



Agenda  
for  
**77<sup>th</sup> PCC Meeting**

**Date: 26.03.2019**  
**Eastern Regional Power Committee**  
**14, Golf Club Road, Tollygunge**  
**Kolkata: 700 033**

# EASTERN REGIONAL POWER COMMITTEE

## **AGENDA FOR 77<sup>TH</sup> PROTECTION SUB-COMMITTEE MEETING TO BE HELD AT POWERGRID ER-II OFFICE, KOLKATA ON 26.03.2019 (TUESDAY) AT 11:00 HOURS**

### **PART – A**

#### **ITEM NO. A.1: Confirmation of minutes of 76<sup>th</sup> Protection sub-Committee Meeting held on 14<sup>th</sup> February, 2019 at ERPC, Kolkata.**

The minutes of 76<sup>th</sup> Protection Sub-Committee meeting held on 14.02.19 circulated vide letter dated 13.03.19.

Members may confirm the minutes of 76<sup>th</sup> PCC meeting.

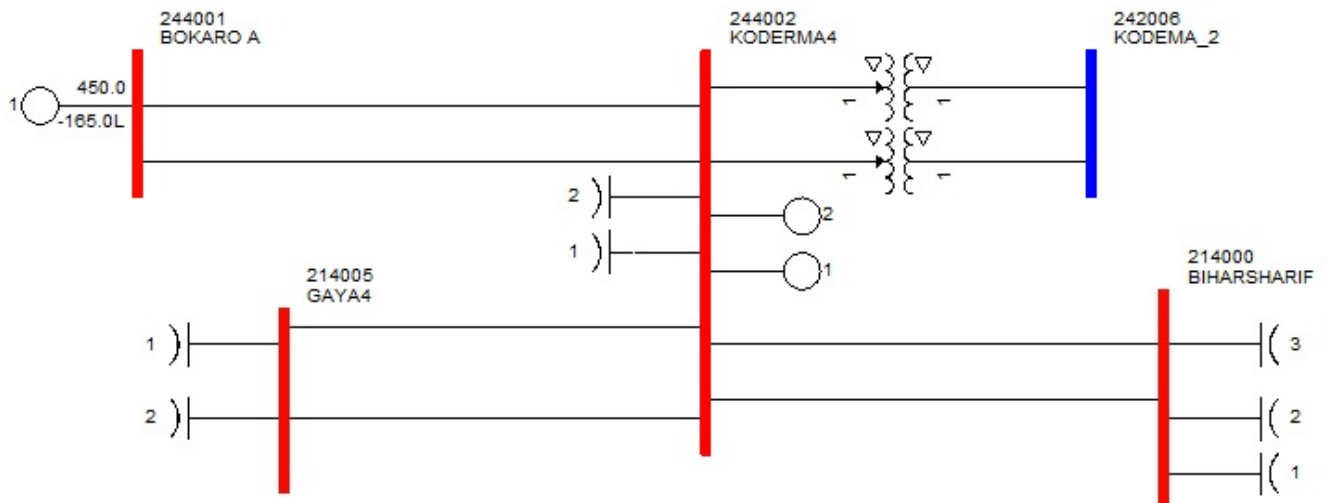
### **PART – B**

#### **ANALYSIS & DISCUSSION ON GRID INCIDENCES OCCURRED IN FEBRUARY, 2019**

#### **ITEM NO. B.1: Disturbance at 400 kV Koderma(DVC) S/s on 25.02.2019 at 21:32 Hrs.**

At 21:32 hrs, 400 kV Biharshariff-Koderma-I & 400 kV Bokaro-Koderma I tripped from both ends along with 400 bus-I. It was reported that LBB protection operated for tie bay between ST-I & GT-I. Two running units also got tripped during the disturbance.

**Generation loss: 900 MW**



**DVC may explain**

**ITEM NO. B.2: Disturbance at 400kV Meramundali(OPTCL) S/S on 26-02-19 at 17:50 hrs.**

At 17:50 hrs, 400 kV bus I at Meramundali tripped due to LBB operation of tie breaker between 400 kV Meramundali - New Duburi - I and 400 kV Meramundali - Mendasal S/C resulting tripping of all elements from bus I at Meramundali. No effect in 220 kV bus as other ICT was in service.

Load Loss: Nil

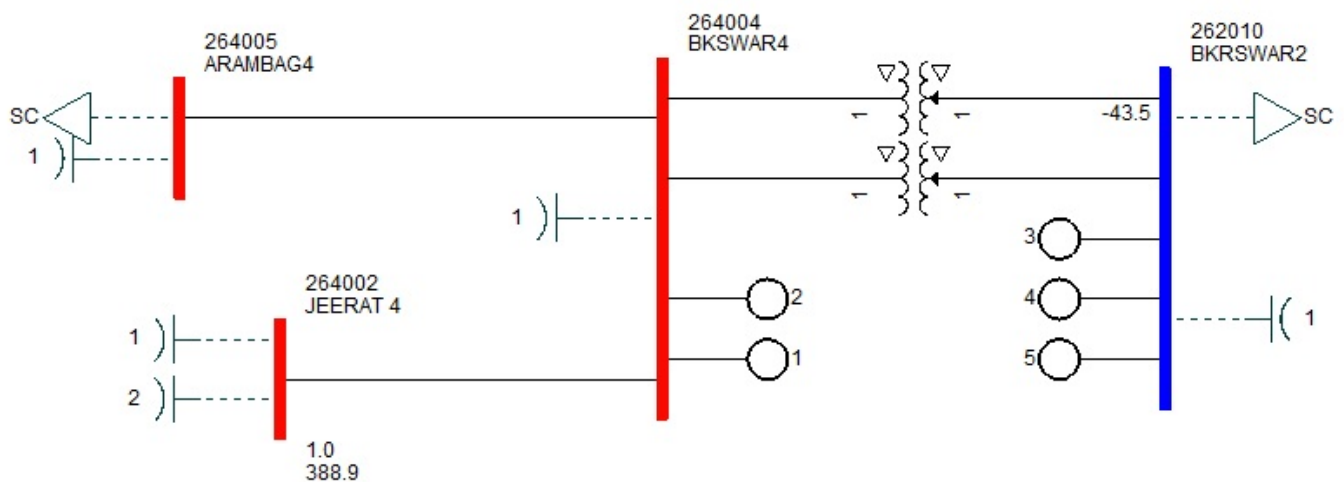
**OPTCL may explain.**

**ITEM NO. B.3: Disturbance at 400 kV Bakreswar S/S on 11-02-19 at 14:54 hrs.**

400 kV bus II at Bakreswar tripped at 14:54 hrs due to Y-N fault at 400 kV Arambag - Bakreswar S/C. This results into tripping of 400/220 kV ICT - II along with GT of Unit#2. Unit#2 was on house load after tripping of GT-II.

