

**CENTRAL ELECTRICITY REGULATORY COMMISSION  
NEW DELHI**

**Petition No. 220/MP/2012**

**Coram:**

**Shri V.S Verma, Member**

**Shri M. Deena Dayalan, Member**

**Date of Hearing: 20.6.2013**

**Date of order: 21.2.2014**

**In the matter of**

Miscellaneous Petition for approval under Regulation 24, 111 & 113 of the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999 and under section 79( c), (i) and (k) of Electricity Act, 2003 for seeking direction for implementation of third party audit report on protection Scheme of Transmission System of Northern Region and Western Region.

**And**

**In the matter of**

Power Grid Corporation of India Limited,  
B-9, Qutab Institutional Area,  
Katwaria Sarai, New Delhi- 110016

**....Petitioner**

**Vs**

1. Northern Regional Power Committee  
Central Electricity Authority,  
18-A, Qutab Institutional Area, Shaheed Jeet Singh Marg,  
Katwaria Sarai, New Delhi- 110016
2. Eastern Regional Power Committee  
Central Electricity Authority,  
14, Golf Club Road, Tollygunge,  
Kolkata- 700033.
3. North Eastern Regional Power Committee  
Central Electricity Authority,  
Meghalaya State Housing Finance Co-operative Society Limited Building  
Nongrim Hills, Shillong- 793003.
4. Southern Regional Power Committee  
Central Electricity Authority,



No.29 Race course cross road,  
Bangalore- 560009.

5. Western Regional Power Committee  
Central Electricity Authority,  
F-3, MIDC Area, Andheri, Mumbai- 400093.
6. CMD, NTPC Limited  
CORE-7, Scope Complex,  
Lodhi Road, New Delhi
7. CMD, Delhi Transco Limited,  
Shakti Sadan, Kotla Marg,  
New Delhi- 110002.
8. CMD, Uttar Pradesh Power Transmission Corporation Limited,  
Shakti Bhavan, 14 Ashok Marg,  
Lucknow- 226007
9. CMD, HaryanaVidyut Prasaran Nigam Limited  
Shakti Bhavan, Sector-6, Panchkula  
Haryana- 134109.
10. Commissioner (Power),  
Power Development Department,  
Grid Substation Complex,  
Jammu, J&K
11. CMD, Madhya Pradesh Power Transmission Company Limited,  
Urja Bhavan, Shivaji Marg,  
Bhopal- 462016.
12. CMD, BBMB,  
Sector-19 B, Madhya Marg,  
SLDC Complex,  
Industrial Area, Phase-I  
Chandigarh- 160019.
13. MD, HPGCL,  
Urja Bhavan, C-7, Sector-6, HPGCL, Panchkula  
Haryana- 134109.
14. CEO, POSOCO  
B-9, Qutab Institutional Area,

**The following were present:**

Shri J. Mazumdar, PGCIL  
Shri Shashi Bhushan, PGCIL  
Shri A.V.S Ramesh, PGCIL  
Shri B.L. Gujar, DTL  
Shri B.S. Bairwa, NRPC  
Shri Vijay Kumar, NRPC  
Shri Padamjit Singh, PSPCL  
Shri K.K.Hatwal, THDCIL  
Shri Rajiv Govil, THDCIL  
Shri R.B.Sharma, JSEB and SLDC, Bhubneswar

**ORDER**

The petitioner, Power Grid Corporation of India Limited, has filed this petition with the following prayers:

"(a) Issue necessary direction to Regional Power Committee (RPC) for ensuring the rectification of deficiencies observed during the protection audit and implementation of all the protection and control system in line with the notification dated 20<sup>th</sup> August, 2010 and monitoring of their healthiness for improvement of stability and reliability of the grid by respective constituents;

(b) Issue necessary direction to RPC for review of various settings of protection systems in view of changes / modification in the system / grid for stable and reliable operation of integrated grid; and

(c) Pass such other relief as the Commission deems fit and appropriate in the circumstances of the case and in the interest of justice."

2. Gist of the submissions of the petitioner is as under:

(a) Consequent to grid disturbance on 30.7.2012 and 31.7.2012 a meeting was convened by Minister of Power, Govt. of India with Chief Ministers/ Power Ministers of different States of the Northern Region. In the said meeting, various

resolutions were adopted to ensure smooth and reliable grid operation including an independent third party audit of the protection systems. Ministry of power vide its Memorandum No. 17.1.2012-OM dated 7.8.2012 directed that “independent third party audit of protection scheme shall be carried out within one month and the Regional Power Committee shall monitor the same. PGCIL would fund and carry out the audit in first instance”.

(b) The protection audit was carried out by Central Power Research Institute (CPRI) in respect of 23 sub-stations in phase-I and 17 sub-stations in phase-II and audit was in progress in 40 sub-stations in phase-III and phase-IV. The protection audit basically covered the performance and availability of Instrument Transformers, Protection systems, DC system and various auxiliaries, under frequency and df/dt relays and Special Protection Schemes at various sub-stations.

