सत्यमेव जयते

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

सं. उक्षेविस/ वाणिज्यिक/ 209/ आर पी सी (47 वीं)/2019/14471-14518 दिनाँक : 27वीं नवम्बर, 2019
No. NRPC/ Comml/ 209/ RPC (47th)/2019/14471-14518 Dated: 27th November, 2019

सेवा में / To,

उ.क्षे.वि.स. और तकनीकी समन्वय समिति के सभी सदस्य (संलग्न सूचीनुसार)
Members of NRPC and TCC (As per List)

विषय: उत्तर क्षेत्रीय विद्युत समिति की 47वीं तथा तकनीकी समंवय उप-समिति की 44वीं बैठक की कार्यसूची ।

Subject: 47th meeting of Northern Regional Power Committee and 44th meeting of TCC– Agenda.

महोदय / Sir,

उत्तर क्षेत्रीय विद्युत समिति की 47वीं बैठक दिनांक 11 दिसंबर, 2019 को 1000 बजे जैसलमेर राजस्थान में आयोजित की जाएगी । उ.क्षे.वि.स. की बैठक से पहले तकनीकी समन्वय उप-समिति की 44वीं बैठक दिनांक 10 दिसंबर, 2019 को 1000 बजे उसी स्थान पर आयोजित होगी । बैठकों की कार्यसूची संलग्न है।

The 47th meeting of Northern Regional Power Committee (NRPC) will be held at 1000 Hrs on 11th December, 2019 at Jaisalmer, Rajasthan. NRPC meeting shall be preceded by 44th meeting of Technical Coordination Sub-committee (TCC) at 1000 Hrs on 10th December, 2019 at the same venue. Agenda for the meetings is attached herewith.

भवदीय
Yours faithfully,

नरेश 27/11/19

(नरेश भंडारी)
(Naresh Bhandari)
सदस्य सचिव
Member Secretary

18-ए, शहीद जीत सिंह मार्ग, कटवारिया सराय, नई दिल्ली- 110016 फोन:011-26513265 फेक्स: 011-26865206 ई-मेल: ms -nrpc@nic.in वेबसाईट: www.nrpc.gov.in
18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016 Phone: 011-26513265 Fax: 011-26865206 e- mail: ms-nrpc@nic.in Website: www.nrpc.g

INDEX

Annex-C.15

Annex-C.24

Annex-D.3

उत्तर क्षेत्रीय विद्युत समिति

NORTHERN REGIONAL POWER COMMITTEE

AGENDA
FOR
44th MEETING OF TECHNICAL COORDINATION SUB-COMMITTEE
&
47th MEETING OF NORTHERN REGIONAL POWER COMMITTEE

Time & Date of TCC meeting: 10:00 Hrs. on 10.12.2019

Time & Date of NRPC meeting: 10.00 Hrs. on 11.12.2019

Venue: Jaisalmer

C O N F I R M A T I O N O F M I N U T E S (T C C)

A.1 Minutes of 43rd meeting of TCC

Minutes of 43rd meeting of TCC held on 23rd September, 2019, were circulated vide letter No. NRPC/Comml/209/RPC(46th)/2019/ 12509-12556 dated 14th October, 2019.

No comment has been received so far on the minutes issued.

Members may kindly confirm the minutes.

C O N F I R M A T I O N O F M I N U T E S (N R P C)

A.2 Minutes of 46th meeting of NRPC

Minutes of 46th meeting of NRPC held on 24th September, 2019, were circulated vide letter No. NRPC/Comml/209/RPC(46th)/2019/ 12509-12556 dated 14th October, 2019.

No comment has been received so far on the minutes issued.

Members may kindly confirm the minutes.

B. OPERATIONAL ISSUES

B.1 System Study for Capacitor Requirement in NR for the year 2019-20

B.1.1 To estimate capacitor requirement in NR at 11/33 kV level for the year 2019-20, the proposal for conducting system study by CPRI was deliberated and decided in the 37th TCC and 40th NRPC meeting. After continuous follow up with states, the desired data for conducting the study has been submitted by Delhi, Haryana, Punjab, Rajasthan, UP and Himachal Pradesh.

B.1.2 To finalise the modalities for carrying out the study, a meeting was held on 01.11.2019 in NRPC Sectt. with the representatives from CPRI and NRLDC. A copy of minutes of meeting is enclosed at **Annex-B.1**.

B.1.3 Regarding verification of the date and time of states' peak for which the data has been submitted by individual states, SLDCs have responded as under:

S. No.	State	Date and Time (Peak Demand)
1.	Delhi	10.07.2018 (15:26 Hrs)
2.	Rajasthan	13.01.2018 (08:15 Hrs)
3.	Uttar Pradesh	12.08.2019 (20:00 Hrs)
4.	Haryana	11.07.2018 (00:45 Hrs)
5.	Himachal Pradesh	28.12.2018 (10:00 Hrs)
6.	Punjab	10.07.2018 (18:45 Hrs)

B.1.4 NRLDC to provide the PSSE data file of NR region for these dates to CPRI. The methodology and the optimum voltages which would be considered by CPRI for calculating the capacitor requirement after modelling the network shall be shared to NRPC Secretariat/NRLDC for comments, if any. In the first instance, pilot study shall be done for Haryana state as a whole, based on which the practical difficulties, if any faced in modelling of network, would be highlighted by CPRI and shall be resolved accordingly.

B.1.5 CPRI has requested for deputing a nodal officer by each state who can be contacted by CPRI for resolving any issue being encountered at the time of modelling of the downstream network.

Members are requested to depute nodal officers for this work and share their

contact details with CPRI urgently.

B.2 Formation of separate Post-Dispatch Analysis group at each SLDC/utility (Agenda by NRLDC)

B.2.1 Post-Dispatch Analysis is very important function for load dispatch centre/transmission licensee/generating stations. At RLDC front, such arrangement is working on following functions:

(i) Tripping Analysis
(ii) SoPR (Standard of Performance and Regulation) data for ISTS licensee
(iii) Frequent Single element tripping in a month
(iv) Multiple element tripping in a month
(v) Inter-Regional tripping in a month
(vi) FRC computation and analysis
(vii) Load Crash analysis
(viii) Reactive Power Management in its control area
(ix) LVRT/FRT issues or other protection related issues for renewable generators
(x) Protection database formation and updation
(xi) UFR and df/dt operation
(xii) ADMS (Automatic demand management system) related updates
(xiii) Analysis of sudden frequency excursions
(xiv) SPS operation and feedback

B.2.2 In line with RLDC, a dedicated Post-Dispatch Analysis group in state will help in coordinating with the site officials and prepare the detailed report for all incidents and submit these reports to NRPC/NRLDC in a time frame stipulated in IEGC.

B.2.3 UPPTCL representative in the 164th OCC meeting has cited improvement in its control area due to the formation of separate group to work on reliability issues. Other SLDC were also receptive to the idea of forming a separate Post-Dispatch Analysis group.

B.2.4 38th PSC and 164th OCC has agreed to the proposal and has advised for obtaining the approval of TCC/NRPC.

Members may deliberate and approve the proposal.

B.3 (I) Cyber Security Preparedness Monitoring

B.3.1 Chief Information Security Officer (CISO), MoP in the 37th TCC and 40th NRPC meeting had made a detailed presentation on potential cyber threats for power sector;

and accordingly monitoring of following action points is being done regularly in OCC meetings of NRPC:

(i) Appointment of organization-wise Chief Information Security Officers and its status.

(ii) Identification of organization-wise Critical Infrastructure and its status.

(iii) Preparation of organization-wise Crisis Management Plan and its status.

(iv) Status of Cyber Security Mock Drill activity in coordination with CERT-In.

(v) Status of Training/Workshops on Cyber Security organized/participated by power sector entities.

(vi) Status of action taken on CERT-In/NCIIPC advisories.

B.3.2 The prompt response of most of the utilities on the aforementioned action points is a positive sign for ensuring the safety of the grid.

B.3.3 However, the recent incident of identification of malware in a PC used for administrative purpose in NPCIL Kudankulam Nuclear Plant is a wakeup call for all the power sector players.

B.3.4 Cyber Security being a dynamic process needs to be dealt with utmost priority as any negligence on this front by any of the involved player, could cripple the grid instantaneously.

B.3.5 Considering the importance of ensuring cyber security preparedness, a training was held on 11.11.2019 at NRPC Secretariat, New Delhi with representation from most of the utilities of Northern region.

(II) Formation of Cyber Security Committee (agenda by PTCUL)

B.3.6 To ensure better coordinated action on matters related to cyber-security, PTCUL has proposed that a Cyber Security Committee may be constituted comprised of the designated CISOs from the utilities of the Northern Region.

B.3.7 Being a platform focussed specifically on cyber-security, this may facilitate a deeper interaction on the topic than is possible in OCC meetings. The closer and regular interaction of the CISOs of power utilities may result in the following benefits:

- Better coordination / uniformity in cyber security policies, designation of critical information infrastructure, crises management procedures, etc.

- Better capacity development, knowledge sharing, etc.
- Better and more detailed monitoring of cyber-security preparedness

Members may deliberate.

B.4 Cold Spare transformer requirement for Northern Region (Agenda by POWERGRID)

B.4.1 CERC had set up a Committee on dated 15.03.2018 consisting of representatives from CERC, NLDC, CEA & POWERGRID under the Chairmanship of the Chief (Engineering) of the CERC to assess the requirement of regional spares including bus reactors, line reactors, ICTs, etc. This would ensure reliability of the grid and reduce downtime in case of any failure/outage.

B.4.2 As per CERC Committee recommendation, the following spares transformers will be needed for Northern Region:

MVA Rating and Phase	Voltage Rating	Qty. Required as per norms	Available Regional Spare	Qty. proposed for procurement	Spare requirement
1Ø-500MVA	765/400	4	3	1	Rajasthan
1Ø-333MVA	765/400	2	1	1	UP
3Ø-500MVA	400/220	5	0	5	Delhi, Rajasthan, Haryana, UP & Punjab
3Ø-315MVA	400/220	9	6	0**	
1Ø-105MVA	400/220	3	0	3	Himachal, J&K & UP
3Ø-200MVA	220/132	1	0	1	UP
3Ø-100MVA	220/132	1	0	1	Uttarakhand
Total		**25**	**10**	**12**	

**The 3Ø-315MVA spare requirement will be met through proposed 3Ø-500MVA transformer.

B.4.3 The matter was discussed during 43rd TCC & 46th NRPC meeting held on 23rd - 24th Sept. 2019 at Thiruvananthapuram wherein it was decided that utilities would first study the committee report and then issue of procurement of spare equipment may be

discussed in next TCC meeting. In the minutes of last meeting, it was informed that a copy of the committee report is available at CERC website; the same is again enclosed at **Annex-B.4**.

B.4.4 POWERGRID has requested for consideration of approval for 12 nos. of cold spare transformers of various ratings as per CERC committee recommendation as mentioned above. The Tariff for the investment made is to be shared by all constituents as per CERC notification.

Members may deliberate.

B.5 Revised SPS (System Protection Scheme) for Kawai - Kalisindh - Chhabra generation complex (Agenda by Rajasthan)

B.5.1 The original System Protection Scheme (SPS) for Kawai - Kalisindh - Chhabra generation complex was approved in the meeting held on 21.04.2016 at NRPC Secretariat. Thereafter, with commissioning of following new elements, the existing SPS was reviewed.

- Chhabra SCTPS Unit No. 6 (660 MW)
- 2km 400 kV D/C Chhabra SCTPS- Chhabra CTPS line
- 400 kV S/C Kota (PG)-Jaipur (south) line
- 400 kV S/C RAPP (C&D)-Kota (PG) line
- 400 kV S/C RAPP (C&D)- Jaipur (south) line
- 400 kV S/C Chhabra TPS-Anta-Kota (PG) line

B.5.2 Considering addition of new elements, a detailed load flow studies for revised SPS was submitted by RVPN to the SE (Operation), NRPC for consideration. After detailed deliberation revised SPS of Kawai - Kalisindh - Chhabra generation complex was approved in the 163rd OCC meeting held on 17.09.2019.

B.5.3 In 163rd OCC meeting, in-principle approval has been accorded to the following logics of revised system Protection Scheme:

S. No.	Condition/contingency	Revised approved SPS action in 163rd OCC meeting

1.	N-1 of Chhabra-Hindaun or Chhabra-Bhilwara lines	No backing down
2.	N-1-1/N-2 of Chhabra-Hindaun and Kawai-Chhabra	No backing down
3.	N-1-1/N-2 of Chhabra- Bhilwara and Kawai-Chhabra	No backing down
4.	N-1-1/N-2 of Chhabra-Hindaun and Chhabra-Bhilwara	Trip Two unit at Chhabra TPS
5.	N-1 of Kawai-Anta 1 & 2	No backing down
6.	N-1-1/N-2 of Kawai-Anta 1 & 2	Trip One unit at Kawai TPS
7.	N-1 of Chhabra SCTPS-Anta 1 & 2	No backing down
8.	N-1-1/N-2 of Chhabra SCTPS-Anta 1 & 2	No backing down
9.	N-1-1/N-2 of Kalisindh - Anta 1 & 2	Trip both unit at Kalisindh TPS
10.	N-1-1/N-2 of 765/400 kV Anta ICTs	Trip one unit of 660 MW at Chhabra SCTPS to limit the flow on the remaining ICT with in safe range
11.	N-1 of Anta-Phagi 1 & 2	No backing down
12.	N-1-1/N-2 of Anta-Phagi 1 & 2	Trip one unit each at Chhabra TPS, Chhabra SCTPS, Kawai TPS and Kalisindh TPS

B.5.4 To expedite implementation of revised SPS, Member Secretary, NRPC vide letter no. NRPC/OPR/106/01/2019/14131-32 dated 11.11.2019 has given in-principle approval to Rajasthan to proceed with implementation of revised SPS scheme for Kawai - Kalisindh - Chhabra generation complex. In this regards, CE (PP&D), RVPN has issued a letter dated 14.11.2019 to concerned officers to implement revised SPS.

B.5.5 In view of above, post facto approval of the revised logics for SPS of Kawai - Kalisindh - Chhabra generation complex may be accorded.

Members may discuss and approve.

B.6 Reliable Communication Scheme (Additional) under Central Sector for Northern Region (Agenda by POWERGRID)

B.6.1 During 39th & 40th NRPC meetings, implementation of Reliable Communication Scheme envisaging 7248 km (including ULDC replacement) was approved for implementation by POWERGRID to provide connectivity of substation of 132 kV and above under central sector as per directive of MOP, GOI.

B.6.2 In order to provide reliability and redundancy in ISTS communication system in line with CERC's Communication Regulation 2017 and draft CEA's Manual of Communication Planning 2019, following additional fibre optic length was proposed in the last TCC/NRPC meeting by POWERGRID for building path redundancy and route diversity for reliable data & voice connectivity:

S. No	Name of Link	Route Length (km)	Purpose
1	400kV Panchkula-Patiala	65.494	Physical Path Redundancy & route diversity for Panchkula S/s
2	400kV Nalagarh-Patiala	93.78	Reliable ICCP link between HP, Punjab and NRLDC
3	400kV Jallandhar Moga	85.15	Physical Path Redundancy & route diversity for Jallandhar (PG) through Central Sector links.
4	400kV Parbati PS - Amritsar	250.53	Path Redundancy & route diversity of Parbati PS (Banala) & Hamirpur through Central sector network.
5	LILO of Parbati-Amritsar at Hamirpur	6.7	
6	400kV Kurukshetra-Malerkotla PG	180	Path Redundancy of Malerkotla (PG) through central sector network.
7	765kV Meerut - Moga	337.15	Route diversity of Moga S/S & creation of reliable ICCP link between Punjab, Rajasthan (through upcoming 765kV Bikaner Moga under GEC Part D & NRLDC.
8	400kV Bassi-Sikar	169.8	Redundancy of Sikar S/S
9	400kV Dehradun-Bagpat	165	Physical path Redundancy & for route diversity of Bagpat S/S

S. No	Name of Link	Route Length (km)	Purpose
10	400kV RAPP B -Jaipur South with LILO at Kota	300	Redundancy of Kota & RAPP through Central Sector network
11	400kV Allahabad-Singrauli	200	Redundancy of Singrauli
12	400kV Allahabad-Fatehpur 765	130	Strengthening of Inter Regional Connectivity (WR-NR). (400kV Fatehpur -Mainpuri is under implementation under Reliable Communication scheme)
13	400kV Patna-Ballia	200	Strengthening of Inter Regional connectivity ER -NR.
14	400kV Kanpur-Ballabhgarh	260	Redundancy of old Agra-Kanpur link which has reached the end of its useful life of 15 years.
15	Chittorgarh 400kv RVPN to Chittorgarh 220 RVPN	52	Redundancy of Chittorgarh 220/132 through Central Sector network
16	400kV Lucknow - Kanpur	156	Redundancy of Network and avoiding multiple sub-stations
	TOTAL	**2651.604**	

B.6.3 In the last TCC/NRPC meeting, it was decided that the above matter may be again discussed in next TeST meeting, as Punjab and Rajasthan apprehended that some requirement could be reduced.