As per PMU data, fault was cleared within 100 ms after tripping of line from both ends.

Load/Generation Loss: Nil



**WBPDCCL may explain.**

**ITEM NO. B.4: Disturbance at 400/220 kV Sagardighi S/S on 03-02-19 at 18:43 hrs.**

Due to B phase CT failure of Bus coupler Bay and actuation of Bus bar protection, 220 kV Sagardighi - New Sagardighi D/C tripped along with 400/220 kV ICT - I and unit I at Sagardighi.

Generation Loss: 300 MW

**WBPDCCL may explain.**

**ITEM NO. B.5: Tripping Incidences in the month of February, 2019.**

Other tripping incidences occurred in the month of February 2019 which needs explanation from constituents of either of the end is given in **Annexure-B5**.

In 36<sup>th</sup> 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 74<sup>th</sup> 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 01<sup>st</sup> Jan. 2019.

**Members may discuss.**

## **PART- C:: OTHER ITEMS**

### **ITEM NO. C.1: Protection Audit and checking of relay settings in transmission system/distribution system within States.**

CERC vide its order dated 26<sup>th</sup> March, 2018 in petition no. 09/SM/2015 directed RPCs to take up the issue of protection audit and relay settings in transmission system/distribution system within states.

*In 75<sup>th</sup> & 76<sup>th</sup> PCC, all the states were advised to submit the present practice which is being followed to carry out protection audit and checking of relay settings in transmission system/distribution system within the states.*

**Members may update.**

### **ITEM NO. C.2: FOLLOW-UP OF DECISIONS OF THE PREVIOUS PROTECTION SUB-COMMITTEE MEETING(S)**

The decisions of previous PCC Meetings are given at **Annexure-C2**.

In 73<sup>rd</sup> 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.3: Schedule of training program to be conducted by PRDC**

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

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

**Members may update.**

### **ITEM NO. C.4: Zone 3 settings of ISTS lines**

Based on the data available in PDMS, the zone 3 settings of all ISTS lines in Eastern Region were verified and compared with the corresponding resistive reach of the line thermal loading. Zone 3 settings were also checked with the agreed protection philosophy of ER. The discrepancies observed in the settings will be presented in the meeting.

In 67<sup>th</sup> PCC, PRDC presented the list of ISTS lines where they observed the discrepancy in zone-3 setting.

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In 73<sup>rd</sup> PCC, It was informed that Powergrid ER-I had verified the settings. Powergrid ER-II and Powergrid odisha will verify the settings at the earliest.

In 74<sup>th</sup> PCC, Powergrid & DVC informed that they will submit the details at the earliest.

DVC has submitted the zone settings data vide mail dated 16.01.19.

In 76<sup>th</sup> PCC, all the other transmission utilities are advised to submit the details at the earliest.

**Members may update.**

**ITEM NO. C.5: Status of Third Party Protection Audit**

The compliance status of 1<sup>st</sup> Third Party Protection Audit observations is as follows:

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

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

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

**Members may note.**

**ITEM NO. C.6: Non-commissioning of PLCC / OPGW and non-implementation of carrier aided tripping in 220kV and above lines.**

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

List of line where auto reclose facility is not available(Information based on PMU data analysis)								
S. No	Transmission name	Lines	Date of Tripping	Reason of Tripping	Owner Detail		Present Status	
					End-1	End-2	OPGW/P LCC Link available	AR facility functional

13	<u>220KV BUDIPADAR-KORBA-II</u>	23.06.16	Y-N FAULT	OPTCL	CSEB	PLCC available	will be activated in consultation with Korba
17	<u>220 KV TSTPP-RENGALI</u>	17.07.16	EARTH FAULT	NTPC	OPTCL		by March 2018
18	<u>220KV BUDIPADAR-RAIGARH</u>	21.07.16	EARTH FAULT	OPTCL	PGCIL	PLCC defective	
20	<u>220 KV FARAKKA-LALMATIA</u>	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	<u>220 KV MUZAFFARPUR - HAZIPUR - II</u>	10.08.16	B-N FAULT	PGCIL	BSPTCL		Voice established. For carrier required shutdown
24	<u>220 KV ROURKELA - TARKERA-II</u>	11.08.16	B-N FAULT	PGCIL	OPTCL	OPGW available	Expected to install protection coupler by Jan 17
27	<u>220 KV BIHARSARIF-TENUGHAT</u>	07.09.16	B-N FAULT	BSPTCL	TVNL		
33	220KV Jamshedpur-Jindal-SC						

34<sup>th</sup> 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:**

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

**BSPTCL:**

SI 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

**Members may update.**

**ITEM NO. C.7: Disturbance monitoring equipment(DME) standardization**

The power system is routinely subjected to faults or disturbances which can range from transient faults on transmission lines to system-wide disturbances involving multiple control areas, states and even countries. Investigation of each incident is critical in optimizing the performance of protection systems with the goal of preventing future incidents from becoming wide-area disturbances. The tools required to perform post-incident analyses include DME which can capture pre-event, event, and post-event conditions with a high degree of accuracy.