(c) The protection audit carried out at the stations of various utilities is as under:

**(a) Phase - I and II**

Sl. No.	Name of the Utility	Sub-station/ Switchyard
1	UPPTCL	17
2	POWERGRID	12
3	NTPC	2
4	HVPNL	2
5	BBMB	2
6	PDD	2
7	DTL	1
8	RGTPP	1
9	MPPTCL	1

**(b) Phase –III and IV**

<b>Sl. No.</b>	<b>Name of the Utility</b>	<b>Sub-station/ Switchyard</b>
1	POWERGRID	24
2	NHPC	8
3	NTPC	5
4	RVPNL	4
5	UPRVUNL	3
6	NJPC	1
7	THDC	1
8	UPPCL	1
9	JPHYDRO	1
10	PSTCL	1
11	LANCO	1

**(c) Phase –V and VI**

<b>Sl. No.</b>	<b>Name of the Utility</b>	<b>Sub-station/ Switchyard</b>
1	POWERGRID	10
2	BBMP	4
3	RRVNL	4
4	HPGCL	1
5	RUVNL	2
6	PSTCL	2
7	UPRVUNL	1
8	UPCL	2
9	JAYPEE	2
10	PSPCL	1
11	UJVNL	1
12	HPSEB	1
13	NPCIL	1
14	NTPC	2
15	UPPTCL	3
16	PDD	1

(d) The Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2010 *inter-alia* provides that

installation of protection and control systems in all the transmission systems are necessary to minimize the damage to the equipment in the event of faults and abnormal conditions. The relevant portion of the above regulations is extracted hereunder:

“(4) Protection and Control

(a) Protective Relaying System

Adequately sectionalized and graded protection relaying system shall be provided for transmission lines, transformers and bus bars so as to automatically isolate the faulty equipment and, thus, minimize the damage to the equipment in the event of faults and abnormal conditions. All main protection relays shall be of numerical type and communication protocol shall be as per IEC-61850/relevant IS.

(b) Grouping of protection

- (i) The protection functions shall be subdivided into two groups each being independent and capable of providing uninterrupted protection even in the event of one of the protection groups failing. Wherever two sets of DC sources are available, the relays shall be electrically and physically segregated into two groups (Gr. A and Gr. B) to obtain redundancy, and to take protection systems out for maintenance while the equipment remains in service. Grouping shall be done to the extent possible in such a way that each group can independently carry out protective functions with near equal redundancy. Interconnection between these two groups shall not generally be attempted. However, if found absolutely necessary such interconnection shall be kept to the bare minimum.
- (ii) Even in cases when only one battery source is available, segregation of protection and trip circuits in two groups may be considered by giving DC supplies through separate fuses.

(c) The protection in respect of transmission lines, transformers, reactors and bus bars are indicated in Schedule – V.

(d) Disturbance recorders, Event loggers and time synchronizations equipments – Each 765 kV, 400 kV and 220 kV line shall be provided with facility for disturbance recording, distance to fault location and time synchronizing equipment (TSE). Event logger either stands alone or as part of substation or switchyard automation system shall be provided for each 220 kV and higher voltage class substation or switchyard. TSE complete with antenna, all cables, processing equipment etc. shall be provided to receive synchronizing pulse through global positioning system (GPS) compatible for synchronization of event

logger, disturbance recorder and SCADA / automation system of the substation or switchyard.

- (e) Power Line Carrier Communication (PLCC): Power line carrier communication (PLCC) equipment complete for speech transmission, line protection and data channels shall be provided on each transmission line of voltage rating 132 kV and higher. The protection system for 400 kV and higher voltage transmission line and the line compensating equipment shall have one hundred percent back up communication channels. Each 765 kV or 400 kV or 220 kV line shall be provided with two protection channels in addition to one speech plus data channel for each direction. In case of 220 kV or 132 kV lines, the speech and data channel can also be used for protection wherever possible. The generating company and the transmission licensee shall co-ordinate with each other and ensure the compatibility of PLCC equipment at their respective ends. Optionally, the above functionally may be achieved using wide band communication based on optical ground wire (OPGW) or any other technology.
- (f) Control Concept: All the breakers in substations and switching stations shall be controlled and synchronized from the switchyard control room or control room of the generating station. Disconnectors of 220 kV and higher rating shall have control from remote as well as local whereas the earth switches shall have local control only. Disconnectors and associated earth switches shall be provided with electrical as well as constructional mechanical interlocks. Provision for operation of circuit breakers and disconnectors from remote control stations may also be provided wherever required.”

(e) Central Electricity Regulatory Commission (Indian Electricity Grid Code), Regulations, 2010 (Grid Code) provides that every transmission licensee shall comply with such technical standards of operation and maintenance of transmission lines as may be specified by the Authority.

(f) Regulation 2.4 of the Grid Code defines the role of RPC. Regulation 2.4.2(f) provides as under:

- “ (f) To undertake operational planning studies including protection studies for stable operation of the grid”.

(g) The CPRI submitted on 30.10.2012 the deficiencies and the summary of protection audit carried out by CPRI for different utilities/sub-stations as per the details given below:

(a) Replacement of balance Static Distance Protection Relays in line with Gazette Notification of GOI to be ensured.

(b) LBB protection and Bus bar protection needs to be made available and functional.

(c) PLCC with Protection coupler feeders needs to be available and functional.

