kV Jeypore-Indravati S/C line and 400 kV Rengali-Indravati S/C line were

being tripped in zone-2 prior to tripping of 400 kV 400 Indravati(PG)- Indravati(UIHEP) line from Indravati(PG) end.

Powergrid suggested to implement line differential Protection in 400 kV Indravati(PG)-Indravati(UIHEP) line and requested to discuss the issue in the meeting. The letter is enclosed at Annexure C11.1.

Deliberation in the meeting

After detailed discussion, PCC advised to implement line differential protection in 400 kV Indravati(PG)- Indravati(UIHEP) line as a permanent measure. PCC also advised OPTCL and OHPC to take appropriate action to implement OPGW based communication for the above line.

PCC advised Powergrid to set the zone-3 timing at a reduced value of 400 msec at Indravati(PG) end for 400 Indravati(PG)- Indravati(UIHEP) line as an interim measure.

2. Checklist for protection Coordination w.r.t. New elements.-ERLDC

Various new elements have been integrated into the Eastern Regional Grid since Jan 2019. The list of such elements along with a checklist of remote end is provided at Annexure C11.2. Constituents need to coordinate and check their protections setting w.r.t. new elements.

Deliberation in the meeting

PCC advised all the utilities to go through the list and coordinate the protection settings at their end wherever required.

3. Protection Coordination confirmation for Bus split operation at Maithon.-ERLDC

DVC and MPL may confirm the protection coordination at their respective ends after the bus split operation on Maithon.

Deliberation in the meeting

DVC informed that they have implemented the protection settings at their end for bus split mode.

MPL representative was not present in the meeting.

Participants in 83rd PCC Meeting of ERPC

Venue: ERPC Conference Hall, Kolkata Time: 11:00 hrs Date: 27.09.2019 (Friday)

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

Participants in 83rd PCC Meeting of ERPC

Venue: ERPC Conference Hall, Kolkata Time: 11:00 hrs Date: 27.09.2019 (Friday)

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

Incident No. 16-08-19/1 (revised) **Dtd: 12-09-19**

Report on the incident in Eastern Region involving WBSETCL (CESC) system

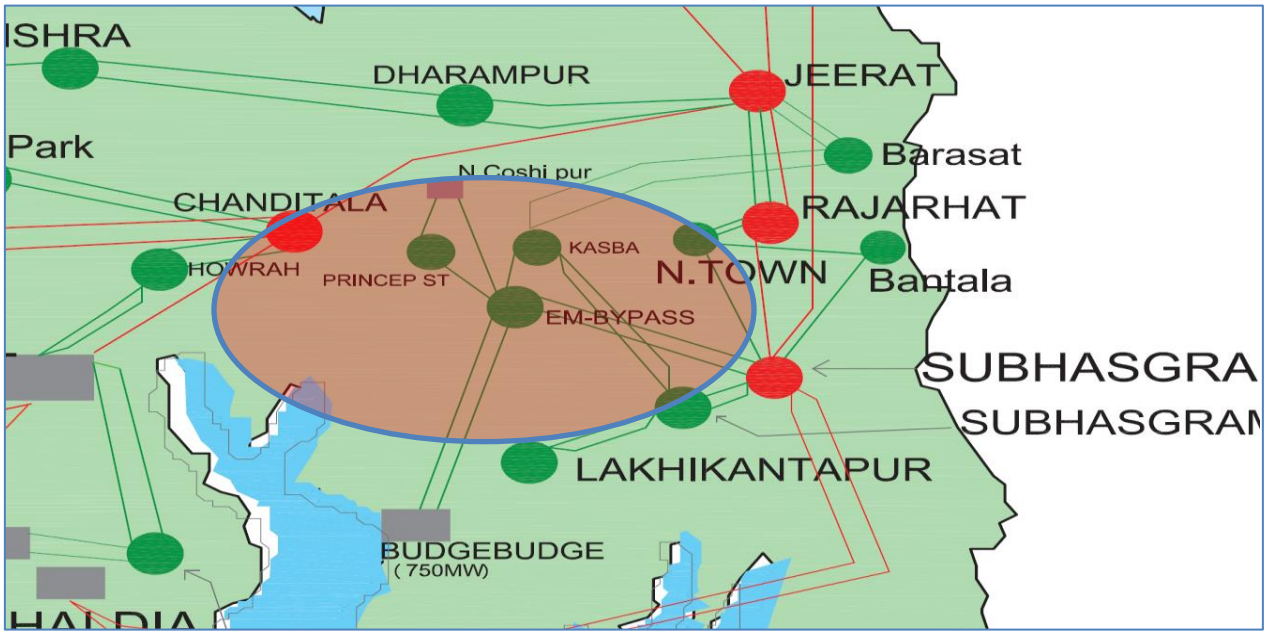
1) **Date / Time of disturbance:** 16-08-19, 16:22 hrs.
2) **Event type:** GD - I
3) **Systems/ Subsystems affected:** EMSS
4) **Antecedent condition:** EMSS was radially connected to Subhasgram via 220 kV Subhasgram – EMSS D/C
5) **Load and Generation loss :** 467 MW load loss occurred with no generation loss
6) **Major elements tripped:**
   - 220 kV Subhasgram – EMSS D/C
7) **Network across affected area**
8) 

Figure 1: Network across affected area

9) **Detailed Analysis and relay indication:**

EMSS was radially connected to Subhasgram via 220 kV Subhasgram – EMSS D/C. 220 kV EMSS - Subhasgram - I tripped at 16:22 hrs. As per PMU data recorded at Subhasgram end, R-N fault occurred at 16:22:31.188 hrs followed by another fault in Y-phase at 16:22:31:688 hrs. Both the faults were cleared within 100 ms. At 16:23:28 hrs 220 kV EMSS - Subhasgram – II tripped due to R-N fault resulting total power failure at EMSS. As per DR received at Subhasgram end for 220 kV EMSS – I feeder, line tripped due to R-N fault after receiving DT from remote end and no A/R attempt taken place at Subhasgram end. DR at Subhasgram and EMSS is not time synchronized.

Time	Name	Relay Indication at End 1	Relay Indication at End 2
16:22:31 Hrs	220 kV EMSS - Subhasgram - I	R-Y, differential operated.	R-N, Z-I, F/C 19.1 kA, DT received; No A/R attempt
16:23:28 Hrs	220 kV EMSS - Subhasgram - II	R-N differential operated, ID1 = 21 kA, IS1 = 1.7 Ka, 21.1 km	Yet to be received

Table 1: Relay Indication as per report received from BSPTCL

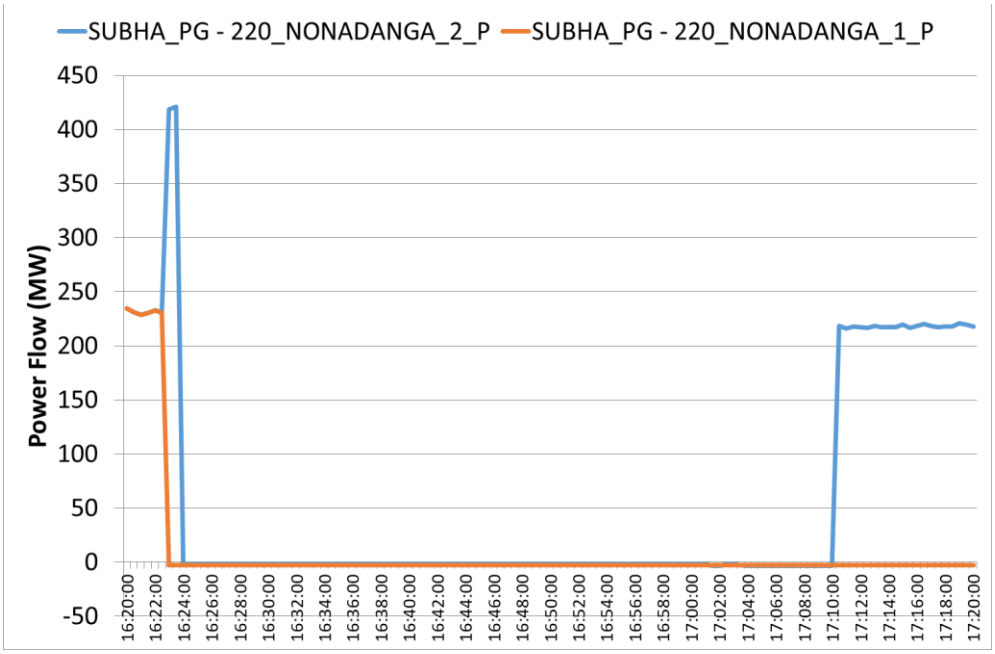


Figure 2: Power flow through various feeders at the time of the events

10) PMU observation:

As per PMU data recorded at Subhasgram end, R-N fault occurred at 16:22:31.188 hrs followed by another fault in Y-phase at 16:12:31:688 hrs. At 16:23:28 hrs another R-N fault has been observed. All the faults were cleared within 100 ms.

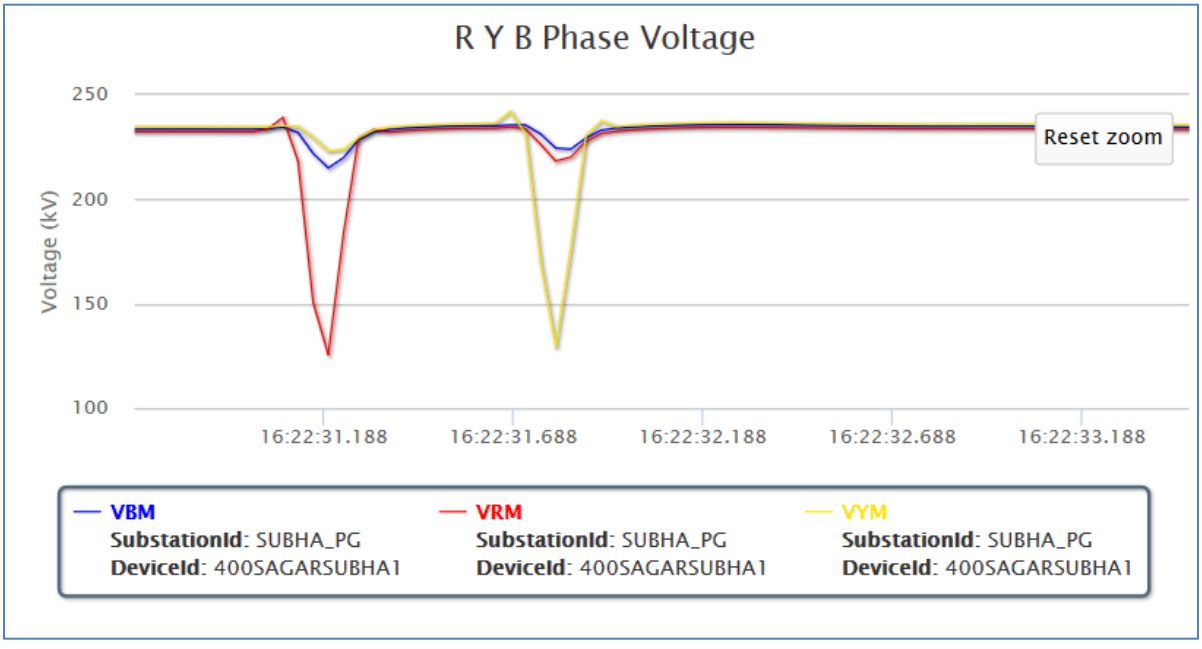


Figure 3: Three phase voltage of 400 kV Subhasgram substation captured at the time of tripping of circuit I

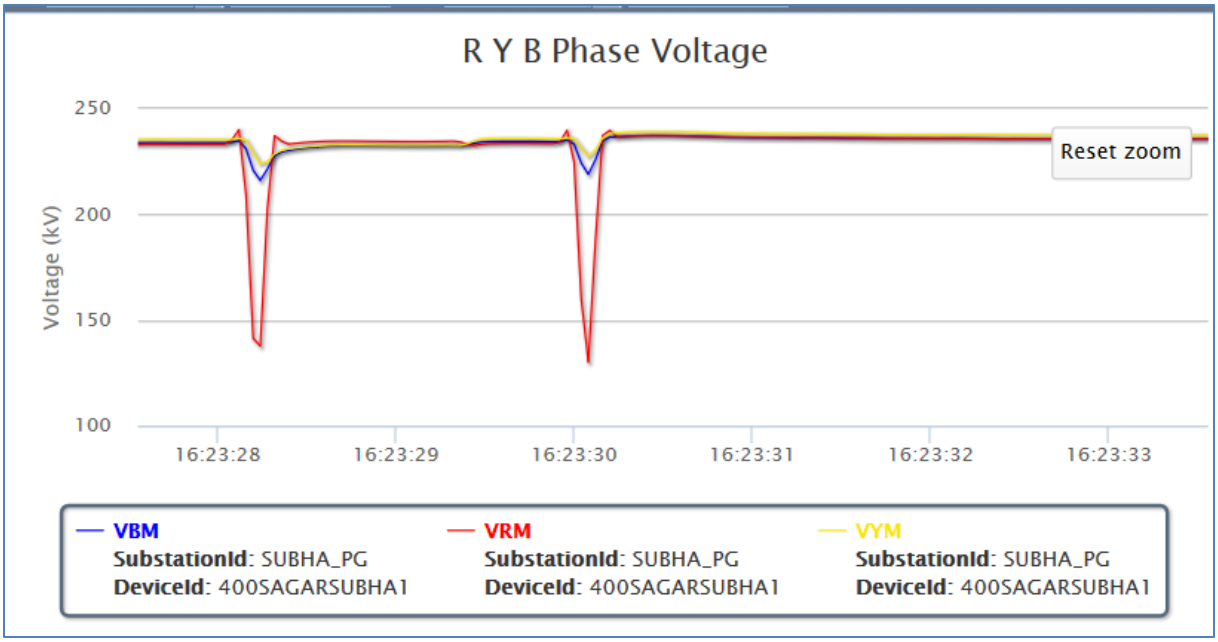


Figure 4: Three phase voltage of 400 kV Subhasgram substation captured at the time of tripping of circuit II

11) Restoration:

Load at New Cossipore, Belur and Princep Street was restored from 16:25 to 16:29 hrs. That is all restored220 kV EMSS – Subhasgram D/C were restored at 17:28 and 17:10 respectively

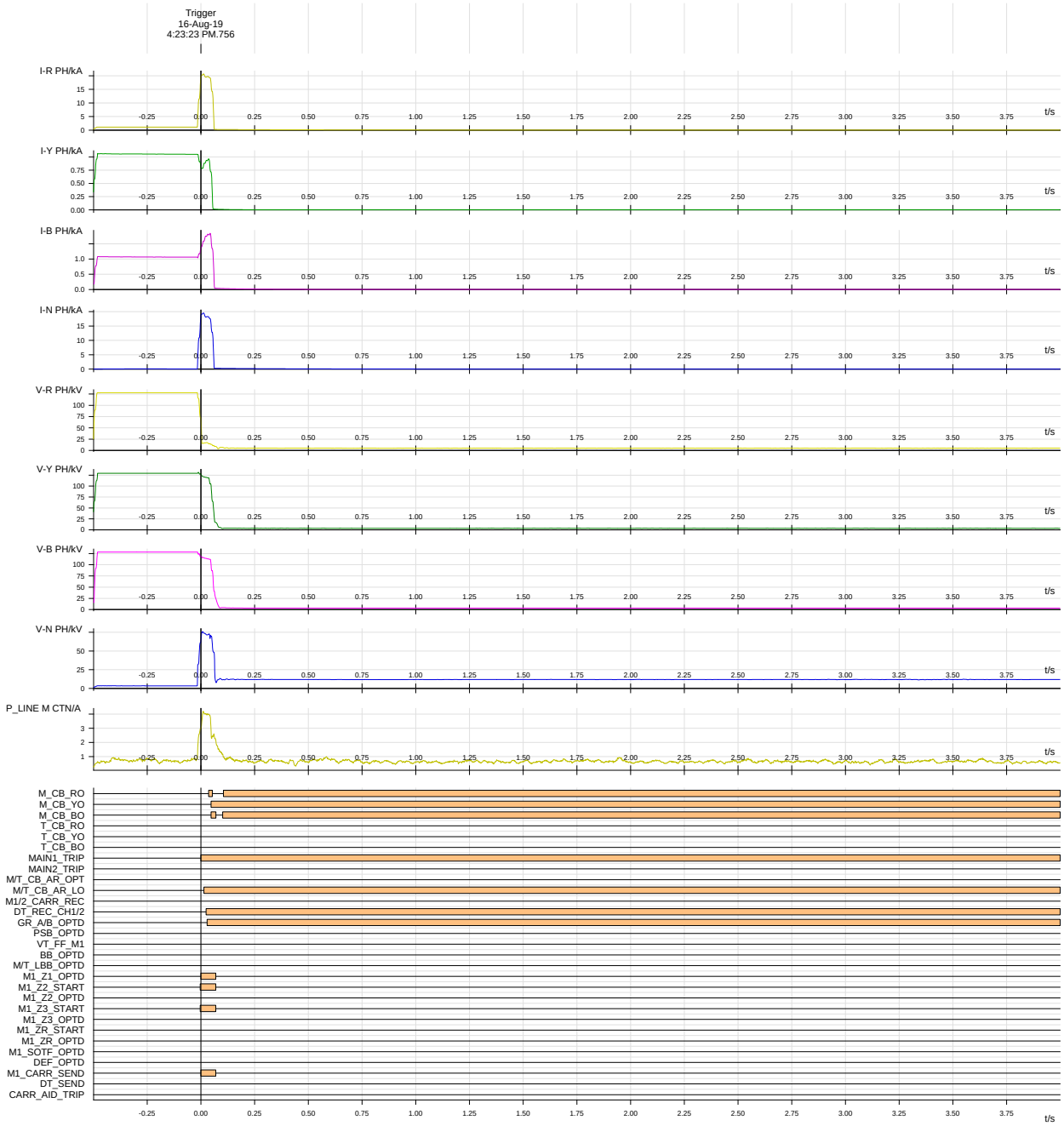
12) Non-Compliance Observed during the event:

Issues	Regulation Non-Compliance	Utility
DR/EL not provided within 24 Hours	1. IEGC 5.2 (r) 2. CEA grid Standard 15.3	POWERGRID ER-II, WBSETCL (CESC)
DR/EL are not time synchronized	1. Indian Electricity Grid Code 4.6.3 2. CEA Technical Standard for Construction of Electrical Plants and Electric Lines: 43.4 .D. 3. CEA (Technical standards for connectivity to the Grid) Regulation, 2007: Schedule Part 1.7.	POWERGRID ER-II, WBSETCL (CESC)

13) Status of Reporting:

DR received from POWERGRID and EMSS.

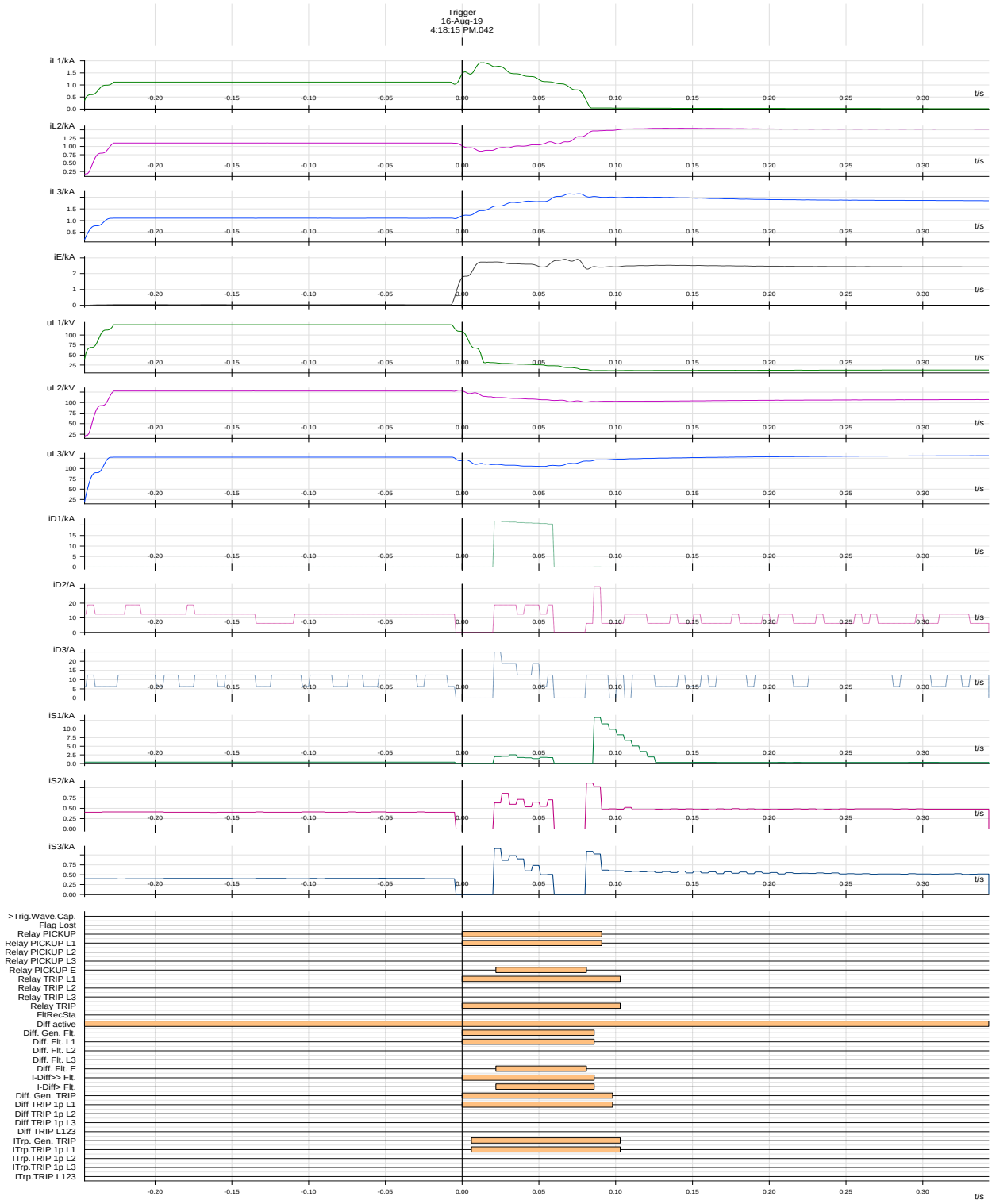
DR recorded at Subhasgram for 220 kV Subhasgram – EMSS – I at 16:23:23 hrs



Observation:

R-N, Z-I, F/C 19.1 kA, DT received, DR not time synchronized as per PMU data at Subhasgram end