Recorders can be classified into two categories:

- FR (Fault Recorder)
- Sequence of events Recorder (SER)

For FR (Fault Recorder) following points may be standardized:

- a. Deployment
- b. Record Length
- c. Triggers
- d. Sampling Rates

For Sequence of events Recorder following points may be standardized:

- a. SER Capability
- b. Point Assignments
- c. Use of RTUs for SER

Common issues:

- a. Data format
- b. Power Supply
- c. Monitoring

Reference documents for this:

1. NERC Standard PRC-002-2 Disturbance Monitoring and Reporting Requirements
2. NPCC Regional Reliability Reference Directory # 11 Disturbance Monitoring Equipment Criteria

In 74<sup>th</sup> PCC, all the constituents were advised to submit their comments/observations relating to the draft standard.

PCC also decided similar kind of standard would be prepared for Transformer Protection and Busbar Protection.

In 75<sup>th</sup> PCC, PRDC presented the draft standard for Transformer Protection and Busbar Protection. Draft standard is enclosed at Annexure-C7.

In 76<sup>th</sup> PCC, all the members were advised to submit their comments to ERLDC and ERPC at the earliest.

**Members may update.**



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# ANNEXURE-B5

Tripping Name	Tripping Date&Time	Element Type	Element Name	From Owner	From Station	FIR(F)	DR(F)	EL(F)	To Owner	To Station	FIR(T)	DR(T)	EL(T)
400KV ALIPURDUAR-BONGAIGAON-II	28-02-2019 20:25:00	Transmission Line	400 KV-ALIPURDUAR PGCIL 400/220KV-400 KV-BONGAIGAON-2	POWERGRID	400 KV-ALIPURDUAR PGCIL 400/220KV	✗	✗	✗	POWERGRID	400 KV-BONGAIGAON	✗	✗	✗
400KV MALBASE-BINAGURI-I	28-02-2019 13:26:00	Transmission Line	400 KV-MALBASE-400 KV-Binaguri 400 Kv-1	BHUTAN	400 KV-MALBASE	✗	✗	✗	POWERGRID	400 KV-Binaguri 400 Kv	✗	✗	✗
220KV NEW MELLI-TASHIDING-SC	28-02-2019 11:57:00	Transmission Line	220 KV-NEW MELLI 220KV-220 KV-TASHIDING HEP 11/220KV GS-1	POWERGRID	220 KV-NEW MELLI 220KV	✗	✗	✗	DANS POWER	220 KV-TASHIDING HEP 11/220KV GS	✗	✗	✗
400 KV-BARIPADA KUCHEI 400KV-400 KV-PANDIABIL 400KV(PGCIL)-1	27-02-2019 23:44:00	Transmission Line	400 KV-BARIPADA KUCHEI 400KV-400 KV-PANDIABIL 400KV(PGCIL)-1	POWERGRID	400 KV-BARIPADA KUCHEI 400KV	✓	✗	✗	POWERGRID	400 KV-PANDIABIL 400KV(PGCIL)	✗	✗	✗
220KV BARIPADA-BALASORE-I	27-02-2019 12:15:00	Transmission Line	220 KV-KUCHEI BARIPADA 400KV-220 KV-BALASORE 220KV-1	POWERGRID	220 KV-KUCHEI BARIPADA 400KV	✓	✗	✗	OPTCL	220 KV-BALASORE 220KV	✗	✗	✗
220 KV-DMTCL DARBHANGA 400KV-220 KV-LAUKAHI 220/132/33KV-1	27-02-2019 10:34:00	Transmission Line	220 KV-DMTCL DARBHANGA 400KV-220 KV-LAUKAHI 220/132/33KV-1	DMTCL	220 KV-DMTCL DARBHANGA 400KV	✗	✗	✗	BSPTCL	220 KV-LAUKAHI 220/132/33KV	✗	✗	✗
220KV DARBHANGA (DMTCL)-MOTIPUR-II	27-02-2019 09:43:00	Transmission Line	220 KV-DMTCL DARBHANGA 400KV-220 KV-MOTIPUR 220 KV-2	DMTCL	220 KV-DMTCL DARBHANGA 400KV	✗	✗	✗	BSPTCL	220 KV-MOTIPUR 220 KV	✗	✗	✗
400 KV-BANKA 400KV-400 KV-BIHARSHARIFF 400KV-1	27-02-2019 06:01:00	Transmission Line	400 KV-BANKA 400KV-400 KV-BIHARSHARIFF 400KV-1	POWERGRID	400 KV-BANKA 400KV	✗	✗	✗	POWERGRID	400 KV-BIHARSHARIFF 400KV	✗	✗	✗
400 KV-Kharagpur 400KV-400 KV-New Chanditola 400 kv-1	27-02-2019 04:19:00	Transmission Line	400 KV-Kharagpur 400KV-400 KV-New Chanditola 400 kv-1	WBSETCL	400 KV-Kharagpur 400KV	✗	✗	✗	WBSETCL	400 KV-New Chanditola 400 kv	✗	✗	✗
Meeramundali Incidence	26-02-2019 17:50:00	Transmission Line	400 KV-MERAMUNDALI 400KV-400 KV-MENDHASAL-1	OPTCL	400 KV-MERAMUNDALI 400KV	✗	✗	✗	OPTCL	400 KV-MENDHASAL	✗	✗	✗
	26-02-2019 17:50:00	Transmission Line	400 KV-MERAMUNDALI 400KV-400 KV-NEW DUBURI 400KV-1	OPTCL	400 KV-MERAMUNDALI 400KV	✗	✗	✗	OPTCL	400 KV-NEW DUBURI 400KV	✓	✗	✗
	26-02-2019 17:50:00	Transmission Line	400 KV-MERAMUNDALI 400KV-400 KV-NEW DUBURI 400KV-2	OPTCL	400 KV-MERAMUNDALI 400KV	✗	✗	✗	OPTCL	400 KV-NEW DUBURI 400KV	✓	✗	✗
	26-02-2019 17:50:00	Bus	400 KV-MERAMUNDALI 400KV--1	OPTCL	400 KV-MERAMUNDALI 400KV	✗	✗	✗	OPTCL		✗	✗	✗
	26-02-2019 17:50:00	Transformer	400 KV-MERAMUNDALI 400KV--1	OPTCL	400 KV-MERAMUNDALI 400KV	✗	✗	✗	OPTCL		✗	✗	✗
765KV JHARSUGUDA-DARLIPALI-I	26-02-2019 17:47:00	Transmission Line	765 KV-JHARSUGUDA 765 KV-765 KV-DARLIPALI SUPER THERMAL-1	POWERGRID	765 KV-JHARSUGUDA 765 KV	✓	✗	✗	NTPC	765 KV-DARLIPALI SUPER THERMAL	✗	✗	✗
