



सत्यमेव जयते

**भारत सरकार**  
**Government of India**  
**विद्युत मंत्रालय**  
**Ministry of Power**  
**उत्तर क्षेत्रीय विद्युत समिति**  
**Northern Regional Power Committee**

No. उ.क्षे.वि.स./प्रचालन/107/01/2019/14926-14964

दिनांक: 06.12.2019

सेवा में : संरक्षण उप-समिति के सदस्य (सूची के अनुसार) ।  
To: Members of Protection Sub-Committee (As per List)

**विषय:** संरक्षण उप-समिति की 39<sup>वीं</sup> बैठक की कार्यसूची ।  
Subject: Agenda for 39<sup>th</sup> Protection Sub-Committee Meeting.

संरक्षण उप-समिति की 39<sup>वीं</sup> बैठक का आयोजन दिनांक 18.12.2019 को 10:00 बजे से उ.क्षे.वि.स. सचिवालय, नई दिल्ली में की जाएगी । उक्त बैठक की कार्यसूची उत्तर क्षेत्रीय विद्युत समिति की वेबसाइट (<http://www.nrpc.gov.in>) पर उपलब्ध है ।

The 39<sup>th</sup> meeting of Protection Sub-Committee is scheduled to be held on **18.12.2019 at 10:00 Hrs at NRPC Secretariat, New Delhi**. The agenda for the meeting is available on NRPC website and same can be downloaded from <http://www.nrpc.gov.in> .

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(सौमित्र मजूमदार)  
अधीक्षण अभियंता (प्रचालन)

**List of Members of PSC**

<b>S.No.</b>	<b>Designation</b>	<b>Organization</b>	<b>Fax No.</b>
1	Director (P&C)	BBMB	0172-2652054
2	General Manager (SLDC)	DTL	011-23236462
3	GM (O&M)	Delhi Transco Limited	011-23236462
4	GM (T)	Common Services IPGCL	23370247
5	Chief Engineer (TS)	HVPNL	0172-2591244
6	SE (M&P)	HVPNL	0172-2540014
7	SE (SO & SLDC)	HVPNL	0172-2560622
8	SE (SLDC)	PTCUL	0135-2763570
9	SE(T&C)	PTCUL	0135-2451826
10	Chief Engineer (SLDC)	UPPTCL	0522-2287880
11	SE(Tech)	HPGCL	0172-5022436
12	SE(O&M-VI)	HPGCL	0180-2566768
13	Chief Engineer (Transmission)	HPSEB	01972-223435
14	SE (PR& ALDC)	HPSEB	0177-2837143
15	Chief Engineer (Comml. & Survey Wing)	PDD	0191-2474233
16	Chief Engineer (SLDC)	PSTCL	0175-2365340
17	Chief Engineer (P&M)	PSTCL	0161-2741280
18	CE (M&P)	RRVPNL	0141-2291891
19	SE (Electrical)	RRVUNL	01509-245299
20	Chief Engineer (LD)	RRVPNL	0141-2740920
21	SE (SO&LD)	RRVPNL	0141-2740920
22	Superintending Engineer (T&C)	UPPCL	0121-2666062
23	Chief Engineer, (L-2)	UPRVUNL	0522-2287822
24	DGM (T&C)	PTCUL	0135-2760331
25	General Manager (O&M)	NHPC	0129-2272413
26	GM (O&M) NR – I	PGCIL	011-26601079
27	GM (O&M), NR-II	PGCIL	01951-237186
28	Chief Manager (TS)	N.R.L.D.C	011-26852747
29	GM(OS-NR)	NTPC	0522-2305848
30	GM (OS)	NTPC Ltd	0120-2410082
31	DGM (Maintenance)	SJVNL	0177-2673283
32	DGM (O&M)	THDC India Ltd	01376-236305
33	Director (GM division)	CEA	011-26109750
34	General Manager	APCLP	01251-266326
35	Director	JPPVL	0120-4516201
36	Assistant Vice President	BRPL	39996055
37	GM (Production)	Jhajjar Power Ltd	01251-270155
38	GM(P&M)	APL	7925557176
39	Sh. Umesh Gupta, AsVP	BRPL	011-26419833
40	Director (NPC)	CEA	
41	1.Maintenance Superintendent	NAPS, NPCIL	05734-222167
	2.Maintenance Superintendent	RAPS, NPCIL	01475-242060

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**Agenda for**  
**39<sup>th</sup> Meeting of Protection Sub-committee of**  
**Northern Regional Power Committee**

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<i>Time of meeting</i>	:	<i>10.00 Hrs.</i>
<i>Date of meeting</i>	:	<i>18.12.2019</i>
<i>Venue</i>	:	<i>NRPC Secretariat, New Delhi</i>

#### **A.1. Confirmation of minutes of 38<sup>th</sup> meeting of protection sub-committee**

Minutes of 38<sup>th</sup> meeting of Protection Sub-committee were issued vide letter dated 09.10.2019. The Minutes are available on NRPC's website at <http://www.nrpc.gov.in>. No comment has been received.

**Sub-Committee may confirm the Minutes.**

#### **A.2. Implementation of Recommendations of Task Force**

As a follow up of one of the recommendations of Enquiry Committee headed by the Chairperson, CEA on grid disturbances that took place on 30<sup>th</sup> and 31<sup>st</sup> July 2012, Ministry of Power had constituted a 'Task Force on Power System Analysis under Contingencies' in December 2012. The Task Force had submitted its report in August 2013. In a meeting taken by Union Power Secretary on 11.03.2014, it was decided that the report be given wide circulation and its recommendations be implemented in a time bound manner. Some of the issues arising out of recommendations of the Task Force were as under:

##### **A.2.1. Database of protection settings**

*In 38<sup>th</sup> PSC meeting held on 18.12.2019:* Members were informed that that process of collection of data for protection setting from STUs and other transmission licensee was also carried out earlier, however complete data wasn't received despite continuous follow up. Considering the amount of data to be collected, it was suggested that data may be collected in stage wise i.e. stage 1: 400kV and above and stage 2: 220kV. It was decided that utilities which have already submitted some of the data will submit updated data for stage 1 within 7 days. The utilities which were yet to share any data, will submit the data for stage 1 within 15 days. However, no data has been received from any of the utilities.

*In 43<sup>rd</sup> TCC/46<sup>th</sup> NRPC meeting held on 23<sup>rd</sup>/24<sup>th</sup> September, 2019:* Members were apprised about the history and decisions taken in the various meetings regarding the project for protection settings database. It was informed that option to nominate CPRI for the project was deliberated in the last TCC/NRPC meeting, however, the same may not be possible under the extant General Financial Rules. The execution methodology involving project bifurcation

as enumerated in the agenda was also discussed.

Members were apprised that it may not be possible to go ahead with the approved DPR as there won't be any possibility of competition in the tendering. It was also informed that as it is necessary to go ahead with the scope defined in the DPR for which PSDF funding is granted, the proposal of executing project in two parts may not be feasible as there will be deviation from scope of work. It was stressed that Task Force had recommended CTU and STUs to collect protection setting data and submit to NRLDC and respective SLDC with a copy to RPC for maintaining the database which should be strictly adhered. Further, after every change in the data of protection setting, STUs need to submit their data to respective SLDC and CTU to NRLDC and coordination can be done by the two agencies whose network is being changed. TCC Chairperson stressed that data should be collected in time bound manner and it should be used further for analysing the tripping where cause of the event due to protection setting/co-ordination can be determined.

Accordingly, TCC recommended that NLDC to be informed about scrapping of DPR and funding thereon. (NLDC has been intimated regarding the decision vide letter dated 22.10.2019) TCC recommended that protection setting data may be submitted by STUs and CTU to SLDCs and NRLDC respectively with a copy to NRPC for maintaining database. The guidelines for data collection in an orderly and time bound manner may be finalized in next Protection sub-committee meeting.