B.6.4 Accordingly, the issue was discussed in the last (16th TeST) meeting held on 14/11/2019. After detailed deliberations, following links were agreed for deletion from additional requirement:

S. No.	Name of Link	Length (km)	Reason for Deletion
1	400kV Patiala-Nalagarh	93.78	PSTCL agreed for one short link to meet redundancy criterion of Patiala. Therefore 400kV Panchkula-Patiala (65.494km) was agreed for implementation.

2	400kV Bassi-Sikar	169.80	Newly awarded transmission lines under TBCB from Sikar S/s (765kV Sikar-Khetri & 765kV Khetri-Jhatikara) will have OPGW to meet redundancy.
3	400kV Patna-Ballia	200.00	This link is under consideration by ERPC for ER-NR inter-regional communication strengthening.
	Total	463.58	

B.6.5 With regard to RAPP-7&8(D) to Jaipur (South), RVPN expressed that available RVPN network along with suitable bandwidth can be utilized in the proposed scheme.

B.6.6 After deliberation, it was observed that RVPN's bandwidth offer may not be appropriate considering ongoing services like RTU/SAS, PMU, VOIP, AMR, AGC, SECD, E&M channel and SPS Protection services etc. and upcoming bandwidth intensive applications. Regarding RVPN's offer of using their Dark Fibres in RAPP (7&8)-Jaipur South section, it emerged that there are 16 nos. of RVPN's inter-mediate stations which will require communication equipment and DC power supply. These intermediate nodes may not be suitable from ISTS Communication network point of view on account of reliability angle. NRLDC and NLDC also expressed that so many intermediate nodes will affect the reliable voice and data communication.

B.6.7 After detailed deliberations, the following links were agreed upon:

S. No.	**Name of Link**	**Route Length (km)**	**Purpose**
1	400kV Panchkula-Patiala	65.494	Physical Path Redundancy & route diversity for Panchkula S/s
2	400kV Jallandhar Moga	85.15	Physical Path Redundancy & route diversity for Jallandhar (PG) through Central Sector links.
3	400kV Parbati PS - Amritsar	250.53	Path Redundancy & route diversity of Parbati PS (Banala) & Hamirpur through Central sector network.
4	LILO of Parbati - Amritsar at Hamirpur	6.7	

S. No.	Name of Link	Route Length (km)	Purpose
5	400kV Kurukshetra-Malerkotla PG	180	Path Redundancy of Malerkotla (PG) through central sector network.
6	765kV Meerut - Moga	337.15	Route diversity of Moga S/S & creation of reliable ICCP link between Punjab, Rajasthan (through upcoming 765kV Bikaner Moga under GEC Part D & NRLDC.
7	400kV Dehradun-Bagpat	165	Physical path Redundancy & for route diversity of Bagpat S/S
8	400kV RAPP B -Jaipur South with LILO at Kota	226	Redundancy of Kota & RAPP through Central Sector network
9	400kV Allahabad-Singrauli	200	Redundancy of Singrauli
10	400kV Allahabad-Fatehpur 765	130	Strengthening of Inter Regional Connectivity (WR-NR). (400kV Fatehpur -Mainpuri is under implementation under Reliable Communication scheme)
11	400kV Kanpur-Ballabhgarh	370	Redundancy of old Agra-Kanpur link which has reached the end of its useful life of 15 years.
12	Chittorgarh 400kV RVPN to Chittorgarh 220kV RVPN	07	Redundancy of Chittorgarh 220/132 through Central Sector network
13	400kV Lucknow - Kanpur	156	Redundancy of Network and avoiding multiple sub-stations
	TOTAL	**2179.024**	

B.6.8 POWERGRID further informed that in accordance with 39th & 40th NRPC meeting, implementation of 7248 Km OPGW is under execution. POWERGRID also informed that around 2031 km OPGW network is not coming up in the original reliable scheme (as approved in 39th NRPC) as some of the IPPs are not coming up and also connectivity for some were covered in different schemes. Considering the same and additional requirement of 2180 km as proposed for taking care of contingencies as per Communication Planning Criteria, the overall network size approved in 39th & 40th

NRPC will increase by only 150 km considering new requirement of 2180 km in lieu of 2031km network not coming up as brought out above.

B.6.9 Accordingly, TeST Committee members have agreed for the implementation of 2180 Km of OPGW network under on-going Reliable Communication Project (7248 km) so that the same can be implemented within the same time period. The revised network size of Reliable Communication Project will become 7398 Km.

B.6.10 **Members may deliberate and approve.**

B.7 Upgradation of STM-16 to STM-64 Communication Equipment (Agenda by POWERGRID)

B.7.1 During last TeST subcommittee meeting, NRLDC requested to explore the possibility of upgradation of communication equipment from STM-16 capacity to STM-64 or adopt other latest technology to cater additional requirement for future projects including RTU/SAS data reporting on 104 protocol, new PMUs under WAMS System, SCED, AGC Project, establishment of inter-regional control centres of SCADA/ PDC, upgradation of NLDC and establishment of REMC control centres and backup control centre at Kolkata for WAMS system and other new schemes.

B.7.2 In this regard, POWERGRID have examined the possibility and 17 Equipment needs to be upgraded from STM-16 to STM-64 on Tejas make Communication Equipment, their associated SFPs and amplifiers are required. Further in view of shortage of Ethernet Ports, new cards also required at several locations/specially NLDC, NRLDC and all SLDCs of Northern Region along with some of station where most of the ports has been utilized for grid operation services (RTU/SAS, PMU, VOIP, AMR, TWFL, Pilot project PMU, some inter-connections for other sub-stations) and ports are not available for AGC and SCED scheme of NLDC.

B.7.3 The estimated cost for above up-gradation is approx. Rs 2.98 Cr. In case of complete replacement, the approximate cost shall be around Rs. 6.5 Rs Cr which is almost double the up-gradation cost. In view of same, the TeST subcommittee members agreed for up-gradation on proprietary basis by M/s. Tejas.

B.7.4 The tariff for the investment made is to be shared by all constituents as per CERC notification under Reliable Communication Scheme. The scheme shall become part of existing Commercial Agreement signed for ULDC Project.

NRPC may deliberate & approve the same.

B.8 Winter preparedness (agenda by NRLDC)

B.8.1 Winter preparedness was discussed in 163rd, 164th and 165th OCC and 43th TCC / 46th NRPC meetings. The following salient points pertaining to power system operation during winter season were discussed:

B.8.2 Large difference in peak and off-peak hours' load

- Demand forecast and ramp forecast
- Ramping of generation commensurate with load ramp
- Load generation balancing/Portfolio management
- Optimization of Hydro resources
- Avoiding sudden connection/disconnection of large load (Staggering of load group)

B.8.3 High voltages

- Monitoring of Reactive power resources through SCADA displays for optimal use of reactive resources
- Ensuring switching-off capacitor banks
- Line Reactor switched as Bus reactor - Real time issues
- Tap optimization of ICTs
- Optimum utilization of FACTS devices like SVC, STATCOM
- Dynamic response by Generators
- Synchronous condenser mode of operation

B.8.4 EHV line opening

- Tripping of EHV line during fog / Smog conditions
- Insulator cleaning / replacement

B.8.5 The following actions among others were informed and taken in afore mentioned meetings:

(i) Load forecasting: load forecasting data being shared by most SLDCs. Though, forecast error needs improvement.

(ii) Telemetry of temperature and humidity data: NR-3 representative informed that they have taken up the matter with substations under their jurisdiction and same would be attended before winter. All other utilities were also asked to check and improve telemetry of temperature and humidity from substations to control centres. This data as being stored in servers would also be useful in future for research and other tool development.

(iii) Tap optimisation: NRLDC has performed tap change studies. In 165th OCC meeting, members discussed and agreed on the tap change proposal as per NRLDC report. NRLDC also emphasized that tap changes could be further done at any point of time even during the season based on the system requirement.

(iv) Fog monitoring: NRLDC representative said that real time fog can be monitored using satellite images which is available at all the control centres.

(v) Synchrotrons condenser operation: MS, NRPC suggested to take up the matter with Hon'ble commission for ISGS generating plant in view of tariff determination and consideration of synchronous condenser mode for grid security. NRPC Sectt. shall share the compiled information with Hon'ble commission.

(vi) Adequate and trained manpower at substations: POWERGRID informed that additional manpower would be provided on all the critical substations during winter months.

Members may discuss and impress upon measures for secure and reliable grid operation during this winter season.

B.9 Low Voltage Ride Through (LVRT) in Renewable generators (agenda by NRLDC)

B.9.1 Two grid events occurred in Rajasthan on 07-May-19 and 16-Sep-19 wherein it is suspected that large solar generation got disconnected indicating non-compliance of

LVRT. During analysis and details received from constituents, a few issues emerged viz. protection setting, data availability etc.

B.9.2 In view of ongoing large RE integration which may get affected by such large outages on LVRT / HVRT, NRPC Sectt. called a meeting on 13-Nov-19.

B.9.3 One of the outcome of the meeting is forming of a Sub-group comprising of members from CEA, NRPC, NRLDC, and three solar developers which would come up with guidelines to be adopted by RE generators connected at ISTS level to avoid unintended disconnection/reduction in RE generation. It was also felt that the guidelines may require revision as and when more RE generation is integrated.

Members may deliberate and approve formation of Sub-group.

B.10 Low Availability of bus reactor at Koldam HEP and Koteshwar HEP (agenda by NRLDC)

B.10.1 At Koldam, 80 MVAR bus reactor is out since 07.06.2019 due to voltage regulation. On 29.09.2019, Koldam was asked to take reactor in service, as voltage was 422kV. However, Koldam informed that reactor could not be taken into service due to heavy rain and also a test is to be performed. Bus Reactor is yet to be charged at Koldam.

B.10.2 NTPC representative clarified that before charging of Koldam bus reactor IR value was found zero. All the connections were checked and found OK. Thereafter, NTPC informed that they have discussed with OEM BHEL and Reactor would be ready before Oct'19. However, the reactor has not been charged till date.

B.10.3 At Koteshwar, there is one 125MVAR bus reactor. The same is charged through transfer bus coupler. Thus, in case of need of transfer bus coupler, bus reactor is opened and it cannot remain in service till transfer bus coupler is engaged.

B.10.4 This poses operational challenge specially in case of high voltage conditions.

NTPC may update the status of bus reactor at Koldam.

THDC may update the remedial measures taken to decouple the operation of bus reactor and transfer bus coupler.

B.11 Dynamic reactive power support from generators (agenda by NRLDC)

B.11.1 Northern region experiences very high voltages during winter months. These high voltages are more severe during night hours when demand of Northern region is further less. IEGC Section 5.2(s) states that:

"All Users, RLDC, SLDC STUs, CTU and NLDC shall take all possible measures to ensure that the grid voltage always remains within the following operating range."

Voltage – (kV rms)		
Nominal	**Maximum**	**Minimum**
765	800	728
400	420	380
220	245	198
132	145	122
110	121	99
66	72	60
33	36	30

B.11.2 Several measures to counter these high voltages under winter preparedness actions were deliberated in earlier OCC and TCC/NRPC meetings and other forums. Most of the measures discussed are being taken care with co-ordination between different control centres and generators. It was also discussed in last TCC/NRPC meeting that adequate dynamic response from generating stations is desirable for high voltage control which is missing since long.

B.11.3 IEGC Section 6.6.6 states that:

"*The ISGS and other generating stations connected to regional grid shall generate/absorb reactive power as per instructions of RLDC, within capability limits of the respective generating units, i.e. without sacrificing on the active generation required at that time. No payments shall be made to the generating companies for such VAR generation/absorption."*

B.11.4 Reactive power response of major generating station is being shown by NRLDC at monthly OCC meetings and it has been observed that even after lot of discussions, significant response from many generators is yet to come. It has been requested in OCC meeting that every state/SLDC should also start focusing on big generator to address issues like plant reactive response, availability of telemetry so that desirable response can be achieved for better system operation.

B.11.5 In this regard, it is suggested that reactive power capability testing of generators, whose response is not found to be adequate, may be carried out after discussions in OCC meeting. This shall also help the generators to provide response for MVAR absorption/generation and hence help to provide better response from generators at the time of need.

Members may deliberate.

B.12 Involvement of SLDC officials in system studies (agenda by NRLDC)

B.12.1 Section 4.1 of Detailed Procedure for Relieving Congestion in Real Time Operation states that

"*State Load Despatch Centre (SLDC) shall assess the Total Transfer Capability (TTC), Transmission Reliability Margin (TRM) and Available Transfer Capability (ATC) on its inter-State transmission corridor considering the meshed intra State corridors for exchange (import/ export) of power with inter-State Transmission System (ISTS). These figures along with the data considered for assessment of TTC would be forwarded to the respective RLDC for assessment of TTC at the regional level. The details of anticipated transmission constraints in the intra State system shall also be indicated separately*"

B.12.2 Further, as per decision taken in the 4th NPC Meeting on 10.12.2015, there is need to carry out ATC/TTC computations of the states' control area. Over the years several training sessions have also been organized at NRLDC/NLDC for PSSe software used for simulation studies in POSOCO. Moreover, representatives of SLDCs have also been visiting NRLDC for interactions with system study engineers.

B.12.3 The issue of need of involvement of SLDC officials in power system studies has been discussed several times in TCC/NRPC as well as OCC meetings. This not only helps to assess TTC/ATC limits of the control area but also provides information about likely constraints and precautionary actions that may be taken to avoid high line/ICT loadings etc. This Intra-state TTC/ ATC computations could also help to identify margins in transfer of power among NR-Constituents. In previous meetings, some of the states had cited man power crunch to carry out the ATC/TTC computations. Here, it is

necessary to mention that this is a regulatory requirement.

B.12.4 Following is the status in this regard:

State	Sharing of Converged PSSe base case	Furnishing of TTC/ATC computation to NRLDC	TTC/ATC computation posted on SLDC website	Nodal Officer status	Study Group	Remarks
Chandigarh	No	No	No	No	No	
Delhi	Yearly	Yearly	No	No	No	Before summer. PSSE also being used for shutdown related studies
UT J&K and UT Ladakh	No	No	No	No	No	Base case shared once but period not defined
Haryana	Yearly	Yearly	No	No	No	Base case details shared quarterly by planning officials
HP	No	No	No	No	No	
Punjab	Yearly	Yearly	Yes	Yes	No	Before paddy
Rajasthan	Yes	No	No	Yes	No	No regular interval for Base case sharing
UP	Yes	Yes	Yes	Yes	No	Generally half-yearly sharing of base case
Uttarakhand	No	No	No	No	No	

B.12.5 Considering the importance and need of involvement of SLDC personnel in system studies, it is requested that Nodal officer may be identified at each SLDC and study group of 2-3 members may also be formed at each SLDC.