400KV FSTPP-KhSTPP-IV	26-02-2019 09:40:00	Transmission Line	400 KV-Farakka(400/220/15.75 )-400 KV-KAHALGAON 400KV-4	NTPC	400 KV-Farakka(400/220/15.75 )	✗	✗	✗	NTPC	400 KV-KAHALGAON 400KV	✗	✗	✗
400 KV-SAGARDIGHI(SGTPP)-400 KV-JEERAT 400KV-1	26-02-2019 02:12:00	Transmission Line	400 KV-SAGARDIGHI(SGTPP)-400 KV-JEERAT 400KV-1	WBPDCL	400 KV-SAGARDIGHI(SGTPP)	✗	✗	✗	WBSETCL	400 KV-JEERAT 400KV	✗	✗	✗
400 KV-Koderma_G(400/220/21kv)-400 KV-BIHARSHARIFF 400KV-1	25-02-2019 21:32:00	Transmission Line	400 KV-Koderma_G(400/220/21kv)-400 KV-GAYA 765KV-1		400 KV-Koderma_G(400/220/21kv)				POWERGRID	400 KV-GAYA 765KV	✗	✗	✗
	25-02-2019 21:32:00	Transmission Line	400 KV-Koderma_G(400/220/21kv)-400 KV-BIHARSHARIFF 400KV-1	DVC	400 KV-Koderma_G(400/220/21kv)	✗	✗	✗	POWERGRID	400 KV-BIHARSHARIFF 400KV	✗	✗	✗
	25-02-2019 21:32:00	Transmission Line	400 KV-Koderma_G(400/220/21kv)-400 KV-BTPSA_D(400/220/33/21kv)-1	DVC	400 KV-Koderma_G(400/220/21kv)	✗	✗	✗	DVC	400 KV-BTPSA_D(400/220/33/21kv)	✗	✗	✗
	25-02-2019 21:32:00	Generator	400 KV-Koderma_G(400/220/21kv)-1	DVC	400 KV-Koderma_G(400/220/21kv)	✗	✗	✗	DVC		✗	✗	✗
	25-02-2019 21:32:00	Generator	GENERATOR-Koderma_G(400/220/21kv)-2	DVC	GENERATOR-Koderma_G(400/220/21kv)	✗	✗	✗	DVC		✗	✗	✗
400KV KISHANGANJ-RANGPO-I [Belongs to M/s TVTPL]	25-02-2019 13:18:00	Transmission Line	400 KV-KISHANGANJ 400KV-400 KV-RANGPO 400KV-1	POWERGRID	400 KV-KISHANGANJ 400KV	✗	✗	✗	POWERGRID	400 KV-RANGPO 400KV	✗	✗	✗
220KV MADHEPURA-NEW PURNEA-I	25-02-2019 12:47:00	Transmission Line	220 KV-MADHEPURA 220KV-220 KV-NEW PURNEA 400KV-1	BSPTCL	220 KV-MADHEPURA 220KV	✗	✗	✗	POWERGRID	220 KV-NEW PURNEA 400KV	✗	✗	✗
400KV BINAGURI-BONGAIGAON-I	25-02-2019 12:43:00	Transmission Line	400 KV-Binaguri 400 Kv-400 KV-BONGAIGAON-1	POWERGRID	400 KV-Binaguri 400 Kv	✗	✗	✗	POWERGRID	400 KV-BONGAIGAON	✗	✗	✗
400KV NEW PPSP-NEW RANCHI-II	25-02-2019 11:17:00	Transmission Line	400 KV-New_PPSP 400KV-400 KV-Ranchi_N(765/400kv)-2		400 KV-New_PPSP 400KV				POWERGRID	400 KV-Ranchi_N(765/400kv)	✗	✗	✗
400KV BIDHANNAGAR-ARAMBAGH-SC	25-02-2019 03:58:00	Transmission Line	400 KV-BIDHANNAGAR/DURGAPR 400KV-400 KV-Arambag 400kv-1	WBSETCL	400 KV-BIDHANNAGAR/DURGAPR 400KV	✗	✗	✗	WBSETCL	400 KV-Arambag 400KV	✗	✗	✗
400 KV-Arambag 400kv-400 KV-BAKRESWAR 400KV-1	25-02-2019 03:00:00	Transmission Line	400 KV-Arambag 400kv-400 KV-BAKRESWAR 400kv-1	WBSETCL	400 KV-Arambag 400kv	✗	✗	✗	WBPDCL	400 KV-BAKRESWAR 400KV	✓	✗	✗
220 KV-JODA220KV-220 KV-Ramchandrapur(220/132/33kv)-1	25-02-2019 00:54:00	Transmission Line	220 KV-JODA220KV-220 KV-Ramchandrapur(220/132/33kv)-1	OPTCL	220 KV-JODA220KV	✗	✗	✗	JUSNL	220 KV-Ramchandrapur(220/132/33kv)	✗	✗	✗
400KV KHARAGPUR-CHAIBASA-II	22-02-2019 13:24:00	Transmission Line	400 KV-Kharagpur 400KV-400 KV-Chaibasa(400/220kv)-2	WBSETCL	400 KV-Kharagpur 400kv	✗	✗	✗	POWERGRID	400 KV-Chaibasa(400/220kv)	✗	✗	✗
220KV JODA-RAMCHANDRAPUR-SC	21-02-2019 13:31:00	Transmission Line	220 KV-JODA220KV-220 KV-RAMCHANDRAPUR 220/132/33KV-1	OPTCL	220 KV-JODA220KV	✗	✗	✗	JUSNL	220 KV-RAMCHANDRAPUR 220/132/33KV	✗	✗	✗
400 KV-RAJARHAT(400/220KV)-400 KV-SUBHAS GRAM PGCIL 400kv-1	20-02-2019 00:43:00	Transmission Line	400 KV-RAJARHAT(400/220KV)-400 KV-SUBHAS GRAM PGCIL 400kv-1	POWERGRID	400 KV-RAJARHAT(400/220KV)	✗	✗	✗	POWERGRID	400 KV-SUBHAS GRAM PGCIL 400KV	✗	✗	✗
400 KV-SUBHAS GRAM PGCIL 400KV-400 KV-RAJARHAT(400/220KV)-1	19-02-2019 23:51:00	Transmission Line	400 KV-SUBHAS GRAM PGCIL 400KV-400 KV-RAJARHAT(400/220KV)-1	POWERGRID	400 KV-SUBHAS GRAM PGCIL 400KV	✗	✗	✗	POWERGRID	400 KV-RAJARHAT(400/220KV)	✗	✗	✗
400KV JHARSUGUDA-RAIGARH-I	19-02-2019 16:12:00	Transmission Line	400 KV-JHARSUGUDA 765 KV-400 KV-RAIGARH_PGCIL-1	POWERGRID	400 KV-JHARSUGUDA 765 KV	✓	✗	✗	WESTERN REGION	400 KV-RAIGARH_PGCIL	✗	✗	✗
220 KV-CHUKHA-220 KV-BirparaPGCIL-1&2 Tripping	16-02-2019 16:38:00	Transmission Line	220 KV-CHUKHA-220 KV-BirparaPGCIL-1	BHUTAN	220 KV-CHUKHA	✗	✗	✗	POWERGRID	220 KV-BirparaPGCIL	✗	✗	✗
	16-02-2019 16:38:00	Transmission Line	220 KV-CHUKHA-220 KV-BirparaPGCIL-2	BHUTAN	220 KV-CHUKHA	✗	✗	✗	POWERGRID	220 KV-BirparaPGCIL	✗	✗	✗
400 KV-Kolaghat TPS 400kv-400 KV-Kharagpur 400kv-1	16-02-2019 10:46:00	Transmission Line	400 KV-Kolaghat TPS 400kv-400 KV-Kharagpur 400kv-1	WBPDCL	400 KV-Kolaghat TPS 400KV	✗	✗	✗	WBSETCL	400 KV-Kharagpur 400kv	✗	✗	✗