In view of the above, it is necessary to fix the timelines and formulate methodology for timely submission of Protection setting data. The protection setting database format is available at <https://nrpc.gov.in/data-formats/> Members may also deliberate regarding updating of the format.

**Members may deliberate regarding submission of the data.**

### **A.3. Final report of the Committee to suggest measures for bringing improvement in the field of Power System Protection among the utilities in Northern Region**

The report, submitted by the duly constituted committee, was accepted for implementation in the 34<sup>th</sup> TCC/38<sup>th</sup> NRPC meeting held on 24<sup>th</sup>/25<sup>th</sup> October, 2016. It was also agreed in the NRPC meeting that each utility would immediately start working to develop training module for Basic Training on Protection System for Sub-Station Engineers (Level-1) and start training programs within 6 months. The issue was also discussed in 32<sup>nd</sup> PSC meeting wherein utilities were requested to organize Level-1 training and submit the details.

BBMB, POWERGRID NR-I and PITCUL have been conducting training on Protection System (Level-I) at regular intervals. Punjab informed that trainings were being conducted for operator level personnel in Punjab and its detail would be shared. Representative of Haryana, UP and POWERGRID also informed that

Level-1 training programmes are being conducted regularly whose details would be shared. *DTL, RRVPNL, BBMB have submitted the details of Level-1 training.*

Other utilities may kindly submit details of level – 1 training comprising of points such as training module, periodicity of training and number of participants covered in the training at the earliest.

First batch of Level-2 and Level – 3 training have been completed. The details are as followed:

Training	Venue	Duration	Unit cost
Level-2	Shimla	21 <sup>st</sup> to 25 <sup>th</sup> November 2016	Rs. 69,532.6 (including ST)
Level-3	Udaipur	19 <sup>th</sup> to 23 <sup>rd</sup> March 2018	Rs. 88,500 (including GST)

Further, POWERGRID was requested for the budgetary quote for 2<sup>nd</sup> batch of Level-2 and Level-3 training (classroom as well as hands-on) for 50 engineers by engaging any of the OEM of relays. Accordingly, POWERGRID has submitted their offer on 26.11.2019. (Enclosed as Annexure - I) The agenda regarding the same has been put up in 44<sup>th</sup> TCC/47<sup>th</sup> NRPC meetings to be held on 10<sup>th</sup> /11<sup>th</sup> December 2019 for the deliberation.

**Members may kindly deliberate.**

#### **A.4. Persistent surge problem encountered by KWHEP since commissioning of Kala Amb substation (Agenda by KWHEP)**

##### **Background of problem**

KWHEP (4 x 250 MW) was connected to Abdullapur through double ckt line (212 km) since its commissioning in 2011. This line, maintained by Jaypee Power Grid Ltd., was working well till Nov 2017 when Kala Amb substation was connected through LILO at about 175 km from KWHEP. Ever since the introduction of Kala Amb S/s, problem of '**increase in LA counters**' located at Karcham Wangtoo Pothead yard is being witnessed. This increase is taking place in all the LAs of both ckt 1 and ckt 2 (Total six nos. LA).

##### **Risk to KWHEP**

The counters have increased manifold (6-7 times) since introduction of Kala Amb and is still continuing to increase. Such high increase and further increasing trend pose risk to the LAs, power transmission and grid. Multiple attempts were taken from Kala Amb end to close their circuit breaker on 21.11.2017 and 05.12.2017 for back charging the line, as their relay tripped due to SOFT each time, they tried to close the CB, and the LA counters increased at Wangtoo end on all trials. The generating station are at the receiving end and bear the most of the risk posed to the equipment and generation loss.

##### **Action till now**

The issue was discussed with the officials at Kala Amb several times telephonically with the request to solve the problem. As per their request,

KWHEP rechecked all settings and also sent relay settings to them for review which was found ok. The mail was further forwarded to AM NR-2 and several other officials in POWERGRID by Kala Amb team. On 05.04.2018, KWHEP received a reply from Mr. Atul Mathur (Asst. Chief Design Engineer) in which he requested to have the LAs tested and report be submitted for review to POWERGRID. KWHEP immediately got its LAs tested by PGCIL National Test Laboratory, Jalandhar on 12.04.2018. All the LAs were found in excellent working condition and the test reports were submitted to POWERGRID on 13.04.2018 (*Copy of mail and test reports attached as Annexure-IV of 37<sup>th</sup> PSC agenda*).

### **Present Status**

There is no feedback till now after the submission of reports despite several telephonic reminders. Despite the request to involve KWHEP also in solving the problem, KWHEP is completely unaware of further development. Looking at the huge risk at KWHEP end, appropriate action needs to be taken immediately to solve this long persistent problem.

***In 37<sup>th</sup> PSC meeting on 21.01.2019***, representative of KWHEP intimated that PIR aren't installed at CB in Kala amb s/s. Representative of POWERGRID told that after LILO line length was decreased to 175 km and PIR aren't installed for the length less than 200km. He told that leakage current observed was also in the limits and the issue has already been taken up with the engineering department and it is also being followed up. POWERGRID was requested to submit the report of Engineering department at the earliest. It was also suggested that POWERGRID may appoint consultant to find out the solution if issue isn't resolved.

***In 38<sup>th</sup> PSC meeting held on 01.08.2019 and 02.08.2019:-*** Representative of POWERGRID informed that issue is being analysed by the Engineering department, however any results weren't obtained yet as it is a peculiar phenomenon. It was also informed that lines would be again LILO at Wangtoo and it may be checked if issue persists after LILO. He stated that Engineering department is further looking into the issue.

Further, KWHEP was requested to share the DR/EL of the events when LA counter is increased at the time of back charging of line and also share settings of SOTF.

**POWERGRID may update the status.**

## **A.5. Oil leakage and High current/Overheating in Line reactor NGR (Agenda by NPCIL)**

### **Event Description**

At RAPP-7 & 8 400kV switchyard on 07.05.2019 about 0900 hrs., oil leakage was observed from 25 NB pipe to conservator of 63 MVAR, 400 kV RAPP-Jaipur



Line reactor. Subsequently, at 0934 hrs., 400kV Bus-II side CB (513-CB-5B) was manually opened (centre breaker (513-CB-5C) was already open) to isolate Jaipur Line Reactor. Excessive humming sound was observed from NGR and approximately 25 A was observed to be flowing in NGR of line reactor. The NGR temperature was increasing continuously and had reached to 75°C at 1145 hrs.

At 1220 hrs., RAPP-Kota line opened. Kota-Jaipur remained charged, which led to slight reduction in Voltage and Current in all three phases. Since the NGR temperature was increasing continuously and had reached to 85°C at around 1230 hrs., NGR deluge was manually operated to cool down the NGR and line isolator was opened at RAPP end, leading to zero current and approximately 3 kV voltage. Line was taken in service next day (08.05.2019 at 1505 hrs.) without the Line Reactor.

### **Observations/Analysis**

- a) **Oil leakage from equalizing/vent pipe header of line reactor:** During visual inspection it is found that there is a crack developed in the pipe line to conservator. Further investigation is in progress to check whether the crack in the pipe is due to material defect or due to consequential effect of the vibration of reactor tank.
- b) **While isolating the Jaipur Line Reactor:** Subsequent to isolation of RAPP-Jaipur line at both ends, voltages in all three phases of the line as recorded by line distance protection relay 21-1 & back up impedance protection relay 21-R of line reactor at RAPP end were observed to be in the range of 96 kV to 105 kV. The phase currents were in the range of 22 A to 25 A and they were almost in phase. This resulted in flow of about 71A in the NGR of line reactor which in turn caused increase in temperature of NGR.

