Agenda
for
91st PCC Meeting

Date: 24.06.2020
Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700 033

EASTERN REGIONAL POWER COMMITTEE

AGENDA FOR 91ST PROTECTION SUB-COMMITTEE MEETING TO BE HELD ON 24.06.2020 AT 10:30 HOURS

PART – A

ITEM NO. A.1: Confirmation of minutes of 90th Protection sub-Committee Meeting held on 13th May 2020 at ERPC, Kolkata.

The minutes of 90th Protection Sub-Committee meeting held on 13.05.2020 circulated vide letter dated 03.06.2020.

Members may confirm the minutes of 90th PCC meeting.

PART – B

ANALYSIS & DISCUSSION ON GRID INCIDENCES OCCURRED IN May 2020.

ITEM NO. B.1: Repeated trippings of 400kV Barh-Motihari line

1. Disturbance at 400 k V Motihari Substation on 07.05.2020 at 12:51 hrs

Tripping of 400 kV Barh - Motihari - 2 due to Y phase to earth fault, had led to loss of supply to Betiah/Raxaul/Motihari as being the single source of supply.

Load Loss: 85 MW

2. Disturbance at 400 k V Motihari Substation on 10.05.2020 at 23:56 hrs

Tripping of 400 kV Barh - Motihari - 2 due to Y phase to earth fault, had led to loss of supply to Betiah/Raxaul/Motihari as being the single source of supply.

Load Loss: 120 MW

3. Disturbance at 400 k V Motihari Substation on 11.05.2020 at 02:48 hrs

Tripping of 400 kV Barh - Motihari - 2 due to Y phase to earth fault, had led to loss of supply to Betiah/Raxaul/Motihari as being the single source of supply.

Load Loss: 120 MW

4. Disturbance at 400 k V Motihari Substation on 20.05.2020 at 13:23 hrs

Tripping of 400 kV Barh - Motihari - 2 due to Y phase to earth fault, had led to loss of supply to Betiah/Raxaul/Motihari as being the single source of supply.

Fault level of 400/132 kV Motihari S/S is reduced to very low as around 3000 MW. DMTCL may restore the others lines at the earliest so the fault level of this substations may be improved.

During April-May 2020, 400 kV Barh-Motihari 2 has tripped on multiple occasions with same fault

location and fault parameter. These incidents to lead to repeated total loss of power supply to Betiah, Raxaul, Motihari and grid disturbance at 400/132 kV Motihari S/S.

During the event, Y and B phase poles (healthy phase) of Tie breaker also got opened at around 300 ms after the opening of R phase pole (faulty phase) (refer Annexure 1). Same was observed in case of earlier events also. DMTCL informed auto reclose operation of main/tie breaker got blocked by starting signal supervision. It means fault was cleared (pole of faulted phase of the breaker opened) but relay was getting initiation continuously. So, relay gave the definite trip to circuit breaker. DMTCL may find the root cause of this mal operation and can take remedial action. Same issue was raised in 90th ER PCC meeting

As per DR recorded at Barh, R pole of the main breaker (faulted phase) did not auto-reclose at 1 second after the fault. After 2 seconds, R pole of the tie breaker attempted at Barh. As the fault persisted, all the healthy poles of main and tie breaker tripped. Non-attempt of auto-reclose has been observed in case of 26th April's event also. NTPC Barh is requested to take action to mitigate these types of repeated problem.

Relay Indications :

Element Name	Motihari End	Barh End	PMU observation
400 kV Barh Motihari - 2	R-N, Zone - 1, 22.6KM, F/C 0.61 KA	R-N, Zone – 1, 3 kA	Unsuccessful auto-reclose operation has been found in PMU data. Fault clearing time was less than 100 ms. As per Barh PMU's data, dead time for auto-reclose operation was 2 secs.

Load Loss: 120 MW

5. Disturbance at 400 k V Motihari Substation on 30.05.2020 at 19:22 hrs

At 19:22 hrs 400 kV Barh – Motihari – 2 tripped due to Y phase to earth fault. The tripping has led to loss of supply to Betiya and Motihari as being the single source of supply causing Grid Disturbance 1 (GD-1) category event.

During April-May 2020, 400 kV Barh-Motihari 2 has tripped on multiple occasions (shown in table 2) with same fault location and fault parameter. These incidents to lead to repeated total loss of power supply to Betiya, Raxaul, Motihari and grid disturbance at 400/132 kV Motihari S/S. Further, during fault, A/R has been successful however fault is reappearing immediately in reclaim time causing voltage dip and line tripping. Such multiple auto-reclosure event in the line connecting a major generating station (NTPC Barh) is not desirable in view of health of the power plant. POWERGRID ERTS – 1 is requested to do the root cause analysis of these repetitive tripping, take the preventive measures for reducing these tripping. Same issue has been raised in 90th ER PCC meeting.

No SOE has been recorded in ERLDC SCADA data at the time of the event. NTPC Barh, BSPTCL and DMTCL are requested to check this issue.Bihar SLDC is requested to share detailed report indicating load loss, loss of energy unserved and restoration of load and any other relevant information

During the event, R and B phase poles (healthy phase) of Tie breaker also got opened at around 300 ms after the opening of Y phase pole (faulty phase) . Same was observed in case of earlier events also. DMTCL informed auto reclose operation of main/tie breaker got blocked by starting signal supervision. It means fault was cleared (pole of faulted phase of the breaker opened) but relay was getting initiation continuously. So, relay gave the definite trip to circuit breaker. DMTCL may find the root cause of this mal operation and can take remedial action. Same issue was

raised in 90th ER PCC meeting

Relay Indications:

Time	Element Name	Motihari End	Barh End	PMU observation
19:22 Hrs	400 kV Barh Motihari - 2	Y-N, 121 km, F/C 0.4KA	Y-N, Zone -1, F/C 4.2 kA	Y phase to earth fault in reclaim time after successful auto-reclose on the same fault. Fault clearing time Is less than 100 ms.
22:05 Hrs		Y-N Z-1 FC0.33kA,123 km	Y-N Z-1 Dist-93km FC-4.61kA	Unsuccessful auto-reclose due to persistent Y phase to earth fault. Fault clearing time is less than 100 ms

Load Loss: 126 MW

6. Disturbance at 400 k V Motihari Substation on 30.05.2020 at 22:05 hrs

At 22:05 hrs 400 kV Barh – Motihari – 2 tripped due to Y phase to earth fault. The tripping has led to loss of supply to Motihari as being the single source of supply causing Grid Disturbance 1 (GD-1) category event.

Load Loss: 0 MW

BSPTCL , DMTCL , NTPC Barh and Powergrid may explain

ITEM NO. B.2: Disturbance at 220 k V Darbhanga Substation on 05.05.2020 at 19:09 hrs.

On 5th May 2020, at 19:09 Hrs, 220 kV Darbhanga (DMTCL)-Darbhanga (BSPTCL) D/C tripped on Y phase to earth fault. At the same time 220 kV Dharbanga-Mushahari-1 also tripped resulting in load loss at Darbhanga, Madhubani and Pandaul. Later on it was informed by BSPTCL that there was a Y-phase jumper snapping of 220 kV Darbhanga (DMTCL)-Darbhanga (BSPTCL) - 2 which was the root cause of the event.

Load Loss: 180 MW

BSPTCL may explain.

ITEM NO. B.3: Total Power failure at 220 k V Sonenagar Substation on 10.05.2020 at 22:51 hrs.

220 kV Gaya Sonenagar – D/C tripped at 22:51 hrs due to R phase to earth fault resulting total power failure at Sonenagar S/S. Around 130 MW load loss was reported at Aurangabad, Sonenagar, Rafi Ganj, Japla. Around 15 MW traction load loss was reported at Japla, Garwah and Rafi Ganj.

Load Loss: 130 MW

BSPTCL may explain

ITEM NO. B.4: Disturbance at 220 k V Muzaffarpur Substation on 24.05.2020 at 19:51 hrs.

220 kV Muzaffarpur Dhalkebar D/C tripped due to B phase directional O/C resulting in loss of power supply to Dhalkebar. Prior to the tripping export schedule to Nepal was 90 MW. Around 60-70 MW power was flowing through 220 kV Muzaffarpur Dhalkebar D/C. At 19:49 hrs power through these two circuits increased to more than 145 MW. No load loss reported in Indian grid**.**

No load and gen. loss

Powergrid may explain.

ITEM NO. B.5: Total Power failure at 220/132 kV Chaibasa Substation on 06.05.2020 at 01:19 hrs.