400KV KhSTPP-BARH-II	15-02-2019 03:24:00	Transmission Line	400 KV-KAHALGAON 400kv-400 KV-BARH 400kv-2	NTPC	400 KV-KAHALGAON 400kv	✘	✘	✘	NTPC	400 KV-BARH 400kv	✘	✘	✘
400 KV-New_PPSP 400kv-400 KV-Arambag 400kv-1	14-02-2019 12:44:00	Transmission Line	400 KV-New_PPSP 400kv-400 KV-Arambag 400kv-1	WBSETCL	400 KV-New_PPSP 400kv	✘	✘	✘	WBSETCL	400 KV-Arambag 400kv	✘	✘	✘
400KV NEW PPSP-ARAMBAGH-I	14-02-2019 11:41:00	Transmission Line	400 KV-New_PPSP 400kv-400 KV-Arambag 400kv-1	WBSETCL	400 KV-New_PPSP 400kv	✘	✘	✘	WBSETCL	400 KV-Arambag 400kv	✘	✘	✘
Gl at Bakreswar II	11-02-2019 14:54:00	Transmission Line	400 KV-BAKRESWAR 400kv-400 KV-Arambag 400kv-2	WBPDCL	400 KV-BAKRESWAR 400kv	✓	✘	✘	WBSETCL	400 KV-Arambag 400kv	✘	✘	✘
	11-02-2019 14:54:00	Bus	400 KV-BAKRESWAR 400kv--2	WBPDCL	400 KV-BAKRESWAR 400kv	✓	✘	✘					
	11-02-2019 14:54:00	Transformer	bak2--2	WBPDCL	bak2	✘	✘	✘	WBSETCL		✘	✘	✘
Tripping of Baripada 132 kv bus	11-02-2019 10:33:00	Bus	132 KV-KUCHEI BARIPADA 400KV--1	POWERGRID	132 KV-KUCHEI BARIPADA 400KV	✓	✘	✘					
	11-02-2019 10:33:00	Transformer	220 KV-KUCHEI BARIPADA 400KV--1	POWERGRID	220 KV-KUCHEI BARIPADA 400KV	✓	✘	✘					
220 KV-Dalkhola 220kv-220 KV-DALKHOLA 220KV-1	09-02-2019 11:51:00	Transmission Line	220 KV-Dalkhola 220kv-220 KV-DALKHOLA 220KV-1	WBSETCL	220 KV-Dalkhola 220kv	✘	✘	✘	POWERGRID	220 KV-DALKHOLA 220KV	✘	✘	✘
220 KV-GAYA 765KV-220 KV-SONENAGAR 220KV-1	08-02-2019 23:08:00	Transmission Line	220 KV-GAYA 765KV-220 KV-SONENAGAR 220KV-2	POWERGRID	220 KV-GAYA 765KV	✘	✘	✘	BSPTCL	220 KV-SONENAGAR 220KV	✓	✘	✘
220 KV-CHUKHA-220 KV-BirparaPGCIL-2	08-02-2019 15:59:00	Transmission Line	220 KV-CHUKHA-220 KV-BirparaPGCIL-2	BHUTAN	220 KV-CHUKHA	✘	✘	✘	POWERGRID	220 KV-BirparaPGCIL	✘	✘	✘
220 KV-MUZAFFARPUR 400KV-220 KV-DHALKEBAR-1	08-02-2019 13:06:00	Transmission Line	220 KV-MUZAFFARPUR 400KV-220 KV-DHALKEBAR-1		220 KV-MUZAFFARPUR 400KV					220 KV-DHALKEBAR			
220 KV-MUZAFFARPUR 400KV-220 KV-MUZAFFARPUR TPS220KV-1	08-02-2019 12:24:00	Transmission Line	220 KV-MUZAFFARPUR 400KV-220 KV-MUZAFFARPUR TPS220KV-2	POWERGRID	220 KV-MUZAFFARPUR 400KV	✘	✘	✘	NTPC	220 KV-MUZAFFARPUR TPS220KV	✘	✘	✘
220 KV-BirparaPGCIL-220 KV-CHUKHA-2 TRIPPING	08-02-2019 10:11:00	Transmission Line	220 KV-BirparaPGCIL-220 KV-CHUKHA-2	POWERGRID	220 KV-BirparaPGCIL	✘	✘	✘	BHUTAN	220 KV-CHUKHA	✘	✘	✘
400 KV-ALIPURDUAR PGCIL 400/220kv-400 KV-Binaguri 400 Kv-1	08-02-2019 09:39:00	Transmission Line	400 KV-ALIPURDUAR PGCIL 400/220kv-400 KV-Binaguri 400 Kv-1	POWERGRID	400 KV-ALIPURDUAR PGCIL 400/220kv	✘	✘	✘	POWERGRID	400 KV-Binaguri 400 Kv	✘	✘	✘
765 KV-GAYA 765KV-765 KV-BALIA-1	08-02-2019 07:31:00	Transmission Line	765 KV-GAYA 765KV-765 KV-BALIA-1	POWERGRID	765 KV-GAYA 765KV	✘	✘	✘	NORTHERN REGION	765 KV-BALIA	✘	✘	✘
220 KV-DARBHANGA NEW 220KV-220 KV-LAUKAHI 220/132/33KV-1	08-02-2019 02:39:00	Transmission Line	220 KV-DARBHANGA NEW 220KV-220 KV-LAUKAHI 220/132/33KV-1	BSPTCL	220 KV-DARBHANGA NEW 220KV	✘	✘	✘	BSPTCL	220 KV-LAUKAHI 220/132/33KV	✘	✘	✘
220KV FSTPP-LALMATIA-SC	07-02-2019 13:05:00	Transmission Line	220 KV-Farakka(400/220/15.75 )-220 KV-Lalmatia(220/132/33KV)-1	NTPC	220 KV-Farakka(400/220/15.75 )	✘	✘	✘	JUSNL	220 KV-Lalmatia(220/132/33kv)	✘	✘	✘
220KV RANCHI-HATIA-II	07-02-2019 12:03:00	Transmission Line	220 KV-Ranchi(400/220kv)-220 KV-HATIA 220/132KV-1	POWERGRID	220 KV-Ranchi(400/220kv)	✘	✘	✘	JUSNL	220 KV-HATIA 220/132KV	✘	✘	✘
400/220 kv ICT III at Gaya	06-02-2019 14:47:00	Transformer	400 KV-GAYA 765KV--3	POWERGRID	400 KV-GAYA 765KV	✘	✘	✘					
400 KV-MUZAFFARPUR 400KV-400 KV-GORAKHPUR-2 on 05-02-19	05-02-2019 05:38:00	Transmission Line	400 KV-MUZAFFARPUR 400KV-400 KV-GORAKHPUR-2	POWERGRID	400 KV-MUZAFFARPUR 400KV	✘	✘	✘	NORTHERN REGION	400 KV-GORAKHPUR	✘	✘	✘
400 KV-MERAMUNDALI 400KV-400 KV-MENDHASAL-1	04-02-2019 04:26:00	Transmission Line	400 KV-MERAMUNDALI 400KV-400 KV-NEW DUBURI 400KV-2		400 KV-MERAMUNDALI 400KV					400 KV-NEW DUBURI 400KV			
	04-02-2019 04:26:00	Transmission Line	400 KV-MERAMUNDALI 400KV-400 KV-MENDHASAL-1	OPTCL	400 KV-MERAMUNDALI 400KV	✘	✘	✘	OPTCL	400 KV-MENDHASAL	✘	✘	✘
GD at New Sagardighi	03-02-2019 18:44:00	Transmission Line	220 KV-SAGARDIGHI(SGTPP)-220 KV-NEW SAGARDIGHI-1	WBPDCL	220 KV-SAGARDIGHI(SGTPP)	✘	✘	✘	WBSETCL	220 KV-NEW SAGARDIGHI	✘	✘	✘
	03-02-2019 18:44:00	Transmission Line	220 KV-SAGARDIGHI(SGTPP)-220 KV-NEW SAGARDIGHI-2	WBPDCL	220 KV-SAGARDIGHI(SGTPP)	✘	✘	✘	WBSETCL	220 KV-NEW SAGARDIGHI	✘	✘	✘
	03-02-2019 18:44:00	Bus	220 KV-SAGARDIGHI(SGTPP)--2	WBPDCL	220 KV-SAGARDIGHI(SGTPP)	✘	✘	✘					
	03-02-2019 18:44:00	Transformer	220 KV-SAGARDIGHI(SGTPP)--1	WBPDCL	220 KV-SAGARDIGHI(SGTPP)	✘	✘	✘	WBSETCL		✘	✘	✘
220 KV-NEW DUBURI 400KV-220 KV-BALASORE 220KV-1	03-02-2019 14:15:00	Transmission Line	220 KV-NEW DUBURI 400KV-220 KV-BALASORE 220KV-1	OPTCL	220 KV-NEW DUBURI 400KV	✓	✘	✘	OPTCL	220 KV-BALASORE 220KV	✘	✘	✘
	03-02-2019 14:15:00	Bus	220 KV-NEW DUBURI 400KV--1	OPTCL	220 KV-NEW DUBURI 400KV	✓	✘	✘	OPTCL		✘	✘	✘
	03-02-2019 14:15:00	Transformer	400 KV-NEW DUBURI 400KV--2	OPTCL	400 KV-NEW DUBURI 400KV	✓	✘	✘	OPTCL		✘	✘	✘
220 KV-CHUKHA-220 KV-BirparaPGCIL-1	03-02-2019 09:32:00	Transmission Line	220 KV-CHUKHA-220 KV-BirparaPGCIL-2	BHUTAN	220 KV-CHUKHA	✘	✘	✘	POWERGRID	220 KV-BirparaPGCIL	✘	✘	✘
220 KV-BirparaPGCIL-220 KV-CHUKHA-1 Tripping incident.	01-02-2019 22:50:00	Transmission Line	220 KV-BirparaPGCIL-220 KV-CHUKHA-2	POWERGRID	220 KV-BirparaPGCIL	✘	✘	✘	BHUTAN	220 KV-CHUKHA	✘	✘	✘
400 KV-Binaguri 400 Kv-400 KV-BONGAIGAON-2	01-02-2019 14:24:00	Transmission Line	400 KV-Binaguri 400 Kv-400 KV-BONGAIGAON-2	POWERGRID	400 KV-Binaguri 400 Kv	✘	✘	✘	POWERGRID	400 KV-BONGAIGAON	✘	✘	✘