(d) Auto Reclose feature, Disturbance recorders and Event Loggers to be made functional.

(e) Earth Fault in DC System to be attended.

(f) Synchronizing of GPS clock with Numerical Relays Disturbance Recorders and Event Loggers.

(g) Directional Earth Fault feature to be enabled in Numerical relays.

(h) REF protection for transformers needs to be made functional.

(i) Annunciation Scheme, Under Frequency and  $df/dt$  relays to be made functional.

(j) Synchronization facility needs to be made available; and



(k) Availability of duplicate DC source and auxiliary supply.

3. The petitioner vide its affidavit dated 9.1.2013 has submitted that the third party audit report containing deficiencies in different sub-stations has already been circulated to all concerned utilities including Member Secretary of respective RPCs. The petitioner has further submitted that entity wise/Organization wise details of the deficiencies, as observed by CPRI, have already been submitted to the Commission along with the petition.

4. During the hearing on 22.1.2013, all respondents were directed to file their replies and action plan in the matter latest by 8.2.2013. Member Secretaries of all RPCs were directed to submit the reports on action taken on protection audit along with time frame of implementation for recommendations of protection audit.

5. Replies to the petition have been filed by the Haryana Vidyut Prasaran Nigam Limited, U.P Power Transmission Corporation Limited, Delhi Transco Limited, NTPC Limited, Rajasthan Rajya Vidyut Prasaran Nigam Limited, North Eastern Regional Power Committee, Eastern Regional Power Committee, Western Regional Power Committee and Bhakra Beas Management Board.

6. Haryana Vidyut Prasaran Nigam Limited (HVPNL) vide its affidavit dated 19.11.2012 has submitted that control area protection audit at 400 kV / 220kV Kirori and 400 kV Khedar was carried out by CPRI. HVPNL has complied with the Grid Code and

CEA`s Regulations. HVPNL has submitted that no sub-station has been commissioned without protection system and control system. HVPVL in its further affidavit dated 28.2.2013 has submitted that in compliance of the Protection Audit report, PLCC protection channels along with protection coupler and Bus-Bar Protection of 400 kV Kirori sub-station and its 220 kV feeders as mentioned in the audit report have been rectified.

7. U.P Power Transmission Corporation Limited (UPPTCL) in its affidavit dated 12.2.2013 has submitted that replacement of old protection relay panels with new ones is not always possible. UPPTCL is contemplating to replace only old/static relays with numeric relays through retrofitting. The whole process may, however, take 9 to 12 month's time i.e. till February, 2014. UPPTCL has submitted the zone-wise actions taken in the State to rectify the deficiencies along with action plan.

8. Delhi Transco Limited (DTL) in its affidavit dated 11.2.2013 has submitted that some deficiencies in respect of Bamnauli sub-station were pointed out in the report of basic protection audit. The defects pointed out by the audit have been partially rectified. However, full rectification work may take 6 to 14 months i.e. till April, 2014.

9. NTPC Limited vide its affidavit dated 13.2.2013 has submitted that compliance report and action plan for Protection Audit for NTPC stations have already been submitted to respective RPCs. NTPC has annexed region wise reports/action plan with its reply. NTPC has submitted that the rectification/replacement of relay shall take

about 9 to 12 months i.e. till February, 2014. However, minor defects shall be attended within 3 to 4 months i.e. by June, 2013.

10. Rajasthan Rajya Vidyut Prasaran Nigam Limited (RRVPNL) vide its affidavit dated 26.2.2013 has submitted that the deficiencies observed in Phase- III, IV, V and VI are not related to any mal operation or shortcoming of the protection systems. Further, no indiscriminate tripping related to the grid failure was observed on 30<sup>th</sup> and 31<sup>st</sup> July, 2012 in RVPNL System. The protection settings recommended by NRPC particularly for power swing detection and all zone blocking has already been done by RVPNL.

11. Bhakra Beas Management Board (BBMB) vide its affidavit dated 8.8.2013 has submitted as under:

(a) The updated status of action plan is submitted to the Member Secretary, NRPC fortnightly.

(b) For 400 kV sub-Stations at Panipat and Bhiwani, procurement and commissioning of balance static distance protection relays at 400 kV Panipat sub-Station and event logger at 400 kV Bhiwani sub-Station would be completed by 2013-14.

(c) For 400 kV sub-Station at Dehar, purchase and commissioning of balance static distance protection relays will be carried out during 2013-14

while the Auto-recloser feature will be commissioned within a year (ending 2013).

(d) For 220 kV sub-stations at Jamalpur, Sayampur, Ch. Dadri and Ganguwal, purchase and commissioning of balance static distance protection relays will be carried out during 2013-14 while GPS system, Event Logger are likely to be commissioned by December, 2013 at the four sub-stations.

(e) Bus-bar protection and service road execution and water logging prevention system at Ch. Dadri sub-station will be commissioned by 31.7.2013 and December, 2013, respectively.

(f) DG set at 220 kV MISS Ganguwal will be commissioned by end of September, 2013 while synchronization facility and PLCC at 220 kV Ganguwal sub-station will be in place by 2013-14.