RAPP-Jaipur line and RAPP-Kota line with LILO at Kota to Jaipur are forming the double circuit lines on common towers. After opening RAPP-Kota line, slight reduction in voltages and currents in RAPP-Jaipur line are observed which were in the range of 83kV to 102kV and 15A to 19A. After opening of line isolator of RAPP-Jaipur line at RAPP end, the currents reduced to zero and voltages came down to 3kV.

It is opined that voltages are expected to be induced in a line adjacent to live line due to mutual coupling between the lines. However, the induced voltages in adjacent line should be nearly symmetrical if the live line voltages are symmetrical. Hence there would not be flow of high current through NGR of line reactor. This is further corroborated by the data recorded during isolation of one of the circuits of RAPP-Shujalpur DC line, where in no such high currents were observed. Also, the simulation studies were made which indicate no such zero-sequence induction if the lines are properly transposed.

Since the zero sequence induced voltages and currents were observed in RAPP-Jaipur line during the present incident, there must be some zero sequence

currents in nearby lines, possibly due to uncleared arcing ground faults somewhere in the grid. DR data of RAPP-Kota line which was carrying a current of about 80A, indicate some zero-sequence current of the order of about 25A. As the data of Kota-Jaipur line is not available with NPCIL, it could not be checked whether zero sequence currents were existing in that line during the subject event.

**In 38<sup>th</sup> PSC meeting held on 01.08.2019 and 02.08.2019:** Representative of NPCIL briefed about the problem of Overheating of reactor and informed that zero sequence current of about 25 A was flowing as indicated in DR of RAPP-Jaipur line. He further inquired about the NGR bypass scheme being implemented by POWERGRID.

Representative of POWERGRID informed that similar phenomena were observed few years back when few reactors were failed. In pursuance of the same a NGR bypass scheme is being implemented at POWERGRID substations. He advised to take both line reactors in service simultaneously and record the observations. If such scenario is observed again, based on that, further study and simulation may be done. He also suggested that option of NGR bypass scheme may be explored.

Further, it was agreed that NPCIL will again record the observations, if issue persists implementation of NGR bypass scheme may be explored.

NPCIL has informed that observations were recorded by taking Line shutdown RAPP-7&8 and Jaipur on 07.08.2019. The report regarding the flow of current in NGR is enclosed as Annexure – II.

**Members may deliberate.**

## A.6. Follow up action on outstanding issues from previous meetings

### A.6.1. Non-availability/defective PLCC link of STU Lines terminated at POWERGRID (NR-2) substations

**22<sup>nd</sup> PSC meeting on 22.07.2013** - POWERGIRD had submitted a list of its NR-2 sub-station where PLCC was non-functional at other side.

**38<sup>h</sup> PSC meeting on 01.08.2019 and 02.08.2019** - Status of PLCC work in these sub-stations, as updated in the meeting is as under:

SI. No.	Name of Substation	Name of Transmission Line	Availability of PLCC	Status
<b>PLCC issues with PSTCL</b>				
1	Amritsar	220 kV Verpal –I	Not installed	Representative of PSTCL informed that panels installed were being replaced and end to end testing would be completed by the end of the month.



**PSTCL may update the status.**

#### **A.6.2. PLCC and Auto Re-closure issues related to UPPTCL**

**28<sup>th</sup> PSC meeting on 19.12.2014** - POWERGRID informed that there were various lines of UPPTCL wherein PLCC panels and auto re-closure schemes were not in working condition due to which frequent tripping of lines on transient faults were taking place.

**38<sup>th</sup> PSC meeting on 01.08.2019 and 02.08.2019** - Status updated by UPPTCL and POWERGRID in the meeting was as under:

<b>Sl. No.</b>	<b>Name of Transmission Line</b>	<b>Details of PLCC</b>	<b>Status</b>
<b>Kanpur S/S</b>			
1.	220kV Kanpur-Mainpuri	PLCC panels not available	PLCC panels were supplied but yet to be commissioned.

**UPPTCL/POWERGRID may update the status.**

#### **A.6.3. Islanding scheme for Rajasthan and Punjab**

##### **A.6.3.1. Islanding scheme for Rajasthan**

**36<sup>th</sup> PSC meeting held on 19.09.2018** - Representative of RVPNL stated that procurement has been completed and scheme would be implemented by Dec 2018. It was also mentioned that Mahi HPS has been permanently excluded from the scheme.

**37<sup>th</sup> PSC meeting held on 21.01.2019** - Representative of RVPNL informed that procurement is under process and expected to be completed by 30.06.2019. MS, NRPC requested RVPNL to submit the complete islanding scheme for Rajasthan at the earliest.

**38<sup>th</sup> PSC meeting held on 01.08.2019 and 02.08.2019:-** Representative of Rajasthan informed that they are implementing the islanding scheme and status as on 31.07.2019 has been shared. Rajasthan was requested to share the scheme under implementation with NRPC/NRLDC.

**RVPNL may update the status.**

##### **A.6.3.2. Islanding scheme for Punjab**

**34<sup>th</sup> PSC meeting held on 04.08.2017** - PSTCL was given approval to implement islanding scheme for only GHTP control area citing the plans of PSPCL to shut the GNDTP Bathinda plant by the year end. They were further requested to complete the same by 30.09.2017 and to submit the details of actual implemented schemes to NRLDC and NRPC Secretariat.

**35<sup>th</sup> PSC meeting held on 20.06.2018** - Representative of PSTCL stated that consent of PSPCL was received a one week before for the execution of Islanding scheme on only GHTP control area and it would be executed by 30.09.2018.

**36<sup>th</sup> PSC meeting held on 19.09.2018** - Representative of PSTCL stated that data was awaited from the PSPCL. He stated that PSPCL was requested to submit the data of the units which would be kept ON during peak/non-peak period. They have submitted the data stating that all the units would be kept ON but in actual scenario it has been observed that units for Lehra-Mohabbat TPS were off during winter and ran up to 50% in paddy seasons. He told that scheme would be implemented in a month after consultation with PSPCL.

**37<sup>th</sup> PSC meeting on 21.01.2019** - Representative of PSTCL informed that installation and commissioning is under progress and it will be completed by **31<sup>st</sup> March 2019** and Bathinda was dropped from the scheme. He informed that currently, scheme for Lehra-Mohabbat is being implemented. PSTCL was requested to share the islanding scheme for Lehra-Mohabbat at the earliest.

**38<sup>th</sup> PSC meeting held on 01.08.2019 and 02.08.2019:-** Representative of Punjab informed that scheme has been installed and commissioned. It was requested to do a mock testing of the scheme and a report along with the scheme to be shared with NRPC/NRLDC.

**PSTCL may update the status.**

**Haryana, UP and other states are also requested to update the status of islanding schemes in their respective states.**

#### **A.6.4. Progress of rectification of deficiencies observed / improvements suggested in Basic Protection Audit**

The status of rectification of deficiencies observed in Basic Protection Audit carried out by POWERGRID & CPRI is to be submitted on monthly basis. The updated status in regard to expected completion time of rectification of protection related deficiencies as informed by utilities is enclosed as **Annexure-III**.

**Utilities are requested to update the latest status.**

#### **A.6.5. Third-Party Protection Audit by the Protection Experts for intra-state system / balance system not covered in Basic Protection Audit.**

In the 34<sup>th</sup> PSC meeting, stress was given over non-rectification of deficiencies found in the audit by most of the utilities. Utilities which have not submitted the action plan were requested to submit the same at the earliest. Status of actions taken on Third Party Protection Audit is enclosed as **Annexure-IV**.