At 01:13 hrs 400/220 kV ICT 1 & 2 at Chaibasa (PG) tripped from 220 kV side due to mal-operation of back up impedance relay. At 01:19 hrs, 220 kV Chaibasa (JUSNL) – Chaibasa (PG) D/C and 220 kV Chaibasa (JUSNL) – Ramchandrapur D/C tripped due to R phase to earth fault resulting in total power failure at 220/132 kV Chaibasa (JUSNL) S/S. 132 kV Rajkharswan – Goelkhera S/C also tripped at same time.

Load Loss: 20 MW

JUSNL may explain.

ITEM NO. B.6: Total Power failure at 220/132 k V Hatia Substation on 14.05.2020 at 15:33 hrs

220 kV Ranchi Hatia T/C, 220 kV Patratu-Hatia D/C and 220/132KV 150MVA ICT-1, 2 and 3 at Hatia tripped at same time resulting in total power failure at 220/132 kV Hatia S/S. In Jamshedpur PMU data, one R phase to earth fault has been captured. Fault was cleared at around 400 ms.

Load Loss: 161 MW

JUSNL may explain.

ITEM NO. B.7: Disturbance at 220/132 k V Hatia Substation on 19.05.2020 at 02:56 hrs.

132 kV side B phase CT of 220/132 kV ICT – 3 at 220/132 kV Hatia S/s got burst. At same time, 220 kV Ranchi Hatia 1 and 3, 220/132KV 150MVA ICT-1, 2 and 3 at Hatia tripped resulting total loss of supply at 132 kV voltage level of Hatia S/S. 220 kV bus at Hatia remained in service along with 220 kV PTPS – Hatia D/C and 220 kV Ranchi – Hatia – 2.

Load Loss : 200 MW

JUSNL may explain.

ITEM NO. B.8: Tripping of both units at TTPS on 24.05.2020 at 12:38 hrs.

At 12:28 hrs 220 kV TTPS – Bihar Sharif S/C tripped due to R phase to earth fault. The whole power generated by TTPS was being evacuated through 220 kV TTPS – PTPS S/C. At 12:38 hrs, 220 kV TTPS – PTPS S/C tripped due to B phase to earth fault resulting in tripping of both running units at TTPS.

Gen. Loss : 292 MW

JUSNL, BSPTCL and TVNL may explain.

ITEM NO. B.9: Disturbance at 220 k V TTPS Substation on 18.05.2020 at 0:53 hrs.

220 kV TTPS – PTPS S/C tripped from PTPS end only on B phase to earth fault. 220 kV TTPS – PTPS S/C, unit 2 at TTPS and station transformer 2 at TTPS were connected to 220 kV bus 2 at TTPS. So, both the running units at TTPS and 220 kV bus coupler at TTPS (tripping of bus coupler was verbally informed by TTPS) tripped to clear the fault. 220 kV TTPS – Bihar Sharif S/C and 220 kV bus 1 at TTPS did not trip during this event.Gen Loss: 749 MW

Gen.Loss : 302 MW

JUSNL, BSPTCL and TVNL may explain.

ITEM NO. B.10: Total Power failure at Dikchu HEP on 19.05.2020 at 20:57 hrs.

At 20:57 hrs both circuits tripped resulting in total power failure at Dikchu HEP. 400 kV Teesta III – Dikchu S/C tripped due to B phase to earth fault. 400 kV Rangpo – Dikchu S/C tripped due to direct trip signal received at Rangpo.

High resistance fault followed by delayed clearing of fault had been observed in the past for 400 kV Rangpo – Dikchu S/C and 400 kV Rangpo – Kishangunj S/C. Considering importance of reliability of 400 kV Teesta III – Kishangunj S/C and 400 kV Teesta III – Dikchu – Rangpo section, option for implementation of differential protection may be explored on these circuit including 400 kV Rangpo-Kishanganj circuit. Similar type of events has occurred on 12th April 2019, 16th April 2019, 30th June 2019 and 15th March 2020 followed by loss of hydro generation. TVTPL, TUL, DIKCHU, PGCIL ERTS-2, PGCIL ERTS-1 may kindly review this for betterment of system. This issue has been highlighted in 90th ER PCC meeting also.

Where was the actual fault and whether the fault was on both circuits or only one also need to be clarified. The fault was in whose jurisdiction (TVTPL or Dikchu LILO portion) also need deliberation and details from the utility and ISTS licensee. TVPTL was instructed to patrol line after failed charging attempt of 400 kV Teesta III – Dikchu S/C at 22:03 hrs. TVPTL is requested to share line patrolling report.

Reason for non-auto reclose attempt at Teesta III end for 400 kV Teesta III – Dikchu S/C may be shared by Teesta III

Relay Indications :

Time	Line name	End 1	End 2	PMU observation
20:57 Hrs.	400 kV Teesta III – Dikchu S/C	B-N, F/C 4.2 kA, Zone – 1; No auto-reclose attempt observed	E/F (TEF) trip, IR = 0.5kA, IY = 0.6Ka, IB = 2.6kA, IN = 1.9 kA, DT sent	High resistance B phase to earth fault has been observed in Rangpo PMU data at the time of the event. Fault clearing time is around 1600 ms.
20:57 Hrs	400 kV Dikchu – Rangpo S/C	E/F (TEF) trip, IR = 0.5kA, IY = 0.6Ka, IB = 2.6kA, IN = 1.9 kA, DT sent	DT received	

Gen Loss : 55 MW

Powergrid , TUL , TVTPL and Dikchu may explain.

ITEM NO. B.11: Disturbance at 220 k V Jorethang and 220 k V Tashiding Substation on 27.05.2020 at 04:28 hrs.

220 kV New Melli - Jorethang - 1 tripped on Y phase to earth fault from Jorethang end. 220 kV New Melli - Jorethang - 2 tripped on overcurrent protection from Jorethang end only. At same time 220 kV Tashiding - New Melli S/C and 220 kV Tashiding - Rangpo S/C tripped from Tashiding end only on Y phase to earth fault.

Tripping of more than one circuits due to single fault is very common in 220 kV JLHEP – New Melli – Tashiding HEP – Rangpo section. Similar type of events has occurred on 16th January 2020, 25th February 2020, 01st April 2020 followed by loss of hydro generation. Due to variable hydro generation and high resistance of the fault, configuration of distance protection setting may be very challenging. Possibility of differential protection system may be explored for this section. JLHEP, THEP and POWERGRID may kindly review this for betterment of system.

Polarity of distance protection relay at Tashiding end of 220 kV Tashiding – Rangpo S/C may be reviewed. O/C protection setting at JLHEP may be reviewed also

Relay Indications:

Line name	End 1	End 2	PMU observation
220 kV Jorethang - New Melli -1	Y-N, Zone-1, IR=0.2 kA IY=1.7 kA, IB=0.3 kA	Y-N, Zone – 1, A/R successful	Around 25 kV dip has been observed in Y phase voltage at Rangpo PMU. Fault clearing time is less than 100 ms.
220 kV Jorethang - New Melli -2	O/C, IR=0.1 kA, IY=0.1 kA, IB=0.1 kA	Did not trip, Zone – 3 start in Y phase	
220 kV Tashiding - New Melli S/C	Y-N, Zone-1, 10.64 km, F/C 2.4 kA	Did not trip	
220 kV Tashiding - Rangpo S/C	Y-N, Zone-1, 28 km, F/C 1.75 kA	Did not trip	

Gen Loss: 110 MW

Powergrid ,JLHEP , THEP and DANS Energy may explain.

ITEM NO. B.12: Tripping of all 220 k V lines from 220 k V NJP Substation on 27.05.2020 at 0:56 hrs

At 00:56 Hrs. all 220 kV lines from 220 kV NJP tripped due to tripping of both 220 kiva Buses ,causing generation loss at TLDP III and TLDP IV on no evacuation path

During tripping at 19:04 hrs. both TLDP IV feeders were connected to 220 kV bus – 2 at NJP. Tripping of bus 2 at NJP buses resulted tripping of both TLDP IV feeders. Both TLDP – IV may be connected different buses at NJP . No SOE has been recorded in ERLDC SCADA data at the time of the events. WBSLDC/WBSETCL are requested to check this issue.