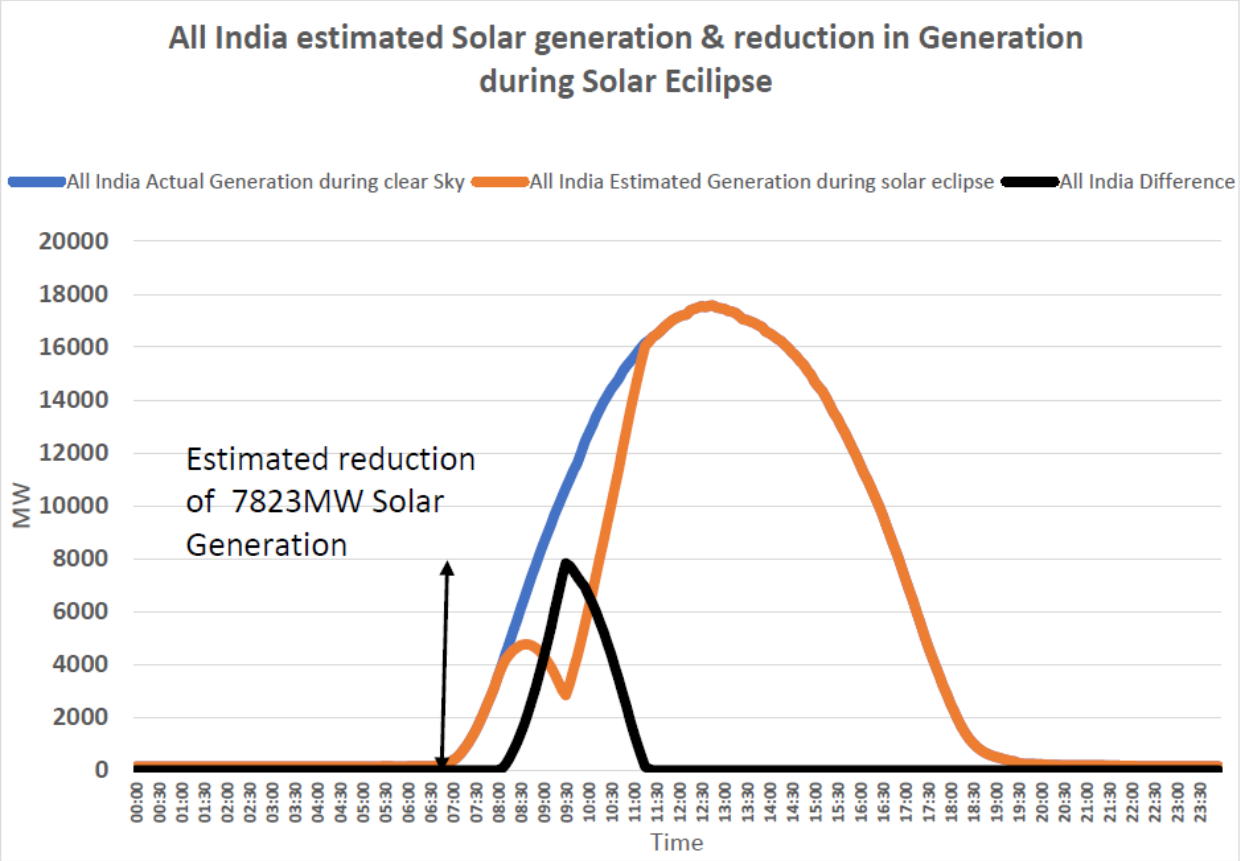
Members may deliberate.

B.13 2019-20 Solar eclipses Preparation (agenda by NRLDC)

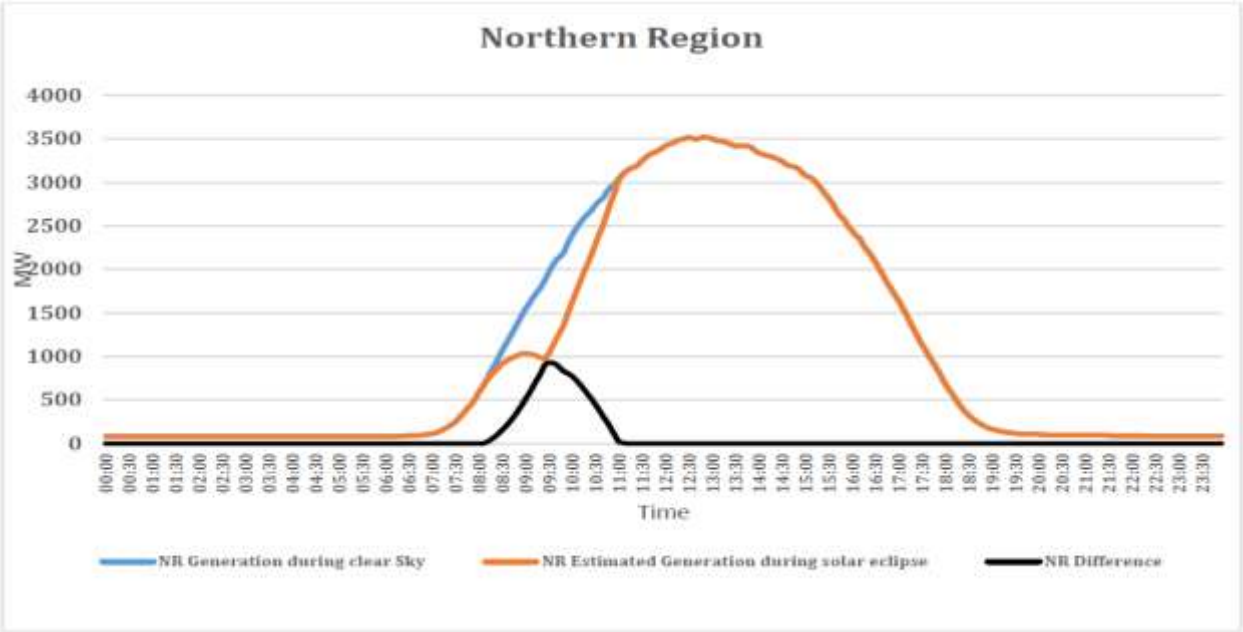
B.13.1 In 162nd and 165th OCC meeting, it was discussed that India is expected to witness two annular solar eclipses on 26th Dec 2019 and 21st Jun 2020. Since share of solar generation has been on increasing trend and has significant portion in our portfolio, it is necessary that we prepare ourselves for impact of solar eclipse on this solar PV generation.

B.13.2 For 26th Dec 2019 solar eclipse, it is estimated that eclipse shall lead to reduction of PV generation by approximately 7823MW. During initial period of eclipse, the generation is likely to reduce by 1124 MW in 1.25 hrs. However, after maximum magnitude of the solar eclipse, the generation from the solar PV plant is likely to increase by 13344 MW in 1:50 hrs. This condition will pose serious challenge to system operators to maintain load and generation balance during the eclipse period i.e. 08:04 AM to 11:58 AM.

B.13.3 It also needs to be mentioned that these results are based on data available (telemetered) in the month of March'2019. However, additional 3600-4000MW of solar generation has also been added on all India basis since then. Thus, reduction in PV is likely to be higher. (Final estimation of reduction in PV generation would be carried out in the first fortnight of December 2019).



It is estimated that Northern Region PV generation would decrease by 1000MW within 1.00 hour from start of eclipse and would increase by almost 2100 MW within 1:45 hrs after the maximum impact of the eclipse.



B.13.4 To maintain the load generation balance due to reduction in PV generation during solar eclipse, around 7823 MW generation (pan-India) from other sources (i.e. Thermal,

Hydro, and Gas) is required within a short duration of time

B.13.5 There could be 1 to 2 % average drop in demand during the eclipse compared to a normal Day due to human behaviour. NRLDC representative had presented the possible impacts of solar eclipse on generation profile and based on discussion OCC recommended the following during meeting:

- Power output from PV plants is highly dependent on Cloud coverage. Day ahead forecast of PV is very important for 26th December 2019
- State utilities specially Rajasthan shall estimate the total solar power reduction due to Solar eclipse.
- Advance coordination between SLDCs /RLDCs and NLDC is required to address ramp issues
- Keeping all state hydro units on bar and maintaining generation at minimum possible levels before start of the eclipse and increasing the generation once Solar eclipse starts. If required gas stations can also be kept on bar.
- Ramp up and Ramp down during solar eclipse start and end time needs to be closely monitored.
- Planned Shutdown of Conventional Power Stations/Transmission lines may be avoided on 26th December 2019
- HVDC set points may be kept such that adequate margin is available to tackle any contingency during solar reduction or major over drawl by states from inter-regional corridor
- Data needs to be shared after actual impact.

Members may deliberate.

B.14 Grid Events in Northern Region during Sep'19-Oct'19 (agenda by NRLDC)

B.14.1 A total 36 number of CEA standard based Grid Events have occurred in Northern Region in Sep'19 to Oct'19 period.

B.14.2 Monthly GD/GI summary is given below:

Month	Event Category		Event Share (in %)	Fault duration > 100ms/160ms
	GD	GI		
Sep'19	9	5	39%	29%
Oct'19	13	9	61%	23%
Total	22	14	100%	25%
GD as % of total		**61%**	**Fault duration > 100ms/160ms for almost every fourth event**	
GI as % of total		**39%**		

These tripping events have been discussed in various OCC, PSC and other special meetings.

B.14.3 From the above, it could be observed that during the past two month periods there are three grid event occurrence in almost every five days.

Members may like to discuss plans for reducing such tripping events and for quality analysis and implementation of remedial measures.

Despite of continuous discussion in various OCC, PSC and TCC meeting reporting from constituents is not satisfactory in view of detailed report and remedial action taken/to be taken report.

Members may like to discuss.

Apart from above, NRLDC has successfully implemented the web portal for online submission of tripping related information.

B.15 Multiple tripping in Kashmir valley due to heavy snowfall on 07, 08 November 2019 (agenda by NRLDC)

B.15.1 All 220kV and below level lines in Kashmir valley tripped during snowfall / inclement weather condition in valley on 07th and 08th November 2019. Consequently, it resulted in complete interruption of power supply in valley including generation loss of around 150-200MW at Kishenganga HEP (NHPC) and 80MW at state own generation. However, valley remained connected through the rest of the grid at 400kV level.

B.15.2 Uri generation was getting evacuated through 400kV network for most of the time

except short interruption on account of evacuation constraint. During the restoration of grid, it was found that except 220kV Kishenganga-Delina D/C, other 220kV circuits at Delina damaged thus rendering 220kV Kishenganga-Delina D/C as only evacuation for Kishenganga HEP. It is pertinent to mention that black start of Kishenganga HEP would have helped in early restoration of load at Delina.

B.15.3 Load at Pampore, Zainakote was revived after restoration of downstream network. Valley load was restored after 3-4 days of the incident. SCADA demand met plot of J&K is as below:

B.15.4 During such contingencies, the non-availability of real time data for the Kashmir valley system is also a serious hindrance in system operation

B.15.5 This agenda point was discussed during 165th OCC meeting, following are the outcome during the meeting:

- Unexpected Snowfall in early days of winter needs to be considered for pre winter maintenance. Tree cutting may be carried out in the month of October.
- Routine line maintenance in Kashmir valley area also to be done.
- Kashmir valley connectivity at 220 kV network needs to be further strengthened.
- Black start of the generating unit is very helpful for grid restoration and black start exercise of 220 kV Kishenganga HEP shall be done on priority this year.

- Mock black start exercises of Uri-I, II HEP, Lower Jhelum HEP, Pampore GT's, Upper Sindh couldn't have completed since last two years because of pending confirmation from J&K. This year also date has been changed due to pending confirmation from J&K.
- Black start exercise is a regulatory compliance and it needs to be followed by all the utilities.
- NHPC & PDD-J&K shall also coordinate and expedite the first time mock black start exercise of 220 kV Kishenganga HEP.
- Protection setting of transmission line and generating station equipment also needs to be thoroughly checked in view of mal-operation & mis-operation during fault in the system.
- Healthy capacitor in J&K shall be kept in service in view of very low voltage observed during peak demand period in J&K. J&K is yet to submit the data for capacitor requirement study being carried out in association with CPRI. The submission of data may be expedited.
- Data telemetry was available for 220 kV Delina (J&K) only. It needs to be improved for better system operation and proper visualization of the grid.

Members may deliberate.

B.16 Reliability of Telemetry (agenda by NRLDC)

B.16.1 Based on CERC/CEA regulations and decisions of TCC/NRPC, the telemetry integration is being insured before charging of new system element at ISTS (super grid) level. However, the reliability of data is very poor leading to issues in real time grid operation and monitoring.

	Northern Region summary sheet and details of current status of implementation of telemetry system												
										Updated Till:		31.10.2019	
Sl. No.	User Name	Total Nos of Stations		Telemetry not Provided				Telemetry Intemittent				Total non-availability of data in % (Telemetry not provided plus Telemetry intermittency)	
				Total nos of station		Non-availability of data in % (w.r.t. total nos of stations)		Total nos of station		Non-availability of data due to intermittency in % (w.r.t. total nos of stations)			
		GS	SS	GS	SS	GS	SS	GS	SS	GS	SS	GS	SS
1	Punjab	17	171	-	65	-	38%	-	12	-	7%	-	45%
2	Haryana	5	71	-	12	-	17%	-	-	-	-	-	17%
3	Rajasthan	20	225	-	-	-	-	4	7	20%	3%	20%	3%
4	Delhi	6	43	-	-	-	-	-	5	-	12%	-	12%
5	UP	21	197	-	-	-	-	1	36	5%	18%	5%	18%
6	Uttarakhand	10	29	-	-	-	-	6	27	60%	93%	60%	93%
7	HP	15	25	-	-	-	-	3	-	20%	-	20%	-
8	JK	4	17	3	12	75%	71%	1	5	25%	29%	100%	100%
9	POWERGRID	-	81	-	-	-	-	-	1	-	1%	-	1%
10	NTPC	15	-	-	-	-	-	1	-	7%	-	7%	-
11	NHPC	14	-	-	-	-	-	1	-	7%	-	7%	-
12	NPCIL	5	-	-	-	-	-	-	-	-	-	-	-
13	NJPC	2	-	-	-	-	-	-	-	-	-	-	-
14	THDC	2	-	-	-	-	-	1	-	50%	-	50%	-
15	BBMB	6	16	-	-	-	-	-	-	-	-	-	-
16	IPP/JV/Patran	9	5	-	-	-	-	3	3	33%	60%	33%	60%
	TOTAL	151	880	3	89	2%	10%	21	96	14%	11%	16%	21%
	Total (over all)	1031		92		9%		117		11%		20%	

Note:

1. Constituents wise details is as furnished by SLDC's / as available at RLDC.
2. 'GS' Generating Stations and 'SS' substations

B.16.2 It may be noted that there is no improvement in non-availability/intermittency of data in last one year. Month-wise non-availability is given below:

Average Data Non-availability	
Jun-18	26%
Jul-18	24%
Aug-18	24%
Sep-18	22%
Oct-18	25%
Nov-18	24%
Dec-18	22%
Jan-19	22%
Feb-19	28%
Mar-19	25%
Apr-19	26%
May-19	23%
Jun-19	25%
Jul-19	24%
Aug-19	21%
Sep-19	21%

Note: The above % is based on number of RTU/gateway reporting and not based on number of measurands. It would be much lower percentage based on number of measurands.

B.16.3 Also even though the telemetry is available correct Digital telemetry is not available. Proper status of CBs and Isolators is required for SE to form network model resembling to actual Power System Model via Topology Processor.

B.16.4 Snapshot of CB availability of 220 KV and above is given below (Based on snapshot of 28th October 2019):

S. No.	Constituent	Total CB	Available	Not Available	% Availability
1	Central Sector	3344	2708	636	85.31%
2	RRVPNL	1851	1264	587	68.29%
3	UPPTCL	2076	1437	639	69.22%
4	BBMB	261	247	14	94.64%
5	DTL	549	444	105	80.87%
6	HVPNL	806	557	249	69.11%
7	HPSEB	121	89	32	73.55%
8	PSTCL	838	587	251	70.05%
9	Uttarakhand	152	100	52	65.79%

B.16.5 Suspected/Inverted status of switches lead to formation of wrong topology and difficulty in smooth grid monitoring/operation.

B.16.6 The importance of correct Digital telemetry was discussed in all the TeST sub-committee meeting and it is observed that there is no improvement in this regard. It was decided in previous TeST Sub-committee meeting that the constituent will furnish the availability status of 220 kV and above stations and improvement there off.

B.16.7 The matter regarding availability of correct digital status is being regularly taken in various TeST Meeting /TCC meetings since 2016 but still there is negligible improvement in availability of digital status.

B.16.8 The matter was also discussed during 16th TeST Meeting where it was decided that all constituents would submit the digital status availability report to NRPC/NRLDC on quarterly basis.

B.16.9 List of Sub-Stations having poor digital telemetry is given below:

Central Sector			
Bhiwadi	Malerkotla	Vindhyanchal	
HVPNL			
Daultabad	Kabulpur	Dhanoda	

PSTCL			
Muktsar	Talwandi Saboo		
RRVPNL			
Suratgarh	KTPS		
DTL			
Bamnauli	Bawana	CCGTB	Harsh Vihar
UPPTCL			
Anapara T	CB Ganj	Greater Noida	Muradnagar
Obra B	Panki 1	Unnao	Vishnu Prayag
HPSEBL			
Baspa			

B.16.10 It was decided during 16th TeST meeting that constituents shall rectify digital status of the above list by 30th Nov 2019.

B.16.11 All members are requested to honour the decision taken in the TeST committee meeting and furnish the status regularly and take actions for making correct digital status available to Control Centres.

Members may discuss and ensure reliability of data.