12. Northern Regional Power Committee (NRPC) vide affidavit dated 24.1.2013 has submitted as under:

(a) Out of 132 Number of sub-stations covered by CPRI in the protection audit, 46 numbers of sub-stations belong to the petitioner. Further, the petitioner is a member of NRPC and is therefore, fully aware of the deliberations and actions being taken at NRPC level.

(b) NRPC Secretariat vide its FAX dated 9.1.2013 had requested heads of all the utilities which were covered in the protection audit to submit fortnightly report in the prescribed format.

13. Southern Regional Power Committee (SRPC) vide affidavit dated 15.2.2013 has submitted as under:

(a) In the 20<sup>th</sup> SRPC meeting held on 28.9.2012, the Committee had approved third party audit in respect of 194 identified critical sub-stations in the region.

(b) The third party audit was concluded on 22.12.2012 with the active participation of all the utilities in the region.

(c) SRPC has furnished the summary of time schedule and assessment of funds by the utilities, namely APGENCO, APTRANSCO, KPTCL, KSEB, TANTRANSCO, NTPC, PGCIL, NCL, NPCIL and KPCL in Southern Region along with its reply. According to SPRC, the rectification /replacement of relay may take about 1 to 2 year. However, minor defects may be attended within 1 to 6 months i.e. by August, 2013.

(d) As per assessment of funds by SR utilities, a total of ₹ 158 crore (Approx.) shall be required for rectification /replacement of relay.

14. North Eastern Regional Power Committee (NERPC) vide its affidavit dated 14.2.2013 has submitted as under:

(a) As per recommendation of enquiry committee constituted by Ministry of Power (Govt. of India) and headed by Chairperson, CEA, due to fund constraint, independent third party protection audit was planned taking representations from various State utilities, NERPC/NERLDC and Central Utilities (NEEPCO/PGCIL/NHPC) in the region.

(b) In NER, there are about 135 generating stations and sub-stations of 132 kV and above voltage class. The protection audit was planned in consultation with NERLDC, STU, CTU and generating companies of NER. As on date, protection audit in respect of about 100 sub-stations/generating stations has been completed and rest of work is likely to be completed by February, 2013.

(c) After completion of protection audit, the deficiencies in NER system will be highlighted and discussed in OCC/PCC meetings. The course of action and time frame of implementation of recommendations of protection audit will be planned accordingly. The report on Protection Audit along with recommendations will be submitted by 31.3.2013.

15. North Eastern Regional Power Committee (NERPC) vide its affidavit dated 7.10.2013 has further submitted as under:

(a) The first phase of protection audit covering eleven (11) sub-stations /generating stations in the State of Tripura was completed on 21.12.2012 and

rest of work was completed by February, 2013. The details of number of Sub-Stations/generating stations of 132 kV and above voltage class in seven (7) State Sector Utilities and four (4) Central Sector Utilities of the NE region are as under:

State Sector Utilities/ Central Sector Utilities in the Region	Number of Sub-Stations/generating stations			Total No. of sub-Stations
	400 kV	220 kV	132 kV	
Arunachal Pradesh		1	4	5
Assam		9	39	48
Manipur			9	9
Meghalaya	1		19	20
Mizoram			7	7
Nagaland			6	6
Tripura			13	13
POWERGRID	4	2	9	15
NEEPCO	1	2	4	7
NHPC			1	1
OPTC	1			1
<b>TOTAL</b>	<b>7</b>	<b>14</b>	<b>111</b>	<b>132</b>

(b) After completion of protection audit, the deficiencies in NER system and recommendations for improvement of whole system in the report were highlighted and discussed in detail in OCC/PCC meetings.

(c) For time frame for implementation of recommendations of Protection Audit, DPR with cost estimate and action plan has to be prepared by STUs and generating companies as per direction of Ministry of Power and Central Electricity Authority

(d) For implementation of recommendations of protection audit, the fund requirement in respect of each sub-station and generating station of State Utility

and Generating Company would be worked out based on findings of protection audit team and taking into account following broad areas:

- (i) Modification in switching scheme;
- (ii) Replacement of existing EM/Static relays by numerical relays/ Bay Control and Protection Units (BC and PUs) and Sub-station Automation System (SAM) and providing TSE, DR and EL;
- (iii) Replacement of old obsolete equipments and material;
- (iv) Establishment of reliable communication link and providing carrier inter-trip facility;
- (v) Improvement of DG system and providing DG set;
- (vi) Improving existing earthing system;
- (vii) Providing required fire fighting system/arrangement for transformers/reactors;
- (viii) Providing modern diagnostic tools;
- (ix) Any other improvement required

(e) Funding is the major constraint for implementation of recommendations of protection audit. However, if fund is made available from PSDF/funded by Government of India/any other source, the work can be executed within 2 to 3 years. Moreover, without financial support, it would not be possible by the constituent States to take up work for rectification of various deficiencies.



16. Eastern Regional Power Committee (ERPC) vide its affidavit dated 20.6.2013 has submitted as under:

(a) The third party Protection Audit has been completed in all 400 kV sub-station and 23 nos. of critical sub-stations at 200 kV.