**All the utilities are requested to submit the updated status and ensure expediting the process for rectification of discrepancies found in the audit.**

#### **A.6.6. Status of Bus Bar protection**

As per the report of Basic Protection Audit carried out by CPRI and POWERGRID in 2012, non-availability/non-functionality of Bus Bar Protection at many of the S/S was one of the major observations.

**34<sup>th</sup> PSC meeting held on 04.08.2017** - UPPTCL informed that alternative schemes had been installed in almost all the substations where Bus bar protection was not installed. PSC advised to remove the alternate arrangement wherever Bus bar protection has been installed. RVPNL intimated that contract was under finalization stage and procurement would start after the same.

**35<sup>th</sup> PSC meeting held on 20.06.2018** - Representative of UPPTCL informed that alternated arrangements were removed in all the substations wherever bus bar protection was installed.

**37<sup>th</sup> PSC meeting on 21<sup>st</sup> January, 2019** - Representative of Rajasthan informed that bus bar protection work was completed in 56 out of 74 locations and installation at other locations is in process.

Status of Bus bar protection for NR is enclosed as **Annexure-V**.

Further, in 38<sup>th</sup> PSC meeting held on 01.08.2019 and 02.08.2019 Constituents were requested to provide the details of bus bar protection in the format (Annexure-5 of Additional agenda of 38<sup>th</sup> PSC meeting) and expedite the commissioning of Bus Bar protection at 132kV & above level.

The status has been received from BBMB, NPCIL, THDC – Koteshwar, UPPTCL, PSTCL, NJHPS etc.

**Other utilities may update the status of Bus-bar protection and the status of interim measures taken at their end.**

#### **A.6.7. CERC order on Petition No. 9/SM/2014 and 10/SM/2014**

CERC in its order dated 14.06.2016 in Petition no. 9/SM/2014 for investigation of tower collapse and load crash in Northern Region on 30.5.2014 and Petition no. 10/SM/2014 for investigation of Line Outage due to Tower Collapse in Northern Region during April 2015 to June 2015 directed RPC Secretariat to examine the cases of delayed clearance of faults on transmission system during last two years and to submit an analysis report within six months from the date of issue of the order. The status of the delayed clearance of the fault from 01.04.2014 to 01.06.2015 was enclosed as Annex-VI of the agenda of 32<sup>nd</sup> PSC meeting. In the agenda following action was proposed:

- Utilities which had not submitted the detailed report along with the

remedial measures taken/being taken were requested to submit the same.

- Utilities whosoever had submitted the report along with the measures to avoid the recurrences of these types of tripping were requested to submit the status of action suggested in report.

In the 33<sup>rd</sup> PSC expressed concern over non-submission of data. Utilities were requested to furnish the information by 07.03.2017, so that the report may be submitted to CERC. Subsequently, vide letter dated 10.07.2017, members of PSC were asked to submit the action taken on the recommendation of the discussions held in last four PSC meetings (30<sup>th</sup>, 31<sup>st</sup>, 32<sup>nd</sup> and 33<sup>rd</sup>) by 25.07.2017. The issue was again flagged in 34<sup>th</sup> PSC meeting in which all the members agreed to submit the details as required.

The complete list of all the events of delayed clearance of faults from 01.04.2014 to 31.03.2016 was again circulated. Utilities are being regularly followed up in 36<sup>th</sup>, 37<sup>th</sup> and 38<sup>th</sup> PSC meetings for early submission of the data. The status of details received is as given below:

Description	Information submitted by
Details regarding List events of delayed clearance of faults from 01.04.2014 to 31.03.2016	UPPTCL (Central and East North Zone), NJHPS, POWERGRID, NHPC, DTL, RRVNPL

***In 40<sup>th</sup> TCC/43<sup>rd</sup> NRPC meeting held on 29<sup>th</sup> and 30<sup>th</sup> October 2018*** - It was informed that list of delayed clearance fault was circulated again and again but data has been only received from the utilities mentioned above. He informed that partial information received till date was submitted to CERC as show cause notice was issued for non-submission of data in compliance of CERC order on Petition No. 9/SM/2014 and 10/SM/2014.

**Utilities may update the status.**

#### **A.7. Complete outage of Multi Terminal HVDC BNC-APD-Agra on 16<sup>th</sup> Sep 2019**

HVDC BNC-APD-Agra shares approximately 50% of the total power transfer between NR, ER and NER, which in itself signifies the reliability of the said network. However, on 16<sup>th</sup> Sep 2019 at 1300 Hrs, complete outage of all poles of HVDC was reported on line fault. Preliminary analysis reveals that the fault occurred in the BNC-APD section. Thus, the poles at APD and BNC should not have tripped. NLDC has also informed about similar cases of outage of all poles in previous cases of line faults in the said section.

Simultaneous outage of all poles resulted in heavy power shift on the parallel AC system and caused wide system oscillations persisting for approximately 13 seconds. Loading of other parallel ac lines also increased and the system became n-1 non-compliant. Any further tripping could have had

serious implications for the security of the grid. POWERGRID has submitted a report for the tripping however some clarifications were sought by NRPC regarding the reasons for the tripping.

In 165<sup>th</sup> OCC meeting, PGCIL representative stated that the reply to the clarifications which were sought by NRPC Secretariat are submitted via e-mail dated 11.11.19. It was informed PGCIL representative that the reply received from POWERGRID does not portrays a clear picture of the reason for occurrence of fault and the remedial action taken. Accordingly, it was decided that a separate Protection Analysis Sub-Group (PSAG) meeting may be held explicitly to deliberate the event, having representation from NRPC Secretariat, NRLDC, PGCIL and Adani Power Limited (special invitee).

Agenda regarding the tripping is being taken up in the Protection sub-committee meeting rather than a separate PSAG meeting. POWERGRID is requested to submit the detailed analysis report including cause of the event and remedial measures taken to avoid occurrence of such event in future.

**POWERGRID may update the status.**

#### A.8. Tripping Events:

Following is the list of tripping events which shall be discussed during 39<sup>th</sup> PSC meeting:

S. No.	Name of Elements (Tripped/Manually opened)	Presentation by	Outage		Generation Loss (MW)	Load Loss (MW)	Category as per CEA Grid Standards	Energy Unserved (in MU)
			Date	Time				
1	1) 400kV Lucknow(PG)-Sultanpur(UP) 2) 400kV Anpara(UP)-Obra(UP)-Sultanpur(UP) 3) 400kV Tanda(NTPC)-Sultanpur(UP) 4) 315 MVA ICT 1 at 400/220kV Sultanpur(UP) 5) 240 MVA ICT 2 at 400/220kV Sultanpur(UP) 6) 315 MVA ICT 3 at 400/220kV Sultanpur(UP)	Uttar Pradesh	9-Jun-19	22:55		60	GD-1	0.05
2	1) 400kV Alaknanda HEP(UP)-Srinagar(UTT) ckt-2 2) 400kV Alaknanda HEP(UP)-Vishnuprayag ckt-2 3) 400kV Bus 1 at 400kV Alaknanda HEP(UP) 4) 82.5MW Unit#1 at 400kV Alaknanda HEP(UP) 5) 82.5MW Unit#2 at 400kV Alaknanda	Uttar Pradesh	11-Jun-19	18:42	300		GD-1	