WBSETCL shared the information that 96 relay of NJP s/s mal operated due to earth fault in control cable between NJP (WB) and Binaguri (PG) and temporary dc earth fault developed due to heavy rain during tripping event at 19:04 hrs. At 01:30 hrs. same incident occurred in addition to tripping of 220 kV bus-1 at NJP also due to water ingress in isolator auxiliary causing mal operation of CT switching relay of 220/132 kV 160MVA ICT – 3 at NJP. System finally restored after changing defective cores of cable by spare ones. WBSETCL may take preventive action for reducing the numbers of such mal-operation. WBSLDC is requested to share detail report along with details at TLDP. WBSETCL is advised to share the information whether the bus bar protection and other equipment are numerical or non-numerical in nature. WBSETCL is advised to share the information of last protection audit along with internal protection audit and details of last DC measurement at substation. Based on submitted details, DC fault on multiple occasion

could have resulted in quite serious situation for evacuation of TLDC III and IV Hydro plant.

Relay Indications :

Time	Element Name	NJP end details	PMU observation
19:04 Hrs.	220 kV bus 2 at NJP, 220/132 kV ICT 2 & 3 at NJP and 220 kV NJP – TLDP IV D/C	96 Trip Relay Operated;	Voltage dip was observed in all three phases from Binaguri bus voltage. Fault was cleared within 100 ms. This indicate transient fault in the system
20:21 Hrs.	220 kV bus 2 at NJP, 220/132 kV ICT 2 & 3 at NJP and 220 kV NJP – TLDP IV - 1	96 Trip Relay Operated;	Voltage dip was observed in all three phases from Binaguri bus voltage. Fault was cleared within 100 ms. This indicate transient fault in the system
00:56 Hrs. (27-05-2020	220 kV bus 1 and 2 at NJP, 160 MVA, 220/132 kV ICT 1, 2 & 3 at NJP, 220 kV NJP – TLDP IV D/C and 220 kV NJP – TLDP III S/C	96 Trip Relay Operated;	Voltage dip was observed in all three phases from Binaguri bus voltage. Fault was cleared within 100 ms. This indicate transient fault in the system

Gen Loss: 280 MW

WBSETCL and TLDP may explain.

ITEM NO. B.13: Disturbance at 400 k V Alipurduar Substation on 07.05.2020 at 18:47 hrs.

At 18:47 Hrs, 400 KV Alipuduar - Jigmelling D/C tripped on R-Y-N fault caused tripping of Mangdechu units #1 and #2 (At Bhutan) on no evacuation path. No generation and load loss at Indian grid. At Bhutan grid around 238 MW generation loss occurred at Mangdechu.

No load and gen. Loss

Powergrid may explain.

ITEM NO. B.14: Total Power failure at 400 k V JSPL Substation on 16.05.2020 at 19:28 hrs.

At 19:26 hrs. 400 kV Meramundali – JSPL – 1 tripped due to receipt of DT signal at Meramundali end. After around 1 min, 400 kV Meramundali – JSPL – 2 tripped due to same reason resulting total power failure at JSPL. Inclement weather condition was reported at the time of the event.

Load Loss: 160 MW , Gen Loss : 230 MW

OPTCL may explain.

ITEM NO. B.15: Tripping Incidences in month of May 2020

Other tripping incidences occurred in the month of May 2020 which needs explanation from constituents of either of the end is given in **Annexure-B15.**

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.

ITEM NO. B.16: List of DR discrepancies in the month of May 2020.

The list of all DR discrepancies in month of May 2020 which needs explanation from constituents of either of end is to be discussed.

Members may discuss.

ITEM NO. B.17: Submission of detailed tripping information on Transmission Element Tripping

A format for submission of detailed information on Transmission element tripping has been prepared for analysis and record keeping. The format includes the details to ensure the better record keeping in view of various requirement in line with IEGC and CEA Regulations. All the transmission owners/licensees were advised to share this detailed record through mail in 90th ER PCC meeting. But tripping information is being received for very few tripping incidents.

Members may discuss.

ITEM NO. B.18: Submission of Follow Up on the Issues Raised by ERLDC in their detailing GD/GI report to utilities

ERLDC through its various detailed report of GD/GI has asked on the various issues and discrepancies observed during any event. It has been observed that follow up action are quite delayed or not being submitted properly by the utilities. All utilities are advised to submit the action taken on the Issues discussed in the last PCC at the beginning of the PCC meeting for ensuring that such tripping will not reoccur. Same has been raised in 90th ER PCC meeting.

Members may discuss.

ITEM NO. B.19: Nomination of nodal persons for communication related to tripping of grid elements

For analysis of tripping incident of any grid elements, high resolution data from various generating stations, transmission utilities, SLDCs and other users. For smooth communication regarding this transfer of data, all the regional generating stations, transmission utilities and SLDCs are requested to nominate at least two persons as nodal person(s) for tripping

analysis of any grid element. Name, contact number and email address of nominated persons may be shared as per following table.

	Nodal Person-1 Name & Contact Details (Phone, email id)	**Nodal Person-2 Name & Contact Details (Phone, email id**
NTPC Farakka		
NTPC Kahalgaon		
NTPC Talcher		
NTPC Barh		
NTPC Darlipalli		
BRBCL		
NPGC		
MPL		
Adhunik		
GMR		
JITPL		
KBUNL		
Teesta V		
Teesta III		
Rangit		
Chujachen		
Jorethang		
Tashiding		
Dikchu		
Bihar SLDC		
Jharkhand SLDC		
DVC SLDC		
GRIDCO SLDC		
WB SLDC		
Sikkim SLDC		
POWERGRID ER -1		
POWERGRID ER -2		
POWERGRID Odisha		
DMTCL		

ITEM NO. B.20: Repeated tripping of transmission lines due to same reason/fault at nearby areas.

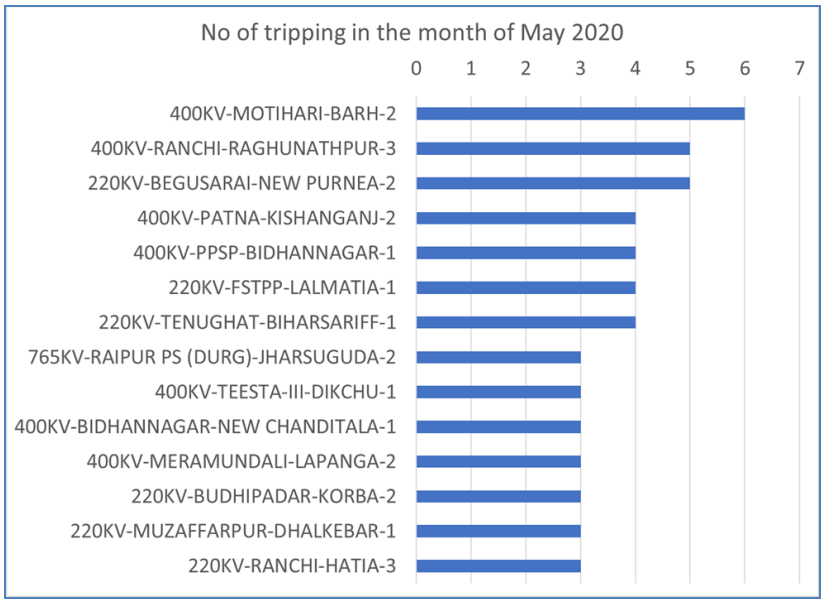

Figure 1: List of the transmission lines which tripped more than two times during the month of May 2020

As shown in Figure 1, there are 14 transmission lines having voltage level 220 kV and above and which tripped more than two times in the month of May 2020. Around 11 transmission lines having voltage level 220 kV and above tripped more than two times in the month of April 2020. Growing number of repeated tripping of transmission lines is putting grid in grid in vulnerable condition. Repeated tripping of some transmission lines resulted repeated grid disturbances and grid incidents along with load and generation loss. **Transmission lines utilities are requested to maintain line properly so that repeated tripping may be avoided.** In some cases, lines tripped due to same reason or fault at nearby location. List of those lines is shown below.

Name of the line	Reason	No of tripping
400KV-MOTIHARI-BARH-2	Y phase to earth fault at 119km to 123 km from Motihari	5
400KV-RANCHI-RAGHUNATHPUR-3	R phase fault at various location	4
220KV-BEGUSARAI-NEW PURNEA-2	Various fault at 32 - 44 km from Begusarai	5
400KV-PATNA-KISHANGANJ-2	Y and B phase fault at 208 km from Kishangunj	3

ITEM NO. B.21: Repetitive tripping of Transmission Lines from Lalmatia substation during March-June 2020

220/132 kV Lalmatia substation and associated transmission lines healthiness has been discussed in detail in the past in the ER protection forum based on which protection audit has also been carried out. The audit finding has been deliberated in the Eastern region Board Meeting in detail. After that, the decision was taken during the board meeting that respective utilities (JUSNL/BSPTCL/NTPC) will be maintaining the equipment healthiness to ensure reliability at the substation.