Sl No.	Name of the incidence	PCC Recommendation	Latest status
<b>76<sup>th</sup> PCC Meeting</b>			
1.	Disturbance at 220kV New Bargarh S/S on 05-01-19 at 10:51 hrs.	ERLDC informed that analog channels and LBB related channels were not configured in the DR and advised OPTCL to configure the DR for better analysis of the disturbance.	
2.	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	
3.	Disturbance at 400kV Gaya(PG), 220kV Gaya and Bodhgaya on 05-01-19 at 11:20 hrs	PCC advised Powergrid to review the distance relay reach and power swing blocking settings of Gaya(PG) end of 220kV Gaya(PG)-Bodhgaya Line-II.  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.	
4.	Disturbance at 220kV Hazipur on 23-01-19 at 12:33 hrs	PCC advised BSPTCL to address the issue of disc damage of GIS bay with the concerned OEM and also advised to implement the bus sectionalizer to avoid complete blackout of the substation	
5.	Disturbance at 400 kV Muzaffarpur S/s on 05.01.2019 at 06:56 hrs.	PCC advised Powergrid to verify and submit the details to ERPC and ERLDC	
6.	Islanding of CESC on 19.01.19 at 1845 Hrs	PCC advised CESC to review the backup overcurrent settings at Howrah(WBSETCL) in consultation with WBSETCL	
7.	Mutual effect 400kV Andal-Jamshedpur-II on 400 kV Adhunik-Jamshedpur D/C	PCC advised Adhunik and POWERGRID to analyze the event in detail to find the root cause in consultation with the ERPC and	