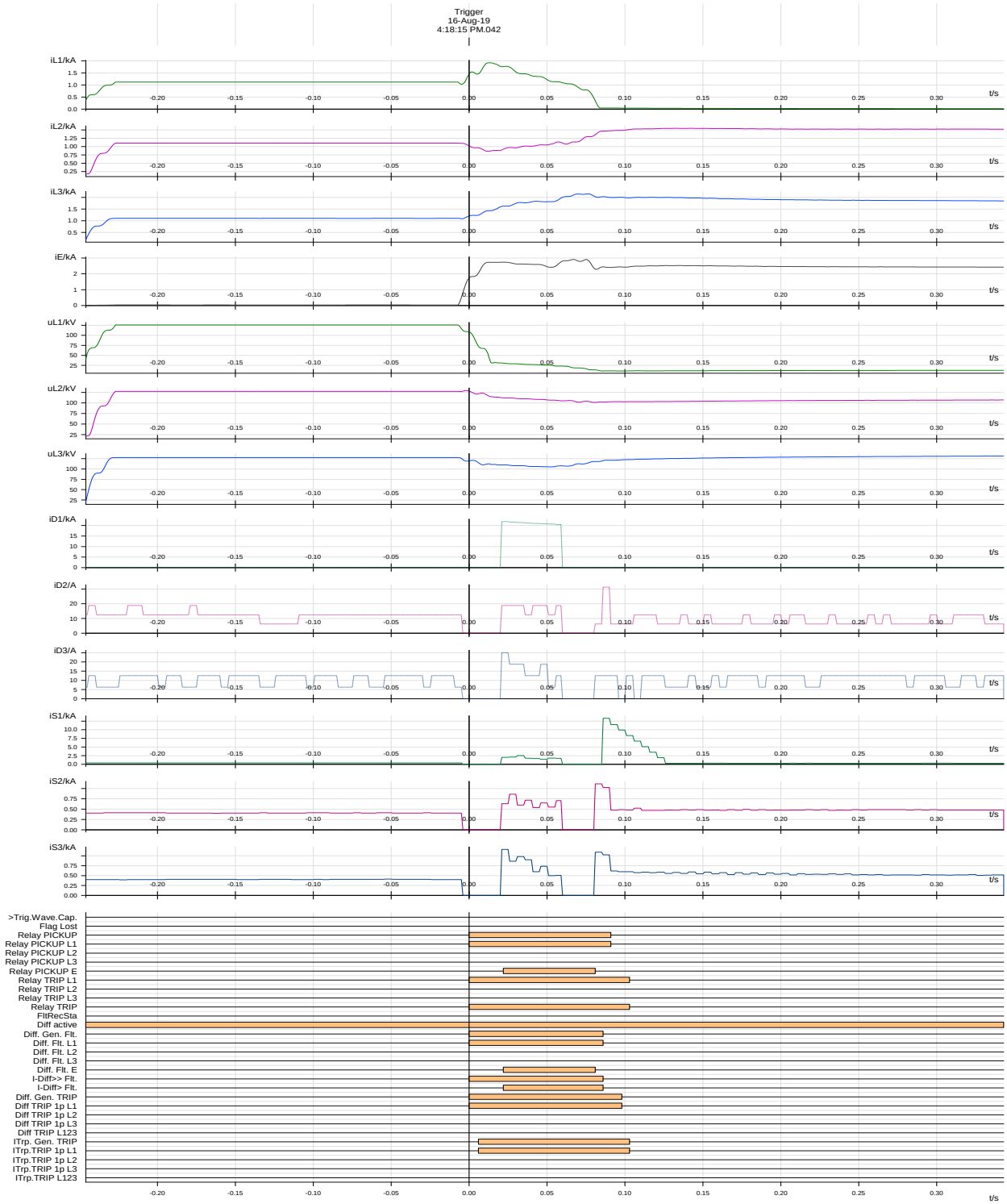
DR recorded at EMSS for 220 kV Subhasgram – EMSS – I at 16:18:15 hrs



Observation:

R phase differential operated, Fault distance 21.1 km

DR recorded at EMSS for 220 kV Subhasgram – EMSS – II at 16:18:15 hrs



Observation:

R-N differential operated, ID_1 = 21 kA, IS_1 = 1.7 kA.

Report received from CESC

EVENT ON 16.08.2019

At 16:22 hrs. and 16:23 hrs. 220 KV F. Subhasgram-EMSS 1 and F. Subhasgram-EMSS 2 tripped from both Subhasgram Substation and EMSS respectively causing interruption of Subhasgram import at EMSS. Total Load Shed around: 470 MW. (NCSS, P. St GIS Reserve 1 and Reserve 2 bus, EMSS 33 kV Main and Reserve bus, KRS (33 kV Siemens and EE bus), BTRD S/S and BRS 33KV SIE bus (M1, M2 and M3 bus), 33 kV SND Buses (Main 1 and Main 2 bus)).

Network prior to disturbance:

220 kV SGSS 1&2 were connected to Main-2 bus. 160 MVA T1, T2 & T5 and NCSS and PRS were feeding from same Bus.

Relay Operation:

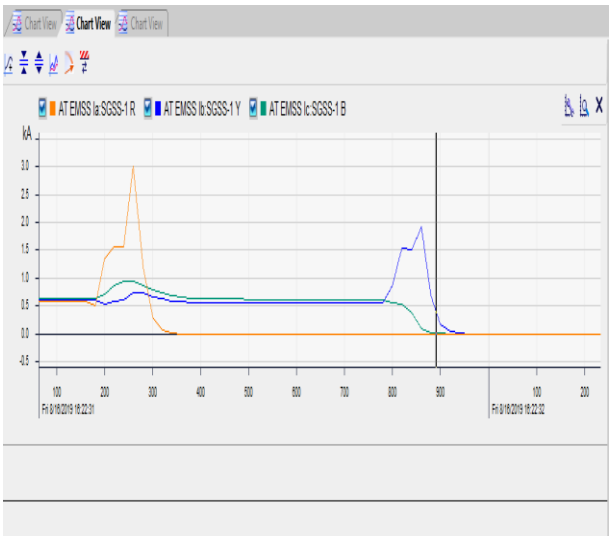
SL. No	Name of Bay/Line	Relay Operation at EMSS end	Relay Operation at Subhasgram S/S end.
1	220kV Subhasgram-1	Line Differential Protection, R-Ph, Y-Ph and I/T rec. Distance: 22.9 km	Line Differential Protection, R-Ph, Y- Ph and D/T rec. Distance: 0.9 km
2	220kV Subhasgram-2	Line Differential Protection, R-Ph, and I/T rec. Distance: 21.1 km	Line Differential Protection, R-Ph, and D/T rec. Distance: 1.25 km

Analysis:

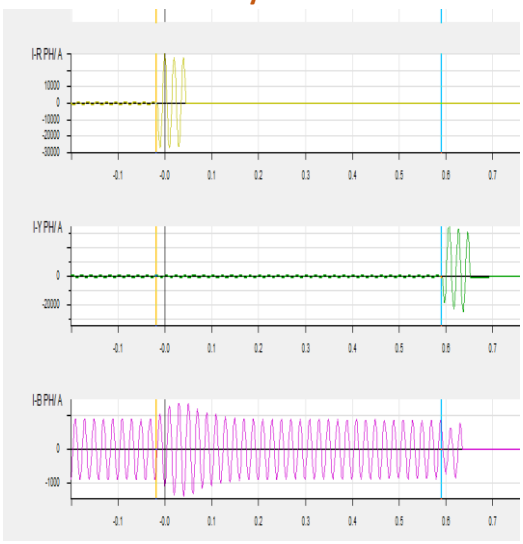
- Event-1:
  R-Ph fault occurred on 220 kV EMSS-SGSS line -1 at an around 16:22:31.172 hrs. Red pole of CBs at both ends tripped through Line differential relay operation. Fault current from EMSS end and SGSS end were 3. 1kA and 19.5 kA respectively. Fault was cleared within 80 ms from fault inception point.

  After 609 ms from fault inception point Y-Ph fault occurred on the same line and 3 phase tripping command issued from both ends due to evolving fault experienced by Auto reclose relay within Dead Time (Dead Time setting 1.0 sec.).

Record From PMU at EMSS



Record From Relay of Ckt.EM-1 at SGSS

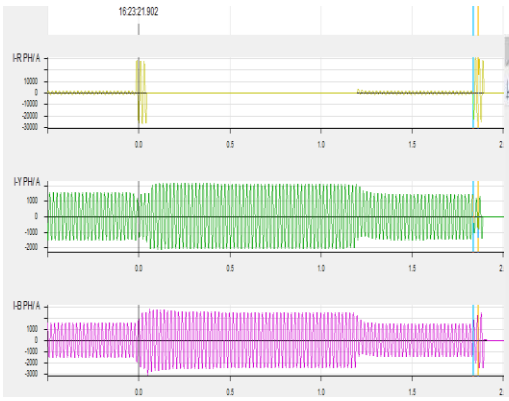


- **Event-2:**

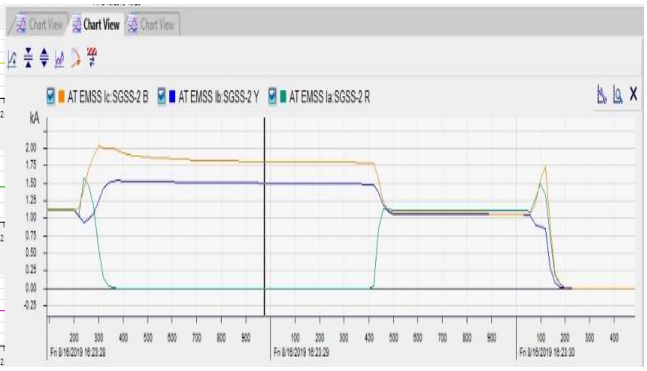
R-Ph fault occurred on 220 kV EMSS-SGSS line -2 at an around 16:23:28.222 hrs. Red pole of CBs at both ends tripped through Line differential relay operation. Fault current from EMSS end and SGSS end were 1.4kA and 20.2 kA respectively. Fault was cleared within 60 ms from fault inception point.

After 1.2sec from fault inception point successful Auto Reclose occurred from both ends.
Again fault occurred on R-Ph of 220 kV EMSS-SGSS line -2 after 1.86 sec from the first fault inception point. Fault current from EMSS end and SGSS end were 1.35kA and 20.3 kA respectively. Fault was cleared within 63 ms from fault inception point.
As the second fault occurred within Reclaim time (25 sec) , 3-Ph tripped command issued by Auto reclose relay from both ends.

Record From Relay of Ckt.EM-1 at SGSS



Record From PMU at EMSS



SYSTEM DISTURBANCES REPORT
(Detail Report)

(1) **Date & Time of Occurrence**: Dt. At 05:53 Hrs of dt. 13.08.2019
Name of the Sub Station/ Generating Station:- 220/132/33 KV GRID S/S, BOLANGIR(NEW)

(2) **Details of Occurrence**:

On dt. 13-08-19 at 05.18hrs - Grid disturbance at 220/132/33 KV Grid S/S, Bolangir New occurred. Due to DC leakage fault in Oil Surge Relay of 220/132/33KV Auto TRF-2,OSR operated & the concern breaker tripped. Simultaneously 220KV Bolangir (New)- Bolangir (PGCIL) ckt tripped. Subsequently at 05.53Hrs 220KV Bolangir (New) -Baragarh (New) feeder tripped which led to complete blackout at Grid S/S, Bolangir(New).

(3)Sequence of Tripping with relay indication:

Sl. No	TIME (Hr:min)	Line / ATR / Unit	Relay Indications	Remarks
1	05:18 Hrs	160MVA,220/132 kV AUTO TRF -II	Oil Surge Relay Operated.	Tripped Both sides.
2	05:18 Hrs	220KV Bolangir (New)-Bolangir(PGCIL) CKT	No relay indication.	Tripped at Bolangir (New) end.
3	05:53Hrs	220KV Bolangir New-Baragarh New ckt.	**At Bolangir (New) end**-DP-1(ALSTOM, MICOM-P444), Zone-1 trip, Fault Loop – L1-E, FD -35.17 KM, FC- Ir- 504.3A, Iy-240.84A, Ib- 508.38A **At Bargarh (New) end**:-DP-1(ALSTOM, MICOM-P444), Zone -1, Fault Loop – L1-E , FD - 39.8 KM, FC- Ir-2.4489 KA, Iy-263.58A, Ib-464.44A.	Tripped at both ends.

Note:-
No tripping of 132KV and 33KV feeders at Bolangir New end during the disturbance.

(4)Weather Condition: heavy to very heavy rain, thunder, lightning & flood like situation.
(5)PLCC counter readings: Not applicable
(6)Restoration:

06:08 Hrs:- 220KV Bolangir (New)- Bolangir (PGCIL) ckt Charged and stood ok.
06.08 Hrs:- 160MVA Auto TRF –I charged and stood ok.
06:32 Hrs:- 220KV Bolangir (New)-Baragarh (New) ckt Charged and stood Ok.
19.35 Hrs:- 160MVA Auto TRF-II charged and stood ok.

(7) Calculation of Generation/ Load Loss:-

Generation Loss- 0 MW
Load Loss - 47 MW
Energy unserved- 0.01175 MU

16/9/19
GM(OS), SLDC
OPTCL,Bhubaneswar

Letter No-SGM(PS)/MIS/237- 2990 (10) **Date** 16.09.2019

Copy Forwarded to the

1.Director(Engg), OERC, Bhubaneswar
2. DGM, 220/ 132 /33 KV Grid S/S, Bolangir(New)
3. DGM, E & MR Division, Bolangir(New)
4. GM,EHT (O&M), OPTCL Headquarters.
5. Member Secretary, GCC
6. Sr GM (RT& C), OPTCL, Bhubaneswar
7. CGM (O&M), OPTCL, Bhubaneswar
8.. GM, ERLDC, Kolkata
9. Member Secretary, ERPC, Kolkata
10.EA to CMD, OPTCL, Bhubaneswar for favour of information.

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

Incident No. 08-08-19/1 (revised) **Dtd: 14-09-19**

Report on the incident in Eastern Region involving DVC system

1) **Date / Time of disturbance:** 08-08-19, 21:23hrs.
2) **Category** : - GI-I
3) **Systems/ Subsystems affected:** CTPS B
4) **Quantum of load/generation loss**: 460 MW generation losses with no load loss.
5) **Antecedent condition:** All the 220 kV feeders connected to CTPS B S/S, are distributed as given in table 1

220 kV CTPS B Main Bus I	220 kV CTPS B Main Bus II
220kV CTPS-B-CTPS-A Tie Ckt-II(L#246)	220kV CTPS-B-CTPS-A Tie Ckt-I(L#245)
220kV CTPS-B-Dhanbad Ckt-II (L#204)	220kV CTPS-B-Dhanbad Ckt-I (L#203)
220kV CTPS-B-BTPS-B Ckt-II (L#206)	220kV CTPS-B-BTPS-B Ckt-I (L#205)
GT#8	GT#7
SST#8	SST#7
B/C was in opened condition	

Table 1: Bus wise feeder arrangement at CTPS B prior to the incident

6) **Major elements tripped:**
   220kV CTPS-B-CTPS-A Tie Ckt-II(L#246)
   220kV CTPS-B-Dhanbad Ckt-II (L#204)
   220kV CTPS-B-BTPS-B Ckt-II (L#206)
   Unit VII & VIII at CTPS B
7) **Network across affected area**

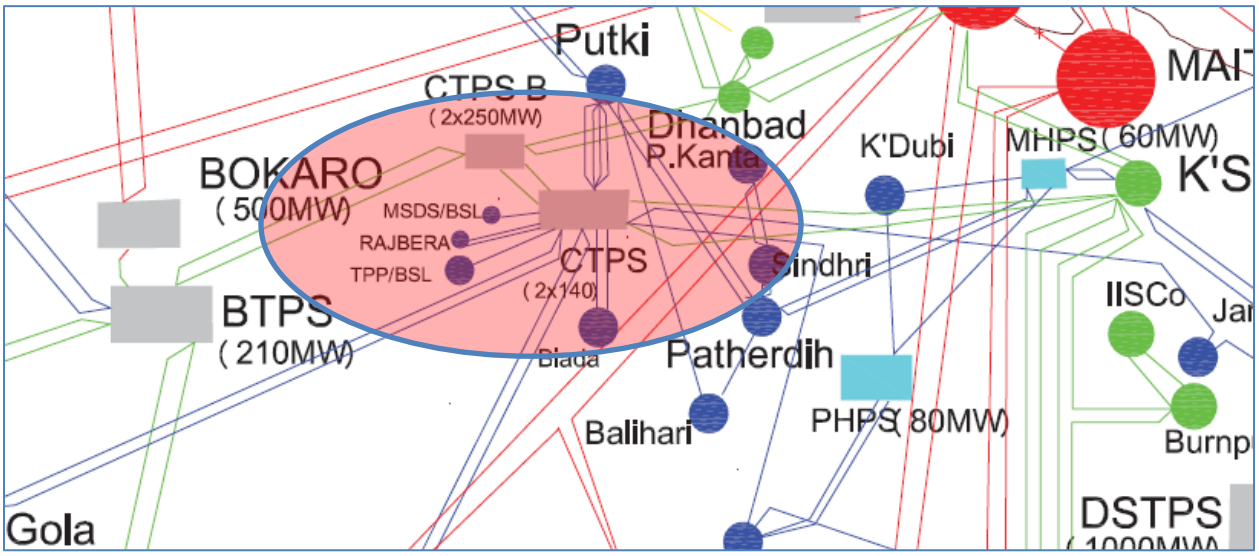


Figure 1: Network across affected area

8) Sequence of events & Detailed Analysis:

At about 21:23Hrs on 08-08-19, There was an R-N fault about 7 Km from CTPS End in 220 kV CTPS B – Dhanbad – II (L#204) for which the line had tripped from both ends through Distance Zone 1. At CTPS end the LBB relay senses the fault and hangs measuring an outrageously high value of 'R Phase' current (Highest fault current measured is 13.897 kA in R phase at CTPS end for Dhanbad – II feeder (L#204) but fault current shown in LBB DCD is 118.7 In i.e. 118.7 * 800/1 = 94.96 kA in R phase). The 'R' Pole of CTPS end CB opened in around 50ms and fault cleared. But as the LBB relay has hanged it issues bus trip command resulting tripping of all connected feeders to bus I (L#204 was connected to bus I and B/C was in opened condition prior to the incident) i.e. 220kV CTPS-B-CTPS-A Tie Ckt-II(L#246), 220kV CTPS-B-Dhanbad Ckt-II (L#204), 220kV CTPS-B-BTPS-B Ckt-II (L#206) and unit VIII at CTPS B. Unit VII (connected to bus II) also tripped due to auxiliary failure, resulting in a generation loss of 460 MW.

Name of the feeder	Relay Indication at End 1	Relay Indication at End 2
220kV CTPS-B-CTPS-A Tie -II	Tripped through 96	Yet to be received
220kV CTPS-B-Dhanbad -II	R-N, Z-I, distance 6.77 Km from CTPS B, F/C 11.8 kA. Finally tripped through LBB and 96 relay	R-N, Z-I
220kV CTPS-B-BTPS-B II	Tripped through 96	Yet to be received
Unit VIII at CTPS B	Tripped through 96	
Unit VII CTPS B	Due to compressor failure (because of Auxiliary Power Fail).	

Table 2: Relay Indication of tripped elements

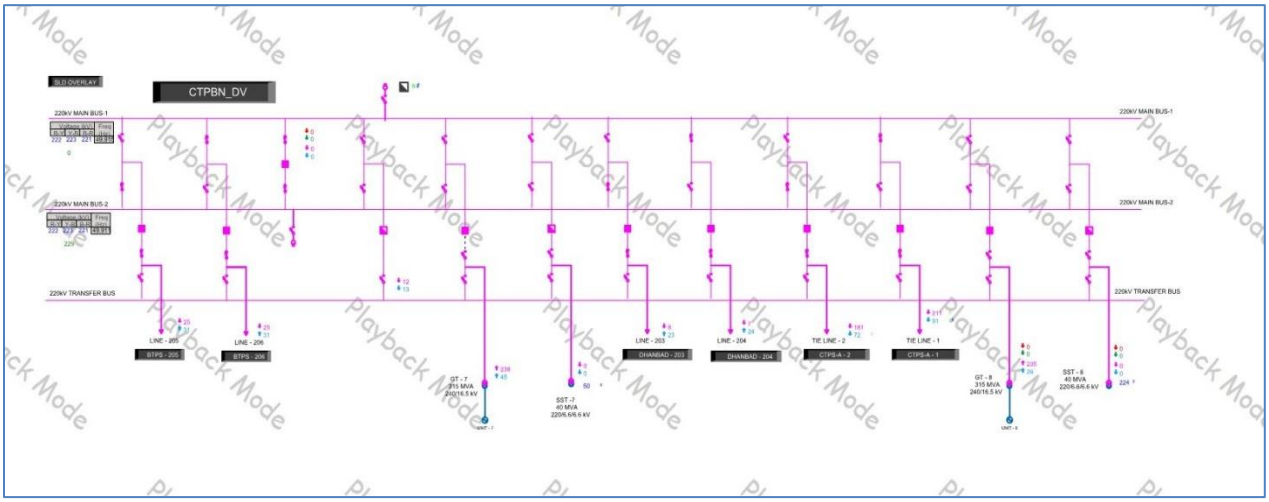


Figure 2: SCADA snapshot of S/S SLD before the event

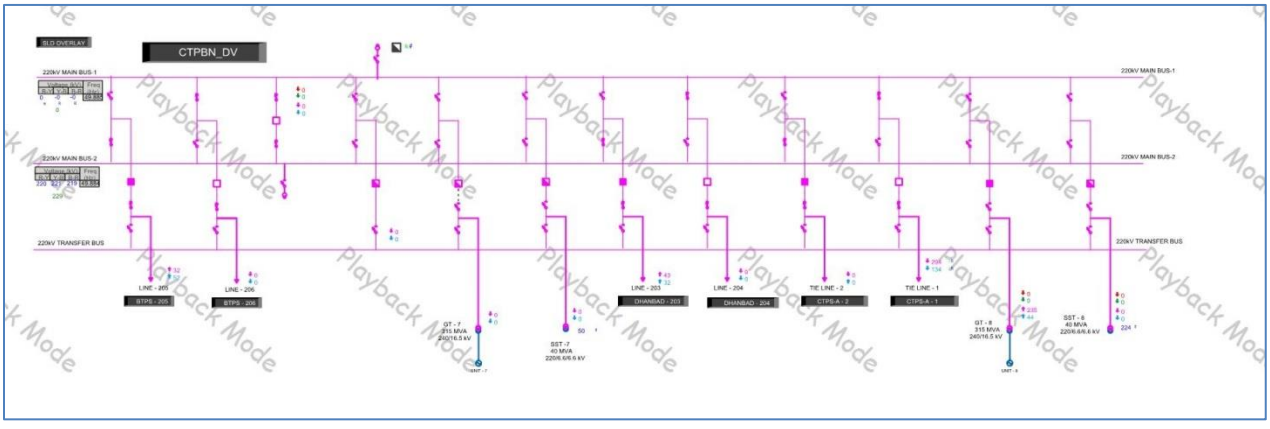


Figure 3: SCADA snapshot of S/S SLD after the event

9) PMU observation:

At the time of the event, 2 kV voltage dip observed in R phase in Maithon PMU data. Fault was cleared within 160 ms.