	HEP(UP) 6) 82.5MW Unit#3 at 400kV Alaknaanda HEP(UP) 7) 82.5MW Unit#4 at 400kV Alaknaanda HEP(UP)							
3	1) 400 kV Bus 1 at 400/220kV Banda(UP) 2) 400kV Banda(UP)- Rewa Road(UP) ckt-1 3) 400kV Banda(UP)- Rewa Road(UP) ckt-2 4) 400kV Banda(UP)- Orai(UP) ckt-2 5) 400kV Orai(UP)-Orai 765kV(PG) ckt-2	Uttar Pradesh	16-Jun-19	15:13			GI-2	
4	1) 400kV Hisar(PG)- Kaithal(PG) ckt-1 & 2 2) 400kV Hisar(PG) - Fatehabad(PG) 3) 400kV Hisar(PG)- Bhiwani(BBMB) 4) 400kV Hisar(PG)- Moga(PG) ckt-1, 2 & 3 5) 400kV Hisar(PG)- Bhiwadi(PG) ckt-1, 2 & 3 6) 400kV Hisar(PG)- Bhiwani(PG) ckt-1, 2 & 3 7) 315MVA ICT-1, 2 & 3 at 400/220 kV Hisar (PG)	POWERGRID	22-Jun-19	10:16		90	GD-1	0.09
5	1) 220KV Bus I & II at 400/220 kV Bareilly(UP) 2) 315MVA ICT-I, II & III at 400/220 kV Bareilly(UP) 3) 220KV Bareilly(UP)- Dohna(UP) ckt-1 & 2 4) 220KV Bareilly(UP)- CB Ganj(UP) ckt-1 & 2 5) 220KV Bareilly(UP)- Pantnagar(PTCUL) 6) 220KV Bareilly(UP)- Shahjahanpur (UP) 7) 220KV Bareilly(UP)- Pithoragarh (PTCUL) 8) 220KV Bareilly(UP)- Pilibhit (UP) ckt-1 & 2 9) 220KV Bareilly(UP)- Dhauliganga (NHPC) 10) 220KV Dhauliganga (NHPC)- Pithoragarh(PG) 11) 70MW Unit-1,2 & 3 at 220 kV Dhauliganga (NHPC)	Uttar Pradesh	24-Jun-19	10:31	210	200	GD-1	0.11



6	1) 400kV Alaknanda HEP(UP)-Srinagar(UTT) ckt-2 2) 400kV Alaknanda HEP(UP)-Vishnuprayag ckt-2 3) 400kV Alaknanda HEP(UP)-Muzaffarnagar(UP) ckt-2 4) 82.5MW Unit#1 at 400kV Alaknanda HEP(UP) 5) 82.5MW Unit#2 at 400kV Alaknanda HEP(UP) 6) 82.5MW Unit#3 at 400 Alaknanda HEP(UP) 6) 82.5MW Unit#4 at 400 Alaknanda HEP(UP)	Uttar Pradesh	30-Jun-19	14:59	350		GD-1	
7	1) 400KV Bus I & II at 400/220kV Jodhpur(Raj) 2) 315MVA ICT-I & II at 400/220kV Jodhpur(Raj) 3) 400kV Jodhpur(Raj)-Kankani(Raj) ckt-I & II 4) 400kV Jodhpur(Raj)-Kankroli(PG) 5) 400kV Jodhpur(Raj)-Bhadla(Raj) 6) 400kV Jodhpur(Raj)-Akali(Raj) 7) 400kV Jodhpur(Raj)-Rajwest(Raj)	Rajasthan	3-Jul-19	16:13			GI-2	
8	1) 400kV Akali(Raj)-Kankani(Raj) ckt-I2) 400kV Akali(Raj)-Ramgarh(Raj) ckt-II3) 315MVA ICT-II & III at 400/220kV Akali(Raj)4) 220KV Akali(Raj)-Bhu(Raj) ckt-II5) 220KV Akali(Raj)-Dangri(Raj) ckt-I6) 220KV Bus Coupler at 400/220kV Akali(Raj)7) 400kV Akali(Raj)-Kankani(Raj) ckt-2 { Tripping at 0459Hrs}8) 400kV Akali(Raj)-Jodhpur(Raj) { Tripping at 0459Hrs}9) 400kV Akali(Raj)-Barmer(Raj) { Tripping at 0459Hrs}	Rajasthan	5-Jul-19	3:56	1500		GD-1	
9	1) 315 MVA ICT 1 at 400/220 kV Bawana(DTL) 2) 315 MVA ICT 4 at 400/220 kV Bawana(DTL) 3) 315 MVA ICT 5 at 400/220 kV Bawana(DTL) 4) 220kV Bawana(DTL)-Rohini(DTL) ckt-1	Delhi	25-Jul-19	10:58		470	GD-1	0.39

	5) 220kV Bawana(DTL)-Rohini(DTL) ckt-2 6) 220kV Bawana(DTL)-Shalimar bagh(DTL) ckt-1 7) 220kV Bawana(DTL)-Shalimar bagh(DTL) ckt-2							
10	1) 220kV BUS-I at 400/220kV Wagoora(PG) 2) 220kV Wagoora(PG)-Pampore(JK) ckt-I & II 3) 220kV Wagoora(PG)-Zainkote(JK) ckt-I & II 4) 315MVA ICT-I, II, III & IV at 400/220kV Wagoora(PG) 5) 220kV Amargarh(NRSS29)-Zainkote(JK) 5) 220kV Amargarh(NRSS29)-Delina(JK) 6) 220KV Zainkote(JK)-Delina(JK) 7) Unit-IV of 400kV URI-I(NHPC) & Unit-I,II,& III of 400kV URI-II(NHPC) 8) Unit-I,II,III&IV of 220kV Kishenganga(NHPC) 9) SVC (-200/+300 MVAR) at New Wanpoh(PG) 10) 400kV Amargarh(NRSS29)-URI-I(NHPC) ckt-2 11) 220kV Rampur(JK)-Mirbazar(JK) & 220kV Kishnepur(PG)-Mirbazar(JK)	POWERGRID	26-Jul-19	17:43	525	1000	GD-1	0.87
11	1) 220 KV Khodri(UTT)-Majri(HP) 2) 60MW Unit#1, #2, #3 & #4 at 220kV Chibro(UTT) 3) 30MW Unit#1, #2, #3 & #4 at 220kV Khodri(UTT)	Uttrakhand	9-Sep-19	11:42	290	112	GD-1	0.08
12	1) 400kV Agra(UP)-Unnao(UP) 2) 400kV Agra(UP)-Fatehabad(765kV) ckt-1 3) 400kV Agra(UP)-Agra(PG)	Uttar Pradesh	5-Oct-19	13:10		200	GD-1	0.56

13	1) 400kV Sarnath(UP)-Anpara(UP) ckt-1 2) 400kV Sarnath(UP)-Anpara(UP) ckt-2 3) 400kV Sarnath(UP)-Varanasi(PG) ckt-1 4) 400kV Sarnath(UP)-Varanasi(PG) ckt-2 5) 400kV Sarnath(UP)-Azamgarh(UP) 6) 315MVA ICT 1 at 400/220kV Sarnath(UP) 7) 500MVA ICT 2 at 400/220kV Sarnath(UP) 8) 315MVA ICT 3 at 400/220kV Sarnath(UP) 9) 400kV Anpara(UP)-Mau(UP)	Uttar Pradesh	5-Oct-19	17:54		450	GD-1	0.42
14	1) 400kV Agra(PG)-Agra(UP) 2) 800kV HVDC Agra(PG)-BNC(PG) Pole-3 3) 1500MVA 765/400kV ICT 1 at Agra(PG) 4) 1500MVA 765/400kV ICT 2 at Agra(PG)	POWERGRID	7-Oct-19	13:33			GI-2	
15	1) 400kV Banala(PG)-Hamirpur(PG)2) 400kV Banala(PG)-Parbati 3 HEP(NHPC)3) 400kV Parbati 3 HEP(NHPC)-Sainj HEP(HP)4) 400kV Parbati 2 HEP(NHPC)-Sainj HEP(HP)5) 130MW Unit#2, #3 at Parbati 3 HEP(NHPC)6) 50MW Unit#1, #2 at Sainj HEP(HP)	NHPC	21-Oct-19	18:29	500		GD-1	
16	1) 220kV Akal(RRVPNL)-Giral(RRVPNL) 2) 220kV Akal(RRVPNL)-Mada(RRVPNL) 3) 220kV Akal(RRVPNL)-Amarsagar(RRVPNL) 4) 400kV Akal(RRVPNL)-Ramgarh(RRVPNL) ckt-2 5) 500MVA ICT 4 at 400/220kV Akal(RRVPNL) 6) 315MVA ICT 1 at 400/220kV Akal(RRVPNL) 7) 315MVA ICT 2 at 400/220kV Akal(RRVPNL)	Rajasthan	1-Nov-19	11:16	1200		GD-1	