		ERLDC. PCC also advised Adhunik to submit the details of PSS tuning to ERLDC/ERPC	
8.	Disturbance at 400/220 kV Alipurduar (Powergrid) S/s on 05.12.18 at 10:29 hrs.	PCC advised Powergrid submit the latest status to ERPC and ERLDC.	
<b>74<sup>th</sup> PCC Meeting</b>			
9.	Multiple tripping incident at Darbhanga at 13:33 hrs on 06-11-18 and at 15:23 hrs on 06-11-18	PCC suggested to keep the highset setting more than 7 and advised DMTCL to review the settings.	
10.	74th PCC Single line tripping of 400 KV Bihar sharif-Sasaram-1 on On 17/11/18 at 6:10 Hrs	POWERGRID was advised to submit a detail report and remedial measure taken to ensure such event does not take place in future.	
12.	Total power failure at 220kV Hatia (JUSNL) S/s on 20.07.18 at 09:10 hrs.	PCC also advised JUSNL to test the healthiness of the relays at 220kV Patratu and 220/132kV Hatia S/s on urgent basis.	JUSNL informed that testing for healthiness of relays will be done by third party vendor. The work has already been awarded to the vendor and it will be completed by February' 19.
<b>73<sup>rd</sup> PCC Meeting</b>			
13.	Total Power failure at 220 kV Hatia (JUSNL) substation on 03.10.18 at 17:23 hrs and on 04.10.18 at 00:26 hrs	PCC advised JUSNL to test the Bus bar and LBB protection, PLCC and configuration of DT signal in the relay at Hatia end.	JUSNL informed that the testing of PLCC and Protection system will be completed by February' 19.
14.	Total Power failure at TLDP-III S/s on 27.10.18 at 10:24 hrs.	PCC advised WBSETCL and NHPC to review the DEF settings for proper protection coordination between the transmission lines and generating station.	PCC advised PRDC to coordinate the settings with reference to GT of TLDP side.
15.	Disturbance at Purnea	From DR it was observed that DEF protection of 220 kV Purnea(PG)-Purnea line at PG end did not reset even after Neutral current reduced to	

		negligible value.	
<b>72<sup>nd</sup> PCC Meeting</b>			
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	
<b>71<sup>st</sup> PCC Meeting</b>			
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 DR of 15.08.18 is not available in the relay. They added that OEM will visit the station for reconfiguration of relay.
18.	Disturbance at 400 kV Farakka S/s on 19.08.18 at 15:26 hrs.	PCC advised NTPC to replace/divert Micom P437 relay to avoid unwanted tripping of such important transmission line. PCC also advised to check the reason for not sending carrier from Farakka to Kahalgaon and non-operation of Autorecloser.	NTPC informed that the relay has been replaced. They added that the carrier healthiness will be checked at next available shutdown.
<b>68<sup>th</sup> PCC Meeting</b>			
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.	Powergrid informed that the issue was referred to OEM but OEM was not responding.  PCC advised Powergrid to coordinate with Kolar end as the same issue has already been resolved at their end.
20.	Issue of Protection Coordination Observed during Blackout of Tala on 23rd May 2018.	PCC advised Bhutan representatives to submit a detailed report on the above disturbance to ERPC and ERLDC at the earliest.	