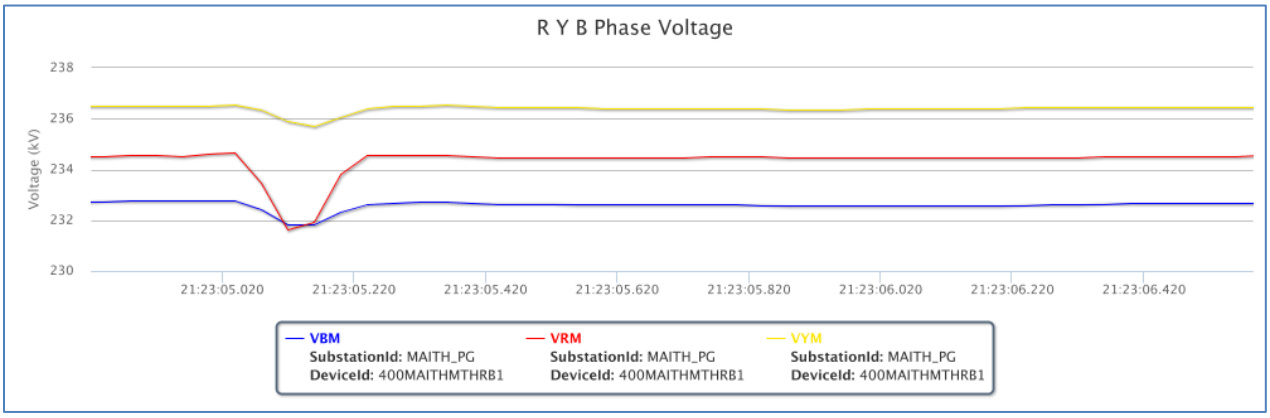


Figure 4: Three phase voltage of 400 kV Maithon substation captured at the time of event

10) Restoration:

1. 220kV CTPS-B - BTPS-B Ckt-II (Line# 206) : 22:23 hrs.
2. Bus-tie : 22:27 hrs.
3. SST#8 : 22:35 hrs.
4. 220kV CTPS-B-CTPS-A Tie Ckt-II (Line# 246) : 22:52 hrs.
5. CTPS U#7 : Lit up at 00:37Hrs of 09-08-19 and synchronized at 04:34Hrs of 09-08-19.

11) Discrepancies observed and remedial action taken

- As the fault at 220 kV CTPS B – Dhanbad – II got cleared within 160 ms from both ends, LBB protection of bus bar I at CTPS B should not operate. On investigation, it was found it got hanged and showed very high value of 118.7 In when the fault current became more than 12 x In. In spite of fault clearing within 160 ms from both ends, LBB relay of bus bar I did not reset and tripped all connected breakers
- As a remedial action, LBB relay of L # 204 has been replaced by Siemens make 7SJ612 relay on 21.08.19. LBB Retrip feature has also been implemented in the replaced relay of L # 204 and is recommended to be implemented in all the LBB relays to be replaced.
- The LBB P/U from neutral current has been eradicated in L # 204 relay and is recommended to be not used in the relays to be replaced in future.

12) Non-Compliance Observed during the event:

Issues	Regulation Non-Compliance	Utility
DR/EL not provided within 24 Hours	1. IEGC 5.2 (r) 2. CEA grid Standard 15.3	DVC
Incorrect/ mis-operation / unwanted operation of Protection system	1. CEA Technical Standard for Construction of Electrical Plants and Electric Lines: 43.4 .A. 2. CEA (Technical standards for connectivity to the Grid) Regulation, 2007: Schedule Part 1. (6.1, 6.2, 6.3)	DVC

13) Status of Reporting:

Detail report received from DVC (attached in annexure). DVC stated no fault data could not be retrieved from relay

Annexure: Report received from DVC

Investigation Report of Main Bus # 1 failure at CTPS 7 & 8 220KV Switchyard on 08.08.19 at 21:23hrs.

Brief History:

On 08.08.19 at about 21:23 hrs, Line#204, connected to Main Bus # 1, tripped through distance protection (Zone-1) from both ends & subsequently LBB protection of the Line operated thereby tripping all bays connected to Main Bus # 1 including SST#8 & GT#8.

On inspection, it was found that LBB relay of L # 204 panel could not be reset and its display and keypad was in hanged condition. No fault data could be read out from the relay and both it's Starter and Trip LED were in lit up condition.

Relay Indications:

Sl. No.	Bay	R/I at CTPS end	R/I at other end
1.	L # 204	21M1- Z1, R Ph, 21M2- Z1, R Ph LBB, 96	21- Z1, R Ph
2.	L # 206	96	
3.	L # 246	96	.
4.	GT # 8	96	
5.	SST # 8	96	
6.	Bus Tie	96	

Data from Fault Records

1. SEL Relay of Line 204 CTPS end:
   - Initiating Signal: Zone 1
   - Highest value of faulted phase current(R Phase) = 13897A approx.
   - Duration of fault (from fault start to drop out Zone 1 signal) = 80 - 90ms
2. LBB Relay (DCD 414):
   - The fault currents measured were: Ia = 118.7In i.e 118.7*800/1 = 94,960 Amps Primary, Ib = 0.00*In, Ic = 0.00*In & IE = 0.00*In.
   - The phase indication was R Phase.

Investigations and Tests and other activities:

1. The faulty LBB relay installed in Line 204 was checked multiple times by secondary injection. It was found that its current measurement, Pick Up, tripping time etc. everything were in order till current applied was of the order of 12xIn but once higher current was being applied the relay was hanging in almost every instance.
2. And once the relay was hanging the current measured by the relay was always 118.7xIn in R Phase irrespective of the applied fault current magnitude and phase (A / B or C) while all other phases were measuring 0.00A current. The current measured by the relay was remaining same after all currents were withdrawn and even when all wires from the test kit were disconnected.
3. If in this hanged condition LBB initiation DC was being applied at its Binary Input 1(LBB initiation BI as per DC schematic), the relay was tripping through LBB Protection.

4. After tripping the fault record shown by the faulty DCD relay was seen to be exactly same as the fault record found in the relay on 08.08.19 i.e. Ia = 118.7*In, Ib = 0.01In, Ic = 0.00In, IE = 0.00In with phase indication A Phase trip although the fault current was present in all phases.
5. It was seen that the hanged condition of relay measurement was sometimes not getting normal at all even after relay Auxiliary DC restarting, sometimes relay became normal after restarting and sometimes it was getting normal by keeping the relay in service for more than about 15 minutes.

Analysis of tripping leading to Main Bus # 1 failure:

1. There was an R-N fault about 7 Km from CTPS End in L # 204 for which the line had tripped from both ends through Distance Zone 1.
2. At CTPS end the LBB relay senses the fault and hangs measuring an outrageously high value of 'R Phase' current.
3. The 'R' Pole of CTPS end CB opens in around 50ms but as the LBB relay has hanged it issues bus trip command inspite CB opening properly and fault current going zero.
4. As the relay was still measuring current of 118.7*In in R Phase(erroneously) LBB trip was initiated by the faulty DCD relay thereby tripping all bays connected to Main Bus # 2 including Bus Tie through operation of respective 96 relays.

Corrective Actions Taken and Further Recommendations:

1. LBB relay of L # 204 has been replaced by Siemens make 7SJ612 relay on 21.08.19. LBB Retrip feature has also been implemented in the replaced relay of L # 204 and is recommended to be implemented in all the LBB relays to be replaced.
2. The LBB P/U from neutral current has been eradicated in L # 204 relay and is recommended to be not used in the relays to be replaced in future.

. .

Report on GI-I Event of New Purnea on 29th Aug 2019 at 08:08 Hrs

Event Category: GI-1

Date and Time: 29th Aug 2019 08:08 Hrs.

Summary of the Event:

The 400 KV Y-ph CT (Commissioned in 2005) of bay 415 (125MVAR BR-1 main bay) of New Purnea Sub-station had failed and caught fire on 29.08.2019 at 08:08 Hrs. The Said 125MVAR Bus Reactor-1 was out of service for voltage regulation, however the bay was in charge condition for completion of the DIA. Due to said failure of the CT, all the feeders emanating from 400kV Purnea SS got tripped. 400kV Busbar-2 protection operated due to failure of CT and all the CB's connected with 400kV Busbar-2 got tripped however as the fault was even persisting after tripping of Busbar-2, all the connected feeders with Bus-1 tripped on operation of Z-2 from remote end and Reverse zone from New Purnea end (Except 400kV Kishanganj 1 & 2, whose main CB didn't trip as the line tripped from Kishanganj end in 350 m Sec in Z2). All the anti-theft charged line from New Purnea (Biharshar-1 &2 and Farakka) also tripped instantaneously. All the 220kV feeders were in service. At the same time 132 kV Purnea(B)-Purnea(PG) T/C tripped from Purnea(B) end on over current earth fault protection and 132 kV Triveniganj-Purnea(B) tripped from Triveniganj on zone 3 leading to total outage of 132 kV Purnea (B) and all radially 132 kV GSS fed from Purnea(B).

Pre -Incident Condition at 08:08 Hrs on 29th Aug 2019:

Generating Station	Generation (MW)
Teesta V	498
Teesta 3	1197
Jorethang	96
Tashiding	112
Chujachen	101
Dikchu	69
Tala+Chukha	1186
Mangdechu	376

Transmission Line	Pre-disturbance Line Flow (MW)	Post-disturbance Line Flow (MW)
400 kV Purnea-Kishanganj D/C	-310	0
400 kV Purnea-Muzaffarpur D/C	266	0
400 kV Purnea-Binaguri D/C	-208	0
400 kV Purnea-Malda D/C	72	0
400/220 kV ICT at Purnea	179	0
MTDC Agra-APD-BNC	1000+500	1000+500
220 kV Binaguri-Siliguri D/C	105	200
220 kV Malda-Gazole D/C	16	-44
400/220 kV ICT at Kishanganj	117	180
400 kV Darbhanga-Kishanganj D/C	-310	-664
400 kV Binaguri-Kishanganj D/C	253	350

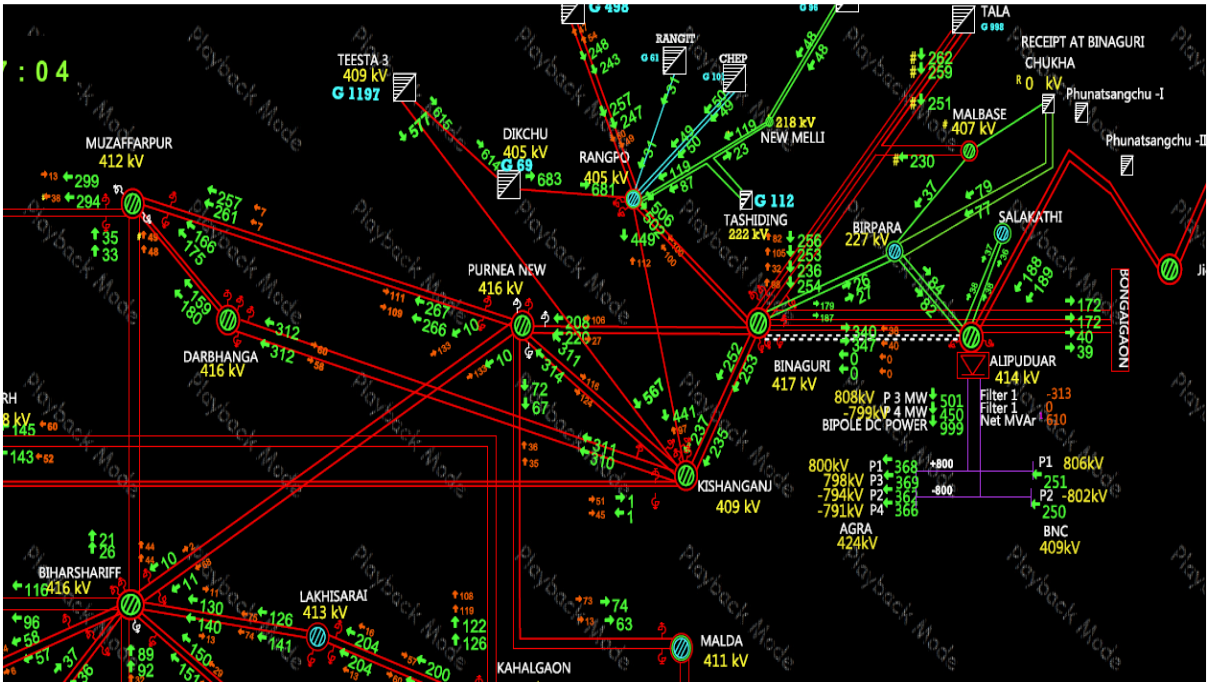


Figure 1: SCADA Snapshot of Purnea at 08:08 Hrs on 29th Aug 2019

Event Overview:

Time	Events
08:08:39:813	Y phase CT of Main bay of B/R-1 blasted and catches fire leading to Y phase fault. (B/R-1 was out but dia was closed).
08:08:39:852	Due to Y-phase to ground fault in Bus zone bus bar differential protection operated and all the main CB connected to 400 kV Bus 2 tripped
08:08:40:226	Kishanganj-1an 2 Tripped from Kishanganj end on zone-2 protection
08:08:40:228	Due to fire Y-N fault evolved into Y-B-N fault
08:08:40:307	Fault converted into R-Y-B-N fault
08:08:40:372	All lines tripped from remote end in Zone 2 and on Zone 4 at Purnea end and 400 kV Bus-1 also become dead.
**08:08:40	132 kV Purnea (B)-Purnea (PG) T/C and 132 kV Triveniganj-Purnea (B) tripped from BSPTCL S/S end.

Event Chronology is from DR except 132 kV Purnea (B)-Purnea (PG) T/C and 132 kV Triveniganj-Purnea (B) tripping time which is from Bihar sldc report as DR is not time synchronize.

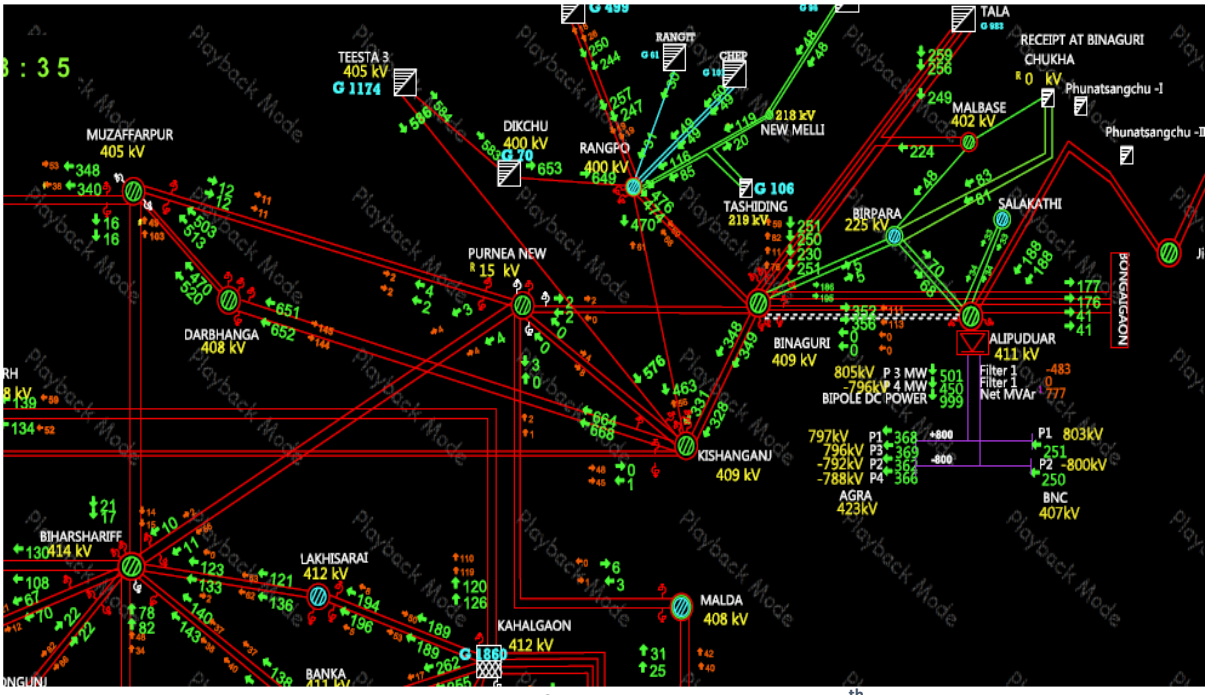


Figure 2: SCADA Snapshot of Purnea at 08:10 Hrs. on 29th Aug 2019

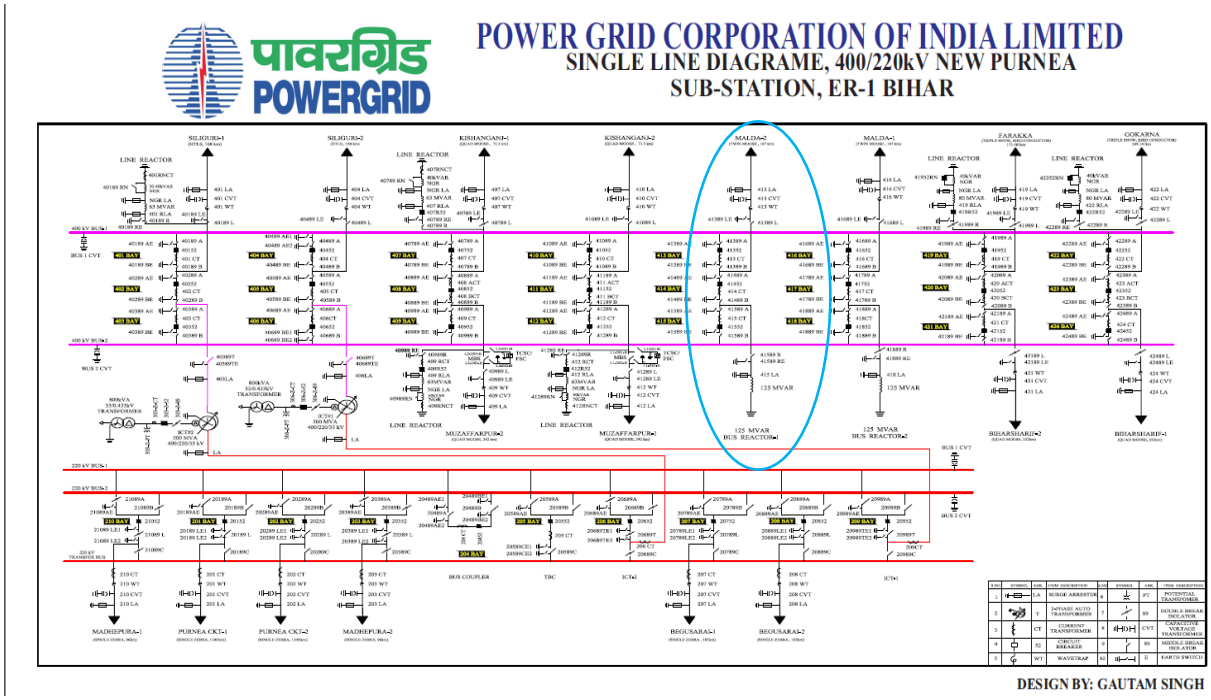


Figure 3: SLD of 400/220 kV New Purnea S/S

Relay Indication:

Transmission line/ Unit	Time	End 1 Relay Indication	End 2 Relay Indication
Bus-2 at Purnea	08:08:39:852	Bus bar Differential protection operated for Bus zone fault	

400 kV Purnea-Muzaffarpur-1	08:08:40:372	Main breaker via Bus bar protection of Bus 2 and Tie Breaker via Zone 4 distance protection	Zone-2 Distance protection
400 kV Purnea-Muzaffarpur-2	08:08:40:372	Main breaker via Bus bar protection of Bus 2 and Tie Breaker via Zone 4 distance protection	Zone-2 Distance protection
400 kV Purnea-Malda-1	08:08:40:372	Main and Tie Breaker via Zone 4 distance protection	Zone-2 Distance protection
400 kV Purnea-Malda-2	08:08:40:372	Main and Tie Breaker via Zone 4 distance protection	Zone-2 Distance protection
400 kV Purnea-Binaguri-1	08:08:40:372	Main and Tie Breaker via Zone 4 distance protection	Zone-2 Distance protection
400 kV Purnea-Binaguri-2	08:08:40:372	Main and Tie Breaker via Zone 4 distance protection	Zone-2 Distance protection
400 kV Purnea-Kishanganj-1	08:08:40:226	Main Breaker didn't trip. Tie Breaker tripped via Zone 4 distance protection of Muzaffarpur-2 line at(08:08:40:372 hrs)	Zone-2 Distance protection
400 kV Purnea-Kishanganj-2	08:08:40:226	Main Breaker didn't trip. Tie Breaker tripped via Zone 4 distance protection of Muzaffarpur-1 line at(08:08:40:372 hrs)	Zone-2 Distance protection
400/220 kV ICT-1 at Purnea	08:08:40:372	Main Breaker tripped via Bus bar protection of Bus 2. Tie Breaker tripped via Zone 4 distance protection of Siliguri-2 line	Didn't trip
400/220 kV ICT-2 at Purnea	08:08:40:372	Main Breaker tripped via Bus bar protection of Bus 2. Tie Breaker tripped via Zone 4 distance protection of Siliguri-1 line	Didn't trip
132 kV Purnea(B)-Purnea(PG) T/C	08:08:40	over current E/F	Didn't trip
132 kV Triveniganj-Purnea(B)	08:08:40	Zone-3	Didn't trip

Load/Generation Loss and Frequency Drop:

Around 230 MW load loss was taken place at 132 kV Purnea (B) and all radially fed substation.

Area/substation affected:

132 kV Purnea (B), Triveniganj, Damdaha, Naugachia, Khagaria, Manihari and Katihar S/S was affected. Within 49 minute power was restored via 132 kV Triveniganj-Purnea (B) , Triveniganj was getting power from Kishanganj New via Forbesganj.