Since the last two months (after Covid19 Lockdown), it has been observed that 220 kV Farakka-Lalmatia cks, 132 kV Lalmatia-Kahalgaon (NTPC) and 132 kV Kahalgaon(BSEB)-Lalmtia are tripping on multiple occasions. The list of tripping is given below where reasons attributed are transient fault (either zone protection or O/C & E/F) or Equipment failure.

Element Name	Tripping Date	Tripping Time	End 1	End 2

Element Name	Tripping Date	Tripping Time	End 1	End 2
132KV-KAHALGAON(BSEB)-LALMATIA-1	20-03-2020	13:59	TRIPPED	
132KV-KAHALGAON(BSEB)-LALMATIA-1	24-03-2020	07:35		Overcurrent in B phase
132KV-KAHALGAON(BSEB)-LALMATIA-1	12-04-2020	03:02	Y,B-Phase fault, overcurrent Protection	
220KV-FSTPP-LALMATIA-1	19-04-2020	23:51	R phase to E/F; Z-1, Fault Loc : 62 km	
132KV-KAHALGAON(BSEB)-LALMATIA-1	19-04-2020	23:55	Zone 1 Distance Protection	
132KV-KAHALGAON(BSEB)-LALMATIA-1	25-04-2020	08:06	No Trip at Lalmatia	
132KV-KAHALGAON(BSEB)-LALMATIA-1	28-04-2020	10:22	O/C & E/F	
132KV-KAHALGAON(BSEB)-LALMATIA-1	02-05-2020	14:20	Earth Fault	
220KV-FSTPP-LALMATIA-1	04-05-2020	07:01	CVT blast in Lalmatia-ECL line at ECL	
132KV-KHSTPP-LALMATIA-1	04-05-2020	07:01	CVT blast in Lalmatia-ECL line at ECL	
132KV-KAHALGAON(BSEB)-LALMATIA-1	04-05-2020	07:01	CVT blast in Lalmatia-ECL line at ECL	
132KV-KAHALGAON(BSEB)-LALMATIA-1	07-05-2020	15:42	Zone 1 Distance Protection	
132KV-KHSTPP-LALMATIA-1	13-05-2020	13:05	Y-B- phase to earth fault ; Fault Loc : 37.1 km	
132KV-KAHALGAON(BSEB)-LALMATIA-1	20-05-2020	12:40	Over current	
132KV-KAHALGAON(BSEB)-LALMATIA-1	20-05-2020	21:13	R phase to E/F	
220KV-FSTPP-LALMATIA-1	24-05-2020	16:06	B phase to E/F, Z1, Fault loc :85 km	
220KV-FSTPP-LALMATIA-1	25-05-2020	15:38	MASTER TRIP(86) RELAY TRIP	
220KV-FSTPP-LALMATIA-1	27-05-2020	01:47	B-N, Zone – 1	
132KV-KAHALGAON(BSEB)-LALMATIA-1	27-05-2020	16:10	O/C operated from Kahalgaon	

Element Name	Tripping Date	Tripping Time	End 1	End 2
220KV-FSTPP-LALMATIA-1	04-06-2020	10:42	Due to tripping of ICT at Lalmatia (O/C E/F-86, I1-0.11 KA, I2-0.12 KA,I3-0.15 KA.)	FSTPP-Z2 R-Y-B ph FD-90.2km
132KV-KAHALGAON(BSEB)-LALMATIA-1	04-06-2020	22:46	R_Y_N, Ir: 2.077 kA, Iy: 1.816 kA, 77.46 KM	

*As on 09th June 2020

Such multiple tripping on account of fault is reducing the substation reliability and as being connected to the fuel source of NTPC power plant. Further lines are going to NTPC power plants thus multiple faults feeding to plants is also causing stress on generating station.
ERLDC advised BSPTCL, JUSNL and NTPC to ensure the healthiness of 220/132 kV Lalmatia substation and associated transmission lines via e-mail communication dated 26th May 2020. But tripping incidents of lines connected to Lalmatia S/S, did not reduce.
BSPTCL, JUSNL and NTPC may share the reason of repeated tripping of these lines.

Members may discuss.

ITEM NO. B.22: Overcompensation of transmission lines in Eastern Region and occurrence of resonance due to overcompensation

On 07th May 2020 at 03:16:10 hrs 400 kV Meramundali-Bolangir tripped on R- Phase to earth fault. Auto-reclose operation started at Bolangir end and line got tripped from Meramundali end. Due to almost 100% shunt compensation, resonance took place in the open phase during auto-reclose operation and extremely high voltage was generated even after line is opened from Meramundali and O/V stage 2 has operated.
In Eastern Region, it has been observed around 38 transmission lines have compensation level more than 70%. Among them, resonance phenomenon has been observed already in five cases.

Members may discuss

ITEM NO. B.23: Other tripping incidents in the month of May 2020

ITEM NO.B.27.1 : Multiple tripping incident at Jeerat at 18:08 hrs on 27-05-2020

At 18:08 Hrs on 27-05-2020, following elements tripped at 400 KV Jeerat S/S (having double main and transfer scheme) along with 400 KV Bus – 2 at Jeerat

- 400/220 KV ICT – 1 and 3
- 400 KV Jeerat-New Chanditala S/C
- 400 KV Jeerat-Sagardighi S/C

As per PMU data (shown in figure 2), at Jeerat there was one Y phase to earth fault followed by R & Y phase fault. Both the faults were cleared within 100 ms. Detailed analysis from WBSETCL/WBSLDC is yet to be received.

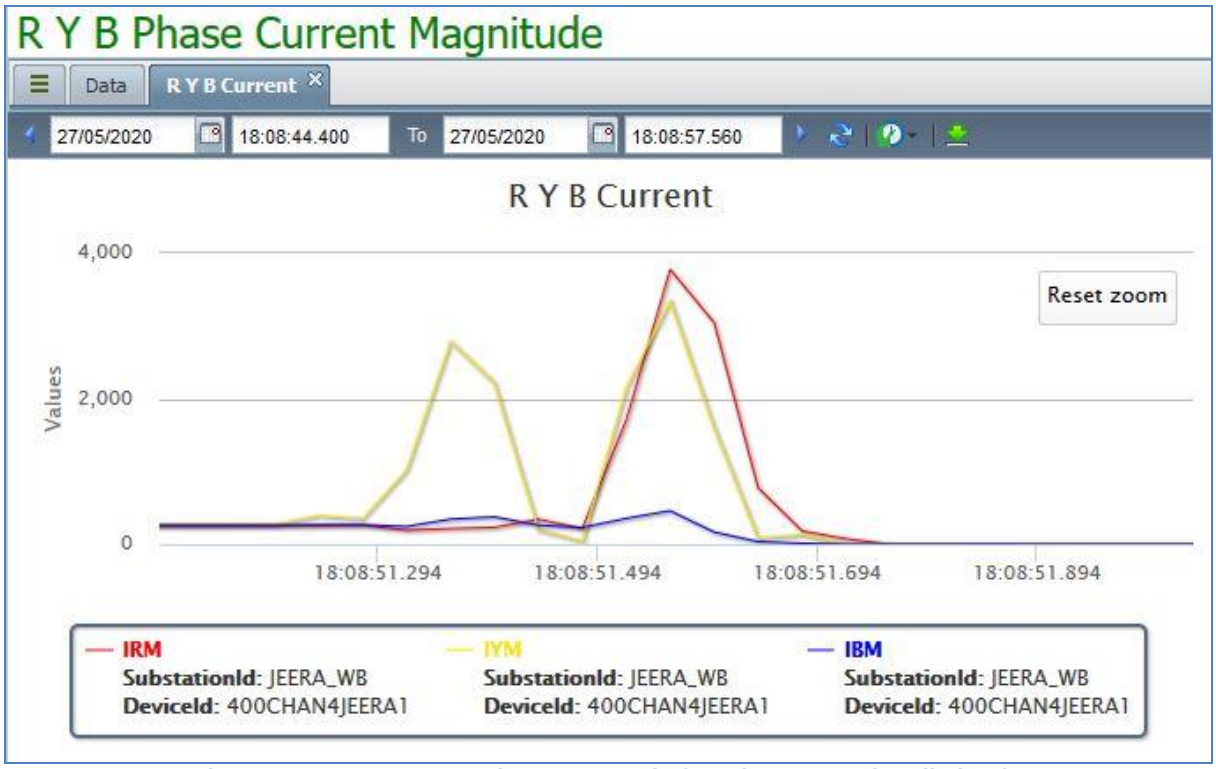

Figure 2: current measured at Jeerat end of 400 kV Jeerat Chanditala S/C

Members may discuss

PART- C:: OTHER ITEMS

ITEM NO. C.1: FOLLOW-UP OF DECISIONS OF THE PREVIOUS PROTECTION SUB-COMMITTEE MEETING(S)

The decisions of previous PCC Meetings are given at **Annexure-C1.**

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.