B.17 Status telemetry of TCSC / FSC (agenda by NRLDC)

B.17.1 NRLDC has been continuously requesting utilities to ensure reliable telemetry at the control centre. However, it is being observed that FSC/ TCSC status is not available from following locations.

S. No.	Station	Line	FSC Data Status
1	Unnao	Bareilly (UP)	Not reporting

B.17.2 UPPTCL and POWERGRID are requested to arrange for integration of telemetry of FSC/TCSC at the earliest. Matter was also discussed in 42nd TCC Meeting, where

UPPCL was requested to procure the AI/DI card or take help from Haryana / HP to make FSC/TCSC status available.

B.17.3 Further matter was also discussed in 43rd TCC Meeting where UPPCTCL informed that they will inform the integration details in due course. However, telemetry is still not available at NRLDC.

UPPTCL/POWERGRID to update the status.

B.18 Communication availability from NLDC/ RLDCs to the nearest wide band node/ switchyard for the generating stations under AGC as per CERC order 319/RC/2018 dated 28th August 2019 (agenda by NRLDC)

B.18.1 Hon'ble Central Electricity Regulatory Commission (CERC), in the matter of Automatic Generation Control (AGC) implementation in India, has issued the direction that all thermal ISGS stations with installed capacity of 200 MW & above and all hydro stations having capacity exceeding 25 MW excluding the Run-of-River Hydro Projects irrespective of size of the generating station and whose tariff is determined or adopted by CERC, to install equipment at the unit control rooms for transferring the required data for AGC as per the requirement to be notified by the National Load Despatch Centre (NLDC). The CERC Order 319/RC/2018 dated 28th August 2019 is available at http://www.cercind.gov.in/2019/orders/319-RC-2018.pdf.

B.18.2 In the Order, Hon'ble CERC directed the Central Transmission Utility (CTU) to commission communication facility from NLDC/ RLDCs to the nearest wide band node/ switchyard for the generating stations in a redundant and alternate path ensuring route diversity and dual communication. The list of plants identified for AGC operation by NLDC as per CERC Order is attached as **Annex-B.18.**

B.18.3 Relevant extracts from the CERC Order 319/RC are given as below:

…The Central Transmission Utility (CTU) is directed to have communication availability from NLDC/ RLDCs to the nearest wide band node/ switchyard for the generating stations in a redundant and alternate path ensuring route diversity and dual communication.

…The expenditure as a result of compliance of the above directions may be claimed as per relevant regulations or provisions of the PPA.

B.18.4 Considering the importance of communication links being used for automatic controls, same common points may not be used along the path to ensure near 100% availability. Also, in line with the CERC Order, all the power plants are supposed to take necessary action for arranging the communication (through redundant and alternate paths) from the existing nearest wideband communication node to the unit control room through two fibre optic cables, in coordination with Central Transmission Utility (CTU).

B.18.5 It may please be noted that all the ISGS stations whose tariff is determined or adopted by CERC should be AGC-enabled before 28th February 2020 as per the Order of the Hon'ble Commission.

B.18.6 On 27th September 2019, nominated nodal officers from CTU discussed the detailed action plan regarding the communication to AGC power plants at NLDC, New Delhi. Two Ethernet ports would be made available from existing SDH node available near generating station, wherever spare ports are available. In case of constraint, upgradation of equipment/cards as required shall be considered while working out requirement for AGC communication connectivity. RLDCs/NLDC will coordinate with concerned generating station for connectivity of Ethernet port to RTU at generating station for AGC application.

B.18.7 In some cases, requirement of usage of STU network for AGC connectivity is expected. The same shall be brought out by CTU. RLDCs/NLDC shall facilitate necessary coordination between STU & CTU for providing Fibres, Equipment, if required.

B.18.8 The matter was also discussed during 16th TeST Meeting held at NRPC on 14th November 2019 where CTU informed that for Northern Region only 4 plants are having dual connectivity with path redundancy and work is in progress of 13 stations where work is expected to be completed by 2021. POWERGRID also submitted tentative plan for redundant channel connectivity for remaining 13 stations.

B.18.9 After detailed discussion it was decided that single channel for all plants shall be established by 31st Dec 2019 and POSOCO requested POWERGRID to provide path level redundancy for standby channel at the earliest and priority may be given for links required for AGC connectivity.

B.18.10 Further POWERGRID may plan for remaining 13 stations for providing redundant

connectivity.

For kind discussion and preparation of the detailed plan.

B.19 Training programme on Power System Protection (Level-2 and Level-3) for Protection System Engineers

B.19.1 While discussing the issue of reimbursement of expenditure of NRPC Sectt. in the 35th NRPC meeting dt. 09.07.2015, it was decided that annual contribution of the members should be kept at same level and additional fund could be used for arranging capacity building programmes, workshops, brainstorming sessions and other purposes with the approval of Chairperson, NRPC.

B.19.2 In an effort to ensure improvement in the protection system among the utilities of Northern Region, a Group was constituted by NRPC Sectt. on 26.08.2015 to suggest measures for improvement in protection system among the utilities of Northern Region. Recommendations of the duly constituted Group inter-alia include organizing three level training (basic training for substation engineers [Level-1], basic training for protection system engineers [Level-2] and advanced training for protection system engineers [Level-3]) for NR constituents under capacity building activities. The Group suggested the modules for Level-2 & Level-3 trainings and recommended that Level-1 training may be developed & organized by the concerned organization. Recommendations of the Group were concurred in the 38th NRPC meeting held on 25th October 2016.

B.19.3 First batch of Level-2 and Level-3 protection system training was successfully conducted for 25 participants through POWERGRID as per following details:

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

B.19.4 In the 40th TCC and 43nd NRPC meeting held on 29th & 30th October 2018, it was decided to conducted second round of Level-2 and Level-3 training (classroom as well as hands-on) for 50 engineers by engaging **any of the OEM of relays** and book the expenditure from NRPC fund.

B.19.5 'Manual for Procurement of Consultancy & Other Services 2017', issued by Department of Expenditure (available on https://doe.gov.in/manuals), mentions:

Para 1.3.2: "Consultancy services" means any subject matter of procurement (which as distinguished from 'Non-Consultancy Services' involves primarily non-physical project specific, intellectual and procedural processes where outcomes/deliverables

would vary from one consultant to another), other than goods or works, except those incidental or consequential to the service and includes professional, intellectual, **training** and advisory services or any other service classified or declared as such by a Procuring Entity but does not include direct engagement of a retired Government servant. These Services typically involve providing expert or strategic advice e.g., management consultants, policy consultants, communications consultants, Advisory and project related Consulting Services which include, feasibility studies, project management, engineering services, finance, accounting and taxation services, **training** and development etc.

Para 3.10.1: Under some special circumstances, it may become necessary to select a particular consultant/service provider where adequate justification is available for such single source selection in the context of the overall interest of Procuring Entity. In Finance Ministry's 'Manual of Policies and Procedure of Employment of Consultants', this is called 'Selection through Direct Negotiations', which is not the generally prevalent nomenclature. The selection by ***SSS/nomination is permissible under exceptional circumstances such as:***

….

iv) At times, other **PSUs** or Government Organizations are used to provide technical expertise. It is possible to use the expertise of such institutions on a SSS basis.

….

Procuring Entity shall ensure fairness and equity and shall have a procedure in place to ensure that:

a) the prices are reasonable and consistent with market rates for tasks of a similar nature; and

b) the required consultancy services are not split into smaller sized procurement.

B.19.6 Considering the provisions in the aforementioned Manual of Deptt. Of Expenditure to engage PSU for training services, POWERGRID was requested on 24.10.2019 (**Annex-B.19.1**) to submit budgetary quote for 05 days each Level-2 and level-3 residential training program on protection system for 50 protection system engineers of NR with faculties exclusively from OEM(s) such as ABB, SIEMENS, GE, etc.

B.19.7 POWERGRID has submitted their offer on 26.11.2019 with following terms & conditions (**Annex-B.19.2**):

a. **Programme**: 5 days Level-2 and 5 days Level-3 residential protection system training for protection system engineers of NRPC constituents.

b. **Venue**: POWERGRID Academy of Leadership (PAL) institute, Manesar

c. **Scope**: Logistics shall be arranged by POWERGRID. Faculties (mainly from the OEM) will be arranged.

d. **Program Fee**: Rs. 66,500 per participant (18% GST extra)

e. Terms of payment: 100% payment within 15 days from completion of program & submission of invoice. Invoicing shall be done for a batch size of minimum 20 participants.

Members may like to deliberate.

C. COMMERCIAL ITEMS

C.1 Default in payment of outstanding dues and surcharge by beneficiaries

C.1.1 The details of outstanding dues are as under:

THDC (as on 08.11.19)

Discoms	Principal Outstanding (Rs. in Cr.)	Principal due for more than 45 days (Rs. in Cr.)	Late Payment Surcharge	Remarks
BRPL, Delhi	52.90	25.66	**83.01**	Payment due for the bills raised in the months (i) For Energy bills- Aug'19 to Nov'19 (ii) For LPSC bills - Mar'16 to Nov'19
BYPL, Delhi	109.33	109.33	**157.18**	Payment due for the bills raised in the months (i) For Energy bills- Mar'15 to July'19 (ii) For LPSC bills - Mar'11 to Nov'19
PDD, J&K	187.87	177.18	**31.12**	Payment due for the bills raised in the months (i) For Energy bills - Nov'18 to Oct'19 (ii) For LPSC bills - Dec'18 to Nov'19
UPPCL, UP	1372.93	1132.18	**171.34**	(A) Payment due for the bills raised in the months

				(i) For Energy bills - Nov'18 to Nov'19 (ii) For LPSC bills - Nov'18 to Nov'19 (B) UPPCL has stopped verification of LPS bills since Oct'18. Matter has been discussed in various meetings but the same is still to be resolved.
PSPCL, Punjab	42.93	0.24	**0.93**	Payment due for the bills raised in the months (i) For Energy bills - Sep'19 to Nov'19. (ii) For LPSC bills - Jul'16 to Feb'17 and Oct'19 to Nov'19
JdVVNL, Rajasthan	23.67	9.46	**0.59**	Payment due for the bills raised in the months (i) For Energy bills - Jul'19 to Nov'19 (ii) For LPSC bills - Jul'19 to Nov'19
AVVNL, Rajasthan	17.85	6.02	**0.33**	Payment due for the bills raised in the months For Energy bills - Aug'19 to Nov'19 (ii) For LPSC bills - Aug'19 to Nov'19
UPCL, Uttarakhand	35.03	8.67	**0.62**	Payment due for the bills raised in the months

				(i) For Energy bills - Aug'19 to Nov'19 (ii) For LPSC bills - Sep'19 to Nov'19

C.1.2 As on 08.11.2019, an outstanding amount of approx. Rs. 2367 Cr. is due for payment. THDCIL has been vigorously pursuing with all the beneficiaries for expeditious payment. Despite vigorous follow up, some beneficiaries, namely BSES Yamuna Power Limited (BYPL), PDD (J&K Discom), UPPCL (UP Discom), AVVNL & JdVVNL (Rajasthan Discoms) UPCL (Uttarakhand Discom) and PSPCL (Punjab Discom) continue to default in making timely payments.

C.1.3 Such huge outstanding dues as brought out above, are seriously affecting the cash flow of THDCIL and, therefore, THDCIL is compelled to avail borrowings to meet its day to day working capital needs and for servicing its long term debts. Non-payment of such a considerable amount has serious adverse impacts on THDCIL and it impairs its financial health. Delay in payments also increase financial burden on the Discoms in the form of LPS.

C.1.4 The above beneficiaries should release the outstanding amount including LPS, as mentioned above, which is due for more than 45 days urgently.

SJVNL (as on 10.11.19)

S.No.	Beneficiary	Total Dues (in Rs Cr.)	Remarks
1.	Govt. of HP/HPSEB	22.39 + 314.94 (LPS)	GoHP, in principle, agreed to release Rs. 8.39 Crore along with Rs. 3.51 Crore (through PTC) in April 2019, which has still not been released. GOHP / HPSEB is requested to release the agreed amount of Rs 11.90 crore as well as balance outstanding along with LPS on priority.

2.	PDD, J&K	325.42	During the current FY PDD, J&K has released only Rs 70.00 Crore (Rs 20 Cr during July 2019 and Rs 50 Crore during the month of September 2019).
3.	UPPCL, Uttar Pradesh	247.92 + 159.02(LPS)	UPPCL is requested to release the outstanding on priority.
4.	AVVNL	31.13	AVVNL &JDVVNL are requested to clear the outstanding dues at the earliest.
5.	JdVVNL	18.97	
6.	PSPCL	10.25 + 5.27(LPS)	PSPCL is requested to release the outstanding on priority.
7.	UPCL	95.13 + 0.69(LPS)	UPCL is requested to release the outstanding on priority.

C.1.5 The outstanding of SJVN as on 10.11.2019 was Rs 746.40 Crore (excluding LPS & interest) for a period more than forty-five (45) days from the Beneficiaries of NJHPS & RHPS. The Beneficiaries viz. PDD, J & K, UPPCL, UPCL, Govt. of HP & Rajasthan Discoms (i.e. Ajmer and Jodhpur) have not cleared their outstanding dues inspite of repeated requests and follow ups. The Beneficiaries may be pursued to liquidate their outstanding on priority as it is seriously affecting the cash flow of SJVN and would also hamper the MOU targets assigned by MOP, GOI.

NHPC (as on 21.11.19)

(Rs. in Cr.)

Sl. No.	Beneficiary	Principal Dues	Outstanding Dues of more than 45 days	Surcharge up to 31.10.2019	Total Dues including Surcharge
1.	PDD, J&K	1416.03	1302.37	171.28	1587.30
2.	UPPCL, UP	973.72	870.53	77.70	1051.42
3.	PSPCL, Punjab	172.08	124.53	6.50	178.58
5.	UPCL, Uttarakhand	95.83	76.94	3.64	99.46

POWERGRID (as on 05.11.19)

Rs. in Cr.

Sl. No.	DIC	45-90 days dues	>90 Days dues
1	UP	367.04	0.00
2	TRN ENERGY (UP)	26.93	97.23
3	KSK Mahanadi(UP)	30.41	460.41
4	RKM POWERGEN (UP)	12.37	0.00
6	PUNJAB	84.06	1.82
7	JAMMU AND KASHMIR	67.50	212.74
8	GMR KEL	29.74	0.00
9	UTTARAKHAND	64.09	0.00
10	RAJASTHAN (JODHPUR) JDVVN	82.88	25.65
11	RAJASTHAN (AJMER) AVVN	52.36	0.00
12	LANCO BUDHIL HYDRO	0.26	8.80
13	LANCO BUDHIL (PTC)	0.00	25.08
14	PTC	0.00	6.18
15	LANCO ANPARA	0.00	0.03
16	MB POWER	24.35	52.34

17	JITPL West Central Railway (Raj.)	0.00	0.59
18	National Fertilizers Ltd.	0.00	0.48
19	DB POWER (RAJ)	21.14	25.68
20	Himachal Sorang	0.00	72.00

C.2 Opening of Letter of Credit (LC) (Agenda by POWERGRID)

C.2.1 The following beneficiaries have to open/enhance LC as listed below:

Rs. in Cr.

DIC Name	LC Required	LC Available
BRPL	85.09	0.00
BYPL	49.71	0.00
PDD J&K	30.43	0.00
Punjab	176.85	100.62
TRN Energy	32.91	13.29
KSK Mahanadi (UP, AP, TNEB)	148.95	108.45
DB Power (Raj.)	25.94	21.76
Maruti Clean Coal and Power Ltd(Raj)	21.80	20.09
Chandigarh	6.38	3.71
NDMC	4.51	2.55
JITPL-West Central Railway (Rajasthan)	5.63	4.89

DIC Name	LC Required	LC Available
Dhariwal Infra (UP)	15.28	13.69
JITPL-WCR & Raj	5.63	4.89
PTC(LANCO Amarkantak)	32.74	14.90

C.2.2 Opening/Enhancement of LCs are being continuously pursued with the DICs. The beneficiaries may renew LC for the requisite amount in favour of POWERGRID.

C.2.3 Beneficiaries may kindly update the status of LC opening.

C.3 Opening of Letter of Credit (LC) (Agenda by NHPC)

C.3.1 The LC of Rs.274.806 Cr opened by JKPCL on behalf of PDD, J&K in favour of NHPC Ltd. has been expired on 13.11.2019.

Constituent members may like to discuss.

C.4 Non-payment of LPS by the beneficiaries (Agenda by SJVNL)

C.4.1 It is to point out that while releasing the amount of energy bill raised by SJVN Limited, the amount of late payment surcharge is being excluded by the beneficiaries.