Restoration:

1. 400kV New Purnea-Kishanganj – 1 with Bus-I : 09:02 hrs
2. 400kV New Purnea-Kishanganj – 2 : 09:15 hrs
3. 400kV New Purnea-Muzaffarpur-1 :09:16 hrs
4. 400kV New Purnea-Binaguri-1 :09:23 hrs
5. 400kV New Purnea-Muzaffarpur-2 :09:27 hrs
6. 400Kv Bus-II :09:47 hrs
7. 400kV New Purnea-Malda-1 :09:48 hrs
8. 400kV New Purnea-Binaguri-2 :09:51 hrs
9. 400/220 kV ICT-I : 09:52 hrs
10. 400/220 kV ICT-II : 09:56 hrs
11. 400kV New Purnea-Malda-2 :10:06 hrs
12. 132 kV Purnea(B)-Purnea(PG) T/C :09:07 hrs
13. 132 kV Purnea(B)-Triveniganj : 08:57 hrs
14. 132 kV Purnea(B)- Dhamdaha : 09:08 hrs
15. 132 kV Purnea(B)- Naugachia : 09:09 hrs
16. 132 kV Purnea(B)- Khagaria : 09:08 hrs
17. 132 kV Purnea(B)- Manihari,Katihar : 09:09 hrs

Analysis of PMU data:

1. **PMU plot of voltage and current of 400 kV Purnea-Malda line at Purnea end:**

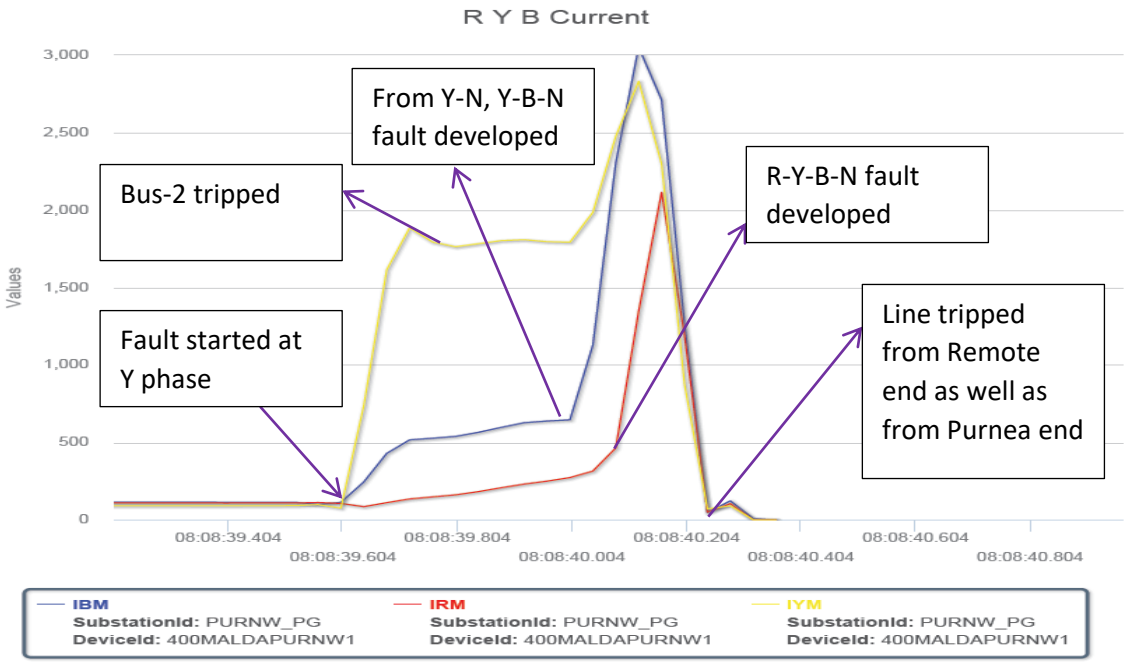


Figure 3: Current ***of 400 kV Purnea-Malda line at Purnea end***

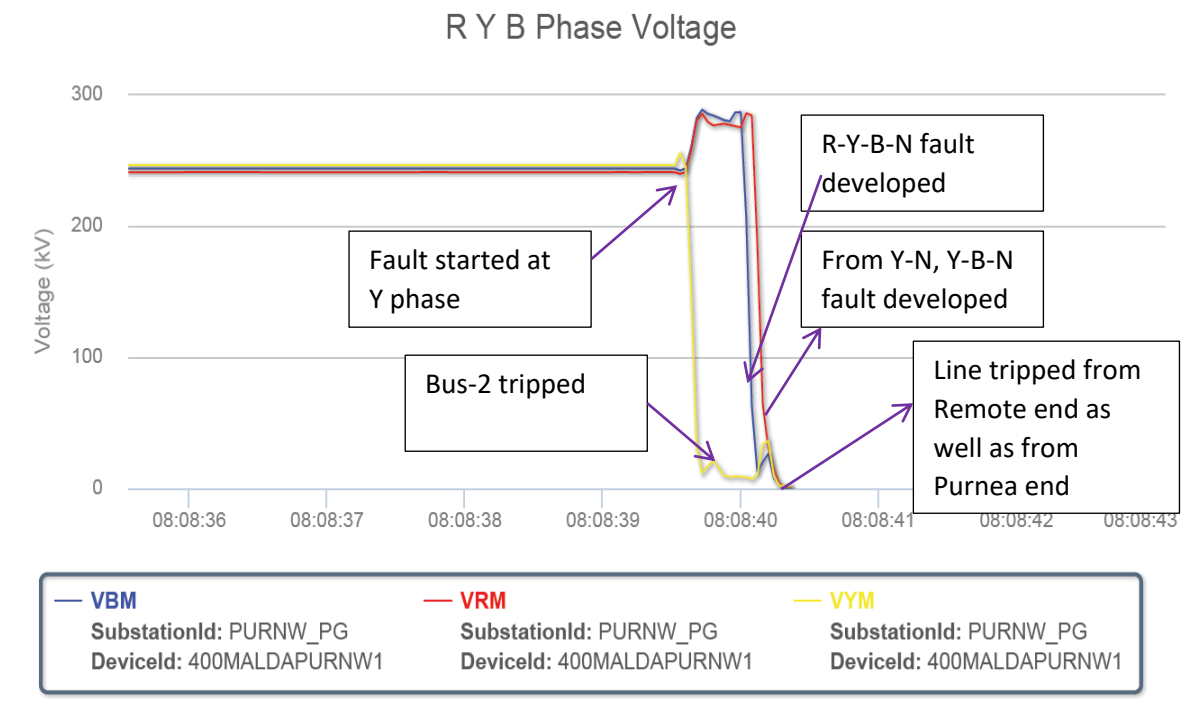


*Figure 4 Voltage **of 400 kV Purnea-Malda line at Purnea end***

Fault signature of 400 kV Muzaffarpur, Binaguri lines are also similar to this.

2. **PMU plot of current of 400 kV Purnea-Kishanganj line at Purnea end:**

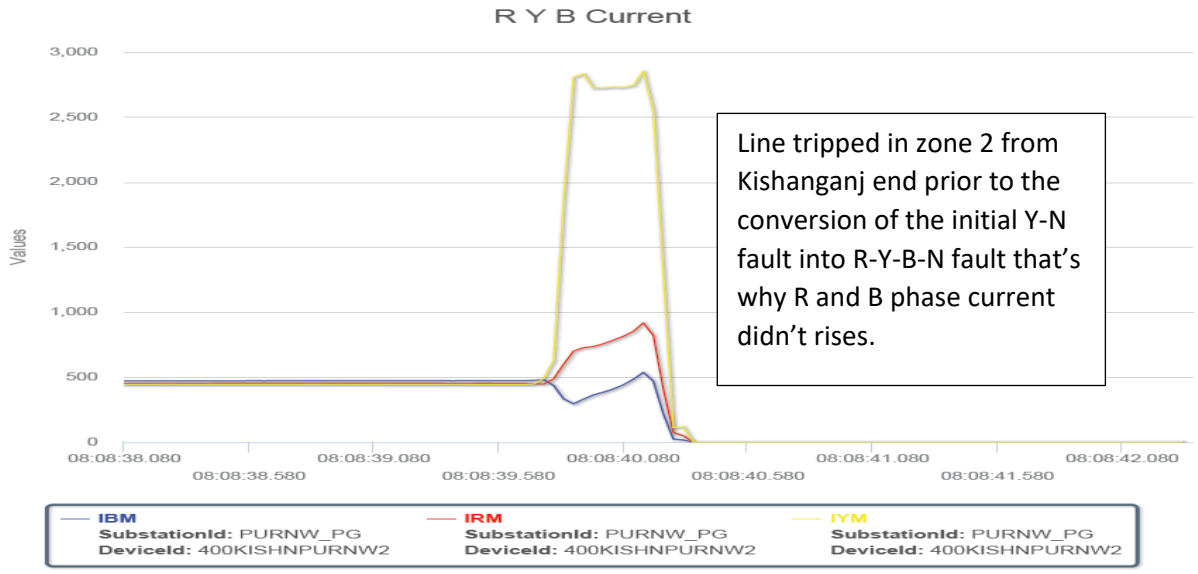
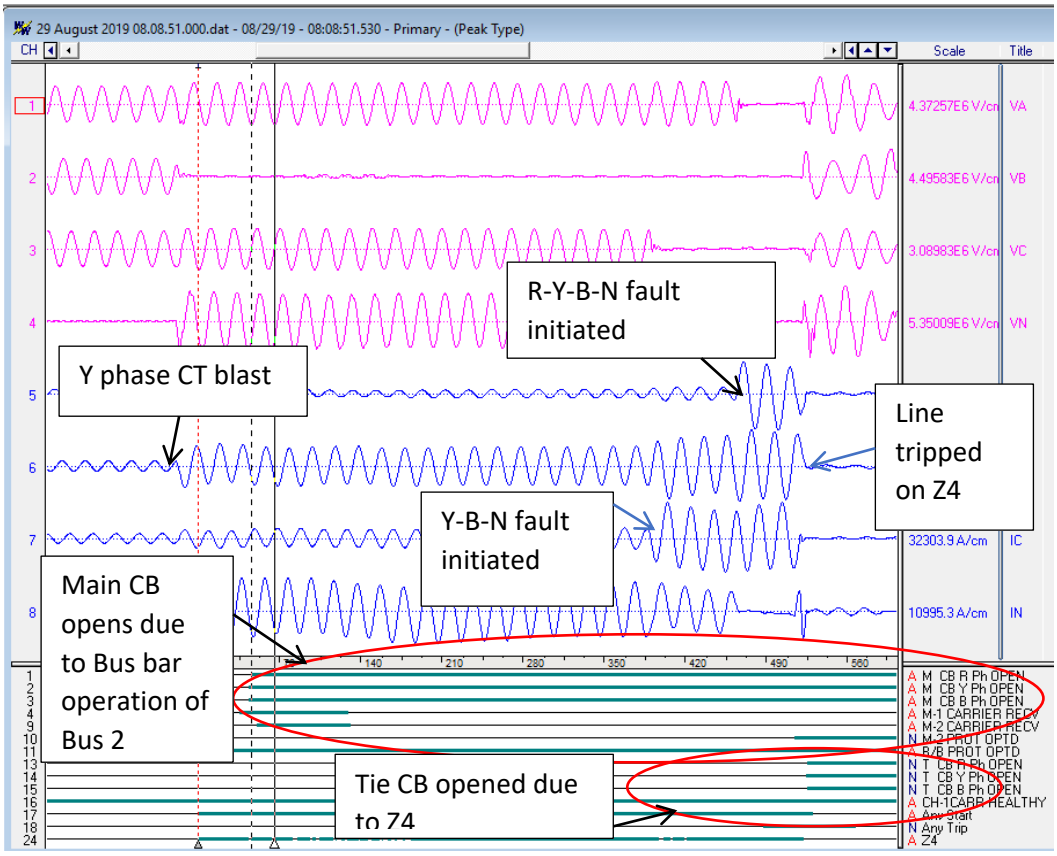


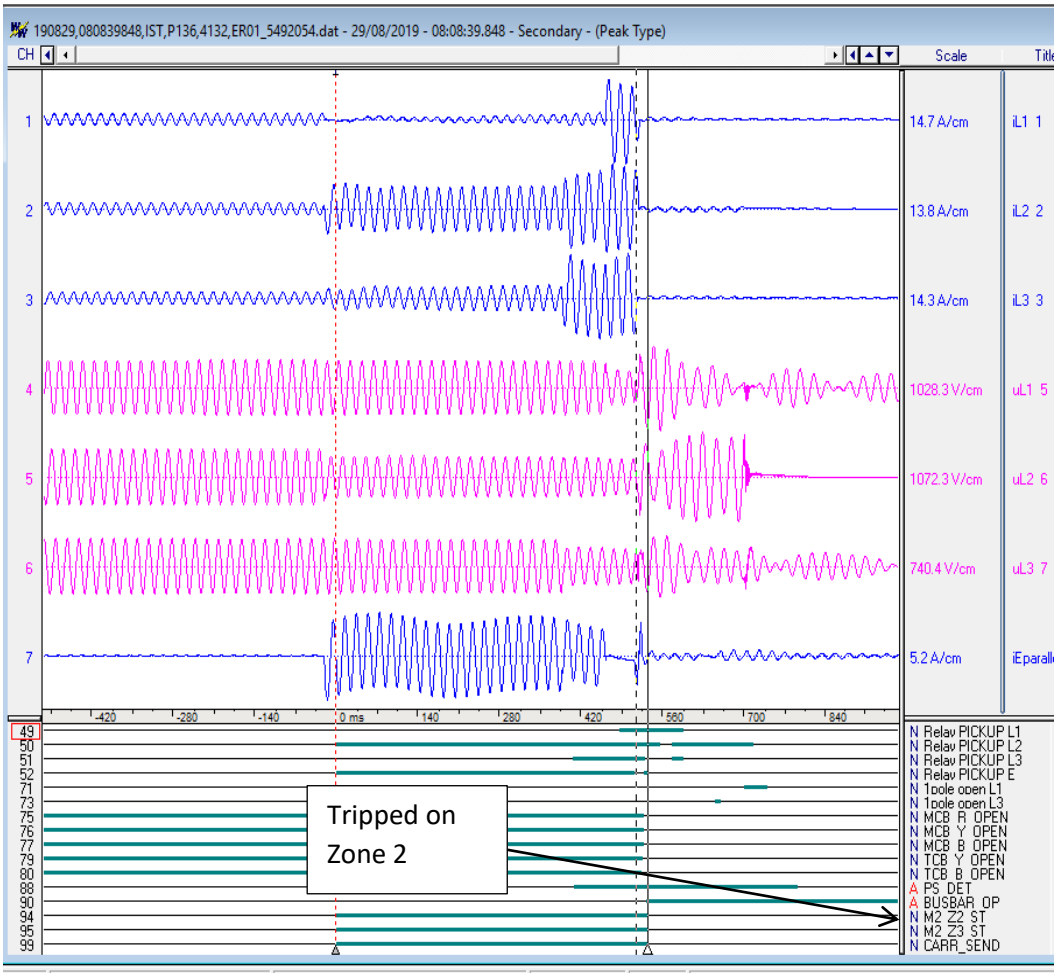
Figure 5 current of 400 kV Purnea-Kishanganj line at Purnea ends.

Analysis of Disturbance Recorder and event logger file:

1. **DR of 400 kV Purnea-Muzaffarpur-1:**
   a. **Purnea end:**

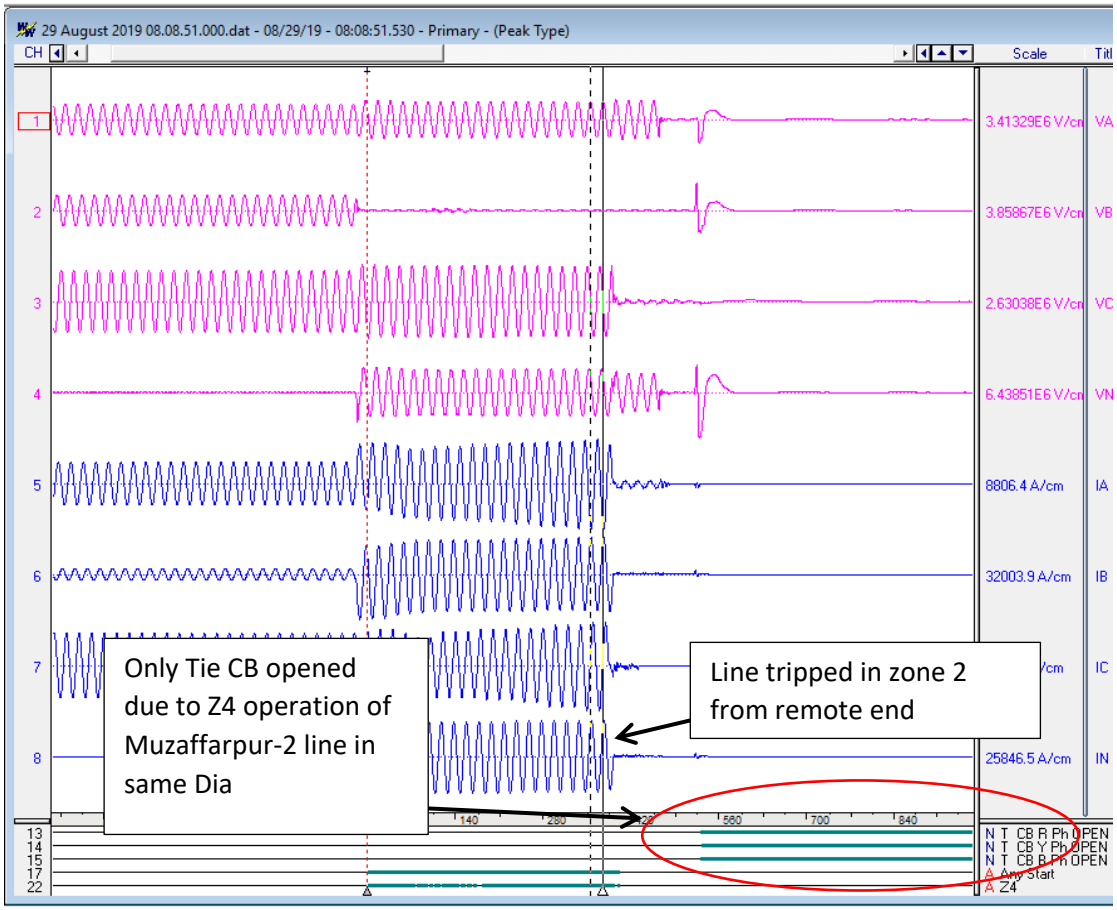


b. Muzaffarpur end:

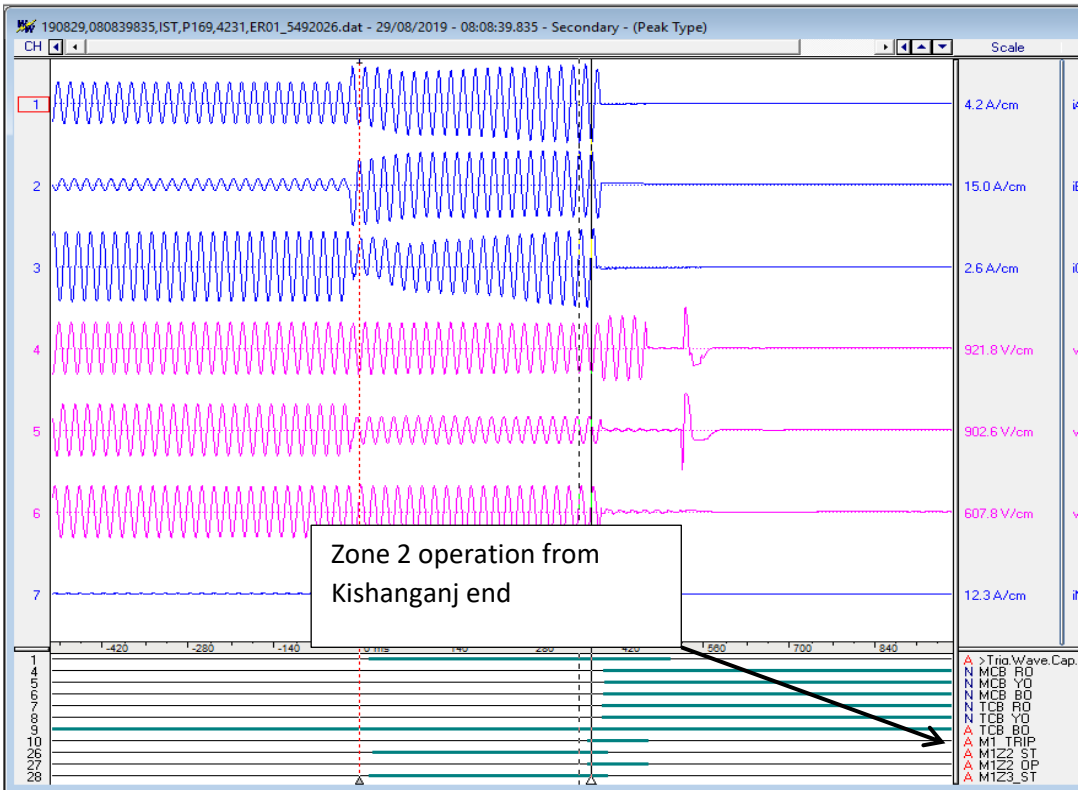


2. **DR of 400 kV Purnea-Muzaffarpur-2**:
   400 kV Purnea-Muzaffarpur-2 was also in the same bus (where fault took place i.e bus 2) just like 400 kV Purnea-Muzaffarpur-1. So its main breaker at Purnea end opened first in bus bar protection followed by opening of the tie breaker on Z4 protection at Purnea end. Also at remote end the line tripped in zone 2. DR signature is similar to line 1 as shown above.

3. **DR of 400 kV Purnea-Kishanganj-1**:
   a. Purnea end:



   b. Kishanganj End:



DR signature foe 400 kV Purnea-Kishanganj-2 is similar to line 1 as shown above.

4. **DR of 400 kV Purnea-Malda D/C and Purnea-Binaguri D/C:**
DR signature of the above line is very similar to 400 kV Muzaffarpur lines (except the post line opening transients), only difference is that as those lines are in the other healthy bus that's why their main and Tie breaker opened together during Z 4 operation at Purnea end. And remote end for these lines also tripped in Zone-2 .