ITEM NO. C.2: 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 is 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.

ITEM NO. C.3: 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 not available	will be activated in consultation with Korba
17	220 KV TSTPP-RENGALI	17.07.16	EARTH FAULT	NTPC	OPTCL	OPGW replaced PLCC.	by March 2018
18	220KV BUDIPADAR-RAIGARH	21.07.16	EARTH FAULT	OPTCL	PGCIL	PLCC defective.	To be commissioned be Chhatisgarh.
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	PLCC commissioned.	Voice established. For carrier required shutdown
24	220 KV ROURKELA - TARKERA-II	11.08.16	B-N FAULT	PGCIL	OPTCL	OPGW available	DTPC installed. A/R to be commissioned.

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 : *Contract awarded*
2. 220kV Indravati(PG)-Indravati(PH) : *Contract awarded*
3. 132kV Baripada(PG)-Baripada : *OPGW completed*
4. 132kV Baripada(PG)-Rairangpur : *OPGW completed*

BSPTCL:

Sl No.	***Lines***	***Status***
1	*220 kV Purnea(PG)-Madhepura*	*Protection through PLCC is working properly*
2	*220 kV Biharsharif-BTPS new*	*BHEL would complete this work*
3	*220 kV BTPS new- Begusarai*	*BHEL would complete this work*
4	*220 kV Biharshariff-Bodhgaya line LILO at Khizersarai*	*OPGW is present. Protection is done through DPC.*
5	*132 kV 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. OPGW commissioned at Dehri end.*
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 & Auto reclose issues in coordination with their communication wing.

Members may update.

ITEM NO. C.4: Any additional agenda – with permission of the Chair.

Annexure B15 List of important transmission lines in ER which tripped in May-2020