C.4.2 LPS is an integral part of energy bills which is imposed/charged in view of CERC regulation and provision contained in the Power Purchase Agreement for non-payment of dues. Hence, the non-payment of LPS is violation of Power Purchase Agreement and CERC guidelines on the subject.

C.4.3 The beneficiaries may be advised to make payment of energy bill including the amount of LPS in future while making the payments.

C.5 Consent from Beneficiaries for purchase of power from Dhaulasidh Hydro Electric Project (66 MW) in Himachal Pradesh (Agenda by SJVNL)

C.5.1 Government of Himachal Pradesh has also allotted Dhaulasidh Hydro Electric Project (66 MW) to SJVN Ltd on Memorandum of Understanding (MoU) Basis. The project is situated on river Beas in district Hamirpur & Kangra in the state of Himachal Pradesh. MoU for execution of Dhaulasidh HEP was signed with the Govt. of Himachal Pradesh on 25th September, 2019.

C.5.2 Dhaulasidh HEP is a run-of- river with with a small live storage for peaking during lean season and is designed to generate annually 304 MUs in 90 % dependable year and the commissioning of the project is expected by September, 2024.

C.5.3 As per MoU signed with GoHP, 12 % or staggered free power royalty slabs on mutual agreement basis as approved by GoHP and another 1% additional free power for Local Area Development Fund (LADF) of the energy generated from project after excluding auxiliary consumption and transformation losses (net energy) shall be given to the State Government at the interconnection point of the power station with the state / Central Transmission Utilities. SJVN would be in a position to offer the remaining power to interested States / UTs of the Northern Region as per the prevalent policies of Govt. of India issued from time to time.

C.5.4 The Project is proposed to be financed in 80: 20 debt equity ratio. The estimated project cost of Rs 654.21 Cr. (including IDC and Financing Charges) at December, 2018 price level has been proposed in the draft PIB proposal for Investment approval. The levelized tariff of the project is Rs 4.54 per kWh based on above mentioned project cost.

C.5.5 All the constituent members are requested to convey the consent for purchase of power, indicating the quantum of power required from this Hydro project.

C.6 Consent from Beneficiaries for purchase of power from Luhri Hydro Electric Project Stage-I (LHEP Stage-I) in Himachal Pradesh (210 MW) (Agenda by SJVNL)

C.6.1 Government of Himachal Pradesh has also allotted Luhri Hydro Electric Project Stage-I (LHEP Stage-I) (210 MW) to SJVN Ltd. on Memorandum of Understanding (MoU) Basis. The project is situated on river Satluj in district Shimla & Kullu in the state of Himachal Pradesh. MoU for execution of LHEP Stage-I was signed with the Govt. of Himachal Pradesh on 25th September, 2019.

C.6.2 LHEP Stage-I is a run-of- river with Diurnal Storage type scheme and is designed to generate annually 758.20 MUs in 90 % dependable year and the commissioning of the project is expected in May, 2025.

C.6.3 As per MoU signed with GoHP, 12 % or staggered free power royalty slabs on mutual agreement basis as approved by GoHP and another 1% additional free power for Local Area Development Fund (LADF) of the energy generated from project after excluding auxiliary consumption and transformation losses (net energy) shall be given to the State Government at the interconnection point of the power station with the state / Central Transmission Utilities. SJVN would be in a position to offer the remaining power to interested States / UTs of the Northern Region as per the prevalent policies of Govt. of India issued from time to time.

C.6.4 The Project is proposed to be financed in 80: 20 debt equity ratio. The estimated project cost of Rs 1743.77 Cr. (including IDC and Financing Charges) at January 2019 price level has been proposed in the draft PIB proposal for Investment approval. The levelized tariff of the project is Rs 4.44 per kWh based on above mentioned project cost.

C.6.5 All the constituent members are requested to convey the consent for purchase of power, indicating the quantum of power required from this Hydro project.

C.7 Consent for purchase of power from Naitwar Mori Hydro Electric Project (NMHEP), 60 MW (2X30 MW) in Uttarakhand (Agenda by SJVNL)

C.7.1 Government of Uttarakhand (GoUK) has allotted Naitwar Mori Hydro Electric Project (2X30 MW) on River Tons (a tributary of river Yamuna) in district Uttarkashi in the state of Uttarakhand to SJVN Ltd. A Memorandum of Understanding (MoU) for execution of Naitwar Mori HEP was signed with the GoUK on 21st November, 2005.

C.7.2 The investment approval for implementation of the project has been accorded by MOP, GOI on 16.10.2017 with an estimated cost of Rs 648.33 Cr at October, 2016 price level. The power from the project shall be evacuated through 220 KV D/c line from NMHEP to Mori 220/132 KV S/s of PTCUL.

C.7.3 The Naitwar Mori Hydro Electric Project (2X30 MW) is a run-of- river type scheme and is designed to generate Annually 265.50 MUs in 90 % dependable year and the commissioning of the project is expected in December, 2021.

C.7.4 As per the condition of Memorandum of Understanding (MoU), 12% of the net energy shall be given to Government of Uttarakhand (GoUK) free of cost. SJVN would be in

a position to offer the balance power being generated from project to interested states / UTs of the Northern Region as per the prevalent policies of Govt. of India issued from time to time.

C.7.5 The Project is planned to be financed on 70:30 debt equity ratio. The levelized tariff of the generated power is Rs 6.39 per Kwh based on above mentioned project cost and the final tariff shall be calculated by the appropriate Regulatory Commission.

C.7.6 All the constituent members are requested to convey their consent for purchase of power, indicating the quantum of power required from this Hydro project.

C.8 Status of DSM Charges (Agenda by NRLDC)

C.8.1 Northern Region Deviation Pool Account is being maintained & operated by NRLDC, in accordance with the CERC Regulations. As per proviso (1) of Regulation 10 of CERC (Deviation Settlement Mechanism and related matter) Regulations, 2014, the payment of charges for Deviation shall have a high priority and the concerned constituents shall pay the indicated amounts within 10 days of issue of statement of Charges for Deviation including Additional Charges for Deviation by the Secretariat of the respective Regional Power Committee in to the "Regional Deviation Pool Account Fund" of the concern region.

C.8.2 DSM Charges payable to pool status as on 07th November 2019 considering week no-27 (due date of which is 31st October 2019) is indicated below: -

All figures in Rs. Lakhs

Sl. No.	Constituents	DSM Charges Payable (Principal)	Deviation DPI up to FY 2018-19	Total Outstanding	Remarks
1	Jammu & Kashmir	3619.97	378.53	3998.50	Outstanding includes the principal amount which is due for more than 90 days
2	Powergrid-NR	290.72	-	290.72	
3	Uttarakhand	411.26	4.08	415.33	-
4	Punjab	97.86		97.86	-

5	Himachal Sorang	-	0.08	0.08	-

C.8.3 Upon continuous persuasion from NRLDC for settlement of the payments, PDD vide letter Ref No. CE/C&S/J/T-4LU)1177/79, dated 30/08/2019 intimated that they are in the process of clearing all the outstanding dues, but payments are delayed due to some unavoidable reasons i.e. non-availability of internet services and the same shall be released on priority as soon as the internet services are restored in Kashmir Valley.

C.8.4 After situation in Union territory of Jammu and Kashmir became normal, NRLDC again vide letter dated 25/10/2019 requested PDD to release all the outstanding. PDD has informed that they are in the process of clearing the outstanding, however, till date UT J&K PDD has not cleared its outstanding.

C.8.5 Upon continuous persuasion from NRLDC for settlement of the payments, POWERGRID has made a payment of Rs. 187.53 lakhs against the deviation charges. NRLDC vide letter dated 05/11/2019, requested POWERGRID to release all the outstanding. The same is still awaited.

C.8.6 All payable utilities are requested to clear the outstanding's as per CERC Regulations at the earliest so that, receivable parties will be paid and to avoid further increase of Delay Payment Interest.

C.8.7 Members may please deliberate.

C.9 Delay Payment Interest (Agenda by NRLDC)

C.9.1 Few entities are deducting TDS while payment of delay payment interest of the pool accounts. As the residual amount after disbursement to the receivable entities in the pool accounts needs to transferred to PSDF (Fund belonging to Govt. of India), deduction of TDS may be exempted from the payments of delay payment interest of pool accounts.

C.9.2 Members may please deliberate

C.10 Status of LC against Deviation Charges delayed payment (Agenda By NRLDC)

Sl. No	Name of NR Pool members	LC Amount (Rs. in Lakh)	Status	No of defaults in Deviation Payment	
				FY 18-19	FY 19-20

1	UT Chandigarh	509.00	LC of Rs.509 Lakhs opened & Valid up to 31.03.2020	9	**2**
2	Greenko Budhil	40.13	LC of Rs.17.19 Lakhs opened & Valid up to 29.05.2020. LC needs to be enhanced	4	**9**
3	Uttar Pradesh	768.05	LC not opened	24	**-**
4	Uttarakhand	501.45	LC not opened	10	**17**
5	Himachal Pradesh	395.72	LC not opened	1	**-**
6	PDD, (UT J&K,UT Ladakh)	954.05	LC not opened	34	**12**
7	EPPL	1.39	LC not opened	10	
8	Punjab	719.46	LC not opened	27	**15**
9	PGCIL	25.22	LC not opened	15	**17**
10	Rajasthan	619.25	LC not opened	4	**-**
11	NFL	1.28	LC not opened	4	**-**
12	Nepal	29.53	LC not opened	2	**-**
13	Azure Power	49.87	LC not opened	0	**8**
14	Renew Power	12.02	LC not opened	0	**2**

C.10.1 Defaulting entities are requested to open the LC against Deviation Charges as per the Regulations of CERC.

Members may please deliberate.

C.11 Reactive Energy charges status (Agenda by NRLDC)

C.11.1 Reactive Energy Charges status as on 07th November 2019 considering week no-27 (due dated of which is 31st October 2019) is indicated here in below: -

All figures in Rs. Lakhs

Sl. No	Constituents	RE Charges Payable (Principal)	RE DPI up to FY 2018-19	Total Outstanding	Remarks
1	UT Jammu & Kashmir/UT Ladakh	960.34	215.75	1176.09	**Outstanding includes the principal amount which is due for more than 90 days**
2	Delhi	35.22	40.07	75.29	**-**
3	Punjab	0.00	9.29	9.29	**-**

C.11.2 Upon continuous persuasion from NRLDC for settlement of the payments, PDD vide letter Ref No. CE/C&S/J/T-4LU)1177/79, Dt:30/08/2019 intimated that they are in the in the process of clearing all the outstanding dues, but payments are delayed due to some unavoidable reasons i.e. non-availability of internet services, and the same shall be released on priority as soon as the internet services are restored in Kashmir Valley.

C.11.3 After the situation in UT of J&K became normal, NRLDC vide letter Dt: 25/10/2019 requested PDD to release all the outstanding. The same is still awaited.

C.11.4 All Payable constituents are requested to release outstanding RE charges payments at the earliest so that, receivable parties will be paid and to avoid further increase of Delay Payment Interest.

Members may please deliberate.

C.12 Congestion Charges (Agenda by NRLDC)

C.12.1 Congestion charge statement is being issued by NRPC. The amount received in the congestion charges account was disbursed to the receivable parties.

C.12.2 Outstanding amount against the entities payable to pool (as on 07th Nov-2019) is indicated here in below: -

All fig. In Rs. lakhs

Sl. No.	Constituents	Congestion Charges Delay Payment Interest 18-19
1	UT Jammu and Kashmir/ UT Ladakh	4.04181
2	Railways	0.29993
3	Himachal Pradesh	0.12411
4	SJVN	0.01101

Members may please deliberate.

C.13 Reconciliation of Pool Accounts (July-19 to Oct-19) (Agenda by NRLDC)

C.13.1 Reconciliation statement of Deviation Charges and Reactive Energy Charges has been forwarded to entities and uploaded on website by NRLDC on 10.10.2019 & 09.10.2019 respectively. The constituents are requested to verify /check the same & comments, if any, on the same were to be reported to NRLDC by 31.10.2019. In case of non-receipt of any communication it will be presumed that reconciliation statement stands reconciled.

C.13.2 However, except ADHPL, NHPC, Azure Power, THDC & Rajasthan (only RE Charges) no one has sent any communication to NRLDC.

C.13.3 It is requested once again to send the signed reconciled statement 26.11.2019. In case of non-receipt of any communication, it will be presumed that reconciliation statement stands reconciled.

C.14 Status of Ancillary Services (Agenda by NRLDC)

C.14.1 The Status from week 01 to 28 of financial year 2019-20 as on 07th Nov 2019 is as herein below as per NRPC bill:

(All fig**.** In Rs**.** Cr**.)**

Week		Surplus in DSM A/c	RRAS			AGC			FRAS
			UP	Down	Net	UP	Down	Net	
W-1	(01.04.19-07.04.19)	29.63	2.75	0.28	2.46	1.27		1.27	0.02453
W-2	(08.04.19-14.04.19)	41.47	2.68	0.50	2.18	2.25		2.25	0.02808
W-3	(15.04.19-21.04.19)	47.01	0.85	0.18	0.67	1.13		1.13	0.02706
W-4	(22.04.19-28.04.19)	40.55	2.58	0.20	2.38	1.02		1.02	0.05016
W-5	(29.04.19-05.05.19)	36.09	0.79	1.41	-0.62	0.00		0.00	0.02166
W-6	(06.05.19-12.05.19)	45.15	15.09	0.18	14.91	1.20		1.20	0.02303
W-7	(13.05.19-19.05.19)	39.60	5.73	0.42	5.31	2.69		2.69	0.02317
W-8	(20.05.19-26.05.19)	51.31	16.63	0.43	16.20	1.53		1.53	0.02310
W-9	(27.05.19-02.06.19)	37.85	9.97	1.23	8.74	0.96		0.96	0.00000
W-10	(03.06.19-09.06.19)	17.92	5.16	0.23	4.93	2.51		2.51	0.00212
W-11	(10.06.19-16.06.19)	42.77	13.98	0.84	13.14	2.40		2.40	0.01129
W-12	(17.06.19-23.06.19)	24.80	11.28	0.18	11.10	2.92		2.92	0.00194
W-13	(24.06.19-30.06.19)	7.35	18.62	0.37	18.25	1.88		1.88	0.00237
W-14	(01.07.19-07.07.19)	17.36	16.65	0.52	16.13	1.52		1.52	0.00310
W-15	(08.07.19-14.07.19)	14.66	4.76	0.31	4.45	1.86		1.86	0.00022
W-16	(15.07.19-21.07.19)	38.12	19.50	0.66	18.84	2.27		2.27	0.00000
W-17	(22.07.19-28.07.19)	27.38	12.11	0.29	11.82	1.50		1.50	0.00000
W-18	(29.07.19-04.08.19)	18.12	13.71	0.33	13.38	1.86		1.86	0.00000
W-19	(05.08.19-11.08.19)	15.47	1.47	1.23	0.23	2.35		2.35	0.00189
W-20	(12.08.19-18.08.19)	23.19	5.30	0.95	4.35	1.21		1.21	0.00062
W-21	(19.08.19-25.08-.9)	17.71	6.34	0.68	5.66	1.19		1.19	0.00000
W-22	(26.08.19-01.09.19)	23.23	12.50	0.88	11.62	0.58		0.58	0.00002
W-23	(02.09.19-08.09.19)	17.66	5.74	1.09	4.64	0.25		0.25	0.00000
W-24	(09.09.19-15.09.19)	11.89	16.60	0.34	16.26	0	0.11	-0.11	0.00000
W-25	(16.09.19-22.09.19)	9.70	5.01	0.91	4.10	0.67		0.67	0.00000
W-26	(23.09.19-29.09.19)	8.40	11.01	0.43	10.58	0.25		0.25	0.00000
W-27	(30.09.19-06.10.19)	9.02	11.40	0.17	11.23	0.44		0.44	0.00000
W-28	(07.10.19-13.10.19)	4.60	7.93	0.36	7.57	0.56		0.56	0.00000

C.14.2 Ancillary Services i.e. RRAS, AGC & FRAS has been settled up to Week 28 of FY 2019-20. There is no outstanding amount for payment of RRAS, AGC & FRAS.

C.15 NRLDC Fee & Charges (Agenda by NRLDC)

C.15.1 The bills are being emailed to all users on the day of billing and soft copies of bills are also available to the link "https://nrldc.in/commercial/bill-details/". NRLDC is also sending the hard copies of bills to all the users regularly on monthly basis.