Analysis of SOE:

Date/Time	Station Name	Point Name	Value	Time Quality	Scan Quality
29/08/19 08:29:47:815	ARRAH_PG	220_ICT3_CB	Closed	Good	Good
29/08/19 08:29:26:923	ARRAH_PG	220_ICT3_CB	Open	Good	NonUpdate
29/08/19 08:08:40:401	SI400_PG	400_PURNW_PG_1_Main_CB	Open	Substituted	Good
29/08/19 08:08:40:377	SI400_PG	400_ALIPU_PG_2_PURNW_PG_2_Tie	Open	Substituted	Good
29/08/19 08:08:40:347	SI400_PG	400_ALIPU_PG_1_PURNW_PG_1_Tie	Open	Substituted	Good
29/08/19 08:08:40:331	SI400_PG	400_PURNW_PG_2_Main_CB	Open	Substituted	Good
29/08/19 08:08:40:392	PURNW_PG	220_ICT2_CB	Open	Good	Good
29/08/19 08:08:40:365	PURNW_PG	400_MUZAF_PG_1_FSC_ISO	Closed	Good	Good
29/08/19 08:08:40:292	PURNW_PG	400_MUZAF_PG_2_KISHN_PG_1_Tie	Open	Good	Good
29/08/19 08:08:40:292	PURNW_PG	400_ICT2_SI400_PG_1_Tie	Open	Good	Good
29/08/19 08:08:40:290	PURNW_PG	400_MUZAF_PG_1_KISHN_PG_2_Tie	Open	Good	Good
29/08/19 08:08:40:289	PURNW_PG	400_ICT1_SI400_PG_2_Tie	Open	Good	Good
29/08/19 08:08:40:289	PURNW_PG	400_SI400_PG_2_Main_CB	Open	Good	Good
29/08/19 08:08:40:289	PURNW_PG	400_SI400_PG_1_Main_CB	Open	Good	Good
29/08/19 08:08:40:287	PURNW_PG	400_MALDA_PG_1_Main_Bus_R2_Tie	Open	Good	Good
29/08/19 08:08:40:284	PURNW_PG	400_MALDA_PG_2_Main_CB	Open	Good	Good
29/08/19 08:08:40:281	PURNW_PG	400_MALDA_PG_2_Main_Bus_R1_Tie	Open	Good	Good
29/08/19 08:08:40:280	PURNW_PG	400_MALDA_PG_1_Main_CB	Travel	Good	NonUpdate
29/08/19 08:08:39:807	PURNW_PG	400_ICT1_Main_CB	Open	Good	Good
29/08/19 08:08:39:806	PURNW_PG	400_BIHAR_PG_2_Main_CB	Open	Good	Good
29/08/19 08:08:39:806	PURNW_PG	400_BIHAR_PG_2_FARAK_PG_Tie	Open	Good	Good
29/08/19 08:08:39:805	PURNW_PG	400_MUZAF_PG_1_Main_CB	Open	Good	Good
29/08/19 08:08:39:805	PURNW_PG	400_ICT2_Main_CB	Open	Good	Good
29/08/19 08:08:39:804	PURNW_PG	400_FARAK_PG_Main_CB	Open	Good	Good
29/08/19 08:08:39:803	PURNW_PG	400_BIHAR_PG_1_Main_CB	Open	Good	Good
29/08/19 08:08:39:803	PURNW_PG	400_MUZAF_PG_2_Main_CB	Open	Good	Good
29/08/19 08:08:39:802	PURNW_PG	400_Main_Bus_R2_Main_CB	Travel	Good	NonUpdate
29/08/19 08:08:39:800	PURNW_PG	400_Main_Bus_R1_Main_CB	Travel	Good	NonUpdate
29/08/19 08:08:40:392	MUZAF_PG	400_GORAK_NR_2_PURNW_PG_2_Tie	Open	Substituted	Good
29/08/19 08:08:40:381	MUZAF_PG	400_PURNW_PG_1_Main_CB	Open	Substituted	Good
29/08/19 08:08:40:377	MUZAF_PG	400_GORAK_NR_1_PURNW_PG_1_Tie	Open	Substituted	Good
29/08/19 08:08:40:368	MUZAF_PG	400_PURNW_PG_2_Main_CB	Travel	Substituted	NonUpdate
29/08/19 07:43:29:177	NRANC_PG	MSR2_CB	Open	Good	Good

Protection Issues Observed:

1.

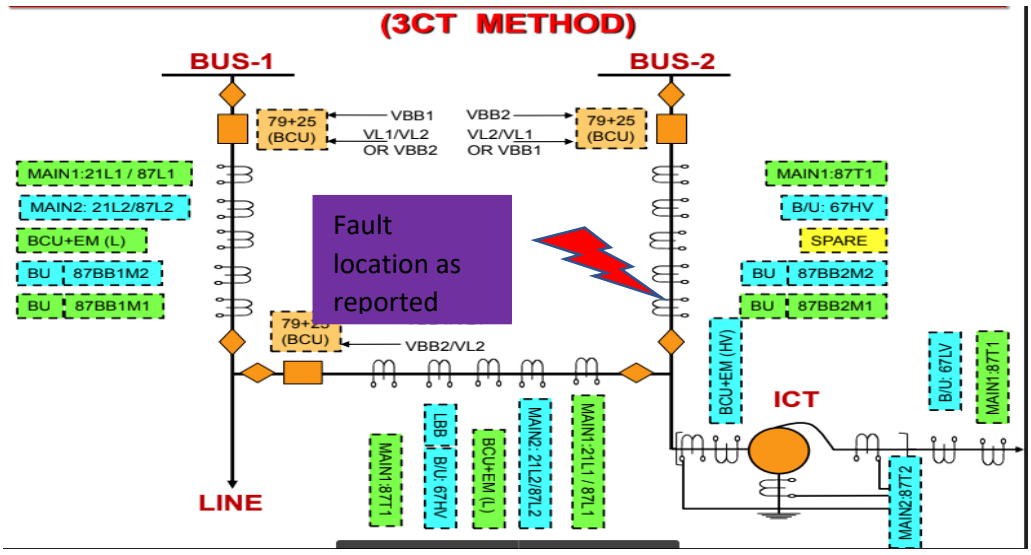


Figure 6 Typical 3 CT scheme with one and half breaker layout

As reported by POWERGRID fault was in the Main CT of the Bus reactor Bay. So its comes under the Bus zone of the corresponding Bus and the overall differential zone of the reactor. So right sequence of operation to clear the fault should be as follows:

a) Operation of Bus bar protection of corresponding bus and opening of all main breaker of that bus.
b) Opening of the Corresponding Tie breaker by Overall reactor differential protection. But why this protection did not operated is not clear. This leads to tripping of all elements from the healthy bus on Zone-4 or by zone 2 of remote end.

2. In the DR of 400 kV Muzaffarpur-Purnea line at Muzaffarpur end why Bus bar protection operation signal picked up is not clear. POWERGRID may explain.
3. Opening of MCB and TCB of 400 kV Muzaffarpur-Purnea line at Muzaffarpur is reversed in the DR. This may be corrected.
4. In DR submitted by BSPTCL it is seen that sampling frequency is only 200 Hz this is causing capturing of insufficient information. BSPTCL may take necessary action to rectify sampling frequency as per DR standard set by ER PCC. Also DR is not time synchronised.
5. Operation of zone-3 for 132 kV Triveniganj-Purnea line within 500 ms is not desirable. Also for a 400 kV fault 132 kV Line tripping in zone-3 is not desirable as zone 3 should not encroach higher voltage level.
6. Over current E/F protection of 132 kV Purnea(B)-Purnea(PG) need to be coordinated properly to avoid tripping for higher voltage level fault.

Annexure I: BSPTCL Flash report

BSPTCL

(Detailed Report of Total Power failure of Purnea GSS (BSPTCL) on dt-29/08/18 at 08:08hrs)

(1) Date & Time of Occurrence

29 august 2019 on 08:08 hrs.

(2) Name of the Sub Station / Generating Station

132/33 KV GSS Purnia (BSPTCL)

3)Pre fault and Restoration

Sl.No.	Line	Pre fault load(MW at 08:00 Hrs)	Outage	Restoration	Duration	Remarks
	Import					
1.	**132 KV Purnea-Purnea(PG) Circuit 1,2,3**	204	08:08Hrs	09:07Hrs	00:59Hrs	Fault in Purnea PG. Fault current feeding from GSS Triveniganj.
	Export					
2.	**132 KV Purnea-**	24	08:08Hrs	09:08Hrs	01:00 Hrs	

	Dhamdaha					
3.	**132 KV Purnea-Naugachia**	28	08:08Hrs	09:09Hrs	01:01 Hrs	
4.	**132 KV Purnea-Khagaria**	37	08:08Hrs	09:08Hrs	01:00 Hrs	
5.	**132 KV Purnea-Manihari,Katihar**	38	08:08Hrs	09:09Hrs	01:01 Hrs	
6.	**132 KV Purnea-Triveniganj**	16	08:08Hrs	08:57Hrs	00:49 Hrs	132 KV Purnea-Triveniganj line and 132KVTriveniganj-Forbesganj **Synchronised** at GSS Triveniganj. GSS Forbesganj getting power from **GSS Kishanganj new**. At 08:57Hrs, GSS Purnea Power restored from GSS Triveniganj.
7.	**33 Feeders**	60	08:08Hrs	08:59Hrs	00:51 Hrs	

4)Relay operated

Sl.No.	Line	Relay Details
1.	**132 KV Purnea(BSPTCL)-**	**Purnea(BSPTCL)-O/C,E/F relay**

	Purnea(PG) Circuit 1	**CAG T, A 773, B 398, C 360, N 0, G 1242, 3I2 191, FREQ 50.09, GROUP:1 SHOT, TARGET 51**
2.	**132 KV Purnea(BSPTCL)-Purnea(PG) Circuit 2**	**Purnea(BSPTCL)-O/C,E/F relay** **CAG T, A 1328, B 748, C 257, N 0, G 2154, 3I2 684, FREQ 50.09, GROUP:1 SHOT, TARGET 51**
3.	**132 KV Purnea(BSPTCL)-Purnea(PG) Circuit 2**	**Purnea(BSPTCL)-O/C,E/F relay** **CAG T, A 678, B 418, C 290, N 0, G 1212, 3I2 220, FREQ 50.09, GROUP:1 SHOT, TARGET 51**
4.	**132 KV Purnea-Dhamdaha**	No Relay operated.
5.	**132 KV Purnea-Naugachia**	No Relay operated.
6.	**132 KV Purnea-Khagaria**	No Relay operated.
7.	**132 KV Purnea-Manihari,Katihar**	No Relay operated.
8.	**132 KV Purnea-Triveniganj**	**Triveniganj-Distance Protection *** **EVENT ABC T,LOCATION 148", FREQ 50.09, GROUP:1 SHOT, TARGET TRIP Z4, IA 466 angle -33, IB 472 angle -155, IC 452 angle 85, IN 0 angle -108, IG 4 angle 27, 3I2 31 angle 46, VA 50.16 angle -2, VB 50.68 angle -121, VC 51 angle 118, FAULT LOCATION Z=31.01Ohm sec angle 67.22, Per Unit LL=1.59, Per Unit R=64.88 Ohm Sec.**

***In Triveniganj GSS, in 132 KV Purnea Bay SEL distance Protection Relay is installed.**

Z4 of SEL distance Protection Relay is same as Z3 of other make distance Protection Relays.

5)Disturbance Record

Disturbance Record of-

1) **132 KV Purnea(BSPTCL)-Purnea(PG) Circuit 1---- Purnea(BSPTCL) end DR,**
2) **132 KV Purnea(BSPTCL)-Purnea(PG) Circuit 2---- Purnea(BSPTCL) end DR,**
3) **132 KV Purnea(BSPTCL)-Purnea(PG) Circuit 3---- Purnea(BSPTCL) end DR,**
4) **132 KV Purnea(BSPTCL)-Triveniganj----------Triveniganj end DR**

Are enclosed herewith in email for perusal.

Annexure II: POWERGRID flash report

First information report in respect of disturbance at NewPurnea S/S on dated : 29.08.2019 at 08:08 Hrs.

The 400 KV Y-ph CT (Commissioned in 2005) of bay 415 (125MVAR BR-1 main bay) of New Purnea Sub-station had failed and caught fire on 29.08.2019 at 08:08 Hrs. The Said 125MVAR Bus Reactor-1 was out of service as per ERLDC instruction on V/R however the bay was in charge condition for completion of the DIA. Due to said failure of the CT, all the feeders emanating from 400kV Purnea SS got tripped . 400kV Busbar-2 protection operated due to failure of CT and all the CB's connected with 400kV Busbar-2 got tripped however as the fault was even persisting after tripping of Busbar-2, all the connected feeders with Bus-1 tripped on operation of Z-2 from remote end and Reverse zone from New Purnea end (Except 400kV Kishanganj 1 & 2, whose main CB didn't trip as the line tripped from Kishanganj end in 350 m Sec in Z2). All the anti-theft charged line from New Purnea (Biharshar-1 &2 and Farakka) also tripped instantaneously. All the 220kV feeders were in service and power to SEB's was not interrupted.

- This DIA is meant for following feeders / Elements.
  - i) Bay 413 – 400 KV Malda-2
  - ii) Bay 414- TIE
  - iii) Bay 415- 400 KV 125 MVAR BUS Reactor.

Consequential Damage : The R & B Phase CTs also appears damaged because of Splinters from Y Phase CT.

- The tripping indications for all the 400kV CB's at New Purnea are as follows:

BAY	FEEDER	TRIP YES / No	Reason / protection
401	Siligiri-1 Main	YES	Z4 , Rev
402	TIE	Yes	Do
403	ICT-2	YES	B / Bar Optd
404	SILIGURI-2	YES	Z4 , Rev.
405	TIE	Yes	Do
406	ICT-I	YES	B / Bar optd
407	KNE-1	No	

408	TIE	YES	Z4 Rev
409	MZP-2	YES	Z4 + B/Bar optd
410	KNE-2	No	
411	TIE	Yes	Z4
412	MZP-1	YES	Z4 + B/Bar optd
413	MALA-2	Yes	Z4, Rev
414	TIE	Yes	Do
415	BR-1	YES	BUS BAR OPERATED
416	MALDA-I	Yes	Z4 , Rev.
417	TIE	Yes	Do
418	B/R-2	Yes	BUS BAR OPERATED

The restoration details of Feeders are as follows:

18. 400kV NPRN-KISHNANGANJ – 1 with Bus-I: 09:02 hrs
19. 400kV NPRN-KISHNANGANJ – 2 : 09:15 hrs
20. 400kV NPRN-MUZAFFARPUR-1 :09:16 hrs
21. 400kV NPRN-BINAGURI-1 :09:23 hrs
22. 400kV NPRN-MUZAFFARPUR-2 :09:27 hrs
23. 400Kv Bus-II :09:47 hrs
24. 400kV NPRN-MALDA-1 :09:48 hrs
25. 400kV NPRN-BINAGURI-2 :09:51 hrs
26. ICT-I : 09:52 hrs
27. ICT-II : 09:56 hrs
28. 400kV NPRN-MALDA-2 :10:06 hrs

The detailed tripping analysis of each feeders including DR/event

Annexure III: HVDC flow and Total Hydro generation in Sikkim and Bhutan complex

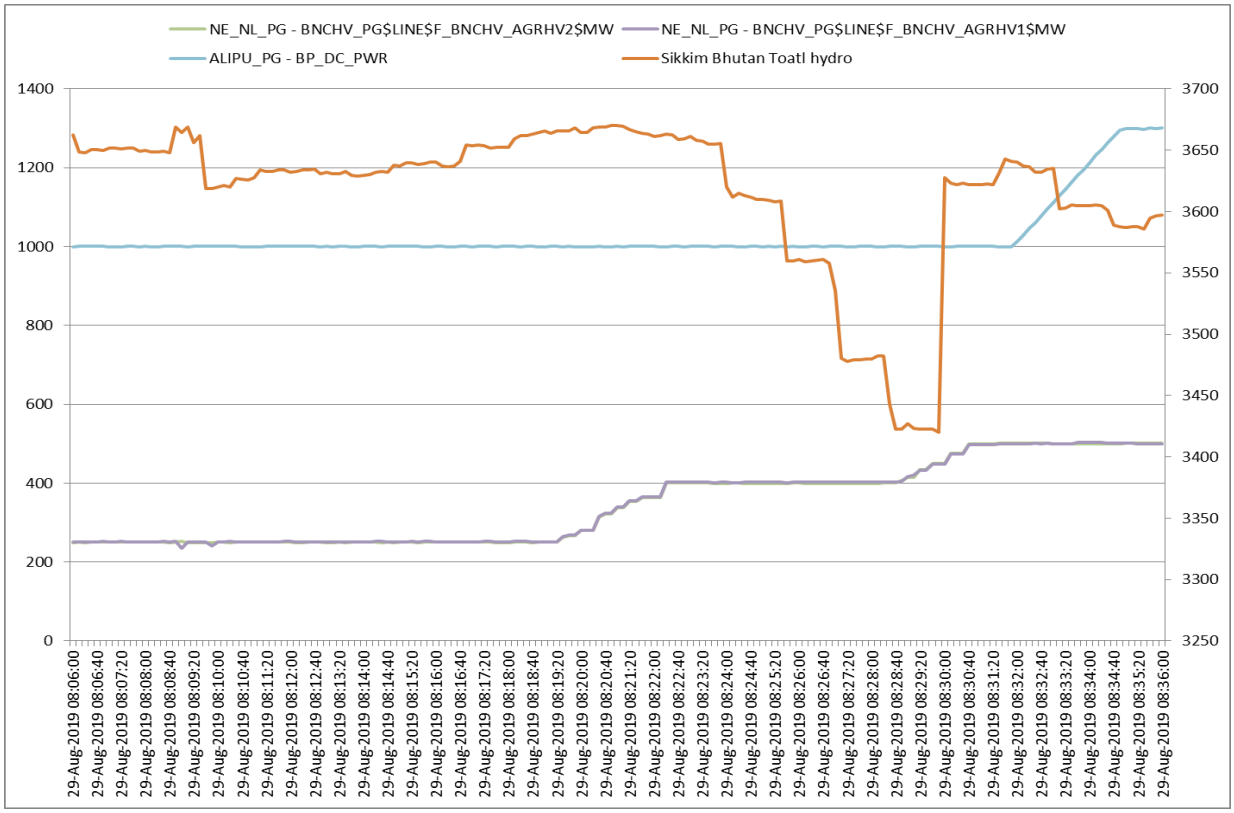


Figure 7 MTDC Flow Total Hydro generation

Annexure IV: 400 and 220 kV Line flows around Purnea:

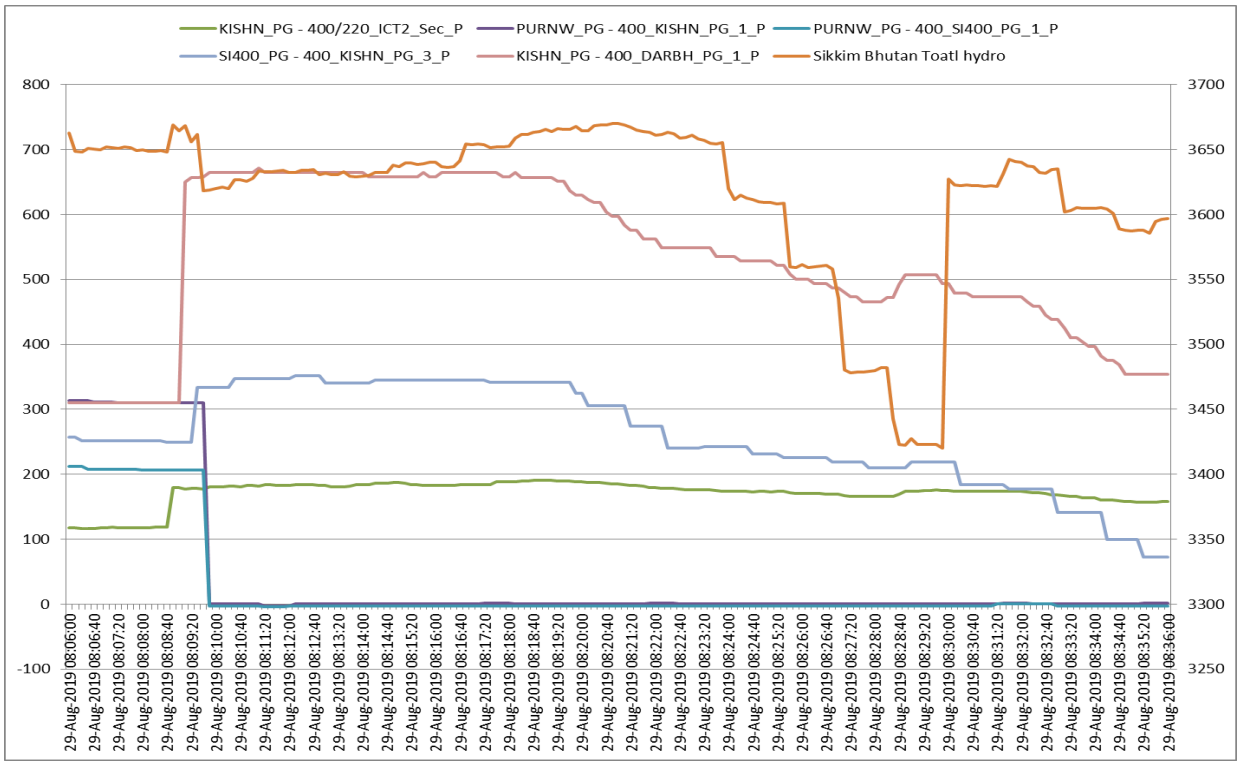


Figure 8400 kV line flows near Purnea

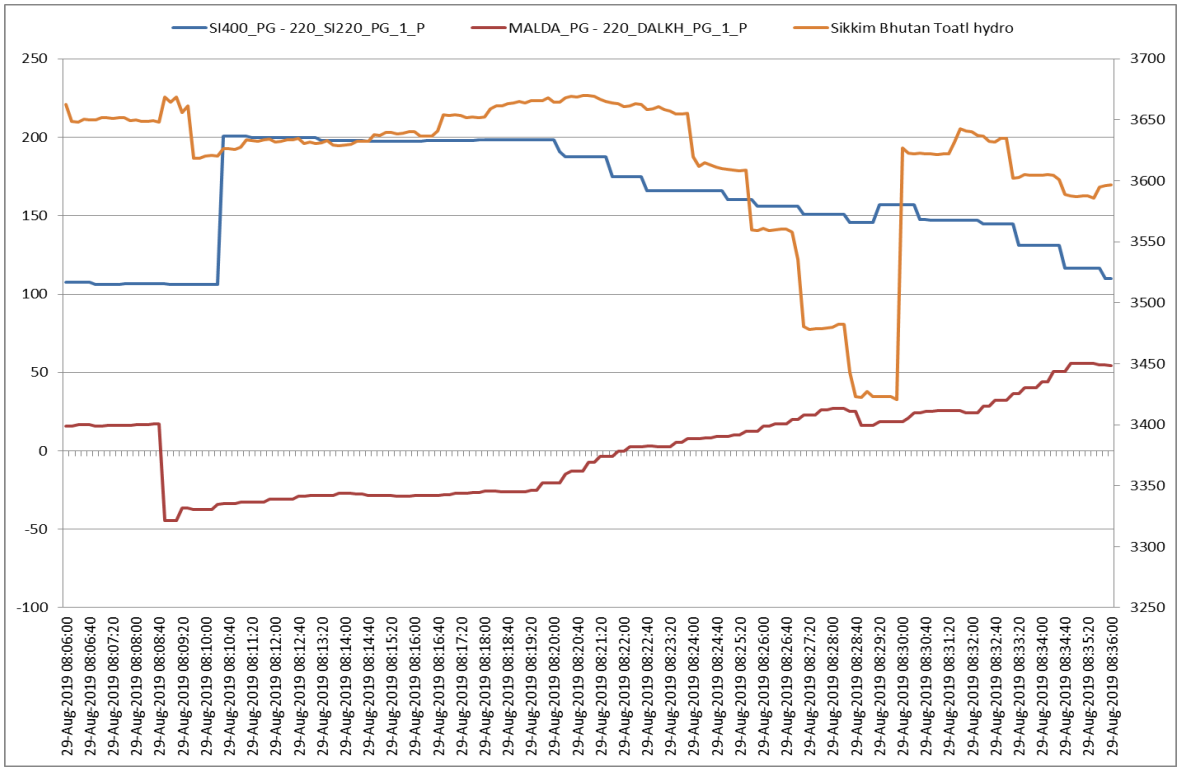
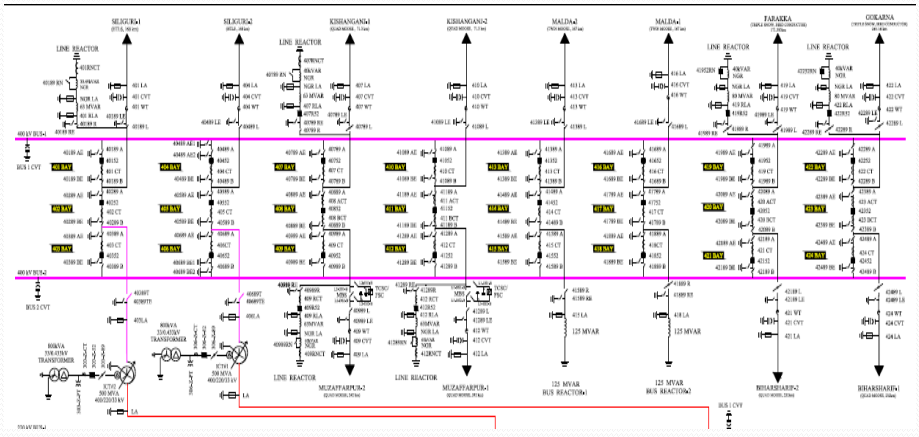


Figure 9 220 kV line flows near Purnea

ANNEXURE-B8.1

REPORT ON DISTURBANCE

AT NEW PURNEA SS ON DTD. 29.08.2019 AT 08:08 HRS.