S.NO	LINE NAME	TRIP DATE	TRIP TIME	RESTORATION DATE	RESTORATION TIME	Relay Indication LOCAL END	Relay Indication REMOTE END	Reason	Fault Clearance time in msec	Remarks	PMU Location	DR/EL RECEIVED FROM LOCAL END	DR/EL RECEIVED FROM REMOTE END	Utility to update
1	400KV-ROURKELA-JHARSUGUDA-4	5/1/2020	12:30	5/1/2020	13:29	Jharsugra-B-N Dist-5.9km FC-27.5kA		B PHASE TO EARTH FAULT	<100 msec	Rourkela DR: Tie CB three phase tripped after 2600 msec. Dead time and PD time of Tie CB may be checked. Healthy phases did not tripped instantaneously from remote end after fault in reclaim time. DR of Jharsuguda end may be shared.	Rourkela	Yes	No	PG Odisha to update.
2	400KV-GMR-ANGUL-2	5/1/2020	15:16	5/2/2020	16:55	GMR: R-n, z1, 22.56 km	Angul:R-n, 2.3 km, 16.34 kA	R PHASE TO EARTH FAULT	<100 msec	PMU: Healthy phases tripped after 700 msec. Both end DR may be shared.	Angul	No	No	GMR and PG Odisha to update.
3	220KV-BUDHIPADAR-KORBA-2	5/1/2020	17:54	5/1/2020	23:14	BP- FL= L1-E, FD= -0.3Kms, d[%]= -0.1%, IL1= 23.84KA	Korba-D/P operated in Zone-II FL= Rph-E FD=229.5Kms Ir= 968A	R PHASE TO EARTH FAULT	< 400 msec	No A/R operation.	Rourkela	Yes	No	OPTCL to Update
4	220KV-PARULIA-DURGAPUR-1	5/2/2020	9:31	5/2/2020	9:50	R_N, Zone III, 6.92 kA (Durgapur). Tripped from Durgapur end only		R PHASE TO EARTH FAULT	<100 msec	Z3 Operated at Durgapur with instantaneous tripping .Z1, Z2 did not started.	Durgapur	Yes	No	PG ER-2 to update.
5	400KV-ALIPURDUAR (PG)-BINAGURI-3	5/2/2020	17:47	5/2/2020	18:53	DT received at Alipurduar		DT received at Alipurduar	----	No fault observed in PMU. Reason of DT received at Alipurduar may be shared.	Binaguri	Yes	No	PG ER-2 to update.
6	400KV-JHARSUGUDA-STERLITE-2	5/2/2020	20:15	5/2/2020	21:07	DT RECEIVED AT JHARSGUDA	DT SENT FROM STERLITE;MALOPERATION; NO FAULT IN PMU	DT sent from Sterlite	----	No fault observed in PMU.Reason of DT sent from Sterlite may be shared.	Jharsuguda	Yes	No	STERLITE to Update
7	400KV-PATNA-NABINAGAR(NPGC)-2	5/3/2020	15:31	5/13/2020	14:52	patna end-DT received		DT received at Patna	----	No fault observed in PMU.Reason of DT sent from NPGC may be shared	Patna	Yes	No	NPGC to Update
8	400KV-PATNA-KISHANGANJ-1	5/5/2020	8:13	5/5/2020	9:05	Patna: R-N,13.02KA,18.14Km	R-N FAULT.F.D.=343.9 KM FROM KISANGANJ,F.C.=1.92 KAMP	R PHASE TO EARTH FAULT	500 msec	Kishanganj DR: Fault cleared in Z2. No carrier received at Kishanganj. Patna end DR may be shared.	Kishanganj	No	Yes	PG ER-1 to update.
9	220KV-TENUGHAT-BIHARSARIFF-1	5/5/2020	8:31	5/5/2020	9:29	Biharshariff: Start phase CN trip phase ABC Start element distance distance trip Frequency-50.06HZ fault duration -61.56msec Relay trip time-79.86msec Fault location- 7.887km Ia-113A Ib-347A Ic-14.14KA ,VAN-134.9KV VBN-116.8KV VCN-98.45KV Fault Resistance-2.193ohm Fault in zone 1		B PHASE TO EARTH FAULT	<100 msec	No A/R Operation	Biharshariff_PG	No	Yes	JUSNL and BSPTCL to update.
10	400KV-BIHARSARIFF(PG)-MUZAFFARPUR(PG)-2	5/5/2020	8:58	5/5/2020	17:42	Y-N fault, F.D.=62.193 km from Muz, F.C.=6.56 KA		Y PHASE TO EARTH FAULT	<100 msec	Biharshariff DR: A/R Unsuccessful after 1sec. Muzaffarpur DR: No A/R operation. Three phase tripping after 2300 msec. It should have tripped after 1000 msec since fault was persisting.	Biharshariff_PG	Yes	Yes	PG ER-1 to update.
11	220KV-BEGUSARAI-NEW PURNEA-2	5/5/2020	9:49	5/5/2020	13:19	21MIXRYB,86, Zone 1, Dist.k=31.916km Ia-4.871a Ib-90ma Ic-131ma from begusarai	R-N,135.8 km,1.37 Ka from new purnea	R PHASE TO EARTH FAULT	400 msec	New Purnea DR: Z1 operated. Fault cleared in 400 msec.	New Purnea	No	Yes	BSPTCL to update.
12	220KV-BEGUSARAI-NEW PURNEA-1	5/5/2020	11:05	5/5/2020	13:50	21MX1R,Y,B, 67/67N, 86A, 86B Ia 85.07A Ib 85.52A Ic 783.48A FROM BEGUSARAI	Relay detail from Purnea end Zone-1, distance-57.7Km, B-N fault fault current-1.993KA	B PHASE TO EARTH FAULT	350 msec	New Purnea DR: Z1 operated. Fault cleared in 350 msec.	New Purnea	No	Yes	BSPTCL to update.
13	400KV-FSTPP-KHSTPP-2	5/5/2020	11:22	5/5/2020	12:04	tripped from farakka end only ;B_N zone 1 a/r fail	from khstpp B_N 26 km 12 KA	B PHASE TO EARTH FAULT	<100 msec	No A/R operation	Farakka	No	Yes	NTPC Farakka and Kahalgaon to Update
14	220KV-MUZAFFARPUR-HAJIPUR-2	5/7/2020	12:47	5/7/2020	15:18	R-N,19.41 km,Z1,9.959 KA FROM muzaffarpur		R PHASE TO EARTH FAULT	<100 msec	No AR operation from one or both end	Yes	No	No	BSPTCL to update.
15	220KV-CHUKHA-BIRPARA-2	5/7/2020	17:26	5/7/2020	17:57	Y-N.3.107 =IY,61.591 km from birpara	CLOSED AT CHUKHA END	Y PHASE TO EARTH FAULT	<100 msec	Line tripped from Birpara end after 1600 msec woithout any fault. It may be due to PD relay operation.	Birpara	Yes	Yes	PG ER-2 to Update
16	220KV-RANCHI-HATIA-3	5/8/2020	14:28	5/8/2020	15:16	Tripped only from Hatia: R-N, 0.55KA		R PHASE TO EARTH FAULT	350 msec	Fault Cleared after 350 msec. 21M did not pickup. JUSNL to share which protection opearted.	Ranchi	Yes	No	JUSNL to update
17	220KV-TENUGHAT-BIHARSARIFF-1	5/10/2020	15:20	5/10/2020	15:55	B_N, 77.36 KM, 1.8 kA (Tenughat)		B PHASE TO EARTH FAULT	<100 msec	Np AR operation	Biharshariff	Yes	Yes	JUSNL and BSPTCL to update.
18	220KV-DARBHANGA (DMTCL)-MOTIPUR-1	5/11/2020	2:45	5/11/2020	12:05	Z-1, R_N, 6.19 KA, 16.2 Km from Darbhanga		R PHASE TO EARTH FAULT	<100 msec	No AR operation	Muzaffarpur	Yes	Yes	DMTCL and BSPTCL to Update
19	220KV-DARBHANGA (DMTCL)-DARBHANGA-2	5/11/2020	19:45	5/12/2020	10:15	R_N, 1.1 KM, 14.72 kA (DMTCL)		R PHASE TO EARTH FAULT	<100 msec	No AR operation	Muzaffarpur	No	No	DMTCL and BSPTCL to Update
20	220KV-DARBHANGA (DMTCL)-DARBHANGA-1	5/11/2020	19:45	5/11/2020	20:20	Tripped from Darbhanga DMTCL: R-n, 17.6 km, 1.6 kA		R PHASE TO EARTH FAULT	<100 msec	No AR operation	Muzaffarpur	No	No	DMTCL and BSPTCL to Update
21	400KV-RANCHI-RAGHUNATHPUR-2	5/12/2020	15:08	5/12/2020	15:37	DT RECEIVED AT RANCHI END	NO TRIPPING AT RTPS END	DT RECEIVED AT RANCHI END	-------	No fault observed in PMU. Reason of DT sent from RTPS may be shared.	Ranchi	Yes	Yes	DVC to Update
22	220KV-CHANDIL-RANCHI-1	5/12/2020	15:28	5/12/2020	16:02	Chandil : Zone- 1, B-N,FC 2.242kA, FD 65.8km	Ranchi: B-N,FD 24.9KM,FC 4.08 KA	B PHASE TO EARTH FAULT	<100 msec	No AR operation from both end. Three phase instantaneous tripping from Ranchi. Healthy phase tripped after 300 msec from Chandil.	Jamshedpur	Yes	Yes	PG ER-1 and JUSNL to Update
23	400KV-NEW PPSP-NEW RANCHI-1	5/12/2020	17:54	5/12/2020	18:39	NPPSP: SPURIOUS DT SEND	NRANCHI: DT RECEIVED	NPPSP: SPURIOUS DT SEND	-------	No fault observed in PMU. Reason of DT sent from NPPSP may be shared.	Durgapur	No	Yes	WBSETCL to Update
24	400KV-RANCHI-MAITHON RB-2	5/13/2020	12:33	5/13/2020	14:07	R-N,131.4 FROM RANCHI,2.6 KA	LINE REACTOR 2 LA R PH BLAST AT MPL;R-N,3.5 KA	R PHASE TO EARTH FAULT	<100 msec	Ranchi: Main CB Three Phase tripped instantaneously. Tie CB AR attempted after 1000 msec.	MPL	Yes	Yes	PG ER-1 to Update
25	400KV-PPSP-BIDHANNAGAR-2	5/13/2020	14:29	5/13/2020	14:45	y-n,Z1,CARRIER SENT.35.5 KM ,8.122 KA FROM BIDHANNAGAR	Z1,138.1 KM, Y-N FROM PPSP	Y PHASE TO EARTH FAULT	<100 msec	No AR from both end	Bidhannagar	No	Yes	WBSETCL to Update
26	400KV-JEYPORE-GAZUWAKA-1	5/15/2020	12:43	5/15/2020	13:31	1.25 KA,29 KM ,B-N from gajuwaka	195 km,1.183 ka,Y-N from jeypore	Y PHASE TO EARTH FAULT	<100 msec	Jeypore: At 12:41:26:840 hrs 3 Phase AR observed in Jeypore PMU. At 12: 43 hrs three phase intantanues trip as per Jeypore DR. Reason of both event may be shared.	Jeypore	Yes	No	PG Odisha to Update
27	400KV-PPSP-BIDHANNAGAR-1	5/17/2020	12:29	5/17/2020	12:49	Durgapur B-N Dist-173.5km Aided trip FC-2.76kA	PPSP-Z1 B-N Dist-39km	B PHASE TO EARTH FAULT	<100 msec	No AR from both end	Bidhannagar	No	Yes	WBSETCL to Update
28	220KV-BUDHIPADAR-KORBA-2	5/17/2020	12:58	5/17/2020	18:24	Z1, DIST 32.3 KM 3.47 KA B-N at Budhipadhar		B PHASE TO EARTH FAULT	<100 msec	No AR from both end	Rourkela	Yes	No	OPTCL to Update
29	220KV-RANCHI-HATIA-1	5/19/2020	3:18	5/19/2020	4:16	TRIPPED FROM PG END;DT RECEIPT	REMAIN CHARGED AT JSEB END	DT RECEIVED AT RANCHI END	-------	No fault observed in PMU. Reason of DT sent from Hatia may me shared.	Ranchi	Yes	No	JUSNL to update
30	400KV-ARAMBAGH-NEW CHANDITALA-1	5/20/2020	18:45	5/20/2020	20:24	AWAITED		Bus Bar operated at Arambagh as per DR	-------	No fault observed as per Arambagh DR. Reason of Bus Bar operation may be shared.	Durgapur	Yes	No	WBSETCL to Update
31	220KV-FSTPP-LALMATIA-1	5/24/2020	16:06	5/24/2020	16:39	FSTPP-Z1 B-N FD-85km		B PHASE TO EARTH FAULT	<100 msec	No AR operation from one or both end.	Farakka	No	No	NTPC Farakka and JUSNL to Update
32	220KV-RENGALI(PH)-TSTPP-1	5/25/2020	13:38	5/25/2020	19:17	RENGALI: R-N, Z2, FC-5.6KA, 24KM	TSTPP: R-N, Z1, FC-7KA, 12KM	R PHASE TO EARTH FAULT	<100 msec	No AR operation	Yes	No	Yes	NTPC Talcher and OPTCL to update
33	400KV-KISHANGANJ-TEESTA-III-1	5/25/2020	14:53	5/25/2020	15:17	DT RECIVED AT TEESTA 3	NO TRIPPING AT KISHANGANJ END	DT RECIVED AT TEESTA 3	-------	No fault observed in PMU. Kishanganj and Teesta III to confirm sending and receiving of DT with reason.	Kishanganj	No	Yes	PG ER-1 and TUL to update
34	220KV-TENUGHAT-BIHARSARIFF-1	5/26/2020	11:52	5/26/2020	17:24	Z1, R-N, 2.026KA, 61.92Km		R PHASE TO EARTH FAULT	<100 msec	No AR from both end	Biharshariff	No	Yes	JUSNL and BSPTCL to update
35	400KV-BIHARSARIFF(PG)-PUSAULI-1	5/26/2020	23:04	5/27/2020	8:27	R-N 2.419 KA,160.85 KM FROM PUSAULI	R-N,13.3 KMM15 KA ;EARTH WIRE SNAPPED AT LOC 18 TO 19 IN THE CROSSING PORTION (10 KM AROUND BSF)	R PHASE TO EARTH FAULT	500 msec	Sasaram: Z1 operated but fault cleared after 500 msec	Biharshariff	Yes	Yes	PG ER-1 to update
36	400KV-BIHARSARIFF(PG)-LAKHISARAI(PG)-1	5/26/2020	23:50	5/27/2020	17:51	Y-N ,102.9 km from bsf ,3.17 KA	4.295 km,7.769 ka,z1 Y-N from lakhsiarai	Y PHASE TO EARTH FAULT	<100 msec	Biharshariff: Main CB AR Successful. Healthy phases of Tie CB tripped after 550 msec.	Biharshariff	Yes	Yes	PG ER-1 to update
37	400KV-MERAMUNDALI-LAPANGA-2	5/27/2020	13:42	5/27/2020	19:40	P444 Main 1 DP: Zone 1 fault, A to G, Distance: 34.10 Km, IA=7.411KA, IB=174.5 A, IC=309 A	D60 Main 2 DP: Zone 1 fault, A to G, Distance: 33.9 Km, IA=7.408KA, IB=166.7 A, IC=296.6 A	R PHASE TO EARTH FAULT	<100 msec	Lapanga: Two AR shots attempted within 100 msec	Talcher	Yes	Yes	OPTCL to Update
38	220KV-CHANDIL-STPS(WBPDCL)-1	5/27/2020	15:27	5/27/2020	16:17	Chandil-Zone-1, Fault location=85.07 Km Ia=177.0 A, Ib=1.823 KA, Ic=269.4 A		Y PHASE TO EARTH FAULT	<100 msec	No AR from both end	Ranchi	No	Yes	JUSNL and WBSETCL to update.
39	400KV-PPSP-BIDHANNAGAR-1	5/27/2020	15:47	5/28/2020	13:38	A Ph, Z-1, 138.8 km, 2.5 kA @BIDHANNAGAR	ppsp end:- 43.4 km, 86 L.	R PHASE TO EARTH FAULT	<100 msec	No AR from both end	Durgapur_WB	No	No	WBSETCL to update.
40	220KV-MAITHON-DUMKA-1	5/27/2020	16:41	5/27/2020	17:11	R-N, 2.364 KA , 51 KM, A/R SUCCESSFUL at Maithon	Madanpur end was as follows:- Fault current, Ia:- 3.345kA,Ib:- 486A & Ic:- 626.7A, fault location:- 3.485km, Zone-1	R PHASE TO EARTH FAULT	<100 msec	No AR from both end	Maithon	No	No	JUSNL and PG ER-2 to update
41	400KV-NEW PPSP-ARAMBAGH-2	5/27/2020	16:47	5/27/2020	18:02	ABG:- DT Recv, Carrier recv	NPPSP-:- Carrier send, DT send.	DT sent from NPPSP	-------	Reason of DT sent from NPPSP may be shared	Arambagh	No	No	WBSETCL to update.
42	400KV-DURGAPUR-SAGARDIGHI-1	5/27/2020	17:19	5/27/2020	18:08	Durgapur :b-n, 81 km,16.44 ka	A/R successful	B PHASE TO EARTH FAULT	<100 msec	Durgapur PMU: Faulty B Phase did not reclosed. Three Phase Tripping after 3 sec. Both end DR may be shared.	Durgapur	No	No	PG ER-2 and WBSETCL to update.
43	400KV-JEERAT-NEW CHANDITALA-1	5/27/2020	18:08	5/28/2020	18:48	Suspected bus fault due to delayed tripping/relay maloperation of 400 kV Jeerat - N Chanditala feeder as verbally reported by SLDC		R-Y PHASE TO EARTH FAULT AS PER PMU	400 msec	Y-Phase to Earth fault converted to R-Y-Phase to Earth fault as per PMU. Both end DR may be shared. Reason of Bus-I tripping at Jeerat may be shared.	Jeerat	No	No	WBSETCL to update.