C.15.2 Status of outstanding against NRLDC Fee & Charges including PLI and supplementary bills issued on Aug 2019 (due date for which is 17.10.2019) are shown here in below:

Sl. No.	Entities	Amount Outstanding in Rs.	Remarks
1	UT J&K/UT Ladakh	1,38,62,457	Outstanding against Feb-19 onwards bills (Rs. 1,34,95,976/-) and Rs. 3,57,278 against Surcharge outstanding.
2	Himachal Sorang HEP	1,66,035	Outstanding against PLI 2016-17 and PLI 2017-18 and July-19 Bills.

C.15.3 Excluding above outstanding, details of some minor outstanding against 'excess rebate deduction' and surcharge are attached as **Annex-C.15**.

C.15.4 It is requested to the users to clear the outstanding at the earliest.

C.15.5 NRLDC is requesting all the Users that while making the payment please provide the payment details in the prescribed format, as provided below:

NRLDC Fee & Charges Format for Payment made /TDS Deduction.

USER Name									
BILLING DETAILS			SETTLEMENT DETAILS						
BILL MONTH AND YEAR -	DATE of Bill issue	Billed AMOUNT	Date of Bill Receipt by Users	Mode of Payment RTGS/NEFT/Others	Date of Clearing of Payment from Users Bank A/c	Amount Paid into POSOCO Fee & Charge A/c by Users	TDS-deducted by Users if any	Rebate-deducted by Users if any	Amount-Admitted (Paid+TDS +Rebate) by Users
			(1)	(2)	(3)	(4)	(5)	(6)	(7)=(4)+(5)+(6)

C.15.6 However, it is observed that most of the Users are not providing the details as per the enclosed formats.

C.16 Reconciliation of NRLDC Fee and charges (Agenda by NRLDC)

C.16.1 NRLDC vide letter dated 25/10/2019 has sent the reconciliation statements of NRLDC Fee and Charges for the quarter-2, 2019-20 to all the users. The users were requested to send the duly signed and verified copy of reconciliation statement as a token of acceptance by 22-11-2019. Reconciliation from ADHPL, Koteshwar HEP, NAPS, NRSS XXXI (B) Transmission Ltd. & NTPC (for all stations) has been received only.

C.16.2 Entities are requested to verify the Reconciliation statements and send the duly signed copy as a normal practice. In case non receipt of any communication with in one week from commercial sub-committee meeting, it will be presumed that statement stands reconciled.

C.17 Reconciliation of STOA (Short Term Open Access) Charges disbursement (Agenda by NRLDC)

C.17.1 NRLDC has sent the reconciliation statement of open access disbursement for the Quarter- 2 of financial year 2019-20 on 23rd Oct 2019. The applicants/STU/SLDCs were requested to verify /check the reconciliation statement & comment if any on the same by 15th Nov 2019.

C.17.2 The reconciliation statements of the following STU/SLDCs are received:

Sl. No.	Name of the STU/SLDC	Date of receiving Reconciled statement
1	Karnataka Power Transmission Corporation Ltd.	13-Nov-19

C.17.3 The reconciliation statements of the following applicants are received:

Sl. No.	Name of the Applicant	Date of receiving Reconciled statement
1	Tata Power Trading Corp. Ltd.	5-Nov-19

C.17.4 In case of non-receipt of any communication till 15th November 2019, it will be presumed that reconciliation statement stands reconciled.

C.18 Status of Outstanding STOA Delay Payment Interest as on 13th November 2019: STOA Delay Payment Interest (Agenda by NRLDC)

C.18.1 NRLDC is the nodal agency for processing of STOA transaction where point of drawal is located in Northern Region in accordance with CERC Open Access Regulations. However, some of the STOA applicants making delayed payment and therefore accountable for payment of interest charges.

C.18.2 The status of pending interest amount is as follows:

Amount in Rs.

Sl. No.	Applicant Name	Transaction Months	Total Pending Interest Amount
1	NORTHERN RAILWAYS (UP)	March, April & May 2019	58,209
2	PTC India Ltd	September & October 2019	46,694
3	Gati_Chuzachen HEP	September & October 2019	1,386
4	GINNI FILAMENTS LTD	August & October 2019	205
6	Baner Sangam Hydro Project (Yogindera Powers Ltd)	September 2019	1,144
7	Adani Power Limited, Stage-2	September 2019	359
8	Adani Power Limited Stage-3	September & October 2019	7,206
9	Kreate Energy (I) Pvt Ltd	July, August, September, October & November 2019	263,394
10	Northern Railway, Delhi Division	April & May 2019	22,296
11	IPCL Power Trading Private Limited	September & October 2019	3,241
12	Baragarh Hydro Power Co. Pvt. Ltd.	July 2019	868
13	Sarvottam Rolling Mills Private	August, September, October & November 2019	1,539
14	Goyal MG Gases UP	August & October 2019	329
15	NHPC Limited	September 2019	5,695
		Total	412,565

C.18.3 All applicants are requested to clear the pending interest amount.

C.19 Status of AMR as on 08.11.2019 (Agenda by NRLDC)

C.19.1 As per the information provided by M/s Kalkiteck, nos. of locations from where AMR data are received in totality and used for energy accounting for last 04 weeks have been given below:

Sl. No.	Week (From-To)	Total No. of locations where SAT is completed	Total No of locations data received in totality	Total No of locations data received in totality by Tuesday	Total No of locations received after Tuesday
1	3009-0610	258 (1551 meters)	209 (1149 meters)	196 (1109 meters)	13 (40 meters)
2	0710-1310	260 (1569 meters)	211 (1185 meters)	198 (1146 meters)	13 (39 meters)
3	1410-2010	260 (1569 meters)	212 (1190 meters)	199 (1150 meters)	13 (40 meters)

4	2110-2710	268 (1617 meters)	219 (1238 meters)	207 (1203 meters)	12 (35 meters)

C.19.2 There is some improvement in data submission to NRLDC by Tuesday particularly after switching over of 64 locations to OPGW. However, data from all locations are required for calculation of losses and preparation of regional energy account. Non-availability of data from any stations is making it difficult for NRLDC to process the meter data for loss calculation and timely submission of data to NRPC for preparation/issuance of weekly energy accounts.

C.19.3 POWERGRID may please coordinate with M/s Kalkitech and ensure that meter data from all sites are regularly provided to NRLDC by Tuesday.

POWERGRID may update.

C.20 Integration of AMR System with Elster Meters (Agenda by NRLDC)

C.20.1 POWERGRID confirmed that both M/s Kalkitech and M/s Synergy are able to integrate Elster make meter with AMR system in last Commercial subcommittee meeting held on 12th September, 2019. At present balance L&T make meters and all Elster make meters are in integration process with AMR system.

C.20.2 Status as on date for integration of Elster make meters with AMR by M/s Kalkitech as follows:

Sr. No.	SUBSTATION NAME	Utility	SEM Integrated	SEM in NPC (AMR)	SEM Non-Reporting
1	AJMER PGCIL	PGCIL	6	6	0
2	AJMER RRVPNL	RRVPNL	2	0	2
3	ALAWALPUR PSTCL	PSTCL	2	0	2
4	BAHADURGARH PGCIL	PGCIL	2	1	1
5	BALLABHGARH PGCIL	PGCIL	12	9	3
6	CHITTORGARH PGCIL	PGCIL	6	6	0
7	DEHRADUN PGCIL	PGCIL	8	7	1
8	JALANDHAR PGCIL	PGCIL	18	16	2
9	KURUKSHETRA PGCIL	PGCIL	19	9	10
10	MAINPURI PGCIL	PGCIL	10	9	1
11	MANDOLA PGCIL	PGCIL	10	10	0
12	NALAGARH PGCIL	PGCIL	18	18	0
13	NOIDA SEC20 UPPCL	UPPCL	1	0	1
14	ORAI PGCIL	PGCIL	8	8	0
15	SAHIBABAD UPPCL	UPPCL	1	0	1
16	SIKAR PGCIL	PGCIL	14	13	1
	TOTAL		**137**	**112**	**25**

C.20.3 Though the integration of Elster make meters are being integrated in AMR system, frequent problems are being observed e.g. for the week 4.11.2019 to 10.11.2019, all

Elster make meters at Kurukshetra become faulty after integration with AMR. Due to this whole week data was lost and Kurukshetra drawal could not be metered. This is a serious issue and it is requested that POWERGRID may take up the matter with Kalkitech to prevent reoccurrences of such issues.

C.20.4 POWERGRID may please apprise the present status and period by which integration of all Elster make meters will be completed.

POWERGRID may update.

C.21 Status regarding procurement of DCD/Meters (Agenda by NRLDC)

C.21.1 NRLDC vide its letter Ref. No. NRLDC/MO/Metering/1606-1613 dated 01.10.18 has intimated POWERGRID regarding estimated nos. of DCDs and meters required for next 1-2 years. Further POWERGRID vide its emails in June-19 informed NRLDC that lot of meters are required for upcoming solar parks in Norther Region and its present availability is not sufficient to meet the requirement.

C.21.2 For estimation of DCD/Meter requirement, NRLDC requested POWERGRID to provide the present availability of DCDs and meters available in POWERGRID store.

C.21.3 Based on the information provided by POWERGRID on 13.06.19, NRLDC vide its letter ref. no. NRLDC/MO/Metering/10/986 dated 12.07.19 informed POWERGRID regarding procurement of estimated quantity of DCDs and Meters. POWERGRID stated that 130 nos. of DCD and 240 nos. of Meters have to be procured and bid opening of the tender was due on 3rd and 4th October, 2019.

POWERGRID may update the latest status on procurement of DCD/meters.

C.22 AMR data through Fibre Optic Network (Agenda by NRLDC)

C.22.1 As informed by M/s Kalkitech, AMR communications through optical fibre link at 64 locations of POWERGRID and other utilities have been configured. Further, balance 58 locations of POWERGRID are in progress.

C.22.2 In the last TCC/NRPC meetings, POWERGRID informed that certain information from as per the format circulated by POWERGRID is required from Utilities to work out the same. TCC requested all utilities to submit the information sought by POWERGRID from utilities for cost estimation of shifting of AMR data on OPGW. All utilities agreed to provide the data by 30.06.19. POWERGRID informed that they shall migrate data

of AMR (on wideband locations) by 31.12.19, if data from all utilities are received by 30.06.19.

C.22.3 POWERGRID is requested to apprise the status of receiving the information from utilities and action plan.

POWERGRID may update.

C.23 Time drift Correction in Interface Energy Meters (Agenda by NRLDC)

C.23.1 There is a significant improvement in Time drift correction in Interface Energy Meters from the last CSC Meeting due to efforts taken by all utilities.

C.23.2 Time Drift Report summary of various utilities for last two weeks is given below:

Sl. No	Utility		Nos. of Meters on which Time-drift has been observed	
			Week 19.08.19 - 25.08.19	Week 21.10.19 - 27.10.19
1	BBMB		5	4
2	Chandigarh		2	2
3	DTL		10	6
4	HPSEB		6	6
5	HVPNL		17	14
6	J&K		4	4
7	NHPC		6	1
8	NPCIL		1	0
9	NTPC		3	1
10	PGCIL	NR-1	3	4
		NR-2	29	8
		NR-3	1	3
11	PSPTCL		1	0
12	PTCUL		25	23
13	Railways		2	2
14	RVPNL		9	3
15	SAINJ		1	0
16	UPPTCL		6	3
Total			**131**	**84**

C.23.3 There is a significant improvement and at present only around 4% meters have time drift as per NRLDC record. NRLDC is regularly uploading the discrepancy report on weekly basis indicating the time drift in meters and also replacement/rectification required in special energy meters. All constituents in whose premises the meters are installed are required to take corrective action for time correction based on the weekly discrepancy report of NRLDC.

C.23.4 In minutes of 43rd meeting of TCC & 46th meeting of NRPC, POWERGRID informed that the time corrections of balance meters shall be done by next TCC meeting. Further, NRLDC vide its letter Ref. No./NRLDC/MO/Metering/3/ dated 04-11-2019 has requested to all utilities for time drift Correction of Interface Energy Meters listed above.

C.23.5 All constituents are requested to regularly monitor the time drift of all meters in their premises and take corrective actions accordingly.

Members may deliberate.

C.24 Replacement/Rectification of SEM meters (Agenda by NRLDC)

C.24.1 NRLDC is regularly uploading the Discrepancy report of meters on weekly basis on NRLDC website. The discrepancy report also contains the details where replacement/rectification of energy meter is required. POWERGRID in its capacity as CTU is to ensure that such rectification/replacement is carried out at the earliest to ensure proper energy account.

C.24.2 As on date, the list of meters where corrective actions are required immediately have been given in **Annex-C.24**. POWERGRID is requested to kindly ensure timely action for replacement/rectification of SEM Meters and ensure availability of software/DCDs at all interface meter locations.

POWERGRID may update the status.

D. ITEMS FOR NRPC

D.1 Reimbursement of Expenditure of NRPC Sectt. for FY 2019-20 by the members of NRPC

D.1.1 In the 42nd NRPC meeting held on 28.06.2018, it was decided to contribute the amount of Rs. 10.0 Lakh per member for the year 2018-19 towards reimbursement of NRPC Secretariat expenditure to GoI, for the year 2018-19, for meeting the expenditure for meetings at Secretariat and other expenditure as approved by Chairperson, NRPC.

D.1.2 In the 45th NRPC meeting, contribution @ Rs. 10 Lakh per member, was approved for the financial year 2019-20.

D.1.3 In the 46th NRPC meeting, all members have agreed to make their payments for current year as well of the past years (if due). For current FY 2019-20, Contribution has been received from 15 members so far and is still awaited from balance 27 members.

D.1.4 Since three quarters of FY 2019-20 is almost over, members are requested to expedite the contribution at the earliest.

D.1.5 From next financial year onwards, 30th April may be considered as cut-off date, for making contribution by all the Members, for that year.

Members may discuss and approve.

D.2 Reimbursement of Expenditure of NRPC Sectt. by the members of NRPC for the previous years

D.2.1 For reimbursing NRPC expenditure to GoI and meeting the expenditure for meetings at Secretariat and other expenditure as approved by Chairperson, NRPC, constituent members are to pay annual contribution as decided in NRPC meetings from time to-time.

D.2.2 The contribution (as on 27.11.2019) from following members is still awaited:

Sl. No.	Constituent Member	Amount (Rs.)
Financial Year 2019-2020		
1	Delhi Transco Ltd.,	10.0Lakh
2	Electricity Department, UT of Chandigarh,	10.0Lakh
3	Dakshin Haryana Bijli Vitaran Nigam Ltd.	10.0Lakh
4	Ajmer Vidyut Vitran Nigam Ltd	10.0Lakh
5	HPSEB Ltd.	10.0Lakh
6	H.P. Power Transmission Corp. Ltd	10.0Lakh
7	J&K Power Development Department,	10.0Lakh
8	J&K State Power Development Corp. Ltd.	10.0Lakh
9	Paschimanchal Vidyut Vitran Nigam Ltd.,	10.0Lakh
10	U.P. Rajya Vidyut Utpadan Nigam Ltd.	10.0Lakh
11	Uttarakhand Power Corporation Ltd.,	10.0Lakh
12	Rosa Power Supply Company Ltd.,	10.0Lakh
13	Lanco Anpara Power Ltd.,	10.0Lakh
14	Adani Power Rajasthan Ltd.,	10.0Lakh
15	Jhajjar Power Ltd.,	10.0Lakh
16	Bajaj Energy Pvt. Ltd.	10.0Lakh
17	Talwandi Sabo Power Ltd.	10.0Lakh
18	Prayagraj Power Generation Co Ltd.	10.0Lakh

19	Lalitpur Power Generation Company Limited,	10.0Lakh
20	Nabha Power Limited,	10.0Lakh
21	Kreate Energy (I) Pvt. Ltd.	10.0Lakh
22	PTC india ltd.	10.0Lakh
Financial Year 2018-2019		
1	Uttar Haryana Bijli Vitaran Nigam Ltd.	10.0Lakh
2	Jaipur Vidyut Vitran Nigam Ltd.,	10.0Lakh
3	J&K Power Development Department,	10.0Lakh
4	J&K State Power Development Corp. Ltd.	10.0Lakh
5	Dakshinanchal Vidyut Vitran Nigam Ltd., Agra	10.0Lakh
6	Uttarakhand Power Corporation Ltd.,	10.0Lakh
7	Rosa Power Supply Company Ltd., Shahjahanpur	10.0Lakh
8	Prayagraj Power Generation Co Ltd.	10.0Lakh
9	Manikaran Power	10.0Lakh
Sl. No.	**Constituent Member**	**Amount (Rs.)**
Financial Year 2017-2018		
1	Dakshin Haryana Bijli Vitaran Nigam Ltd., Hisar	10.0Lakh
2	Madhyanchal Vidyut Vitran Nigam Ltd., Lucknow	10.0Lakh
3	Uttarakhand Power Corporation Ltd., Dehradun	10.0Lakh
4	Prayagraj Power Generation Co Ltd., Allahabad	10.0Lakh

Financial Year 2016-2017		
1.	J&K PDD, Srinagar	7.0 Lakh Each
2.	PVVNL, Varanasi	
	Financial Year 2015-2016	
1	J&K State Power Development Corp. Ltd., Srinagar	11.0 Lakh Each
2	Paschimanchal VVNL, Meerut	
3	GMR Energy Trading Limited, New Delhi	
	Financial Year 2014-2015	
1	J&K State Power Development Corp. Ltd., Shrinagar	11.0 Lakh Each
2	Dakshinanchal VVNL, Agra	
3	Bajaj Energy Pvt. Ltd., Noida	
	Financial Year 2012-2013	
1	Purvanchal VVNL, Varanasi	10.0Lakh

D.3 Capacity Building Programme for Northern Regional Constituents (proposed to be funded through PSDF)

D.3.1 In 45th NRPC meeting held on 08.06.2019, NRPC proposed a capacity building programme for studying the power exchange of Nordic countries, role of TSO (Transmission System Operator), Renewable Energy in power trading, EV integration with grid etc. to be carried out for Northern Region Constituents.