(b) The utility has taken necessary action to replace/rectify the deficiencies observed. Out of 24 sub-stations, replacement/ rectification works would be completed between May to October, 2013 at most of the sub-stations.

(c) 4 sub-stations of NTPC, replacement/rectification work would be completed by end of December, 2013.

(d) DVC has furnished the action/compliance plans for 10 sub-stations for replacement/rectification of deficiencies observed in the Audit Report. He has stated that deficiencies will be rectified shortly.

(e) WBSETCL/WBPDCL has furnished the action/compliance plans for 10 sub-stations for replacement/rectification of deficiencies observed in the Audit Report. According to it, delivery of some of the equipments is expected soon.

(f) OPTCL/OHPC has submitted action/compliance plans for 10 sub-stations for replacement/rectification of deficiencies observed in the Audit Report. OPTCL has further submitted that procurement of equipments for some of the sub-stations is under process while at some stations equipments will be commissioned by September, 2013.

(g) According to NHPC, voice communication between ERLDC and Teesta-V station, which was installed on 25.1.2012, is working satisfactorily.

(h) BSEB has stated that the procurement plan for rectification/replacement is in process at some of the stations while at some stations, recommendations of third party audit observations will be implemented soon.

(i) Among the IPPs, Maithon has submitted that PLCC has been rectified by PGCIL. Maithon and PLCC protection of both channels is now in service. GMR and Sterlite have not submitted any action/compliance plan for their 400 kV sub-stations.

(j) According to JSEB, equipments are available at some of the stations and will be enabled shortly while estimates are being prepared for remaining equipments to be replaced/ rectified.

17. Western Regional Power Committee (WRPC) vide its submission dated 20.12.2013 has submitted as under:

(a) As per audit report submitted by PGCIL in respect of Protection Audit by CPRI for 42 sub-stations, only Bina (PG) sub-station comes under WR and the petitioner has complied with the audit observation for the same.

(b) In pursuance of Enquiry Committee recommendations of grid disturbance of 30.7.2012 and 31.7.2012, protection audit was completed by utilities involving third party by April, 2013. The complete status on the protection audit was regularly furnished to CE (GM), CEA/MoP with respect to protection audit and also other aspects of recommendation.

18. SRPC in its letter dated 31.12.2013 has submitted that CEA has sought DPR in respect of Renovation and Up-gradation of Protection Equipment at the substation/switchyard within 15.4.2013. Accordingly, the utilities of SR have submitted the DPR for the above at a total estimate of about ₹ 665 crore. In the 22<sup>th</sup> and 23<sup>rd</sup> SRPC meetings held on 18.5.2013 and 26.10.2013 respectively, members had requested for 100% funding from PSDF. Chairperson, SRPC by letter dated 10.12.2013 has requested Secretary (Power) for support from PSDF with provision for retroactive funding.

19. NERPC has stated that the issue was discussed in 15<sup>th</sup> meeting of Protection Sub-committee. SE(O) informed that the estimated cost projected in DPR for rectification/renovations of sub-stations/generating stations of seven States of the region is about ₹ 816 crore. Member-Secretary, I/C requested to all constituent States of the region to take up the issue with their respective Power Ministry for approaching the Ministry of Power, Government of India so that funding under NLCPR-Central is approved at the earliest and the scheme is implemented early for smooth operation of

grid. However, the petitioner stated that certain works need to be carried out on urgent basis by NER constituents even if funding is not available from external resources in order to avoid unwarranted tripping/system isolation and smooth operation of the grid. The Sub-committee requested to all constituent States to take up the matter with their respective Power Ministry so that funding for execution of above work is made available from NLCPR-Central to the constituent States of the region at the earliest.

20. We have considered the submissions of the petitioner, respondents, NRPC, WRPC, SRPC, ERPC and NERPC and the “Third Party Protection Audit Report” conducted by CPRI in association with the petitioner consequent to the grid disturbances on 30/31.7.2012 to ensure smooth and reliable Grid operation at some critical sub-stations identified by POSOCO. The summary of current status of implementation of recommendations submitted by RPCs are tabulated below:

**(1) Western Region**

<b>Name of Sub-station</b>	<b>Status ( as on 20.12.2013)</b>
Bina (PG)	(1) Audit completed in respect of Bina (PG) Sub-station, the only Sub-station of Western Region figuring in the protection audit.  (2) POWERGRID has complied with the audit observation.

## (2) Southern Region

Name of Sub-station covered	Status ( as on 30.12.2013)
194 sub-stations under APGENCO, APTRANSCO, KPTCL, KSEB, TANTRANSCO, NTPC, POWERGRID, NLC, NPCIL, KPCL	(1) Audit completed in respect of 194 Sub-stations in Southern Region by 22.12.2012. (2) Minor defects may be attended within 1-6 months and rectification/replacement may take 1 to 2 years. (3) ₹ 665 crore (para 18) is required to take up the work. (4) Southern Region members have requested for 100 % funding from PSDF. (5) In 23 <sup>rd</sup> SRPC meeting, utilities have agreed to carry out implementation of recommendations relating to the audit as per prioritization in phased manner.