44	400KV-JEERAT-SAGARDIGHI-1	5/27/2020	18:08	5/27/2020	20:02	Awaited		R PHASE TO EARTH FAULT AS PER PMU	<100 msec	No AR Operation. Both end DR may be shared	Jeerat	No	No	WBSETCL to update.
45	400KV-KHSTPP-BARH-1	5/27/2020	23:51	5/27/2020	18:29	At Khstpp Z-2 ,B-n Fault,90.1%,1.15kA/ Barh,z-1, B-n, 31.9 Km,11.19 Ka		No Fault Observed in PMU	----	Both end DR may be shared with reason of tripping	Kahalgaon	No	No	NTPC Barh and Kahalgaon to Update
46	400KV-KHSTPP-LAKHISARAI-1	5/27/2020	23:51	5/27/2020	16:04	awaited		No Fault Observed in PMU	----	Both end DR may be shared with reason of tripping	Kahalgaon	No	No	PG ER1 and NTPC Kahalgaon to Update
47	400KV-BINAGURI-TALA-4	5/28/2020	14:22	5/29/2020	15:00	DT RECEIPT AT BINAGURI	Zone I Trip,29.4km,6.21kA fault current,B-phase Fault. AT TALA	B PHASE TO EARTH FAULT	<100 msec	B-Phase to earth fault as per PMU with 33kV dip in B-phase. Binaguri to confirm whether Distance protection operated or not. Both end DR may be shared.	Binaguri	No	No	PG ER-2 to update
48	220KV-BUDHIPADAR-KORBA-2	5/29/2020	21:44	5/30/2020	1:51	Korba-21 R-N FC-6.8kA Dist-38.45km	B'padar-Z2 FC-1.24kA	R PHASE TO EARTH FAULT	<100 msec	No AR from both end	Rourkela	Yes	No	OPTCL to Update
49	400KV-PPSP-BIDHANNAGAR-1	5/30/2020	16:24	5/30/2020	17:03	BID: Y-N,Z1,3- 9KM	PPSP: Y-N,Z1,FD 140 KM,FC 1.432kA	Y PHASE TO EARTH FAULT	<100 msec	No AR Operation. Both end DR may be shared	Durgapur	No	No	WBSETCL to update.
50	220KV-JODA-RAMCHANDRAPUR-1	5/31/2020	13:56	5/31/2020	14:42	e/f,B-N,166 KM,Z1,1 735 KA FROM RAMCHANDRAPUR	Distance-1.09KM Fault Loop-L1-N Zone-01 Fault current-3.3-4535.34A AT JODA	B PHASE TO EARTH FAULT	520 msec	Reason of delayed fault clearance may be shared	Jamshedpur	No	No	JUSNL and OPTCL to Update

ANNEXURE-C1

Sl No.	Name of the incidence	PCC Recommendation	Latest status
90th PCC Meeting			
1.	Tripping of both running units at 220 k V TTPS on 15.03.2020 at 16:12 hrs.	PCC advised JUSNL to take the following measures to avoid the unwanted tripping of transmission lines: • Check any fault was appeared in downstream network of Patratu PTPS S/s • Send the relevant DR of zone 4 tripping of 220 kV TTPS – PTPS S/C line at PTPS end • Check the zone 4 reach and time settings of 220 kV TTPS – PTPS S/C line at PTPS end as the line should not trip within 100 ms. • Test the protection relays of 132kV and 220 kV system at PTPS including 220/132kV ATRs	
2.	Black out at 220 k V Tenughat Substation on 14.04.2020 at 12:47 hrs	After detailed deliberation. PCC opined that tripping of 220 kV TTPS – PTPS S/C line not clear, PCC advised JUSNL to collect the details and submit to ERPC and ERLDC. PCC advised BSPTCL, JUSNL and TVNL to take following corrective measures to avoid frequent tripping of the lines: • 220 kV Tenughat Biharshariff S/C tripped 7 times in the months of March and April, 2020. 220 KV TTPS PTPS line also tripped several times in March and April 2020. JUSNL and BSPTCL were advised to carry out the line patrolling and ensure healthiness of these line. • TVNL was advised to review the O/C, E/F protection settings of 220 kV Tenughat Biharshariff S/C , O/C ,	