D.3.2 This programme would benefit the participants from the Central Transmission Utility (CTU), State Transmission Utilities (STUs), Distribution Companies, State Load Despatch Centres (SLDCs), Generators (including ISGS) of Northern Region, Power System Operation Corporation (POSOCO), Northern Regional Power Committee (NRPC) Secretariat, Central Electricity Authority (CEA) and Ministry of Power.

D.3.3 In the last NRPC meeting held on 24.09.2019, it was proposed that the programme can have 4 batches of 15 participants each (five days for each batch). The tentative tenure of the programme is for one year w.e.f. 01.04.2020. After deliberations, it was decided that POWERGRID would execute the programme.

D.3.4 Accordingly, POWERGRID vide letter no. NRPC/Commercial/209/RPC(46th)/2019 dated 09.10.2019 was requested to furnish the complete proposal including estimated cost details for preparing the DPR for PSDF funding.

D.3.5 In response to the above, POWERGRID vide e-mail dated 15.11.2019 has shared the detailed programme after discussion with the Nordic agencies and the same is enclosed as **Annex-D.3**. Further, POWERGRID intimated that they are working on the commercials and will be submitting the same subsequently.

Members may discuss and approve the program in-principle.

D.4 HOSTING OF NEXT MEETINGS OF NRPC / TCC

As per agreed roster for hosting of meetings, the next meetings of TCC (45th) & NRPC (48th), which would become due in March/April, 2020 are to be hosted by UT of Chandigarh.

Minutes of meeting held on 01.11.2019 at NRPC Secretariat, New Delhi to finalize the modalities for System Study for Capacitor Requirement in NR for the year 2019-20.

The proposal for conducting system study for capacitor requirement in NR at 11/33 kV level for the year 2019-20 was deliberated and decided in the 37th TCC and 40th NRPC Meeting. After following up with the states for long, the required data in the format specified by CPRI for conducting the study was submitted by Haryana, Punjab, Rajasthan, Himachal Pradesh and Delhi by 15.10.2019, which was the last date for submission of data as per the decision taken in 43rd TCC and 46th NRPC meeting.

In view of the above a meeting was held on 01.11.2019 at NRPC Secretariat, New Delhi to finalize the modalities for System Study for Capacitor Requirement in NR for the year 2019-20. List of the participants of the meeting is attached at ***Annexure-I***.

In the meeting the following was decided: -

i. The date and time of state's peak for which the data has been submitted by individual states need to be verified from respective SLDCs. Initially, the date and time for Punjab shall be verified and intimated to NRLDC and CPRI.

(***Action***: NRPC; ***Timeline***: - 05.11.19)

ii. Accordingly, NRLDC to provide the PSSE data file of NR region for these dates to CPRI (Initially, for the date and time for which data is submitted by Punjab)

(***Action***: NRLDC; ***Timeline***: - 11.11.19)

iii. The methodology and the optimum voltages which would be considered by CPRI for calculating the capacitor requirement after modelling of the network shall be shared to NRPC Secretariat/ NRLDC for comments, if any.

(***Action***: CPRI; ***Timeline***: - 15.11.19)

iv. In the first instance, pilot study shall be done for Punjab state as a whole, based on which the practical difficulties, if any faced in modelling of network, would be highlighted by CPRI and shall be resolved accordingly.

(***Action***: CPRI; ***Timeline***: - 15.12.19)

After successfully carrying out the pilot study for Punjab, the activity would be replicated for all the states who has submitted the data i.e. Haryana, Rajasthan, Himachal Pradesh and Delhi.

Meeting ended with a vote of thanks to the chair.

Annexure-I

List of Participants of meeting held on 01.11.2019 at NRPC Secretariat, New Delhi to finalize the modalities for System Study for Capacitor Requirement in NR for the year 2019-20.

Sr.No.	Name	Designation	Organization	e-mail ID
1.	Sh. Saumitra Mazumdar	SE (O)	NRPC	seo-nrpc@nic.in
2.	Dr. Manohar Singh	Engineering Officer	CPRI	manoharsingh@cpri.in
3.	Sh. M M Hassan	GM	NRLDC	mm.hassan@posoco.in
4.	Sh. Alok Kumar	Sr. DGM	NRLDC	alok.kumar@posoco.in
5.	Smt. Suruchi Jain	Chief Manager	NRLDC	suruchi.jain@posoco.in
6.	Sh. Akshay Dubey	AEE (O)	NRPC	dubey.akshay@gov.in

CENTRAL ELECTRICITY REGULATORY COMMISSION

3rd & 4th Floor, Chanderlok Building, 36, Janpath, New Delhi-110001

Subject: Report of the Committee to assess requirement of regional spares in compliance with the Commission's order dated 18.1.2018 in Petition No 38/TT/2017 of POWERGRID.

Petition No. 38/TT/2017 pertaining to spare ICTs and Reactors was heard on 10.1.2018. The Commission vide ROP dated 18.1.2018 at para 2 in petition no 38/TT/2017 issued the following directions:

> 2. Since the petitioner has not submitted proper reply regarding requirement of regional spares vis-à-vis their current availability, the Commission directed to submit a proper reply. The Commission further directed to set up a Committee consisting of representatives from PGCIL, NLDC and CEA under the Chairmanship of the Chief (Engineering) of the Commission to assess the requirement of regional spares including bus reactors, line reactors, ICTs, etc., present availability and other related issues and submit a comprehensive report on the requirement of spare bus reactors, line reactors, ICTs and related equipment in different regions of the country to the Commission by 9.3.2018. The Commission also observed that final tariff in the matter would be allowed only after consideration of the Report to be submitted by the Chief (Engineering) of the Commission.

The commission assigned the task of assessing the requirement of spares including ICTs and Reactors, present availability and other matters to the committee.

2. In pursuance of the subject order of the Commission, a committee comprising of members from CERC, CEA, POSOCO and POWERGRID was constituted under the Chairmanship of Chief (Engineering), CERC vide office order dated 15th March, 2018 (attached at Annexure-I).

3. The members of the Committee are:

i. S.C. Shrivastava, Chief (Engineering), CERC -- Chairman of the committee
ii. M.K. Anand, Chief (Finance), CERC -- Member
iii. Srinivas, Dy. Chief (Legal), CERC -- Member
iv. Y.K. Swarnakar, Director (PSE&TD), CEA -- Member
v. R.K. Tyagi, GM (Asset Management), POWERGRID -- Member

vi. M.M. Mehendale, DGM, POSOCO -- Member

vii. G. Ram Anjaneyulu, Assistant Chief (E), CERC -- Convener of the Committee

4. The following Terms of reference were defined for the Committee:

a) To examine the incidences of malfunction of power system devices – assessment of their failure rates, frequency and duration.

b) To estimate the requirement of spares.

c) To identify details of present available quantum of spares.

d) To enlist the existing practices of keeping and maintaining spares

e) To redefine the need and composition of spares for various voltage levels; and suggest modifications to (b) and (c), thereof.

f) To distinguish between Capital Spares and Operation & Maintenance spares i.e. to be allowed as part of capital cost along with the equipment or to be allowed as part of O&M cost.

g) To outline a policy for maintenance of spares, salvage at end of life, costs to be allowed/ disallowed in their handling, etc.

h) To examine any other related issue, if any.

5. First meeting of the committee was convened on 27th March'18. Minutes of the meeting are attached at Annexure-II. Presentation by CERC representative is at Annexure-III. Based on the deliberations in the meeting PGCIL has submitted a detailed report on 18.7.2018. The final meeting of the committee was convened on 25th Febraury'18

6. The Committee deliberated on the issue of Policy of PGCIL of maintaining and managing of the regional spares, bifurcation of spares, value and cost of spares, utilization of spares, their accounting treatment and recovery of the cost or tariff. The issues are deliberated as under:

Policy of PGCIL of maintaining and managing of the regional spares

7. Presently, the population of 3Ø/1Ø ICTs and reactors as indicated by PGCIL is 873 and 1363, respectively. The corresponding spares are kept either in Hot or Cold condition. The hot-spares are normally available at 765 kV level and are kept in standby ready

condition. At 765kV level, for every three 1Ø transformers, one transformer of 1Ø type is maintained as a hot spare. The cold spares are kept off-grid but are ready for deployment when required.

8. The overall average failure rate of transformers and reactors in 2017-18 is 1.21% and 0.89 %, respectively. The failure rate is computed considering failure data of last 25 years using the formula (∑ No of failures/ ∑ Total Equipment Year). The percentage-wise failure of transformers and reactors on account of various components is as under:-

Component name	ICT Failure Rate
Bushings	38 %
Windings	33 %
Leads	5 %
OLTC	10 %
Tap leads	6 %
Magnetic circuit	5%

9. Initial spares are minor spares required for entire project and do not comprise spare ICTs and reactors. All ICTs and reactors of AC system are covered under self-insurance. Equipment of HVDC Stations is covered under external insurance (Mega Insurance Policy).

10. The requirement of spare Transformer and Reactor are determined based on the following factors:

i. Availability of Transformer based on voltage class and MVA rating in each state
ii. Availability of Reactor based on voltage class and MVAR rating in each state
iii. Availability of Transformer based on impedance rating
iv. Based on criticality and redundancy of the system
v. Based on experience and failure History

For single phase transformer and reactor the hot spares are kept as per CEA guideline i.e. 1 single phase unit of each category for the entire sub-station or switchyard so that it can replace any of the units, whenever required.

11. Following criteria has been followed by PGCIL with regard to assessing the requirement of regional spares:

Transformer:

- For 1Ø 400kV and 765kV rated equipment – One 1Ø spare transformer for each type in each rating in each state;
- For 3Ø 400kV rated equipment where population is less than 20 nos. – One 3Ø spare transformer for each type in each state;
- For 3Ø 400kV rated equipment where population is more than 20 nos. – Atleast two 3Ø spare transformer in each state;
- For 3Ø 220kV and below rated equipment – One 3Ø spare transformer with highest MVA rating in each state;

Reactor:

- For 1Ø 400kV and 765kV rated equipment – One 1Ø spare reactor for each type in each rating in each state;
- For 3Ø 400kV rated equipment – Atleast one 3Ø spare reactor for each type in each state;
- For 3Ø 400kV rated equipment where population is more than 20 nos. – Atleast two 3Ø spare reactors in each state;

12. In view of the above, spare requirements are estimated and total estimated requirement of Transformer is 90 no's and total estimated requirement of Reactor is 70nos.

13. Against the above requirement availability of regional spares is as follows:

Sl. No	Spares available	Approved and available spares
(i)	Transformers: 72 nos. (1Ø& 3Ø -5 to 500 MVA)	RPC approved spare:35
		Spare on account of augmentation:21
		Through insurance proceeds(Procured by POWERGRID and the same are not covered under Tariff mechanism):16
(ii)	Reactors: 29 nos. (1Ø - 6.67 to 110 MVAr) (3Ø - 20 to 125 MVAr)	RPC approved spare: 11
		Spare on account of Augmentation:4
		Through insurance proceeds(Procured by POWERGRID and the same are not covered under Tariff mechanism)::14

14. To maintain the availability and reliability of the system, few Transformers have been procured as per the approval of RPC/SCM and few Transformers and Reactors have been procured, utilizing insurance fund.

15. To meet the spare requirement, Transformer removed from the service due to system augmentations are also considered as regional spare as long as, it can provide service and same can be strategically placed in the state where the deficit of spare Transformer/ Reactor is felt.

16. The maintenance policy followed for spare Transformers is same as that of installed in-service Transformers. Salvage value at the end of life is 10% of capital cost. At present there is no provision in the regulation for claiming of O&M charges for handling / maintenance of spares separately. These spares are maintained as per standard norms of POWERGRID. Cost involved for up keeping the spare is covered under O &M cost of the installed equipment.

Utilisation of Regional spares in last 5 years

17. The following numbers of spare Transformers and Reactors have been utilized in last 5 years:

Sl. No	Spare Transformer /Reactor description	No of Utilization
1	3Ø 315 MVA,400kV	8
2	1Ø 500 MVA,765kV Cold spare	1
3	1Ø 500 MVA,765kV standby spare unit	11
4	1Ø 333MVA,765kV standby spare unit	2
5	3Ø 500 MVA,400kV	5
6	1Ø 105 MVA,400kV standby spare unit	2
7	1Ø 167 MVA,400kV standby spare unit	1
8	1Ø 5MVA,132kV	1
9	1Ø 10MVA,220kV	1
10	1Ø 80 MVAR 765 kV Reactor	10
11	1Ø 110 MVAR 765 kV Reactor	5

10	3Ø 125 MVAR 420kV Reactor	5
11	3Ø 80 MVAR 420kV Reactor	6
12	3Ø 63 MVAR 420kV Reactor	3
13	3Ø 50 MVAR 420kV Reactor	3
	Total	64

Practice for inter/intra-Regional transfer and its treatment

18. With regard to Inter/Intra-regional transfer and its treatment, it is submitted that as per current practice Tariff for shifted asset is being claimed in its original petition. However, shifting cost along with additional bay equipment cost i.e. civil works/ erection & Foundation cost/bay equipment cost etc. is being claimed in new projects without taking Gross block/WDV cost of shifted asset.

19. PGCIL has submitted that in recent petitions, shifted asset is de-capitalized in the original petition and is recapitalized at new location. They have requested to allow them to claim the shifted asset in the original petition and do final adjustment of the shifted asset in original petition/project at the time of 2014-19 truing up to avoid repetition of filing true up petitions. They have submitted that in most of the cases, tariff impact of shifted asset is very minimal and same can be adjusted at the time of 2014-19 truing up of these petitions.

Tariff recovery for assets dismantled and kept as regional spares

20. According to PGCIL, if the age of the asset dismantled is less than 15 years, the same is generally utilized i**n** new projects. However, if their age is more than 15 years, the same are kept as regional spares as stop gap arrangement in case of future failures. Further, as the transformers/ reactors are already capitalized, it continues in the books of account of the original project despite dismantling.

Cost of recovery w.r.t. repair, insurance, transportation etc. and accounting treatment in books of account.

21. Cost of repair, insurance & transportation etc. of damaged equipment is being met through SIS/ Mega Insurance claim. Therefore, the expenditure w.r.t. repair, insurance,

transportation etc. are not being booked to the capital account to the extent claim received from the insurance.

22. PGCIL has submitted the details regarding tariff claimed by them for the regional spares in different petitions and the same is enclosed at Annexure-IV.

23. POSOCO has submitted that for grid operator spares improving availability of elements are important. The Main Equipment (Three Single phase units) along with one Hot Spare unit of a transformer/Reactor for 500 KV and above, are capitalized together as single element, named Main Equipment. Main Equipment is in service whereas Hot Spare is available standby. Availability of Main Equipment, inter alia, should cover Availability of Hot spare also. Under Breakdown condition, failed unit is taken out for repairs andHot Spare comes into service as a part of Main Equipment. Repair time as stated by PGCIL is of the order of 1-2 years, in most cases. Accounting of non-availability of Hot Spare unit, therefore, may need to be looked into.