NEW PURNEA SS HAVING ONE AND HALF CB SCHEME IN 400 KV SIDE WITH FOLLOWING FEEDERS:

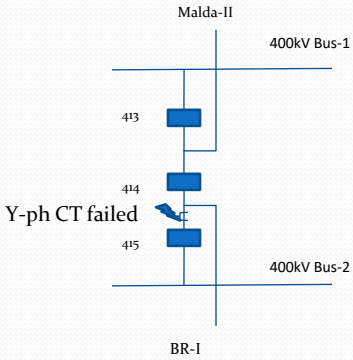
400 KV BUS-I:	A) SILIGURI-I
	B) SILIGURI-II
	C) KISHANGNAJ-I
	D) KISHANGNAJ-II
	E) MALDA-I
	F) MALDA-II
400 KV BUS-II:	A) ICT-I
	B) ICT-II
	C) MUZAFFARPUR-I
	D) MUZAFFARPUR-II
	E) BUS REACTOR-I
	F) BUS REACTOR-II
	G) BIHARSHARIF-I- UNDER B/D
	D) BIHARSHARIF-II- UNDER B/D

BEFORE THE INCIDENT FOLLOWING WAS THE CONDITION :

- 400 kV Purnea-Kishanganj D/C: -310 MW
- 400 kV Purnea-Muzaffarpur D/C: 266 MW
- 400 kV Purnea-Binaguri D/C: -208 MW
- 400 kV Purnea-Malda D/C: 72 MW
- 400/220 kV ICT at Purnea: 179 MW

- The 125MVAR BR-2 was in service however 125MVAR Bus Reactor-1 was out of service as per ERLDC instruction on V/R however the bay was in charge condition for completion of the DIA as per standard practice.

On 29.08.2019 at 08:08:39 hrs. the 400 KV Y-ph CT of bay 415 (125MVAR BR-1 main bay) had failed and caught fire :



*Note: BR-I was out of service on V/R however DIA was closed.

Sequential analysis of the tripping event:

- 400kV Bus Bar-2 protection operated due to failure of Y-ph CT (415, Bus-2 Main bay) of Bus Reactor-1.
- Due to the above fault, the below mentioned lines tripped on distance protection, zone-2 protection operation at remote end. The zone-2 tripping time after fault detection is specified against each line.
- At 08:08:40:200 hrs, 400kV Kishenganj-New Purnea -2 (350msec).
- At 08:08:40:206 hrs, 400kV Kishenganj-New Purnea -1 (350msec).
- At 08:08:40:334 hrs, 400kV Muzaffarpur-New Purnea -1 (485msec).
- At 08:08:40:359 hrs, 400kV Muzaffarpur-New Purnea -2 (499msec).
- At 08:08:40:345 hrs, 400kV Siliguri-New Purnea -1 (501msec).
- At 08:08:40:347 hrs, 400kV Siliguri-New Purnea -2 (501msec).
- At 08:08:40:348 hrs, 400kV Malda-New Purnea -1 & 2 (505 &507 msec)

Sequential analysis of the tripping event:

At New Purnea end, distance protection, zone-4 (reverse, 500msec) operated for the below mentioned lines in sequence. The zone-4 tripping time after fault detection is specified against each line.

- 400kV New Purnea-Malda-2 (487msec)
- 400kV New Purnea- Muzaffarpur-1 (487msec)
- 400kV New Purnea-Malda-1 (489msec)
- 400kV New Purnea- Muzaffarpur-2 (493msec)
- 400kV New Purnea-Siliguri-2 (Binaguri) (497msec)
- 400kV New Purnea-Siliguri-1 (Binaguri) (498msec)

- 400kV New Purnea-Kishenganj-1 & 2:

Zone-4 (reverse) protection not operated as fault was cleared from remote end in 350msec and other feeder at local end in reverse zone before its protection operated.

Observations:

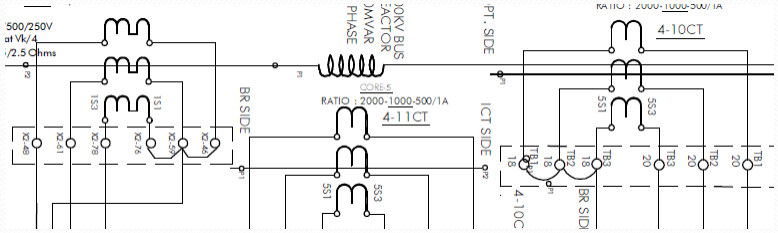
- As mentioned in the report of ERLDC, this type of fault should be clear as follows:

➢ Operation of Bus bar protection of corresponding bus and opening of all main breaker of that bus.

➢ b) Opening of the Corresponding Tie breaker by Overall reactor differential protection. But why this protection did not operated is not clear. This leads to tripping of all elements from the healthy bus on Zone-4 or by zone 2 of remote end.

Observations:

- The Busbar-2 protection operated to clear the fault and accordingly all main CB connected with Bus-2 opened.
- The CT used for differential protection of Bus Reactor are:



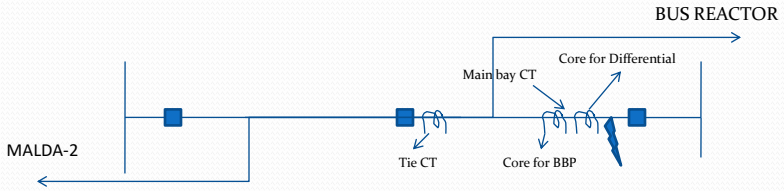
Observations:

Accordingly the Differential Relay will operate when there is sufficient differential current after summation of Main bay CT, Tie Bay CT & Reactor Bushing CT.

- In this case there is no current in Reactor Bushing CT and hence this current will be zero.
- The operation of differential protection will be dependent upon the secondary current in differential core of Main CT and since this CT itself failed, its behaviour can't be summarized. However the probability of different cases are explained in next slides.

Observations:

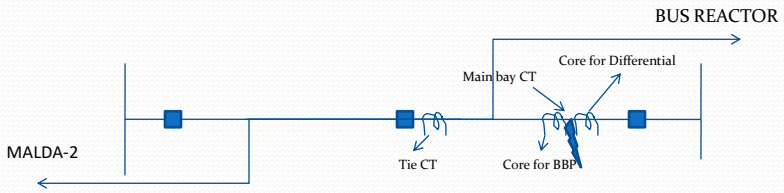
Case-I: Fault on the bus-side



In this case the current in Reactor Differential Relay will be zero and thus Reactor Differential will not operate.

Observations:

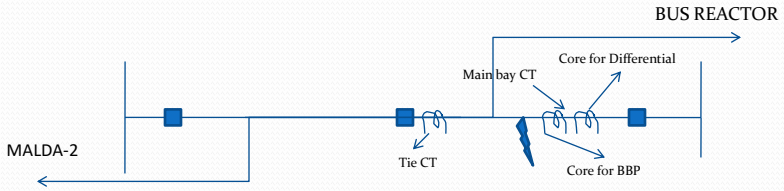
Case-II: Fault in between the cores:



In this case there will be current in both Reactor and Busbar Differential Relay and both Busbar and Reactor Differential will operate.

Observations:

Case-III: Fault towards tie bay:



In this case also there will be current in Reactor Differential Relay and Reactor Differential will operate however busbar differential will not operate.

Conclusion:

- The differential protection relay of Bus Reactor has been tested after the event and Relay was operating satisfactorily on set value i.e. 200A (.2 A on secondary side).
- Accordingly it is assumed that the Differential Protection relay has not operated due to non-availability of differential current in the Relay.
- Since the used differential Relay is of Electromechanical type, hence DR are not available and actual current values are not available.
- The all protections at New Purnea SS as well as from remote end has operated successfully as per the Protection Operation philosphy.

Improving Measures:

- The differential protection relay of Electromechanical type shall be replaced by Numerical Relay. The replacement shall be carried out by 30.11.2019.
- Since the failed CT was tested in March, 2019 during AMP and all the test results were in order and hence it seems to be sudden failure of CT. We have planned for DGA testing of all these model (ALSTOM make Dead Tank type) CTs installed at New Purnea SS.
- The other two observations regarding DR of Muzaffarpur end has been rectified also.

Observations regarding DR of Muzaffarpur end:

Following observations also included in the report:

- In the DR of 400 kV Muzaffarpur-Purnea line at Muzaffarpur end why Bus bar protection signal picked up is not clear:
  - Inadvertantly some other signal was configured as "BUSBAR OP" which has been rectified.
- Opening of MCB and TCB of 400 kV Muzaffarpur-Purnea line at Muzaffarpur is reversed in the DR. This may be corrected.
  - Rectified

POWERGRID CORPORATION OF INDIA LTD
2000 MW HVDC Station Talcher
Odisha Projects

BRIEF REPORT ON TRIPPING OF POLE-1

TALCHER-KOLAR HVDC LINK ON

05.08.2019 AT 10:14 HRS

Date: 05.08.2019 **HVDC Station, Talcher**

BRIEF REPORT ON TRIPPING OF POLE-1 OF TALCHER-KOLAR HVDC LINK ON 05.08.2019

BACKGROUND:

Pole-1 of Talcher-Kolar HVDC Transmission system tripped on dtd 05.08.2019 at 10:14 Hrs. Before tripping, the power flow through the link was 598 MW and after tripping of Pole-1, Pole-2 came to MR Mode with Power flow through the Link of 598MW without any loss of power.

PRECONDITIONS:

Date of event: 05.08.2019
Time of event: 10:14 hrs
Pre-Fault Power: 598 MW at Talcher.
All elements / protections: In service

Description of event:

- On dated 05.08.2019 at 10:14 Hrs, Pole-1 tripped during normal operation .
- The SER shows the followings:
  1) 10:14:00:000 Valve Cooling system pump 2 ON.
  2) 10:14:24:678 Valve Cooling system pump 2 OFF
  3) 10:14:24:743 Transformer Protection tripped.
  4) 10:14:24:752 External/ protection tripped.
  5) 10:14:59:000 Valve Cooling system pump 2 ON

Observation:

- During normal operation Pump 2 was in service in Auto mode in Pole 1. At 10:14 Hrs, suddenly the status of Pump 2 in operation changed to ON -> OFF ->ON. This momentary change of status of operation tripped the Pole 1 instantaneously. Further, there is no change over command to Pump 1 by the PLC Controller Simatic S5.
- Immediately, the Pole 1Valve cooling system was checked and found that Pump 2 was already in service. There was no trace of any overheating or any overload trip of Pump 2. Both the pumps were also in Auto mode.
- Simatic S5 Controller was checked visually and no abnormality could be noticed.

Action Taken:

1. Simatic S5 logic system was resetted.
2. Auto Change over operation was tested for both the pumps and found Normal.
3. With no trace of any defect in any system, Pole 1 was deblocked at 11:02 Hrs on dtd. 05.08.2019.

Conclusion: It is seen that Pump 2 Operation – ON status has been indicated in the SER although it was already ON. Normally such a status does not come when the equipment is already in ON condition. It can come only when the status gets changed from OFF state to ON state. It means the ON status of Pump 2 is lost (some how) to Simatic S5 and immediately gets restored, whereas practically there was no such pump interruption. Hence this can be termed as erratic operation of Simatic S5.

Submitted please.
Encl: SER, TFR, DOR

(R.L Panda)
Sr. GM Kaniha

Disturbance and Outage Report

Report No: Pole-I / 1191

Reporting Terminal ☒ HVDC TALCHER

Location of fault (Terminal/Pole etc): HVDC Pole-1

Time and Duration
Time of occurrence: Date: 05/08/19 Time: 10:14 Hrs
Operation resumed: Date: 05/08/19 Time: 11:02 Hrs

Category of Event ☒ Forced Outage ☐ Scheduled outage ☐ Alarm ☐ Transient Disturbance

Occurrence during ☐ Commissioning ☒ Operation ☐ Maintenance

Severity of Event ☐ Bipolar ☒ Monopolar

Conditions prior to Event
Poles in operation: Bipole Power, Pole 1: 299 MW Pole 2: 299 MW
Power direction: *East → South*
Operation conditions: Both Poles Were in Service

Conditions during Event
Poles in operation: Monopole Power, Pole 1: 0 MW Pole 2: 598 MW
Loss of Capacity: 1000 MW Total Power loss: 0 MW

	AC and AUX Equipment	Valves	DC Control & Protection	Primary DC Equip.	Other	DC Transm. Line	External AC System
Substation Category (CIGRÉ)	☐ AC-E	☒ V	☐ C-P	☐ DC-E	☐ O	☐ TL	☐ EXT
Subcategory	☐ AC Filter & shuntbank	☐ Valve, Electrical	☐ Local Control & Protection	☐ DC Smooth Reactor	☐ Unknown	☐ DC Line	☐ External AC Network
	☐ AC Control & Protection	☒ Valve, Cooling	☐ Master Control & Protection	☐ DC Switching Equipment	☐ Test		
	☐ Converter Transformer		☐ Contr. & Prot. Telecomm	☐ DC Ground Electrode	☐ Human Error		
	☐ Synchronous Compensator			☐ DC Ground Electr. Line			
	☐ Aux. Equipm. & Aux. Power			☐ DC Filters			
	☐ Other AC Sw. Yard Equipm			☐ DC Sw. Yard & Valve Hall Eq.			

Failing Unit: ---- Nil
Supplier: ----

Description of cause of event Pole-1 Blocked at 10:14 Hrs due to Stuck of Valve Cooling Simatic S5 PLC logic System.

Major Alarms: "" Converter Protection Tripped.
External Protection Trip.

Measures Taken: Pole-1 Deblocked at 11:02 Hrs. with 598 MW Bipole power.

Documentation: (Attachments) ☒ TFR ☒ SER Print ☐ LFL Print ☐ Equipment Failure Record No.

Reference to Other Documents: As per Annexure

Date/Signature: 05 - 08 - 2019 /

This DOR-form is based on CIGRÉ protocol No. 14 -97 (WG 04) "Protocol for Reporting the Operational Performance of HVDC Transmission Systems".

Archive Print Selection
Printed: 05.08.2019 13:26:17

05.08.2019 10:05:59 - 05.08.2019 10:16:59
Class Selection: -E-W-M-S-C-
Sorting: TIME

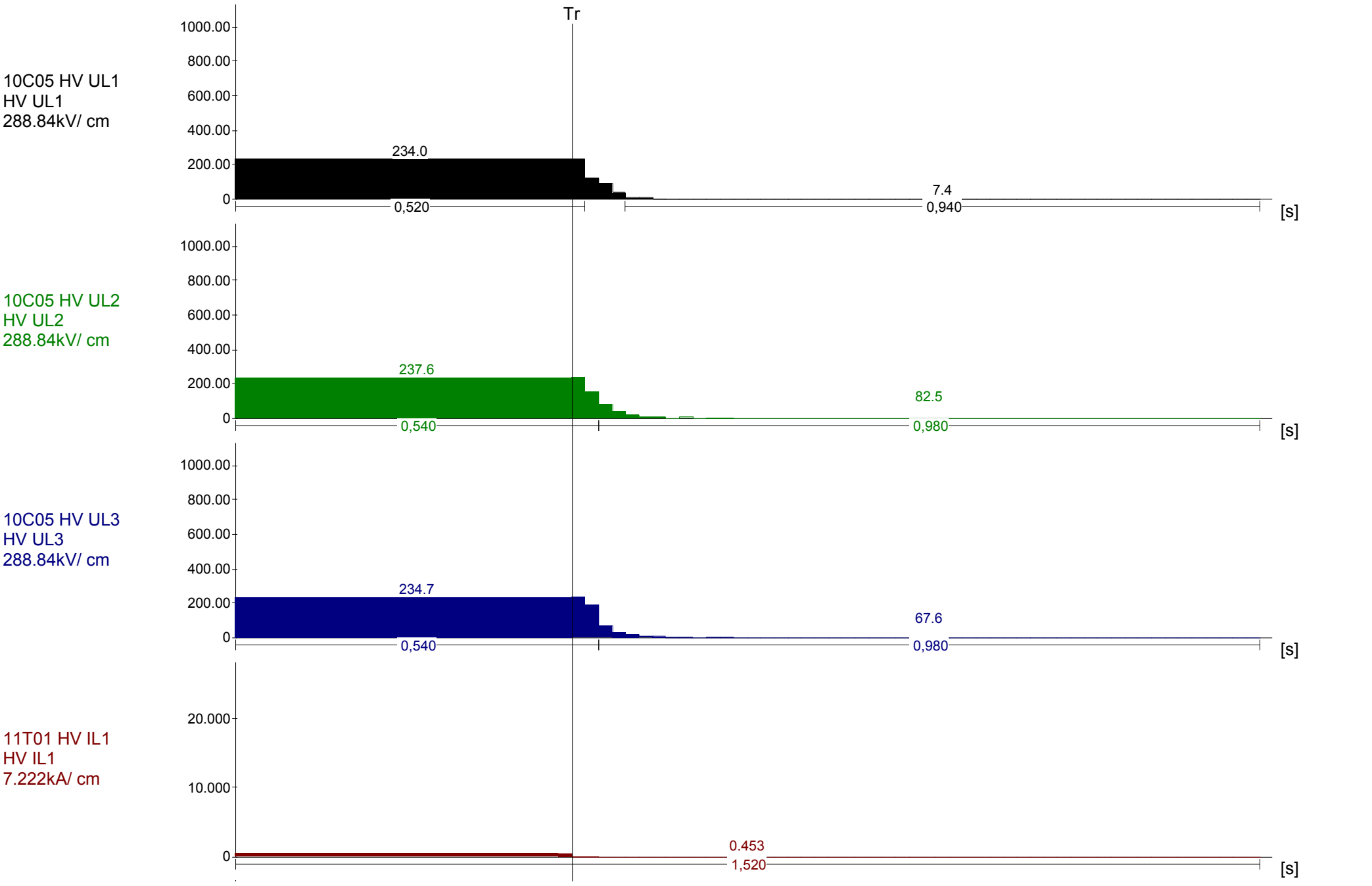
EvtNo	Date	Time	Grp	Clss	Device	Event Text	Status
15663	05.08.2019	10:05:59.614	00000	STAT	= FFPH	JOCKEY PUMP-2 RUNNING	+
17553	05.08.2019	10:09:00.004	00000	MNOR	=10XX00+X2	SU200 DEVICE DISTURBANCE CLEARED	+
15663	05.08.2019	10:09:09.348	00000	STAT	= FFPH	JOCKEY PUMP-2 RUNNING	-
1811	05.08.2019	10:13:59.999	00000	STAT	=11U61+UT1	SU200 UNIT POWER UP	+
242	05.08.2019	10:14:00.000	00000	STAT	=11U61	VALVE COOLING SYSTEM ON	+
246	05.08.2019	10:14:00.000	00000	STAT	=11U61	VALVE COOLING SYSTEM PUMP 2 ON	+
266	05.08.2019	10:14:00.000	00000	STAT	=11U71	VALVE HALL VENTILATION ON	+
268	05.08.2019	10:14:00.000	00000	STAT	=11U71	VALVE HALL VENTILATION FAN 2 ON	+
273	05.08.2019	10:14:00.000	00000	STAT	=11U71	VALVE HALL VENTILATION DAMPER NOT CLOSED	+
278	05.08.2019	10:14:00.000	00000	STAT	=11U71	V H AIR COOLING UNIT 2 ON	+
8	05.08.2019	10:14:00.476	00000	WRN	=11U61	VALVE COOLING SYSTEM FAULTY	+
243	05.08.2019	10:14:00.476	00008	WRN	=11U61	VALVE COOLING SYSTEM ALARM	ALARM
8	05.08.2019	10:14:04.981	00000	WRN	=11U61	VALVE COOLING SYSTEM FAULTY	-
243	05.08.2019	10:14:04.981	00008	WRN	=11U61	VALVE COOLING SYSTEM ALARM	CLEAR
278	05.08.2019	10:14:24.675	00000	STAT	=11U71	V H AIR COOLING UNIT 2 ON	-
8	05.08.2019	10:14:24.676	00000	WRN	=11U61	VALVE COOLING SYSTEM FAULTY	-
243	05.08.2019	10:14:24.676	00008	WRN	=11U61	VALVE COOLING SYSTEM ALARM	CLEAR
244	05.08.2019	10:14:24.676	00008	WRN	=11U61	VALVE COOLING SYSTEM COOLING TOWER FAULT	CLEAR
246	05.08.2019	10:14:24.678	00000	STAT	=11U61	VALVE COOLING SYSTEM PUMP 2 ON	-
7	05.08.2019	10:14:24.743	00000	EMCY	=11T01	TRANSFORMER PROTECTION TRIPPED	+
382	05.08.2019	10:14:24.743	00007	EMCY	=11T01+R1	PROTECTION RELAY OPERATED	TRIP
2	05.08.2019	10:14:24.752	00000	EMCY	=11V00-A1	CONVERTER TRIPPED	+
1586	05.08.2019	10:14:24.752	00002	EMCY	=11V00-A1	EXTERNAL/ PROTECTION TRIP	TRIP
15391	05.08.2019	10:14:24.758	00000	STAT	=10C05.A-Q0	CIRCUIT BREAKER CLOSED	-
15431	05.08.2019	10:14:24.760	00000	STAT	=10C05.B-Q0	CIRCUIT BREAKER CLOSED	-
15390	05.08.2019	10:14:24.768	00000	STAT	=10C05.A-Q0	CIRCUIT BREAKER OPEN	+
15430	05.08.2019	10:14:24.768	00000	STAT	=10C05.B-Q0	CIRCUIT BREAKER OPEN	+
12995	05.08.2019	10:14:24.856	00000	STAT	=12X61+X61	RECORDING EVENT	+
1426	05.08.2019	10:14:24.864	00000	STAT	=11V00-A1	STOP SEQUENCE RUNNING	+
7629	05.08.2019	10:14:24.870	06011	STAT	=12V00-A1	DC CURRENT LIMIT BY AC FILTER /MRTB/ MRS	BEGIN
16055	05.08.2019	10:14:24.870	00000	STAT	=10X61+X61	RECORDING EVENT	+
1629	05.08.2019	10:14:24.944	00011	STAT	=11V00-A1	DC CURRENT LIMIT BY AC FILTER /MRTB/ MRS	BEGIN
1642	05.08.2019	10:14:24.944	00011	WRN	=11V00-A1	POWER SWING DAMPING ACTIVE	FAULT
1450	05.08.2019	10:14:25.024	00000	STAT	=11U61	VALVE COOLING READY FOR POWER TRANSM.	-
1629	05.08.2019	10:14:25.464	00011	STAT	=11V00-A1	DC CURRENT LIMIT BY AC FILTER /MRTB/ MRS	END
7595	05.08.2019	10:14:25.830	00000	STAT	=12V00-A1	POLE DC CURRENT LIMITED	BEGIN
1003	05.08.2019	10:14:25.864	00000	MNOR	=11V00-A1	SYS1 COMM TO SEVERAL I/O-UNITS DISTURBED	+
1642	05.08.2019	10:14:25.984	00011	WRN	=11V00-A1	POWER SWING DAMPING ACTIVE	CLEAR
12995	05.08.2019	10:14:26.103	00000	STAT	=12X61+X61	RECORDING EVENT	-
1007	05.08.2019	10:14:26.104	00000	MNOR	=11V00-A1	SYS2 COMM TO SEVERAL I/O-UNITS DISTURBED	+
16055	05.08.2019	10:14:26.124	00000	STAT	=10X61+X61	RECORDING EVENT	-
1013	05.08.2019	10:14:26.544	00000	WRN	=11V00-A1	SYSTEM 1, SOFTWARE WARNING	+
1324	05.08.2019	10:14:26.544	00011	WRN	=11V00-A1	AMBIENT TEMPERATURE OUT OF RANGE	ALARM
1015	05.08.2019	10:14:26.744	00000	WRN	=11V00-A1	SYSTEM 2, SOFTWARE WARNING	+
1003	05.08.2019	10:14:27.184	00000	MNOR	=11V00-A1	SYS1 COMM TO SEVERAL I/O-UNITS DISTURBED	-