**ERPC Proposed****Guide Lines**

<b>Triggering criteria for DR :</b>	Any Start	Internal protection trip signals, external trigger input, analog triggering (any phase current exceeding 1.5 pu of CT secondary current or any phase voltage below 0.8pu, neutral/residual overcurrent greater than 0.25pu of CT secondary current).	
<b>DR time window :</b>	minimum 3 seconds.	minimum 2 seconds.	
<b>Pre-fault time window (S):</b>			0.5 -
<b>Post fault time window (S):</b>			2.5
<b>Minimum sampling frequency:</b>	1000 Hz	64 Samples Per Cycle	0.3
<b>Analog signals as per priority</b>			
<b>A. Mandatory signals:</b>	<ol style="list-style-type: none"> <li>1. Three phase voltage</li> <li>2. Neutral voltage</li> <li>3. Three phase current</li> <li>4. Neutral current</li> </ol>	<ol style="list-style-type: none"> <li>1. Three phase-to-neutral voltages</li> <li>2. Three phase currents and neutral currents.</li> <li>3. Neutral Currents</li> <li>4. Frequency</li> </ol>	
<b>B. Optional signals:</b>	<ol style="list-style-type: none"> <li>1. Mutual current</li> <li>2. Check Sync</li>   <li>3. Open Delta</li> </ol>	<ol style="list-style-type: none"> <li>1. Polarizing currents and voltages, if used.</li> <li>2. Real and reactive power</li> </ol> <p>The Minimum parameters to be monitored in the Fault record shall be specified by the respective RPC.</p>	
<b>Digital signals as per priority</b>			
<b>A. Mandatory signals:</b>	<ol style="list-style-type: none"> <li>1. Any Start</li> <li>2. Any trip</li> <li>3. Z1, Z2, Z3, Z4 pick up</li> <li>4. Over current and Earth fault pick up</li> <li>5. Over voltage stage I &amp; II pick up</li> <li>6. DT send &amp; reverse</li> <li>7. Carrier send &amp; Receive</li> <li>8. Main three phase CB open signal</li> <li>9. Tie three phase CB open signal (where applicable)</li> <li>10. Power Swing</li> <li>11. SOTF/TOR</li> <li>12. LBB</li> <li>13. A/R L/O</li> <li>14. Main-1/2 operated</li> <li>15. Bus Bar trip</li> <li>16. VT failure</li> <li>17. Distance Forward &amp; Reverse</li> <li>18. T1, T2, T3, T4</li> <li>19. Broken conductor</li> <li>20. 86A &amp; 86B</li> <li>21. A/R 1P In Prog</li> <li>22. A/R Fail</li> <li>23. STUB/TEED (where applicable)</li> </ol>		
<b>B. Optional signals:</b>	<ol style="list-style-type: none"> <li>1. Any External input</li> <li>2. Any Binary Input</li> </ol>		

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<b>Triggering criteria for DR :</b>	Any Start	Internal protection trip signals, external trigger input, analog triggering (any phase current exceeding 1.5 pu of CT secondary current or any phase voltage below 0.8pu, neutral/residual overcurrent greater than 0.25pu of CT secondary current).	
<b>DR time window :</b>	minimum 3 seconds.	minimum 2 seconds.	
<b>Pre-fault time window (S):</b>		0.5 -	
<b>Post fault time window (S):</b>		2.5	0.3
<b>Minimum sampling frequency:</b>	3200Hz	64 Samples Per Cycle	
<b>Analog signals as per priority</b>			
<b>A. Mandatory signals:</b>	<ol style="list-style-type: none"><li>1. Three Phase Currents &amp; Neutral Currents of HV</li><li>2. Three Phase Currents &amp; Neutral Currents of LV</li><li>3. Three Phase Currents &amp; Neutral Currents of MV</li><li>4. I Ref HV</li><li>5. I Ref LV</li><li>6. I Ref MV</li><li>7. Voltages</li><li>8. Frequency</li><li>9. Differential Currents</li><li>10. Restraining Currents</li><li>11. Low Impedance REF-DIFF - of all windings</li><li>12. Low Impedance REF-Restraining - of all windings</li></ol>		
<b>Digital signals as per priority</b>	<ol style="list-style-type: none"><li>1. Any Start</li><li>2. Any trip</li><li>3. Differential Trip</li><li>3. REF Trip HV, MV &amp; LV</li><li>4. Over-current Trip</li><li>5. Earth Fault Trip</li><li>6. Over Flux</li><li>7. Over Voltage</li><li>8. Under Voltage</li><li>9. 2nd Harmonic</li><li>10. 5th Harmonic</li><li>11. Frequency Protection</li><li>12. External Trip Signals</li></ol>		



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<b>Triggering criteria for DR :</b>	Any Start
<b>DR time window :</b>	minimum 3 seconds.
<b>Pre-fault time window (S):</b>	
<b>Post fault time window (S):</b>	
<b>Minimum sampling frequency:</b>	3200Hz
<b>Analog signals as per priority</b>	
<b>A. Mandatory signals:</b>	<ol style="list-style-type: none"><li>1. 3Phase Diff Current</li><li>2. 3Phase Bias Current</li><li>3. Neutral Differential Current</li><li>4. Neutral Bias Current</li></ol>
<b>B. Optional Signals:</b>	<ol style="list-style-type: none"><li>1. Individual Feeder Currents if available</li><li>2. Zone wise Differential and Bias Currents</li></ol>
<b>Digital signals as per priority</b>	<ol style="list-style-type: none"><li>1. Any Start</li><li>2. Any trip</li><li>3. R-Phase Fault</li><li>4. Y-Phase Fault</li><li>5. B-Phase Fault</li><li>6. Earth Fault</li><li>7. Check Zone Operated</li><li>8. Zone 1 BB Fault</li><li>9. Zone 2 BB Fault</li><li>10. Trip Bus bar Zone 1</li><li>11. Trip Bus bar Zone 2</li><li>12. Trip Breaker Failure Zone 1</li><li>13. Trip Breaker Failure Zone 2</li><li>14. Bus bar Differential Blocked</li></ol>

Internal protection trip signals, external trigger input, analog triggering (any phase current exceeding 1.5 pu of CT secondary current or any phase voltage below 0.8pu, neutral/residual overcurrent greater than 0.25pu of CT secondary current).  
minimum 2 seconds.

0.5 -  
2.5  
64 Samples Per Cycle  
0.3