## (3) North -Eastern Region

Name of Sub-station covered	Status (as on 6.12.2013)
132 Sub-stations under Arunachal Pradesh, Assam, Manipur, Meghalaya, Mizoram, Nagaland, Tripura, POWERGRID, NEEPCO, NHPC, OPTCL	(1) Audit completed in respect of 132 Sub-station in North-Eastern Region by February, 2013. (2) DPR with cost estimates and action plan for implementation of recommendations of audit is to be prepared by STUs and Generating companies. (3) ₹ 816 crore (para 19) is required to take up the work. (4) North-Eastern members have requested for 100 % funding under NLCPR-Central.

## (4) Eastern Region

Name of Sub-station covered	Status
Sub-stations under POWERGRID	(1) Complied with observations at some of the stations. (2) Numerical relays at Subhashgarm 400 kV S/S will be replaced by November, 2013. (3) Voice communication with RLDC at Gaya 765 kV S/S will be available by October, 2013. (4) PLCC and Voice communication with RLDC at Patna

	<p>400 kV S/S will be available by September and October, 2013.</p> <p>(5) Voice communication with RLDC at Muzaffarpur 400 kV S/S and Ara 220 kV S/S will be available by October, 2013.</p> <p>(5) Bus-bar protection at Birpara 220 kV S/S will be installed by November, 2013.</p>
Sub-stations under NTPC	<p>(1) Complied with observations at some of the stations.</p> <p>(2) Static relays will be replaced with numerical relays at Farakha STP 400 kV S/S, Kaniha TSTPS 400 kV S/S and Kahalgaon 400 kV S/S by December, 2013.</p> <p>(3) Work is under progress and is likely to be completed by December, 2013.</p>
Sub-stations under DVC	<p>(1) Observations implemented at some of the stations and preliminary process has been initiated at other stations to implement observations.</p> <p>(2) No time frame has been given.</p>
Sub-stations under WBSETCL /WBPDCL	<p>(1) Some of the equipments have been rectified and procurement process is going on to rectify others.</p> <p>(2) Bus Bar protection (220 kV) at Kolaghat will be available by July, 2014.</p> <p>(3) No time frame has been given for rectification of equipments at other Sub-stations.</p>
Sub-stations under OPTCL/OHPC	<p>(1) For some of the equipments tentative date of commissioning is 31.12.2013.</p> <p>(2) Event logger at Theruvali 220 kV S/S is likely to be commissioned by September, 2013.</p> <p>(3) Action is being taken for procurement of other equipments but time frame for implementation is not given.</p>
Sub-stations under NHPC (Teesta-V 400 kV sub-station)	<p>(1) Complied with observations of audit report.</p> <p>(2) Voice communication with ERLDC is working satisfactorily.</p>
Sub-stations under JSEB (Ramchandrapur 220 kV, Chandil 220 kV, TVNL 220 kV)	<p>(1) Bus Bar protection, Voice and data communication to SLDC Local Breaker backup, Event logger, Synchronization facility, PLCC, Earthing switches and Auto reclosing features are not available.</p> <p>(2) Works are under process of implementation. Some of them may be available shortly. No time frame has been</p>

	given.
Sub-stations under BSEB (Bodhgaya 220 kV, Biharshariff 220 kV)	<p>(1) Bus Bar protection at Bodhgaya 220 kV S/S and Biharshariff 220 kV S/S (132 kV level) is not available.</p> <p>(2) Local Breaker backup, Event logger, Synchronization facility, PLCC, Earthing switches and Auto reclosing features are not available at both Sub-stations.</p> <p>(3) Equipments are under process of procurement. No time frame has been given.</p>
Sub-stations under IPPs	<p>(1) Voice communication will be made available by Sept. 2013 by GMR.</p> <p>(2) PLCC has been rectified by POWERGRID at Maithon.</p> <p>(3) Sterlite has complied with the recommendations.</p>

**(5) Northern Region**

<b>Name of Sub-station Covered</b>	<b>Status</b>
46 Sub-stations under POWERGRID	As on 20.11.2013, POWERGRID has complied with observations.
21 Sub-stations under UPPTCL and 4 sub-stations under UPRVUNL	<p>(1) As on 16.12.2013 at UPPTCL Sub-stations:</p> <p>(i) Bus Bar protection at Sarojini Nagar will be completed by January, 2014, at Sultanpur, Chinhath, Muzaffarnagar, Muradabad, G. Noida, Sarnath, Gorakhpur, Mau, Azamgarh and Fatehpur will be completed by June, 2014.</p> <p>(ii) LBB protection at Panki, Moradabad, Muradnagar, G. Noida, Mau, Muzaffarnagar, Lucknow will be completed by November, 2013.</p> <p>(iii) PLCC problems at most of the stations will be rectified by December, 2013.</p> <p>(2) As on 16.12.2013 at UPRVUNL Sub-stations:</p> <p>(i) Bus Bar protection, DR&amp;EL and earth fault have been rectified except Anpara by January, 2014 and at Obra (A) by March, 2014</p> <p>(ii) PLCC problem will be rectified at Anpara by December, 2013 and at Harduaganj and Obra</p>