17	<p>1) 400kV Muzaffarnagar(UP)-Ataur(UP)</p> <p>2) 400kV Muzaffarnagar(UP)-Roorkee(PG)</p> <p>3) 400kV Muzaffarnagar(UP)-Meerut(PG)</p> <p>4) 400kV Muzaffarnagar(UP)-Vishnuprayag(UP)</p> <p>5) 400kV Muzaffarnagar(UP)-Alaknanda(UP)</p> <p>6) 315MVA ICT 1 at 400/220kV Muzaffarnagar(UP)</p> <p>7) 315MVA ICT 2 at 400/220kV Muzaffarnagar(UP)</p>	Uttar Pradesh	5-Nov-19	3:16	220		GD-1	
18	<p>1) 68.67 mw rampur hep - unit 6</p> <p>2) 400 kv nathpa jhakri(sj)-rampur hep(sj) (pg) ckt-2</p> <p>3) 400kv bus 2 at nathpa jhakri(sj)</p> <p>4) 250 mw nathpa-jhakri hps - unit 2</p> <p>5) 250 mw nathpa-jhakri hps - unit 3</p> <p>6) 68.67 mw rampur hep - unit 1</p> <p>7) 400 kv nathpa jhakri(sj)-karcham wangtoo(jsw) (hbpl) ckt-2</p>	SJVN	24-Nov-19	20:43	600	0	GD-1	0
19	<p>1) 400 kv uri_2(nh)-wagoora(pg) (pg) ckt-1</p> <p>2) 400KV Uri_2(NH)-Uri_1(NH) (PG) Ckt-1</p> <p>3) 60 MW Uri-II HPS - UNIT 1</p> <p>4) 60 MW Uri-II HPS - UNIT 2</p> <p>5) 60 MW Uri-II HPS - UNIT 3</p> <p>6) 60 MW Uri-II HPS - UNIT 4</p>	NHPC	27-Nov-19	9:07	215	0	GD-1	0
20	<p>1) 220kV bus 1 at samaypur(bb), 220 KV</p> <p>2) Faridabad(PG)-Samaypur(BB) (UNDEF) Ckt-1,</p> <p>3) 220kV Ballabgarh-Samaypur (BB) Ckt-2,</p> <p>4) 220kV Ballabgarh-Samaypur (BB) Ckt-3,</p> <p>5) 220kV Palwal(HV)-Samaypur(BB) (UNDEF) Ckt-1,</p> <p>6) 220kV Samaypur(BB)-Badshahpur(HV) (UNDEF) Ckt-2,</p> <p>7) 400/220 kV 500 MVA ICT 1 at Ballabgarh(PG),</p> <p>8) 400/220 kV 500</p>	BBMB	30-Nov-19	15:05	0	200	GD-1	0

	MVA ICT 2 at Ballabgarh(PG), 9) 400/220 kV 500 MVA ICT 4 at Ballabgarh(PG), 10) 220 kV Samaypur(BBMB)-Palli ckt-2							
21	1) 400 kv Hapur-Dasna (up) ckt-2, 2) 400/220 kV 315 MVA ICT 1 at Dasna(UP), 3) 400/220 kV 315 MVA ICT 2 at Dasna(UP), 4) 400KV Bus 1 at Dasna(UP), 5) 400KV Hapur-Dasna (UP) Ckt-1	Uttar Pradesh	30-Nov-19	15:08	0	36	GD-1	0.11

**All the utilities are requested to submit DR/EL and other tripping related data to NRPC/NRLDC and bring the same in the 39<sup>th</sup> PSC meeting scheduled to be held on 18<sup>th</sup> December 2019.**

**Utilities shall make presentation highlighting cause of the event, actions taken and remedial measure to be taken in future for avoidance of similar instances. It will be presented during PSC meeting by the representative of concerned utility.**

For better reliability of power system each and every multiple element tripping should be analysed properly and remedial measures to be taken by utilities. Total 121 multiple element tripping event reported by NRLDC to RPC and constituents for the month of June to November, 2019.

Among 121 events, around 21 events would be discussed in 39<sup>th</sup> PSC meeting. For rest events, utilities may kindly submit the details (DR/EL and detailed report along with remedial measures) to NRLDC and NRPC at mail ID: nrldcso2@posoco.in, nrldcso2@gmail.com, seo-nrpc@nic.in and sep-nrpc@nic.in.

List of the all the multiple elements tripping event is available at NRPC website at following link:  
[http://164.100.60.165/meetings/PCC/pcc39/PCC39\\_Grid\\_Incident.xls](http://164.100.60.165/meetings/PCC/pcc39/PCC39_Grid_Incident.xls)

**Member may kindly submit the details.**



Ref: CC/HRD/NRPC/2019-20/131503

Dated: 26/11/2019

To,

The Member Secretary  
Northern Regional Power Committee  
Ministry of Power, Government of India  
18-A, Qutab Institutional Area, Shaheed Jeet Singh Marg,  
Katwaria Sarai, New Delhi-110 016

**Sub: Offer for conducting "Training on Protection System Level-2 & Level-3" for executives from the constituents of NRPC.**

Sir,

- 1.0 This has reference to your letter ref NRPC/OPR/111/04/2019/13101 dated 24.10.2019 regarding the subject. We are pleased to intimate the following in respect of conducting the subject mentioned training program:
- 2.0 **Program Title:**  
2.1 Training on Protection System Level-2  
2.2 Training on Protection System Level-3
- 3.0 **Participants profile:** Protection system Engineers from the constituents of NRPC
- 4.0 **Duration of program:** 5 days (for each program)
- 5.0 **Program nature:** Residential
- 6.0 **Venue:** POWERGRID Academy of Leadership (PAL), Manesar
- 7.0 **Schedule:** During FY 2019-20 (Program dates shall be finalized in consultation with NRPC). The schedule will also be subject to availability of conferencing and accommodation facilities at PAL, Manesar as well as the faculties.
- 8.0 **Program Content:** Conforming to the Encl-II & Encl-III of the letter from NRPC ref: NRPC/OPR/ 111/04/2019/13101 dated 24.10.2019. However, modules may be rearranged for effective delivery of the topics.

Contd. P-2

OP.



P-2

**9.0 Scope of services:**

1. Classroom sessions, hands on & demonstrations with experienced faculty (mainly from the OEM),
2. Accommodation for the participants at Executive hostel of PAL on single occupancy basis (6 nights, check in – a day before the Program start date; check out – a day after the last day of the program),
3. Meals and refreshments (breakfast, lunch, dinner and 2 times tea & snacks),
4. Training Kit (Bag, pen and writing pad), Reading material & Participation certificate,
5. Post training activities including one local trip to Gurgaon (Kingdom of Dreams)

**10.0 Program Fee:**

For the above scope of services the programs fees shall be as mentioned below:

<b>Program fees per participant:</b>	<b>INR 66,500.00</b>
<b>Total Program fee:</b> For a batch size of <b>20</b> participants	<b>INR 13,30,000.00</b> (Rupees Thirteen lakhs Thirty thousand only)

\*GST excluded

**11.0 Terms of Payment:**

- a. 18% GST will be applicable extra on program fee.
- b. 100% payment within 15 days from completion of program and submission of invoice.
- c. Invoicing shall be done for a batch size of minimum 20 participants.
- d. If the no of participants increase beyond 20, the fee for additional participants shall be charged on pro-rata basis.