SER

P1EH1

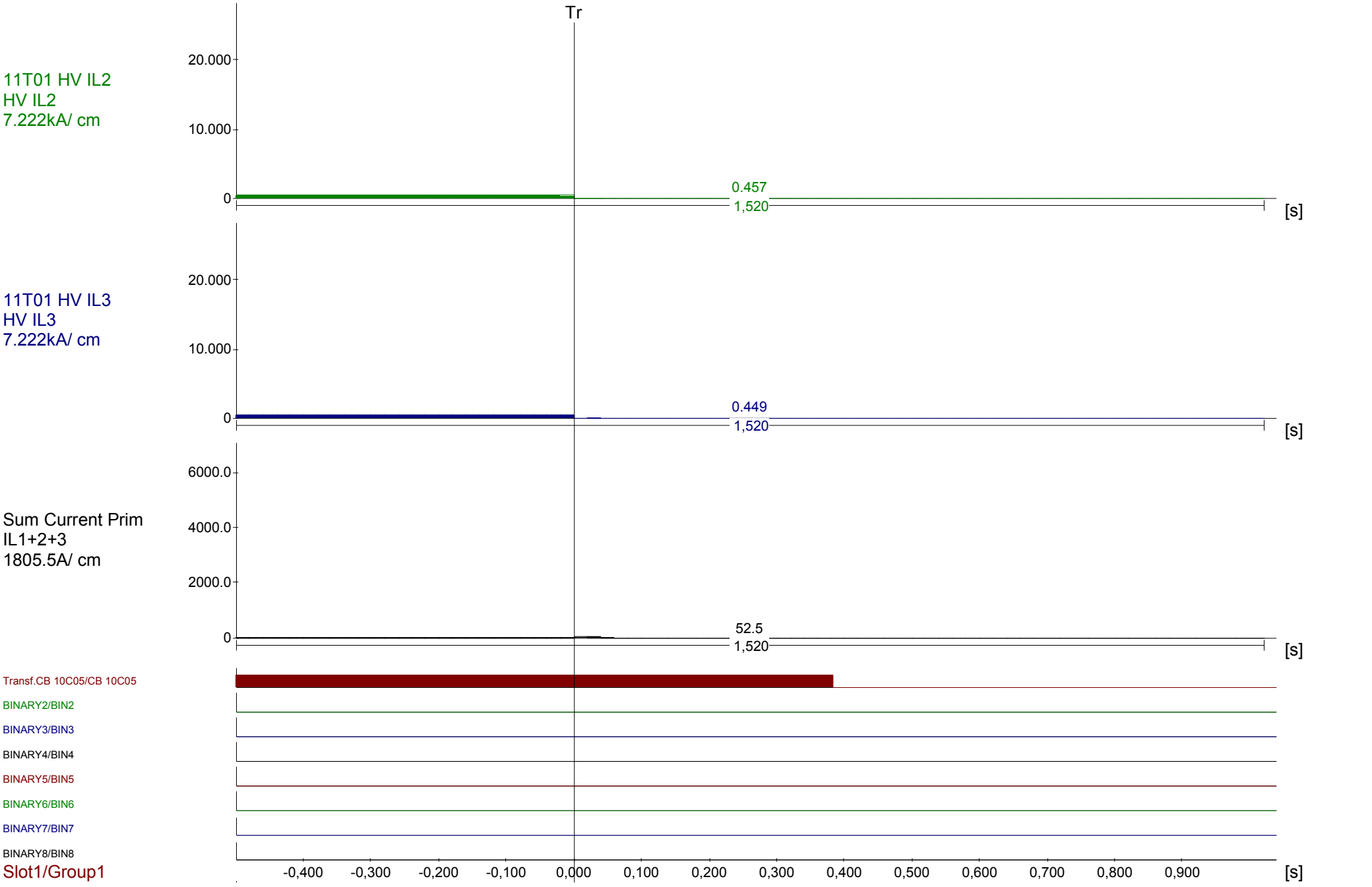
Scanning frequency: 12800Hz

TFR



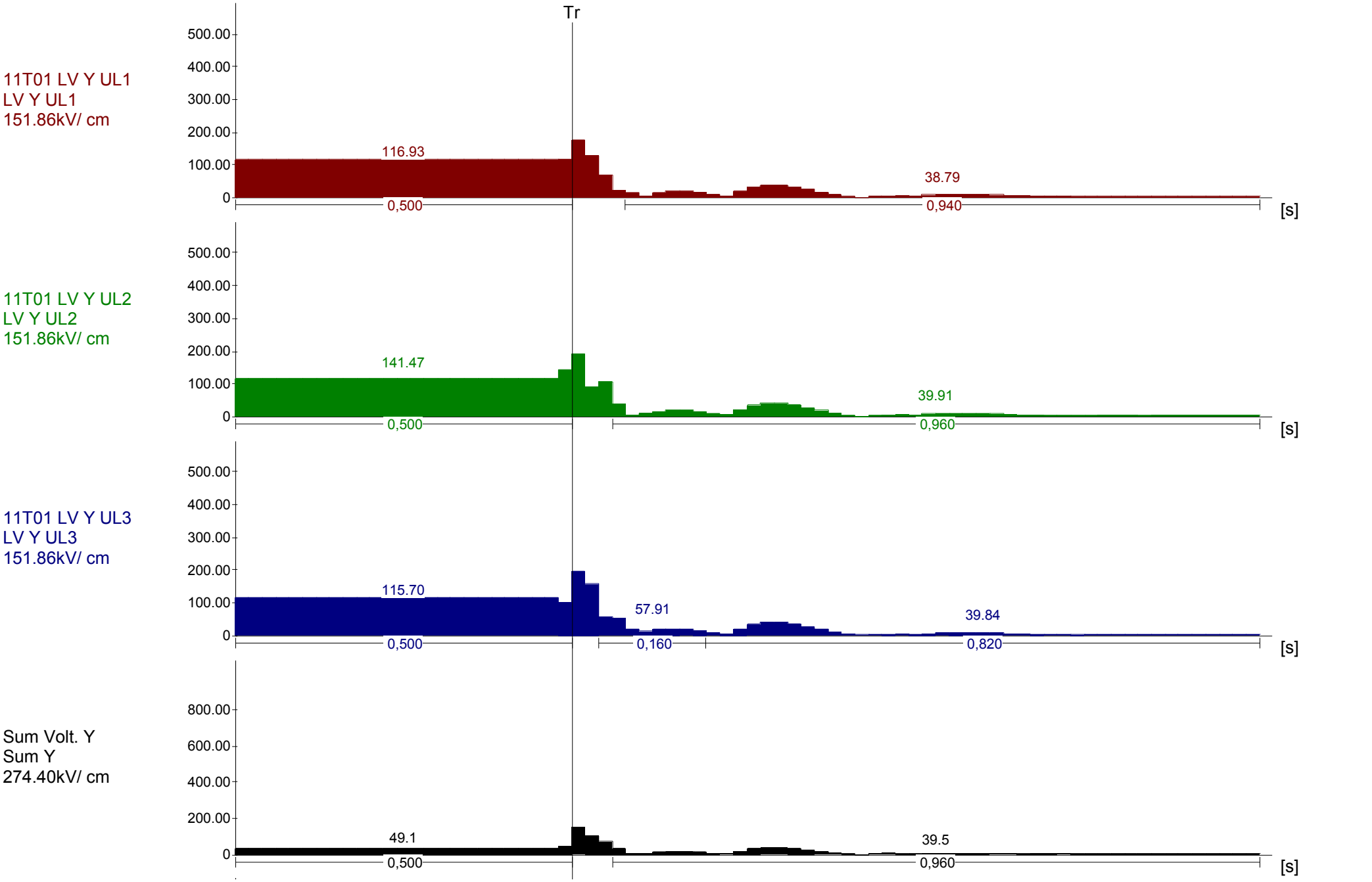
P1EH1

Scanning frequency: 12800Hz



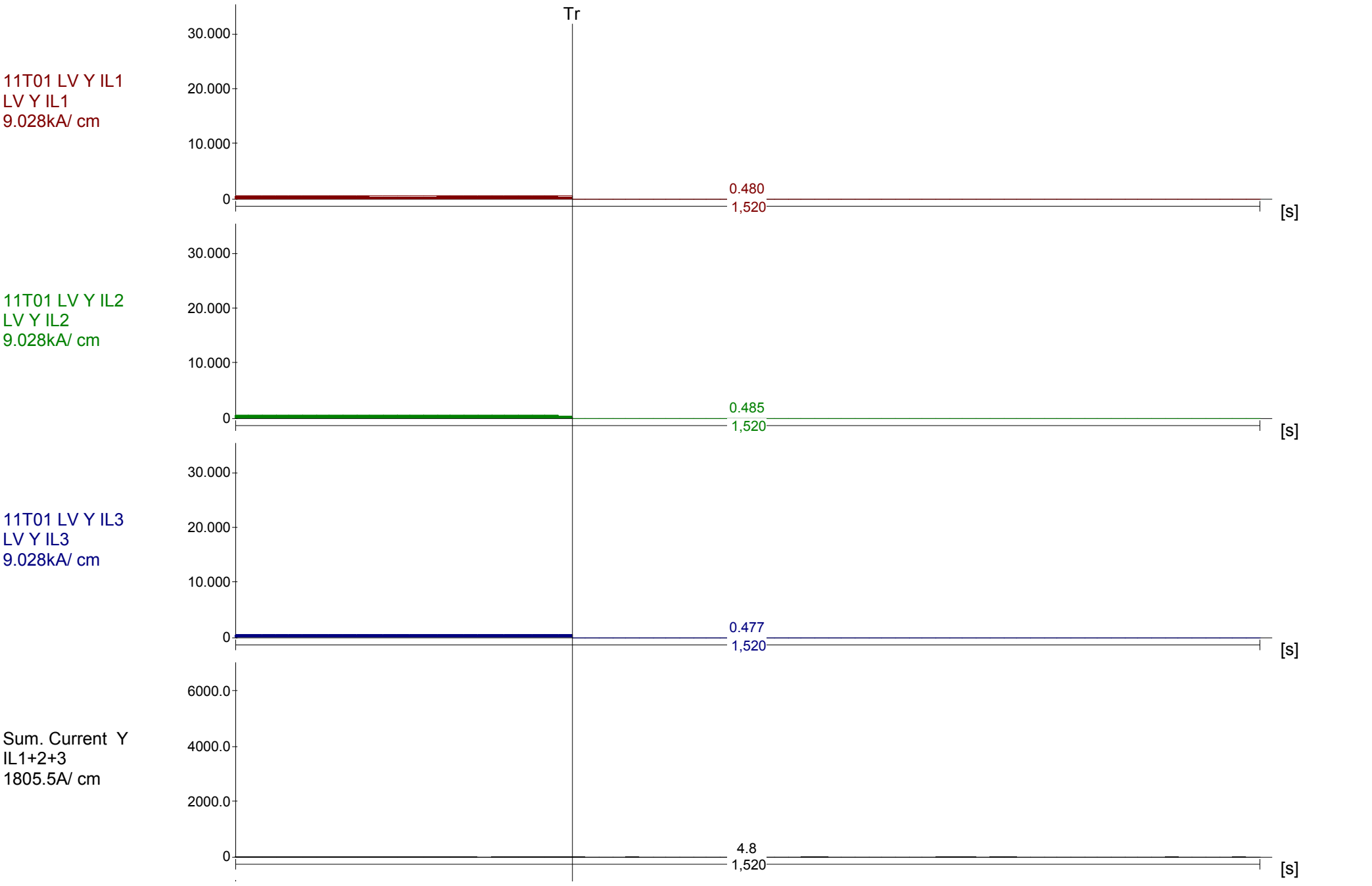
P1EH1

Scanning frequency: 12800Hz



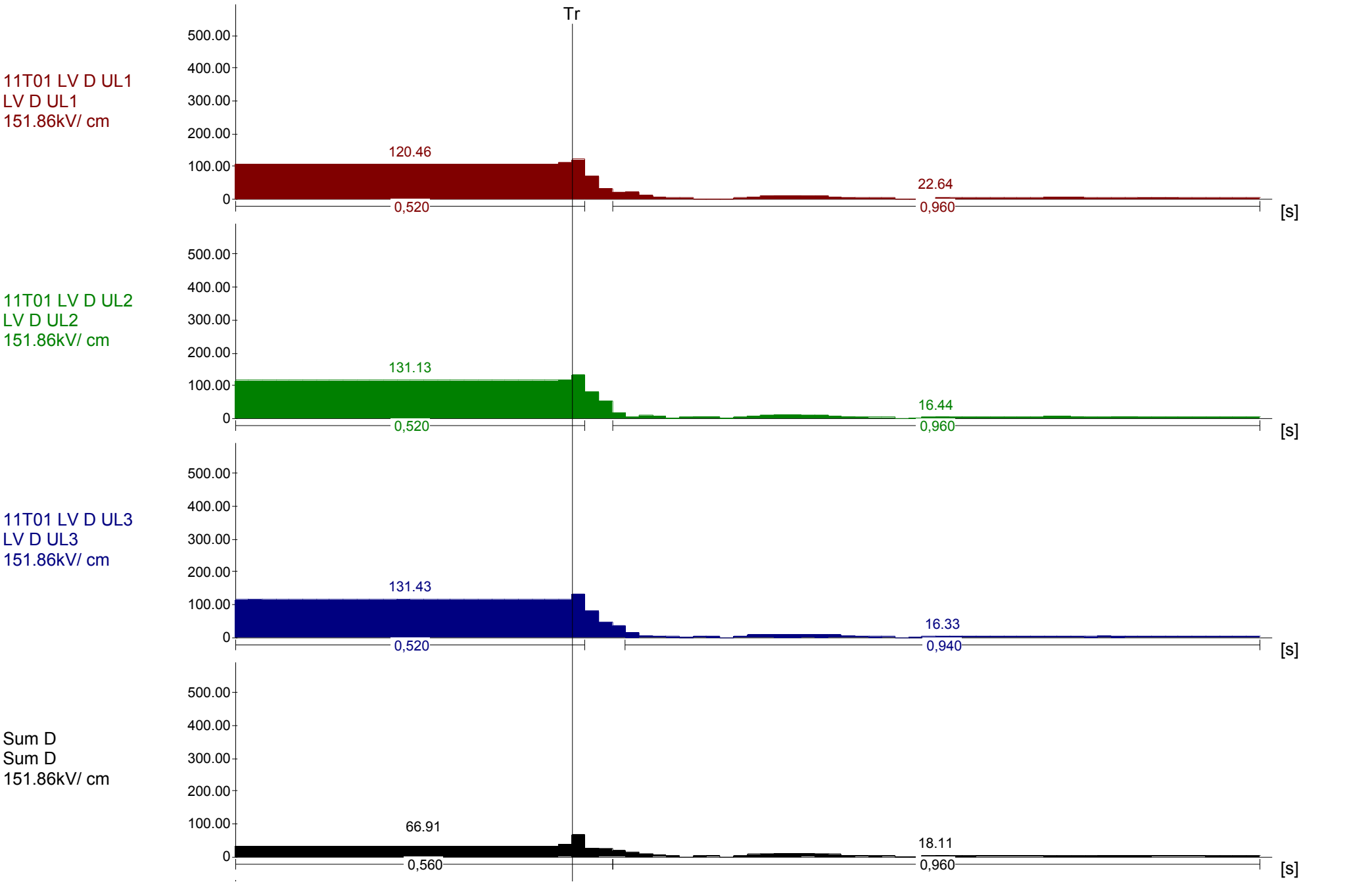
P1EH1

Scanning frequency: 12800Hz



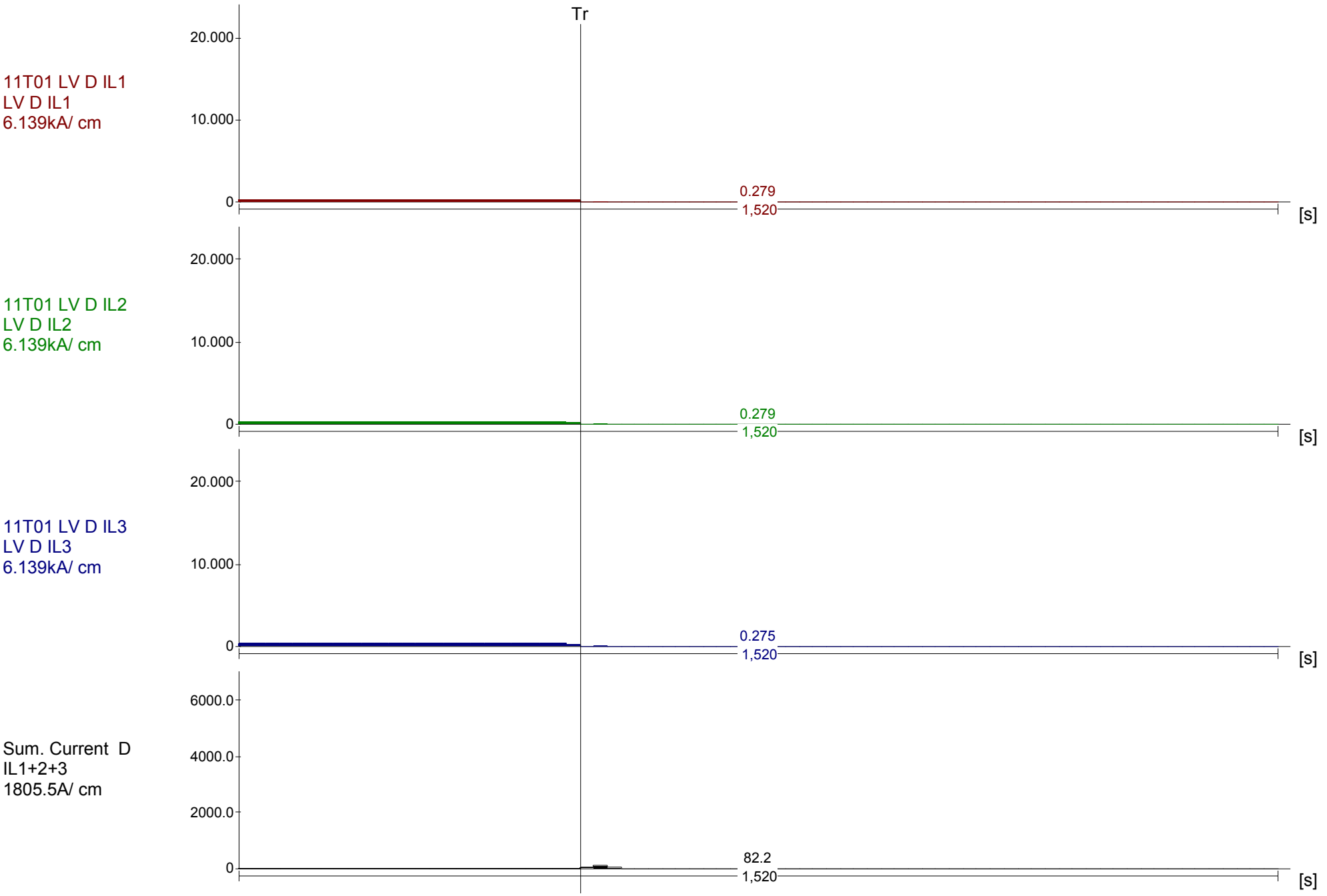
P1EH1

Scanning frequency: 12800Hz



P1EH1

Scanning frequency: 12800Hz



Observations in 3rd Party Protection Audit by ERPC Protection Team

Name of Substation: **220/132 kV Sipara (BSPTCL)**

Date of Audit: **23.08.2019**

Observations:

Observations/Remarks	Category
1. Event logger is not available for 220 kV & 132 kV System. The same shall be provided	B
2. Time synchronising equipment is not available.	B
3. Autorecloser feature is not in service for 220 kV Sipara-Fatuha T/C lines, 220 kV Sipara-Khagul line and 220 kV Sipara-Fatuha line.	B
4. Inter tripping scheme is not in service for all the 220 kV lines.	B
5. PLCC are not operational for 220 kV Sipara-Bihta line and 220 kV Sipara-Khagul line. The same shall be installed for these lines.	B
6. It was found that 220 kV Busbar protection relay(RADHA ABB) is faulty and obsolete one. It was advised to keep the faulty relay out of service till new busbar relay is installed.	A
7. It was advised to enable zone-4 of distance protection with suitable time setting in 220 kV Sipara-Patna T/C lines to cover Bus fault at 220 kV Sipara Bus.	A

Note:

1. As per CERC order dated 21st Feb 2014 protection deficiencies are categorised as

Category-A : The deficiencies which can be corrected without any procurement.
Category-B : The deficiencies involving procurement of equipments.