	(A) by March, 2014, time synchronization at Obra (A) by January, 2014.
1 switchyard under Lanco	No major deficiency was observed.
1 sub-station under DTL (Bamnauli)	As on 19.11.2013, Numerical relays and DR and EL will be rectified by January, 2014.
3 Sub-stations under HPGCL and 1 sub-station under HVPNL	(1) As on 4.12.2013 at HPGCL Sub-stations, Earth fault in DC system at PTPS-1, 2 by March, 2015, Bus Bar protection will be taken under R and U, DR and Event Logger will be made available by March, 2015.  (2) As on 20.11.2013 at HVPNL sub-station, Bus Bar protection will be rectified shortly.
8 Sub-stations under RRVPNL and 2 sub-stations under RRVUNL	(1) As on 22.11.2013 at RRVPNL Sub-stations, DR and Event Logger at Jodhpur and Khetri by September, 2013 and December, 2013 and Ratangarh by October, 2014.  (2) As on 22.11.2013 at RRVUNL Sub-stations, Time synchronization and DR and Event Logger at Suratgarh and Kota will be replaced by March, 2015.
3 Sub-stations under PSTCL and 1 sub-station under PSPCL	(1) As on 20.12.2013 at PSTCL Sub-stations, Bus Bar protection and PICC at Sarna, Ajitgarh, Govindgarh are expected to be completed by September, 2013.  (2) As on 18.2.2013 at PSPCL S/Y, Bus Bar protection will be rectified by January, 2014 and DR and Event Logger by September, 2013, Time Synchronization and earth fault by February, 2013 and Earth fault by March, 2013.
2 Sub-stations under PTCUL and 1 sub-station under UJVNL	(1) Till 20.11.2013, earth fault at Kashipur sub-station and Rishikesh sub-station have been rectified while for other faults, work is under progress.  (b) UJVNL has not given any information regarding the switchyard till 21.11.2013.
1 Sub-station under HPSEB (Kunihar)	(1) As on 3.12.2013, time synchronization and LBB protection works will be completed by March, 2014.  (2) Bus Bar protection at Kunihar will be covered under R and U of 220 kV Kunihar sub-station.
3 Sub-stations under J&K	As on 21.11.2013, information is awaited with respect to Event Logger, LBB protection, PLCC and DG set while rest of faults will be rectified by December, 2013.
4 Sub-stations and 3 switchyard under BBMB	(1) As on 16.11.2013, DR and Event Logger at Bhiwani, Dehar, Samypur, Ch. Dadri (04 S/S) and Jamalpur, Ganguwal (02 S/Y) have been rectified.  (2) Bus Bar protection at Charkhi Dadri will be available by November, 2013.



	<p>(3) PLCC at Jamalpur and Gangwal will be available by September, 2013.</p> <p>(4) LBB protection will be made functional at Charkhi Dadri by November, 2013.</p> <p>(5) Time Synchronization at Charkhi Dadri, Samypur (02 Sub-stations), Jamalpur and Gangwal (02 S/Y) will be commissioned by December, 2013.</p>
10 Switchyards under NTPC	<p>(1) As on 31.11.2013, NTPC has rectified earth fault, time synchronization, DR and EL, Bus Bar and LBB protection.</p> <p>(2) Replacement of static distance relays by numerical relays will be completed by December, 2014.</p>
01 Switchyard under SJVNL (Jhakri)	<p>(1) As on 6.12.2013, SJVNL has rectified time synchronization, replacement of static relays with numerical relays, DR and Event Logger.</p> <p>(2) Earth fault in DC system will be rectified by 30.4.2013 during next annual maintenance.</p>
3 Switchyard under JPVL	As on 10.7.2013, all the equipments have been rectified except time synchronization at Baspa-II HEP which will be completed by December, 2013.
8 Switchyard under NHPC	<p>(1) As on 20.12.2013, most of the defaults have been rectified.</p> <p>(2) Replacement of static relays with numerical relays at Dhauliganga and Tanakpur will be completed by March, 2014.</p> <p>(3) Earth fault at Uri will be rectified by November, 2013,</p> <p>(4) Time synchronization at Salal and Dhauliganga by March, 2014 and May, 2013 respectively.</p>
1 Switchyard under THDC (Tehri)	As on 19.11.2013, all equipments are functional at Tehri.
1 Switchyard under NPCIL (Narora)	As on 20.11.2013, rectifications have been completed except DR and Event Logger at Narora which is expected to be completed by October, 2013.

21. The Protection Audit was carried out by CPRI for 42 sub-stations. Out of these, only Bina (PG) sub-station comes under Western Region and the recommendations contained in respect of Bina sub-station in the Protection Audit have been complied with

by the petitioner. Constituent States and Utilities of Eastern Region and Northern Region have submitted the time frame for implementation/ rectification of equipments in their respective regions. Constituents of North-Eastern Region and Southern Region have cited non-availability of funds as major constraints in implementation of recommendations of Protection Audit report.