**12.0 Validity of Proposal:**

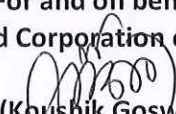
This offer will be valid till July 2020.

**13.0 Contact Persons:**

- a. Koushik Goswami, DGM (HRD), +91 9599683573
- b. Shafiqur Rahman, Manager (HRD), +91 9599192365

Kindly forward you acceptance of the offer. We at PAL (POWERGRID) are always committed to maintain highest standards and to provide value addition exceeding the expectation of our clients.

Thanking you and assuring you our best services at all times,

For and on behalf of  
Power Grid Corporation of India Limited  
  
(Koushik Goswami)  
Dy. General Manager (HRD)



Sr. No. RRS-7&8/O&M/SME(E)/2019/S/60

Date:- 08/08/2019

**Report on Flow of Current in 145 kV NGR of 400 kV, 63 MVAR Line Reactor  
(RAPP-C-Jaipur 400 kV Line)**

Jaipur Line was in service from its first charging on 26/03/19 at 17:10 hrs. 320 MW of power was flowing from RAPP to Jaipur.

513-CB-5B (Line CB) was manually opened to isolate 63 MVAR Line Reactor on 07/05/2019 due to oil leak in Reactor. Following were the observations from field investigation, Relay DR, Disturbance Recorder and PLCC Panel:

- a) When 513-CB-5B opened and line was discharged from remote end, it was observed that Phase current of magnitude of 25 A (approx.) and Neutral current of approx. 70 A (approx.) was flowing in the NGR of Line Reactor even though the 513-CB-5B and remote end CB was open.  
Value of voltage and current as taken from 21-1 Distance protection relay and distance relay are tabulated below.

Event Date: 07/05/2019		
Line Voltage (in kV)	Phase Voltage in kV (Phase Angle)	Phase Current in Amp (Phase Angle).
Distance Relay 21-1 Data:		
$V_{AB} = 21$	$V_{AN} = 105 (0^\circ)$	$I_A = 25 (97.8^\circ)$
$V_{BC} = 23$	$V_{BN} = 96 (-9.6^\circ)$	$I_B = 23 (78^\circ)$
$V_{CA} = 10$	$V_{CN} = 102 (1.2^\circ)$	$I_C = 22 (99.3^\circ)$
	$V_N = 319.8 (-2.6^\circ)$	$I_N = 68 (91.5^\circ)$

- b) Due to flow of this current through the NGR, its oil temperature was rising and it raised up to 75 degree Celsius. Normal oil temperature of NGR oil was 40 degree Celsius. However it raised to 85 degree Celsius in just 1 hour 30 minutes.
- c) Subsequently, Kota-2 line to manually tripped in a hope of reduction in induction voltage. It has been observed that the phase current reduced by around 8 A after Kota-2 line is discharged.
- d) Line 513-DS-39C was opened followed by Reactor Disconnect Switch (513-RDS-1). Earth Switch 513-RES-1 was taken in service. The phase current reduced to zero while phase voltages reduced to around 4 kV.
- e) Reactor oil line to radiator inlet and outlet valves along with conservator tank valves were closed. Oil inside the equalizing header pipe drained and equalizing header pipe removed. Opening was blanked with dummy plate.
- f) Kota-2 Line synchronized again.



**The issue has been presented in PCC meeting held on 02.08.2019. Following were the recommendation:**

- a) M/s PGCIL & PCC chairman had requested to take both line reactors in service simultaneously and record the observations. If such scenario is observed again, based on that, it will be decided for further study and simulation will be decided. Else the reactors are to be taken in to service.

M/s PGCIL has shared its operating experience, that due to NGR bypass scheme, their NGR was not getting affected.

In view of PCC meeting recommendation point no a), attempt was done to take 400 kV Jaipur Line Reactor in service and record the observations, if such similar phenomenon is observed or not.

Hence Line shutdown was taken on 07.08.2019 at 10:21 hrs. Following sequence of operation was carried out and data recorded:

- a) RAPP-7&8 and Jaipur end Circuit Breakers are open  
RAPP-7&8 end Line DS Close & RDS Open and  
Jaipur end Line DS and RDS Close & NGR bypassed (NGR got bypassed when Line CB manually opened from RAPP-7&8)

Event Date: <b>07/08/2019</b>		
<b>Line Voltage (in kV)</b>	<b>Phase Voltage (in kV)</b>	<b>Phase Current (in Amp.)</b>
Distance Relay 21-1 Data:		
$V_{AB} = 6.8$	$V_{AN} = 3.85$	$I_A = 0$
$V_{BC} = 8.4$	$V_{BN} = 8.20$	$I_B = 0$
$V_{CA} = 1.7$	$V_{CN} = 3.7$	$I_C = 0, I_N = 0$

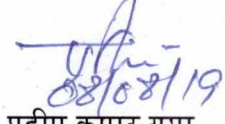
- b) RAPP-7&8 and Jaipur end Circuit Breaker are open,  
RAPP-7&8 end Line DS & RDS Close and  
Jaipur end Line DS and RDS Close with NGR bypassed.

Event Date: <b>07/08/2019</b>	
<b>Phase Voltage (in kV)</b>	<b>Phase Current (in Amp.)</b>
Distance Relay 21-1 Data:	
$V_{AN} = 99 (0^\circ)$	$I_A = 20 (97.6^\circ)$
$V_{BN} = 113 (-8.8^\circ)$	$I_B = 21 (84.6^\circ)$
$V_{CN} = 103 (1.6^\circ)$	$I_C = 21 (97.7^\circ),$
$V_N = 314 (-2.6^\circ)$	$I_N = 66 (92.8^\circ)$

Humming sound observed in the NGR and therefore, line isolator opened at RAPP end and Reactor taken out by opening RDS. Subsequently, Jaipur Line was synchronized at 11:17 hrs without its Line Reactor.

It is to be noted that the at our end NGR is rated for 145kV & 20 A current, but as per DR records, the Voltage appearing at Neutral is approx 314 kV and Current flowing is approx 66A.

The disturbance file for 21-1, 21-2 and 21R Relay dt 07.05.2019 and 07.08.2019 are attached with this letter for review and further action please.



प्रदीप कुमार गुप्ता  
व.अ.अ. ( विद्युत )  
आर.ए.पी.पी.7&8

सदस्य सचिव Member Secretary  
एन.आर.पी.सी. न्यू दिल्ली  
Northern Regional Power Committee,  
New Delhi

प्रतिलिपि:-

आर.ए.पी.पी.7&8  
मुख्य अधीक्षक,  
आर.ए.पी.पी.7&8  
अनुरक्षण अधीक्षक,  
आर.ए.पी.पी.7&8  
फाइल

एन.पी.सी.आई.एल. मुम्बई  
श्री वि.एच. मनोहर,  
एसोसिएट निर्देशक, विद्युत डिजाईन  
श्री जी. सेबस्टियन,  
मुख्य अभियंता, विद्युत डिजाईन  
श्री ए मन्नेपल्ली, मुख्य अभियंता,  
विद्युत डिजाईन

पी.जी.सी.आई.एल. जयपुर ( )  
श्री पंकज पचौरी, मुख्य प्रबंधक  
पी.जी.सी.आई.एल. जयपुर (साउथ)