		E/F protection settings of PTPS unit so that high resistance faults could be identified reliably.	
3.	Total Power failure at 220 k V TTPS on 22.04.2020 at 20:12 hrs	PCC advised JUSNL to submit the relay settings of 220 kV PTPS-TTPS line at PTPS end to ERPC and ERLDC	
4.	Disturbance at 220 k V Tenughat Substation on 28.04.2020 at 06:29 hrs.	PCC advised TVNL to replace the EM type Busbar protection with numerical relay.	
5.	Disturbance at 220 k V Chandil Substation on 29.03.2020 at 19:21 hrs.	PCC observed the following discrepancies and advised JUSNL and WBPDCL to take appropriate action: • 220kVChandil-Ramchandrapur S/C line got tripped within 100 ms. (Relay fault pickup details are not available due to incorrect DR configuration) JUSNL may check timing of distance protection at Ramchandrapur. • Disturbance recorders of all the substations of JUSNL involved in this disturbance are to be configured as per the ERPC guidelines. • STPS end DR of 220kV Chandil-STPS line is to be configured as per the ERPC guidelines • Protection system of 220/132kV ATRs to be tested and the settings are to be coordinated with 220kV and 132 kV protection relays. • Busbar protection for all 220kV substations are to be installed to minimize the fault clearing time. • As 220kV Chandil S/s has single bus and transfer scheme, option for sectionalizer may be explored. • Healthiness of carrier signal of 220kV Chandil-STPS line is to be	

		checked. • STPS end DR of 220kV Chandil-STPS line is to be configured as per the ERPC guidelines	
6.	Total Power failure at 220 k V Chandil Substation on 15.04.2020 at 17:20 hrs	PCC observed the following discrepancies and advised JUSNL to take appropriate action: • Disturbance recorders of all the substations involved in this disturbance are to be configured as per the ERPC guidelines. • CB of 220kV STPS-Chandil line at Chandil end is to be tested • Protection system of 220/132kV ATRs to be tested and the settings are to be coordinated with 220kV and 132 kV protection relays. • Busbar protection for all 220kV substations are to be installed to minimize the fault clearing time.	
7.	Total Power failure at 220 k V Chandil Substation on 30.04.2020 at 19:37 hrs	PCC observed the following discrepancies and advised JUSNL to take appropriate action: • Disturbance recorders of all the substations involved in this disturbance are to be configured as per the ERPC guidelines. • The reach and time settings of distance protection of 220kV STPS-Chandil line at Chandil end are to be reviewed. • Protection system of 220/132kV ATRs to be tested and the settings are to be coordinated with 220kV and 132 kV protection relays.	
8.	Total Power failure at 400 k V Teesta III and Dikchu Substations on 15.03.2020 at 16:12 hrs	PCC advised Powergrid to explore implementation of line differential protection for 400 kV Teesta III – Kishangunj S/C, 400 kV Rangpo –	

		Kishangunj S/C and 400 kV Teesta III – Dikchu – Rangpo section to avoid uncoordinated trippings. This would identify the high resistive faults reliably and clear the faults immediately. PCC advised Dikchu to review earth fault settings at 400 k V side of 400/132 kV ICT of Dikchu HEP as tripping of this ICT is not desirable. PCC already advised same in earlier PCC Meetings.	
9.	Tripping of 400 k V Teesta III – Dikchu S/C from both ends on 21.04.2020 at 11:00 hrs	PCC advised Dikchu to review the relay settings. PCC advised TUL to maintain the spare reserves.	
10.	Black out of 132 k V Chujachen Hydro Power Substation on 01.04.2020	PCC advised DANS Energy to send relay settings , SLD and line parameters at Tashiding and Jorethang to ERPC and ERLDC.	
11.	Tripping of Unit 1 of JITPL on 05.03.2020 at 19:27 hrs	PCC advised JITPL take following corrective actions: • Reduce zone 4 time setting of transmission lines to 0.5 second. • Bay CT could be taken in reactor differential protection. • As a temporary measure, set reactor bays backup impedance tripping time to 200-300 milisecond instead of 0 second to avoid maloperation.	
12.	Tripping of both units of JITPL on 21.04.2020 at 18:29 hrs	PCC advised JITPL to take following action: 1) Tripping of both units at JITPL for bus bar protection operation of any bus may be reviewed. 2) Units shall be connected to grid	

		through remaining healthy bus	
13.	Multiple tripping incident at Melli at 18:29 hrs on 13-03-2020	PCC advised powergrid and sikkim to take necessary action and submit details to ERPC and ERLDC	
14.	Islanding of CESC system at 14:31 hrs on 28-04-2020	PCC advised WBSETCL and CESC to coordinate the protection settings and islanding scheme settings to minimize separation of CESC system.	
89th PCC Meeting			
1.	Disturbance at 220 kV Bidhannagar Substation on 01.02.2020 at 21:05 Hrs.	PCC suggested WBSETCL to take the following remedial measures: • Submit the last test report of the CT which was failed during the disturbance • Carry out the testing of other CTs at Bidhanagar S/s • Avoid uneven distribution of lines between the Buses • WBSETCL along with SLDC, WB should explore to change the network configuration to reduce the fault current level at Bidhanagar	
2.	Tripping of 220 kV Muzaffarpur-Hajipur D/C on 09.02.2020 at 12:53 Hrs and Tripping of 220 kV Hajipur-Amnour D/C on 10.02.2020 at 17:32 Hrs.	PCC advised BSTCL to take the following actions: • Check the past trippings for successful/unsuccessful operation of LBB and Bus Bar protection • Test LBB protection and Bus bar protection. PCC also advised SLDC Bihar and Powergrid to check reason for voltage unbalance at Muzaffarpur Substation.	

3.	Disturbance at Muzaffarpur Substation on 20.02.2020 at 12:29 Hrs.	PCC advised BSPTCL to resolve the O&M issues with Powergrid at the earliest.	
4.	Multiple tripping incident at RTPS at 01:55 hrs on 08-02-2020	PCC advised DVC to change GPS time synchronization.	
5.	Multiple tripping incident at NBU at 22:01 hrs on 29-02-2020	PCC advised WBSETCL to send detailed report to ERPC.	
6.	Sharing DR/EL for any tripping incident within 24 hrs of the incident and detailed report of any grid disturbance/grid incident/grid event within seven days	PCC advised SLDCs, generating stations and transmission utilities involved to send detailed report along with DR/EL to ERPC and ERLDC	
88th PCC Meeting			
1.	Disturbance at 220 kV Maithon(PG) Substation on 25.01.2020 at 15:14 Hrs.	PCC advised Powergrid to replace the relay with numerical relay.	
2.	Tripping of 220 KV Gaya Sonenagar D/C on 13.01.2020 at 00:40 Hrs.	PCC advised BSTPCL take the following corrective actions: • Send the PSL logic and relay setting file to ERPC Secretariat. • DR synchronisation need to	

		be reviewed.	
3.	Tripping of 400 kV Teesta V – Rangpo D/C on 05.01.2020 at 20:04 Hrs.	PCC advised NHPC to take following corrective actions: • Revise their Zone-4 time settings to 500 ms. • 400kV Teesta-V – Rangpo Ckt-I distance protection input needed to be checked.	
87th PCC Meeting			
1.	Tripping of 220 KV Darbhanga (DMTCL) – Motipur I on 14.12.2019 at 02:50 Hrs.	PCC advised BSPTCL to take following corrective actions: - • Digital signals configuration of relays at Motipur end need to be checked. • Over voltage settings of relay at Motipur end need to be reviewed.	
2.	Tripping of 132 kV Dumka – Lalmatia D/C on 09.12.2019 at 11:35 hrs	PCC advised JUSNL to collect DRs and discuss above issue with the SLDC and send the details to ERPC/ERLDC. PCC advised NTPC to share the DR at Lalmatia end. In 88th PCC meeting JUSNL informed that they did not got the reply from SLDC Jharkhand yet	
83rd PCC Meeting			
1.	Total power failure at 220 kV Darbhanga (BSPTCL) S/s on 16.08.2019 at 22:23 Hrs.	PCC observed that DR configuration at DMTCL end is not in order. PCC advised DMTCL to configure the DR settings as per the standard. In 87th PCC meeting, DMTCL informed that DR would be configured by end of February, 2020.	
81st PCC Meeting			
1.	Disturbance at 400 kV Dikchu S/s on 30.06.2019 at 09:55	The time setting for the DEF relay at Jorethang end was 500 msec. PCC advised Jorethang to review the	

	Hrs.	timer setting of DEF protection at Jorethang end. PCC advised Chuzachen to review the zone settings for 132 kV Chuzachen-Rangpo line. 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. In 87th PCC meeting, Chuzachen informed that they have asked for information related to Rangpo end from Powergrid and Sikkim. Further, Chuzachen informed that they would send the zone setting file to ERPC/ERLDC at the earliest. In 89th PCC Chuzachen was advised to review the zone 3 settings for 132 kV Chuzachen-Rangpo line as it is very high	
2.	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 synchronization. In 3rd TeST meeting, OPTCL informed that they had replaced the old relay at Korba. In 87th PCC meeting, OPTCL informed that DR for Budhipadar – Korba Circuit-I has been configured.	