22. Monitoring of status of action taken on implementation of recommendations of Third Party Protection Audit is regularly being maintained by CEA. The information as available on the website of CEA with respect to protection audit and also other aspects of recommendation of Enquiry Committee, the status as on 19.9.2013 is as under:

*"Third party protection audit in all the States of the country was completed by April, 2013. Corrective action as per the observation of the audit has been initiated and likely to be completed by September, 2013 where purchase is not involved and by the end of the year 2014, where the procurement of equipment is involved."*

23. However, it is noted from the detailed status submitted by RPCs through affidavits/e-mails that minor defects were being attended to by some of the utilities and work in some of the utilities is likely to be completed by 2015. Some of the utilities, namely DVC, WBSETCL/WBPDCL, BSEB and JSEB have not given any time-frame for completion of protection and control system.

24. The Commission deems it appropriate to emphasize that implementation of protection and control system is essential not only to protect the equipment/isolate the faulty elements from the grid and avoid any major grid incident but also to facilitate

analysis of the problems/causes of trippings so that corrective action can be taken by all concerned. It is not only essential to install the protection and control systems in all the transmission elements and generating stations as per technical standards notified by CEA, but also to keep them in healthy condition for safe and secure operation of the grid. With the synchronous interconnection of NEW Grid and Southern Regional Grid, provision for requisite protection and their healthiness assumes critical importance.

25. Protection Audit in all the regions has been completed and RPCs are regularly monitoring implementation of recommendations of Protection Audit. It is necessary that the role of STU and SLDC in implementation of the recommendation of Protection Audit for the removal of deficiencies need to be clearly brought out so that the recommendations for rectification of deficiencies observed in the Protection Audit carried out by POWERGRID can be implemented in a time bound manner. Section 34 of Electricity Act, 2003 provides for responsibility of transmission licensees to comply with grid standards as under:

“34. Grid Standards: Every transmission licensee shall comply with such technical standards, of operation and maintenance of transmission lines, in accordance with the Grid Standards, as may be specified by the Authority”.

26. The role of SLDCs has also been prescribed in Section 32 (e) of the Electricity Act 2003 as under:

"32. Functions of SLDC:

.....

(e) Be responsible for carrying out real time operation for grid control and dispatch of electricity within the State through secure and economic operation of the State grid in accordance with the Grid Standards and the State Grid Code."

27. Since the protection system is a vital requirement for the safe and secure operation of the grid, we have decided that in order to implement the recommendations of the Protection Audit, a compliance mechanism with definite time line needs to be put in place as under:

- (a) Each STU and CTU shall submit its action plan against each deficiency within one month from issue of this order clearly stating the deficiencies which can be corrected without any procurement (Category-A) and deficiencies involving procurement of equipment (Category-B). However, action plan for deficiencies dealt in Petition No. 146/MP/2013 shall be submitted therein;
- (b) The remaining deficiencies, if any, in Category-A shall be rectified by the concerned STU and CTU within 2 months of issue of the order and compliance report in this regard shall be submitted to respective RPC.
- (c) As protection is a matter of critical importance, a time period of one year, as informed by various agencies in RPC for rectifying the deficiencies, which involve procurement, cannot be allowed. All deficiencies of Category-B shall be rectified within 6 months of issue of the order. In this regard, reasons of non-availability of fund or delay in procurement process shall not be accepted. The procurement and implementation is to be completed by each STU using their own fund which can be reimbursed through a common request of funding through PSDF forwarded through RPCs as per procedure recently approved by Government of India.

(d) Each SLDC shall be responsible to monitor the action taken by STU. If any deficiency in the STU system in regard to the Category-A deficiencies is not corrected after 3 months of issue of this order, the concerned SLDC may approach the respective State Commission for appropriate action against defaulting State entity in accordance with State Grid Code. The Office-in-Charge of the concerned SLDC shall be responsible for monitoring and ensuring compliance of the action plan and filing of the petition as directed herein.

(e) RPCs at the end of each quarter shall prepare a report on the protection deficiencies and their rectification which shall be sent to this Commission with a copy to CTU not later than 45 days of expiry of the quarter. The report shall inter-alia identify deviations from time lines as well as the State sub-stations which have interface with ISTS system. CTU shall take necessary action and issue a show cause notice for disconnection to sub-station of STU for not complying with the Standards for Protection and Control as per Central Electricity Authority (Technical Standards for Construction of Electric Plants and Electric Lines) Regulations, 2010 and Central Electricity Authority (Grid Standards) Regulations, 2010.

28. Accordingly, we direct CTU, STUs and Generating Companies /Stations of all the regions to ensure rectification of defects in the protection system as pointed out in the protection audit within the time frame specified in paragraph 27 herein and submit the latest status of corrective actions to Member Secretary of the respective Regional Power Committee within one month of issue of this order. All RPCs are directed to to

furnish consolidated report with their observations/recommendations to the Commission within 2 months of issue of this order. Thereafter, CTU and SLDCs shall submit quarterly report to the respective RPC latest by 15th day of the first month of next quarter and RPCs shall submit the report to the Commission latest by 15th day of the second month of next quarter.

29. We direct Member Secretaries, Regional Power Committees to continue monitoring the protection related issues and bring to the notice of the Commission any instance of non-compliance of the Regulation 1.5 of the Grid Code in respect of the protection related issues considered in the instant petition.

30. With this, Petition No. 220/MP/2012 stands disposed of.

**Sd/-**  
**(M Deena Dayalan)**  
**Member**

**sd/-**  
**(V S Verma)**  
**Member**