**Status of pending rectification of defects observed during BPA**

Sl. No.	Utility	No. of sub-stations covered under BPA	Expected Completion	Remarks
1	UPPTCL	21	-	<b>Representative of UPPTCL informed that in 220 kV stations, PLCC panels were being procured from CGL and all major deficiencies have been rectified.</b>
2	UPRVUNL	4	-	<b><u>Obra 'A'</u></b> – including rectification of time synchronization & BBP, PLCC (to be installed by UPPTCL). To be updated by UPRVUNL.  <b><u>Harduagani</u></b> – To be updated by UPRVUNL.
3	HPSEB Ltd.	1	October 2017	<ul style="list-style-type: none"> <li>Out of 12 deficiencies observed, 8 already rectified.</li> </ul> <p>To be updated by HPSEBL.</p>
4	UJVNL	1	December, 2016	Breaker for 220 kV Khodri-I &II needs to be replaced. Expected date as intimated by SLDC Uttarakhand in 127 <sup>th</sup> OCC meeting was 31.12.2016.  <b>Status could not be updated as there was no representation from UJVNL in the post meetings.</b>
5	PDD, J&K	3	Status of progress is not submitted. Target completion not known.	As informed during 33 <sup>rd</sup> NRPC meeting that deficiencies where procurement was not involved had been rectified and other works where procurement is involved are yet to be taken up. PDD J&K informed that they have submitted the proposal for PSDF funding and deficiencies will be rectified when fund will be disbursed from PSDF.

				<p>As informed by PSTCL defects at 220kV Sarna-Udhampur line, pertains to PDD, J&amp;K.</p> <p><b>Status could not be updated as there was no representation from PDD J&amp;K in the post meetings.</b></p>
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**Protection audit of intra-state system/balance system not covered in Basic Protection Audit**

<b>Utility</b>	<b>Third party protection audit carried out by</b>	<b>No. of substations covered/ expected to be covered</b>	<b>Status of Audit</b>	<b>Status of Report</b>	<b>Status of submission of action Plan for rectification of deficiencies</b>
RRVPNL, RRVUNL	CPRI	RRVPNL-39 RRVUNL-5	Completed	Submitted	<b><u>RRVPNL</u></b> - Lead Acid Batteries have been procured and installed.  <b><u>RRVUNL</u></b> - Action Plan submitted.
BBMB	-do-	20	Completed	Submitted	The action to attend the deficiencies observed in the audit is underway.
PSTCL, PSPCL	-do-	PSTCL-22 PSPCL-3	Completed	Submitted	<b>Representative of PSTCL informed that Report on CPRI Audit already submitted and emailed.</b>
UPRVUNL	-do-	2	Completed	Submitted	<b>Parichha TPS and Panki TPS:</b> Updated status on rectification of all deficiencies to be submitted by UPRVUNL.
UPPTCL	-do-	41	Completed	Shall be submitted after receipt and	<b>In 43<sup>rd</sup> TCC/46<sup>th</sup> NRPC meeting, UPPTCL informed 68 nos. 220kV substations</b>

Utility	Third party protection audit carried out by	No. of substations covered/ expected to be covered	Status of Audit	Status of Report	Status of submission of action Plan for rectification of deficiencies
				examination of Report, same.	<b>work awarded to CPRI and work at 33 substations completed.</b>  <b>Rest to be completed by January 2020.</b>
Rosa Power	-do-	1	Completed	Submitted	Action Plan submitted and the deficiencies observed rectified.
UJVNL	-do-	2 (Chilla, Chhibra)	Completed	Submitted	Action Plan not submitted.
PDD J&K	-do-	3 (Janipur, Amargarh, Hiranagar)	Completed	Submitted	Action Plan for <b>Heeranagar</b> and <b>Amargarh</b> not submitted.
JSW	-do-	1	Completed	Submitted	Rectification of observation complied.
HPSEB Ltd.,	-do-	6 (Uprela Nangal, Giri 220 kV, Jassore 220 kV, Baddi, 220 kV Kangoo, 220 kV Kotla)	Completed	Submitted	Action Plan for <b>220 kV Kotla</b> not yet submitted. Rectification of observation partly complied.  Updated status to be submitted by HPSEBL

Utility	Third party protection audit carried out by	No. of substations covered/ expected to be covered	Status of Audit	Status of Report	Status of submission of action Plan for rectification of deficiencies
UT Chandigarh	-do-	1 (Kishengarh)	Completed	Submitted	Not submitted.
Budhil Power	-do-	1	Completed	Submitted	Not submitted.
HVPNL	-do-	4 (Sector 72, Gurgaon ; Tepla; Bastara; A-5, Faridabad)	Completed	Submitted	Updated status to be submitted by HVPNL.
DTL	-do-	4 (Rohini; Mehrauli; Mundka; Shalimar Bagh)	Completed	Submitted	Action has already been taken.
PTCUL	-do-	4 (Pantnagar, Haridwar, Kashipur, Roorkee)	Completed	Submitted	Not submitted for <b>Haridwar, Roorkee</b> <b>Relays have been delivered at the site.</b> To be updated by PTCUL.

**Status of Bus bar Protection for Northern Region Constituents**

State/ Constituent	TRANSC O/GENC O	Total no. of S/S/ Sw. yards (220 kV and above)	No. of S/S/ Sw. yards where Bus bar protection is functioning	Remarks	Action Plan
Delhi	DTL	37	34	For 220 kV S/S namely, Gopalpur and Kanjhawala is being planned.(Lodi Road is GSS)	PO awarded to M/s GE T&D India Ltd. for the work of Supply and ETC of 26nos. Bus Bar Schemes in 400 and 220kV DTL substations on 06.04.18. Completion period is 9 months.  <b>Status may be updated.</b>
Haryana	HVPNL	63	48	12 out of which 5 in process ;7(date is yet to be decided); 3 not required	Tentative date of commissioning was informed to be 30.06.2019.  <b>Haryana may update the status.</b>
	HPGCL	03	03		
Rajasthan	RVPNL	53	46 (7 defective)		74 nos. New Bus bar Protection scheme under commissioning. 10 Commissioned.

Himachal Pradesh	HPSEB	08	04	At one s/s it was working, 2 sub-station it was defective.	<b>04 nos. commissioned and for remaining 04.</b> <b>To be updated by HPSEBL.</b>
Punjab	PSTCL	98(5 no 400 kV s/s)	46(5 no. 400 kV s/s)		Work in progress for BBPS protection, 46/98 (220kV) 05/05 (400kV) completed. For remaining substations, work has been undertaken by TS organization and will be completed by 31.12.19. by TS organization. Procurement process for BBPS delayed due to re-tendering twice by Finance wing of PSTCL. Re-tendered again last month and target date is 31-12-19 & PSDF funding available. PLCC work will also be completed by 31-3-19 as procurement process is underway. <b>To be updated by PSTCL.</b>
J&K	PDD	06	-		<b>The status for the same could not be ascertained as representative</b>

					<b>from PDD, J&amp;K was not present in the post meeting.</b>
Uttarakhand	PTCUL	10	09		Order placed for 01 defectives.  <b>To be updated by PTCUL</b>
BBMB	BBMB	23	20	Not required at Dhulkote and Jagadhari. also for Sangrur, Kurukshetra and Delhi as no. of feeders is less than five. PSC decided that it needs to be installed.	For Barnala it is to be provided by PSTCL as agreed in PSC. PSTCL were to commission it by 31.12.2016. <b>BBP is being provided at Kurukshetra and Delhi substations. New Numerical Bus Bar Protection for both the substations has been received at site and likely to be commissioned by 31.03.2020.</b>
Uttar Pradesh	UPPTCL	141	94		Representative of UPPTCL informed that SEL panels are being procured and its installation would be completed within 6 months.
POWERGRID	PGCIL	55	55		
Central Generating Stations	NTPC	11	11		
	NHPC	09	09		
	NPCIL	02	02		