List of Intra Regional line tripping in the month of August 2019 where violation of protection standard has been observed

S.NO	LINE NAME	TRIP DATE	TRIP TIME	RESTORATION TIME	RESTORATION DATE	Relay Indication LOCAL END	Relay Indication REMOTE END	Reason	Fault Clearance time in msec	Remarks	DR From End	DR To End	PCC Comments
Miscellaneous: High Fault clearence time (or) Tripping on DT (or) No Fault observed in PMU													
1	400KV PPSP-NEW PPSP-I	07-08-2019	13:44	07-08-2019	14:52	DT sent from NPPSP	DT Received	DT sent from NPPSP	--	--	NO	NO	Contact issue, attended.
2	400KV ARAMBAGH-NEW CHANDITALA-SC	08-08-2019	5:43	08-08-2019	6:52	Maloperation of O/V Relay	DT RECEIVED	Maloperation of O/V Relay at Arambag	--	No Fault observed in PMU	NO	NO	CVT problem at Arambag.
3	400KV KOLAGHAT-ARAMBAGH-SC	13-08-2019	8:39	13-08-2019	9:39	Tripped from Kolaghat end only		Tripped from Kolaghat end only	--	--	NO	NO	Problem in R-ph cable of trip circuit, rectified
4	220KV GAYA-SONENAGAR-I	16-08-2019	6:58	16-08-2019	7:38		Tripped from Sonenagar end only	Tripped from Sonenagar end only	--	No Fault observed in PMU	NO	NO	No details available with BSPTCL
5	220KV DARBHANGA (DMTCL)-DARBHANGA-I	16-08-2019	23:17	17-08-2019	10:56		Tripped from Dharbhanga(B) end	Tripped from Dharbhanga(B) end	--	No Fault observed in PMU	YES	NO	Already discussed in Disturbance case
6	220KV ATRI-PANDIABILI-II	17-08-2019	12:37	17-08-2019	13:10	86A & 86B operated	DT Received	DT Received at Pandiabili	--	--	NO	NO	No details available with OPTCL
7	400KV JEERAT-SAGARDIGHI-SC	17-08-2019	18:00	17-08-2019	18:14	Tripped from jeerat end only		Tripped from jeerat end only	--	No Fault observed in PMU	NO	NO	DT received at Jeerat, DC earth fault found during testing
8	400KV LAPANGA-OPGC (IB THERMAL)-I	18-08-2019	2:29	18-08-2019	4:54	B-N, 6.9kA, 24km		B-N Fault	--	No Fault observed in PMU	NO	NO	I> 3 to be disabled
9	400KV LAPANGA-OPGC (IB THERMAL)-2	18-08-2019	2:29	18-08-2019	4:54	B-N, 12.58kA, 11.71km		B-N Fault	--	No Fault observed in PMU	YES	NO	I> 3 to be disabled
10	220KV NEW MELLI-JORETHANG-I	22-08-2019	12:22	22-08-2019	12:40	B-N,12.08KMFC 673AMP	B-N,Z1,FD 4.7KM,FC 118.1AMP	B-N Fault	--	No Fault observed in PMU	YES	NO	Already discussed in Disturbance case
11	220KV JORETHANG-NEW MELLI-II	22-08-2019	12:22	22-08-2019	12:34	B-N,Z1,FD 4.511KM,586.5 AMP	Tripped from Jorethang end only	B-N Fault	--	No Fault observed in PMU	YES	YES	Already discussed in Disturbance case
12	400KV KOLAGHAT-KHARAGPUR-II	25-08-2019	21:05	25-08-2019	21:31	Spurious DT received at Kharagpur		Spurious DT received at Kharagpur	--	--	NO	NO	Long pending PLCC issue, to be addressed on 28.09.2019
13	220KV STPS(WBSEB)-CHANDIL-SC	28-08-2019	19:48	28-08-2019	20:12		BN, Z1 , 90.07 KM , 5.35 kA	B-N Fault	1200 msec	--	NO	YES	Chandil: Tripping command issued as per DR but no CB opening
14	400KV KHARAGPUR-CHAIBASA-II	30-08-2019	12:54	30-08-2019	13:21	DT received at Kharagpur		DT received at Kharagpur	--	--	NO	NO	DT received at both side, DR to be sent by Powergrid ERTS-I and West Bengal
Autoreclose related issues													
1	220KV DEHRI -GAYA-II	04-08-2019	20:11	04-08-2019	20:36	Z1, RN, 52..64 KM, 1.88 KA	RN, 4.61 KA, 39.138 KM, A/R successful	R-N Fault	< 100 msec	No Autoreclose	YES	YES	No details available with BSPTCL
2	220KV DEHRI -GAYA-II	05-08-2019	21:34	05-08-2019	22:11	Y_N, 4.17 kA, No A/R	Y_N, 75.5 KM, 2.168 kA, No A/R	Y-N Fault	< 100 msec	No Autoreclose	YES	YES	No details available with BSPTCL
3	220KV STPS(WBSEB)-CHANDIL-SC	06-08-2019	21:05	06-08-2019	21:25	A/R Successful, Z1, Y-N, 17Km, 5.91KA	Z1, Y-N, 84.33Km, 1.864KA	Y-N Fault	< 100 msec	No Autoreclose	NO	NO	No details available with JUSNL
4	400KV MERAMUNDALI-LAPANGA-I	07-08-2019	15:42	07-08-2019	17:07	B-N, 2.91 kA, 152.4 km	Z-1, B-N, 6.48 ka, 38.79 km	B-N Fault	< 100 msec	Different A/R timing	YES	YES	A/R timing to be made same for both ends
5	220KV NEW PURNEA-MADHEPURA-II	10-08-2019	10:58	10-08-2019	11:44	A/R Successful, 76.1 KM .2.32 KA,B-N	B-N pickup carrier send Z1 trip IL3-2.05 KA dist- 20.05 km	B-N Fault	< 100 msec	No Autoreclose	YES	NO	No details available with BSPTCL
6	220KV DARBHANGA(DMTCL)-LAUKAHI-I	11-08-2019	9:14	11-08-2019	9:52	Z1, B-N, 63.3KM		B-N Fault	< 100 msec	No Autoreclose	NO	NO	No details available with BSPTCL
7	400KV BINAGURI-ALIPURDUAR-I	12-08-2019	19:24	12-08-2019	19:29	YN, 1.648 KA	A/R Successful	Y-N Fault	< 100 msec	No Autoreclose	NO	NO	Problem at Binaguri end, Solved
8	220KV MADHEPURA-NEW PURNEA-I	17-08-2019	13:40	17-08-2019	13:53	B-N,1.96 KA,68.9 KM, A/R Successful		B-N Fault	--	No Autoreclose	NO	NO	No details available with BSPTCL
9	400KV JHARSUGUDA-OPGC-I	18-08-2019	2:19	18-08-2019	3:25	R-N, A/R Successful		R-N Fault	< 100 msec	No Autoreclose	NO	NO	No details available from OPGC
10	400KV JHARSUGUDA-OPGC-II	18-08-2019	2:19	18-08-2019	3:11	R-N, A/R Successful		R-N Fault	< 100 msec	No Autoreclose	NO	NO	No details available from OPGC
11	400KV KOLAGHAT-KHARAGPUR-II	21-08-2019	10:02	21-08-2019	10:40	RN , Z1 , 25KM , 8.7 kA	RN , Z1 , 73 KM , 3.16 kA	R-N Fault	< 100 msec	No Autoreclose	NO	YES	Fault in reclaim time
12	400KV MEERAMUNDALI-ANGUL-II	24-08-2019	15:10	24-08-2019	15:32	Successfull A/R,13 km,24 KA	R_N ,17 KA,14.4 Km from angul	R-N Fault	1500 msec	No Autoreclose	YES	NO	Earthing issue at Meeramundali to be solved
13	220KV NEW PURNEA-MADHEPURA-II	25-08-2019	15:32	25-08-2019	16:13	B-N Fault		B-N Fault	< 100 msec	No Autoreclose	NO	NO	No details available with BSPTCL
14	220KV SUBHASGRAM(PG)-SUBHASGRAM-II	29-08-2019	12:45	29-08-2019	13:02	RN , 5.94 KM , 9.85 kA	RN ,1.85 kA	R-N Fault	< 100 msec	No Autoreclose	NO	NO	Corrected
15	400KV BINAGURI-MALBASE-III	30-08-2019	10:57	30-08-2019	11:19	Y-N,FD 50.41KM,FC 3.607KA. A/R SUCCESSFUL		Y-N Fault	1000 msec	No Autoreclose	NO	NO	To be taken up with Malbase
16	220KV ALIPURDUAR-BIRPARA-II	30-08-2019	11:46	30-08-2019	12:14	RN , Z1 , 16.8 KM , 4.24 kA	RN , Z1 , 39.3 KM , 1.6 kA	R-N Fault	< 100 msec	Dead time 1500 msec	YES	NO	Ok, Fault in reclaim time
17	400KV ARAMBAGH-BAKRESWAR-SC	31-08-2019	6:59	31-08-2019	16:52	B_N, 160 KM, 3.77 kA, B ph suspension insulator string failure at TL no 110	B_N, 33.7 KM, 4.82 kA	B-N Fault	< 100 msec	No Autoreclose	NO	NO	Permanent fault

ANNEXURE-C7

Sl No.	Name of the incidence	PCC Recommendation	Latest status
82nd PCC Meeting			
1.	Total Power failure at 220 kV Jorethang, 220 kV Tashiding & 220 kV New Melli S/s on 14.07.2019 at 10:35 Hrs.	*PCC advised DANS Energy to take the following actions to avoid the unwanted tripping of the lines:* • *Since the line length of the transmission lines are less than 20 km, differential protection may be implemented for 220kV Tashiding-New Melli line and Jorethang-New Melli line to improve the reliability.* • *Distance relay reach settings and selection of primary/secondary in the relay configuration settings to be reviewed at both Tashiding and Jorethang end.* • *Exact impedance of the line to be measured using off line fault location and the realy settings are to be reviewed accordingly.* *Distance relays at Tashiding and Jorethang end should be tested to verify the correct operation.* *Powergrid was advised to check the Distance relay reach settings and selection of primary/secondary in the relay configuration settings New Melli end.*	Powergrid informed that relay settings at new Melli end has been checked.
2.	Disturbance at 220 kV Siliguri S/s on 22.07.19 at 03:57 Hrs.	*PCC advised Powergrid to take the following corrective actions:* • *As the autorecloser at 220 kV Dalkhola end did not operate, it was advised to check the relay settings at Dalkhola end.* • *The trip status for 220 kV Siliguri-Dalkhola-II at Dalkhola end also need to be checked.* • *Time synchronization of DRs need to be checked and rectified at Dalkhola end.* • *As carrier was sent from dalkhola end in zone-2 initiation, Powergrid was advised to check overreach scheme in the relay*	

		settings at Dalkhola end and to review the settings.	
3.	Multiple tripping incident at Bihar Sharif at 16:39 hrs on 12-06-19. (Dead time at Sasaram and Bihar Sharif are different)	*Powergrid informed that the dead time at Sasaram was set at 700 ms to match with HVDC control.* *PCC advised Powergrid to review the settings at B'sharif end so that proper coordination can be done.* *PCC also advised Powergrid to configure the DR settings properly.*	*Reggarding dead time coordination Powergrid informed that it would be completed by next month.* *Powergrid informed that they have configured the DR settings as per the standard.*
4.	Tripping of 400 kV Malbase-Binaguri on 13-05-19 at 10:44 hrs	*PCC advised Powergrid to review for TOV settings.*	
5.	Submission of Load Trimming Scheme in Eastern region from States	*PCC advised all the state utilities to submit details of load trimming scheme/SPS implemented in their system to ERLDC/ERPC.*	
81st PCC Meeting			
6.	Disturbance at 400 kV Dikchu S/s on 30.06.2019 at 09:55 Hrs.	PCC advised Dikchu to review the backup E/F time setting of the ICT and coordinate the setting with with the zone-3 timing of the transmission line. The time setting for the DEF relay at Jorethang end was 500 msec. PCC advised Jorethang to review the timer setting of DEF protection at Jorethang end. PCC advised Chuzachen to review the zone settings for 132 kV Chuzachen-Rangpo line. PCC advised Teesta-III & Dikchu to study the effect on their machine for synchronization at higher angular differences. Based on the study results, suitable settings for breaker closing conditions during synchronization can be evaluated.	

		PCC advised TPTL to do line patrolling for 400 kV Rangpo-Dikchu line to find out the cause of such high resistive fault in the line.	
7.	Disturbance at 400 kV TSTPS (NTPC) S/s & Talcher HVDC station on 05.06.2019 at 19:01 Hrs.	PCC advised Powergrid to explore the feasibility of broken conductor protection at HVDC Talcher station end to avoid such kind of disturbances.	*Powegrid informed that implementation of broken conductor protection is not feasible as voltage signal would be required for the same.*
8.	Disturbance at 220 kV Budhipadar(OPTCL) S/s on 12.06.2019 at 00:37 Hrs.	PCC advised OPTCL to properly configure the DRs for 220 kV Budhipadar – Korba D/C & 220 kV Budhipadar-Raigarh circuit at Budhipadar end and for 220 kV Budhipadar – Lapanga - II at Lapanga end as per the DR standard finalised in 79th PCC Meeting. PCC also advised OPTCL to check the time synchronisation of DRs at Lapanga end.	
9.	Disturbance at 400 kV Meramundali (OPTCL) S/s on 03.06.2019 at 01:15 Hrs.	For voltage rise issue, PCC advised to check for any CVT related issues in the substation. PCC also advised to carry out earthing audit of the complete substation.	OPTCL informed that earthing audit of the substation would be planned at the earliest.
10.	Disturbance at 220/132 kV Dumka(JUSNL) S/s on 19.06.2019 at 13:02 Hrs.	PCC advised both Powergrid & JUSNL to configure the digital signal of DR output as per the DR standards finalized in 79th PCC Meeting. PCC also advised for time synchronization of the DR outputs at both Maithon & Dumka end.	J*USNL informed DR settings has been configured as per the standard. They informed that time synchronisation issue would be resolved at the earliest.*
11.	Repeated auto-reclose operation of 400 kV Ranchi-RTPS- II at Ranchi end during the tripping at 14:50 hrs on 31.05.2019	Powergrid informed that the reason for repeated autoreclosure during persistent fault would be checked during next available shutdown.	*Powergrid informed that the issue has been rectified.*

80th PCC Meeting			
12.	Protection Coordination issue in 400 kV Kishanganj-Darbhanga D/C line along with Line Reactor at Darbhanga end	PCC advised KPTL to analyze and find out the reason for tripping of 400 kV Kishanganj-Darbhanga D/C line in zone-3 protection for a fault in same line and simultaneous tripping of Line reactor at Darbhanga end. PCC also advised KPTL to submit the relevant relay settings to ERLDC/ERPC.	It was informed that backup impedance protection had been enabled in line reactor which caused the tripping of the reactor. PCC advised to coordinate the settings properly to avoid unwanted tripping.
79th PCC Meeting			
13.	Disturbance at Sikkim Hydro Complex on 12.04.19 at 23:55 hrs.	PCC advised Powergrid to configure the DR settings properly at Kishanganj end as per the DR standard finalized in PCC meeting. PCC also advised to send all the relay settings at Kishanganj end to ERPC for updating of the settings in PDMS database. PCC advised PCC advised TPTL to enter into an agreement with Powergrid for Operation & Maintenance of the bays in view of reliability and security of the grid. In 80th PCC Powergrid was advised to submit a report on actions taken on 79th PCC observations.	Powergrid informed that the DRs has been configured as per the standard.
76th PCC Meeting			
14.	Disturbance at 220 kV Katapalli S/s on 07.01.2019 at 15:40 hrs.	PCC advised OPTCL to send the details of Hindalco islanding scheme to analyze the reasons behind failure of the islanding scheme during this disturbance	*OPTCL has submitted the islanding scheme to ERLDC.*

15.	Disturbance at 400kV Gaya(PG), 220kV Gaya and Bodhgaya on 05-01-19 at 11:20 hrs	PCC advised BSPTCL to review the Khijasarai end relay settings to avoid unwanted tripping at Khijasarai end and submit the relay settings to ERPC for inclusion in PDMS.	BSPTCL informed that they will send the relay settings at the earliest.
72nd PCC Meeting			
16.	HVDC TFR triggering standardization and reporting requirements.	PCC advised POWERGRID to submit TFR triggering criteria and TFR signal list for all HVDC station of Eastern region to ERLDC.	It was informed that required information was received from Talcher HVDC station.
71st PCC Meeting			
17.	Disturbance at 220/132 kV Motipur(BSPTCL) S/s on 15.08.18 at 13:00 hrs.	PCC advised BSPTCL to check the disturbance recorders of all the lines in 220 kV Motipur S/s and communicate the findings to ERPC/ERLDC at the earliest.	BSPTCL informed that OEM is yet to visit the station.
18.	Disturbance at 400 kV Farakka S/s on 19.08.18 at 15:26 hrs.	PCC advised to check the reason for not sending carrier from Farakka to Kahalgaon and non-operation of Autorecloser.	NTPC informed that the carrier healthiness will be checked at next available shutdown.
68th PCC Meeting			
19.	Issues related with Generation Backing down during Talcher-Kolar SPS operation on 16th May 2018.	PCC advised Powergrid to explore for inclusion of pole block with ground return mode signal in the SPS logic. PCC advised NTPC also to explore for inclusion of pole block with ground return mode signal in the SPS logic.	PCC advised Powergrid and NTPC to coordinate and implement pole block with ground return mode signal in SPS. Powergrid informed that confirmation from NTPC is awaited whether they are receiving the pole block signal or not. *PCC decided that a team from ERPC would visit Talcher substation to resolve the issue..*

Annexure-C11.1

पावर ग्रिड कारपोरेशन ऑफ इंडिया लिमिटेड
(भारत सरकार का उद्यम)
POWER GRID CORPORATION OF INDIA LIMITED
(A Government of India Enterprise)
पावरग्रिड

प्लाट नं.- 4, यूनिट - 41, निलाद्री विहार, चंन्द्रशेखरपुर - 751021,
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Ref: ODP/BBSR/AM/ **Date: 26.09.19**

To,

Member Secretary,
Eastern regional Power Committee,
14 Golf Club Road,
Tollygunj, Kolkata-700 033.

Sub: - Additional Agenda points for discussion in 83rd PCC meeting from POWERGRID-Odisha.

Sir,

It is requested to include the following agenda point in 83rd PCC meeting for discussion.

Implementation of Line differential protection in 400kV Indravati (PG)-Indravati (UIHEP) line.

a. Recently, repeated faults in 400kV Indravati (PG)-Indravati (UIHEP) line were observed due to tree infringement in the line. Single phase transient faults (Bph-G) have occurred on 17.09.19 at 16:03hrs & 21.09.19 at 13:44hrs. Trip reports are enclosed at Annexure-1 for reference. Relays at Indravati(PG) end are sensing these faults in Zone-3 due to short length of the line (4km). This is causing tripping of upstream lines i.e 400kV Jeypore-Indravati (72km) & 400kV Rengali indravati lines (356km) in zone-2 prior to tripping of 400Kv Indravati-OHPC line. As such, implementation of Line differential protection in 400kV Indravati-OHPC line may be please considered. Since the line belongs OPTCL, implementation of differential protection & cost needs to be borne by OPTCL.
b. Modification of Zone timings as a temporary measure to avoid trippings of upstream lines for faults in 400kV Indravati-(PG)-Indravati (UIHEP) line till the implementation of Line differential protection.

Submitted for your kind consideration please.

Thanking you,

Yours faithfully
26/09/19
(A K Behera)
Sr.GM (Asset Management)
Power Grid, Bhubaneswar

For kind information Please:

1. Sr. GM(AM-I/C), Odisha Projects, Powergrid,
2. CGM - I/C, Odisha Projects, Powergrid,
3. Sh A Sensarma, Sr.GM, CC(AM), Gurgaon.

Annexure-C11.2

SL NO	Element Name	Owner	Charging Date	Protection Coordination Confirmation from Remote end				
				Utility 1	Utility 2	Utility 3	Utility 4	Utility 5
1	400kV Teesta_III-Kishanganj	TPTL	04-01-2019	DMTCL (Darbhanga)	Dikchu	PGCIl ERTS 2	PGCIL ERTS 1	
2	400kv Subhashgram-Rajarhat	PGCIL	28-01-2019	HEL (Haldia)				
3	400kv Jeerat-Rajarhat	PGCIL	28-01-2019	WBSSETCL (Chanditala)	WBPDCL (Bakreshwar, Sagardighi)			
4	220 KV Chaibasa(JUSNL)-Ramchandrapur-I	JSUNL	30-01-2019	PGCIL ERTS-1 (Chaibasa, Jamshedpur)	OPTCL (Joda)			
5	220 KV Chaibasa(JUSNL)-Ramchandrapur-II	JSUNL	30-01-2019	PGCIL ERTS-1 (Chaibasa, Jamshedpur)	OPTCL (Joda)			
6	500 MVA 400/220 ICT 3 at Gaya	PGCIL	06-02-2019	PGCIL (NR)	NPGC NTPC			
8	400 Kv Rangpo Kishanganj	TPTL	11-02-2019	DMTCL (Darbhanga)	Dikchu	Teesta 5	PGCIl ERTS 2	PGCIL ERTS 1
9	400 KV Darbhanga-Kishanganj-1	PGCIL	12-03-2019	PGCIL ERTS-1	PGCIL ERTS-2	Teesta 3 (TUL)		
10	765 KV Jharsuguda Raipur I	OGPTL	04-04-2019	PGCIL Orissa (Angul)				
11	765kv Jharsuguda-Rsipur-2	OGPTL	05-04-2019	PGCIL Orissa (Angul)				
12	400/220kv 315MVA ICT-2 at Bokaro-1	DVC	25-04-2019	DVC (Koderma)				
13	400 kV Bidhanagar - New Chanditala	WBSETCL	10-07-2019	WBSEDCL (PPSP)	PGCIL ERTS 2			
14	400 kV New_Chanditala-Arambag	WBSETCL	16-07-2019	SBSETCL (New PPSP)	WBPDCL (Bakreshwar, Kolaghat)			
15	400 KV Patna-NPGC II	PGCIL	17-07-2019	Ballia (PGCIL NR)	NTPC Barh	PGCIL ERTS-1 (Kishenganj)		
16	401 KV Patna-NPGC I	PGCIL	18-07-2019	Ballia (PGCIL NR)	NTPC Barh	PGCIL ERTS-1 (Kishenganj)		
17	220 kv Dalkhola-Gazole-1	WBSETCL	25-07-2019	PGCIL ERTS-1 (Purnea,Kishenganj)	WBSETCL (Dalkhola)			
19	220 kv Dalkhola-Gazole-2	WBSETCL	25-07-2019	PGCIL ERTS-1 (Purnea,Kishenganj)	WBSETCL (Dalkhola)			
23	220 KV Keonjhar-Keonjhar II	OPTCL	03-08-2019					
24	220 KV Patna khagaul ckt 2	BGCL	08-08-2019	PGCIL ERTS-1 (Ara)	BSTPCL (Sipara, Fatuah)			
25	220 KV Patna khagaul ckt 3	BGCL	08-08-2019	PGCIL ERTS-1 (Ara)	BSTPCL (Sipara, Fatuah)			