Recommendations of the Committee:

24. The Committee observes that the causes of component failures in a transmission system are mainly on account of frequent switching for voltage control, abnormal stress due to grid operating condition such as operating at high voltage than designed limit, excessive ambient temperature, Weather conditions (storms, lightning, and moisture), Ageing, Design issues and Manufacturing defects.

25. The Committee feels that a reasonable level of spares has to be maintained in order to ensure the reliability of the grid, reduce downtime, and normalize tariff and the ecological footprint. In case of failures, wherever possible, rerouting of power and shifting of load to other transformer and reactors should be done.

26. The details of failure rate of transformers and reactors submitted by PGCIL is enclosed at Annexure-V. The failure rate in case of transformers has come down from 1.15% in 2013-14 to 0.36% in 2017-18. The failure rate in case of reactors has come down from 0.93% in 2013-14 to 0.683% in 2017-18. It is observed that on the basis of failure rate of transformers and reactors as per international practice of failure rate calculations for all

voltage levels are 1.21% and 0.89%, for a period of 26 years (1992-2018) for PGCIL. Globally, the failure rate of transformers and reactors are 0.5% and 3% respectively for the period of 14 years (1996-2010). The failure rates of reactors of PGCIL are below the failure rates in countries like Canada (3.15%) and Australia (0.97%). Further, the failure rate of transformers of PGCIL in voltage level of 500 KV and above is comparable to failure rates in most of the countries.

27. The Committee notes that Clause 43(2)(a)(v) and 43(2)(b)(i) of CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2010, provide as follows:

> 43. Salient Technical Particulars and Requirements of Sub-stations and Switchyards
> ...
> ...
> (2) Main equipment
> (a) Power Transformers
> ...
> ...
> (v) The transformers may be single phase or three-phase type depending upon transportation constraints. In case single phase transformers are provided, one single phase transformer shall be provided as spare for the entire sub-station or switchyard so that it can replace any of the units, whenever required.
> ...
> ...
> (b) Reactive Compensation
> (i) Shunt Reactors
> Shunt reactors, wherever provided, shall comply with relevant standards in general. Shunt reactors upto 420 kV rated voltage shall have linear voltage vs. current 0/11) characteristics upto 1.5 per unit voltage. 800 kV Shunt reactors shall have linear characteristics upto 1.25 per unit voltage. If required, the neutral of the line reactors shall be grounded through adequately rated neutral grounding reactors to facilitate single phase auto-reclosure. The neutral of shunt reactors shall be insulated to 550 kV peak for lightning impulse and shall be protected by means of 145 kV class surge arresters in case of line reactors of 420kV or 800kV rated voltage. In case single phase shunt reactors are provided, then minimum one single phase unit shall be provided as spare for entire substation or switchyard.

28. As specified in CEA (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2010, the spares for 1Ø equipment are to be maintained as one 1Ø unit of transformer/ reactor for the entire switchyard. PGCIL maintains the spares according to the CEA (Technical Standards for Construction of Electrical Plants and Electric

Lines) Regulations, 2010 as hot spares. These are other than the regional spares which are cold spares.

29. As per CEA regulation, there is provision for 1Ø spare transformer/ reactor. However, no such norm exists for 3 phase spares. Most of the 400 KV and below class transformers and reactors installed in POWERGRID station are of 3 phase. Considering this and keeping in view the ageing of equipment and lead time for replacement, requirement of 3Ø spares should be met after approval in RPC for the same. Any additional requirement of 1Ø cold spare transformers and reactors should also be met after approval in RPC.

30. The Committee is also of the view that the transformer or reactor taken out after its replacement by augmentation/ capacity addition should be considered as the regional spares after approval of the RPC.

31. PGCIL has worked out the requirement of regional spares based on methodology given at Para no 11. This methodology is proposed by PGCIL based on their own assessment considering international practices. Internationally different practices are followed by different utilities. In the light of above, the methodology proposed by PGCIL could be accepted. The requirement of Regional Spares submitted by PGCIL is enclosed at Annexure-VI.

32. PGCIL stated that if the age of the replaced spares is less than 15 years and the same is utilized in new projects, in such a case, the gross value of the asset replaced shall be decapitalised from the original project and capitalized in the new project. For the unrecovered cost during the time of shifting the replaced asset to the new location should also be considered for the purpose of tariff at the new location and the tariff may be claimed accordingly.

33. However, if their age is more than 15 years, the same are being kept as regional spares, if recommended by RPC as stop gap arrangement in case of future failures. Wherever a spare has been created at a particular location and proposed / being utilized as regional spare, due to augmentation by higher capacity, the spare will be decapitalized from the original project and the tariff would be discontinued till it is put to use again as per existing

practice. The dismantled asset which is to be kept as regional spare as per RPC approval should get tariff and could be suitably placed within the same region considering the need, geographical location and transportation cost. In case dismantled asset is not approved by RPC to be regional spares, the tariff should be allowed only when it is put to use. However, such denial of tariff is likely to discourage transmission licensee from agreeing to up-gradation in future and would prefer augmentation with new system which may be undue burden on beneficiaries. A call may have to be taken by the Commission on the issue.

34. The POSOCO suggestion of accounting of non-availability of hot spare units has merit. PGCIL may be advised to furnish quarterly report to POSOCO regarding non-availability of hot spares.

35. The Committee recommends that the methodology of spares requirement of PGCIL shall be reviewed after three years.

36. PGCIL shall submit half yearly report of utilization of Regional Spares to the CERC.

Annex-B.18

List of power plants identified by NLDC for implementing AGC as per CERC Order 319/RC/2018

S.no.	Power Plant	Reg	T/H	Cap (MW)	Nearest wideband node	Main communication path available ?	Alternate communication path available?	Route diversity available for alternate path ?
1	Singrauli STPS	NR	T	2000				
2	Naptha Jhakri	NR	H	1500				
3	Indra Gandhi STPS	NR	T	1500				
4	Tehri	NR	H	1000				
5	Koldam	NR	H	1000				
6	Rihand TPS Stage – III	NR	T	1000				
7	Rihand TPS Stage – I	NR	T	1000				
8	Rihand TPS Stage – II	NR	T	1000				
9	Dehar	NR	H	990				
10	Dadri TPS Stage – II	NR	T	980				
11	Dadri TPS Stage – I	NR	T	840				
12	Dadri Gas	NR	T	830				
13	Bhakra Right	NR	H	785				
14	Auraiya Gas	NR	T	663				
15	Bhakra Left	NR	H	594				
16	Chamera-I	NR	H	540				
17	Parbati III	NR	H	520				
18	Unchahar TPS Stage – IV	NR	T	500				
19	Unchahar TPS Stage – I	NR	T	420				

S.no.	Power Plant	Reg	T/H	Cap (MW)	Nearest wideband node	Main communication path available ?	Alternate communication path available?	Route diversity available for alternate path ?
20	Unchahar TPS Stage – II	NR	T	420				
21	Anta Gas	NR	T	419				
22	Koteshwar	NR	H	400				
23	Pong	NR	H	396				
24	Dulhasti	NR	H	390				
25	Chamera-II	NR	H	300				
26	Dhauliganga	NR	H	280				
27	Chamera-III	NR	H	231				
28	Bairasiul	NR	H	180				
29	Sewa-II	NR	H	120				
30	Rampur	NR	H	412				

सत्यमेव जयते

150 YEARS OF CELEBRATING THE MAHATMA

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

No: NRPC/OPR/111/04/2019/13101 Dated: 24.10.2019

To,
Sh. Anil Saberwal
Executive Director (HRD),
POWERGRID Corporation of India Ltd.,
Saudamini, Plot No.2, Sector 29,
Near IFFCO Chowk, Gurgaon (Haryana) - 122001

Subject: Budgetary quote for Training on Protection System (Level-2 and Level-3) for Protection System Engineers – reg.

The necessity of basic as well as advanced training for protection system engineers of Northern Region had been felt in various NRPC forums. In the past, five days residential training program on Protection System i.e., Level-2 and Level-3 for NR constituents had been conducted through POWERGRID during 21st to 25th November 2016 and 19th to 23rd March 2018 respectively.

In the 43rd NRPC meeting, it was decided to conduct Protection System (Level-2 & Level-3) training for second batch of 50 Protection System Engineers through OEM. It is decided that program shall include classroom as well as hands on training.

In this regard, POWERGRID may like to offer its budgetary quote for 05 days each Level-2 and level-3 residential training program on protection system for 50 protection system engineers of NR with **faculties exclusively from OEM(s)** such as ABB, SIEMENS, GE, etc. The training modules for Level-2 and Level-3 training program is enclosed in the **Annexure**. It is requested that budgetary quote may be supplemented with detailed session-wise schedule for each day of training with respective proposed OEM faculties.

संलग्नक: यथोपरि

24/x/19

(नरेश भंडारी)
सदस्य सचिव

18-ए, शहीद जीत सिंह मार्ग, कटवरिया सराय, नई दिल्ली-110016, दूरभाष:011-26511211 फैक्स: 011-26865206 ई-मेल: ms-nrpc@nic.in वेबसाईट: www.nrpc.gov.in
18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016 Phone: 011-26511211 Fax: 011-26865206 e- mail: ms-nrpc@nic.in Website: www.nrpc.gov.in

Encl-II

Training Module for Level 2

Day1 Session1

- Interaction with participants
- Expectations from the training
- Initial Assessment test

Day1 Session2

- Basic Substation Layout
- Substation Bus Schemes
- Introduction to CT, VT, LA , Isolator and CB

Day1 Session3

- Per Unit System.
- Fault analysis (Symmetrical faults).
- Importance of earthing system and measurement of earth resistance

Day1 Session4

- Unsymmetrical faults
- Sequence diagram of transformers

Day2 Session1

- Distance Protection

Day2 Session2

- Distance protection schemes(PUTT,POTT etc)

Day2 Session3

- Distance protection relays(Theory)

Day2 Session4

- Distance protection relays(Handson)

Day3 Session1

- Transformer Protection (Diff, REF)

Day3 Session2

- Transformer Protection(Backup O/C, Mechanical protections)

Day3 Session3

- Transformer protection relays(Theory)

Day3 Session4

- Transformer protection relays (Hands on)

Day4 Session1

- Bus Bar Protection (Diff, REF)

Day4 Session2

- Bus Bar Protection Relays (Theory)

Day4 Session3

- Bus Bar protection relays(Hands on)

Day4 Session4

- Auto Reclosure

Day5 Session1

- Distance protection testing (Hands on with presentation)

Day5 Session2

- Transformer protection testing(Hands on with presentation)

Day5 Session3

- Bus Bar protection testing (Presentation with hands on)

Day5 Session4

- Case Studies and Knowledge Sharing
- Doubt clearing and closure session

Encl-III

Training Module for Level 3

Day1 Session1

- Interaction with participants
- Expectations from the training
- Initial Assessment test

Day1 Session2

- Per Unit System.
- Fault analysis (Symmetrical faults).
- Sample calculations by Participants for a typical network

Day1 Session3

- Unsymmetrical faults
- Sequence diagram of transformers
- Sample calculations by Participants for a typical network

Day1 Session4

- Calculations by participants for symmetrical and asymmetrical fault for a Particular 400/220kV Substation of Northern Region

Day2 Session1

- Distance Protection
- Distance protection schemes(PUTT,POTT etc)
- Auto Reclose Scheme

Day2 Session 2

- Distance protection relay setting Calculations example
- Distance protection relay setting Calculations by Participants for a typical line cases

Day2 Session 3

- Procedure for Distance protection relay setting and configuration of various Numerical Distance Relays installed in Northern Region e.g. ALSTOM/ABB/SIEMENS /GE/ERL etc

Day2 Session 4

- Hands on for Distance protection relay setting and configuration various makes of Numerical Distance Relays installed in Northern Region e.g. ALSTOM/ABB/SIEMENS /GE/ERL etc.

Day3 Session 1

- Transformer protection Theory, Differential, REF, Mechanical Protection relays
- Sample calculations for Transformer Differential and REF Protection

Day3 Session 2

- Procedure for relay setting and configuration of various Numerical Transformer Differential Relays installed in Northern Region e.g. ALSTOM/ABB/SIEMENS /GE/ERL etc
- Hands on for relay setting and configuration of Major Numerical Transformer Differential Relays installed in Northern Region e.g. ALSTOM/ABB/SIEMENS /GE/ERL etc

Day3 Session 3

- High Impedance and Low Impedance type of Busbar Protection schemes
- Centralized and Distributed type of Numerical Busbar Protection Schemes
- Typical CT and Trip Circuit schemes for different types of Busbar Protection
- LBB scheme

Day3 Session 4

- PMU
- System Protection Schemes(SPS)
- Typical SPS for Parallel ICT's and for Typical HVDC and 765kV Lines case

Day 4 Session 1

- Feeder Backup Relay Setting Calculations
- Transformer Backup Protection relay setting calculations

Day 4 Session 2

- Calculations for Backup relay setting by Participants using Fault Level Data_ A Case study for typical network

Day 4 Session 3

- Substation Automation and IEC 61850. Emerging trends including Process Bus level Automation, Merging Units and Non Conventional Instrument Transformers

Day 4 Session 4

- Protection schematic Design Philosophy for typical 400kV Feeder
- Protection schematic Design Philosophy for typical 400kV Transformer.

Day 5 Session 1

- Hands on for Distance Relay Testing

Day 5 Session 2

- Hands on for Transformer Differential Relay Testing
- Pre Commissioning Tests for Transformer , Feeders and Busbars

Day 5 Session 3

- RECAP OF FAULT LEVEL CALCULATION, Backup and Distance Relay settings_ CASE STUDY AND TUTORIAL FOR PARTICIPANTS

Day 5 Session 4

- Discussions, sharing of knowledge and case studies
- Assessment and conclusion

पावरग्रिड
POWERGRID

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

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

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:

Program fees per participant:	**INR 66,500.00**
Total Program fee: For a batch size of **20** participants	**INR 13,30,000.00** (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

26/11/2019

(Koushik Goswami)
Dy. General Manager (HRD)

Annex-C.15

NRLDC Fee & Charges Outstanding against surcharge and rebate issues upto Bill of Aug 2019 Due date of which is 17/10/2019

Sl. No.	Entities	Amount Outstanding in Rs.	Remarks
1	PGCIL	57268	Rebate issue from Mar-19 to July-19
2	Rajasthan	48428	Feb-18 May-18 (2% deducted however 1% allowed & Dec-18 Rebate has been disallowed issues
3	RAPPS B&C	42516	Rebate has been disallowed against F&C 2014-19 and S PLI 2017-18 & P PLI 2018-19 Bill
4	Uttarakhand	37809	Surcharge
5	Chammera 1	26093	Rebate against suplementary bills has been disallowed
6	Salal	20261	Sep-18 Rebate disallowed , May-19 Rebate issue and amount of Rs. 11667 surcharge against suplementary bills.
7	Dhauliganag	17988	Rebate against suplementary bills has been disallowed
8	Delhi	15298	Rebate / Surhcharge issue
9	Chandigarh	15092	Rebate issue
10	Haryana	12819	Rebate against May-19 bills has been disallowed & Surcharge against PLI 2016-17 and PLI 2017-18 Bills
11	Punjab	11941	Surcharge against PLI 2016-17 and PLI 2017-18 Bills
12	Chamera 3	4355	May-18 to Aug-18 Rebate issue
13	Kishangagna	1951	Apr-19 and Agu-19 Rebate issue
14	Parbati2	1515	Rebate issue Apr-19
15	Power Link	753	May-19 Rebate deducted 2% allowed 1.5 %
16	RAPP TL	538	Oct-17 outstanding TDS issue
17	PG Unchahar	490	Surcharge
18	NRSS 29	464	Errorneous rebate deduction May-19
19	Renew Solar	421	Surcharge against Jun-19 & July-19

20	Tanakpur	376	Errorneous rebate deduction Aug-19
21	Bairasuil	342	Errorneous rebate deduction against Apr-19
22	Gurgaon Palwal TL	172	Errorneous rebate deduction
23	NRSS 36	45	Surcharge

Annex-C.24

List of Defective/Faulty SEM meters in Northern Region as on 08.11.19

Sl. No.	Meter No.	Element Name	Station/Utility	Issue	Remarks(if any)	Pending since
NR-I REGION						
1	NR-4527-A	220kV Gazipur-DTL at Sahibabad-UPPCL	Sahibabad-UPPCL	Meter healthy but data not received due to non-availability of DCD	Meter may be replaced with L&T make and integrated with AMR	Pending since April-19
2	NR-3771-A	400 KV Jind(PG)-1 at Kirori(HVPNL)	Kirori(HVPNL)	Time drift approx. 12 hrs	Meter to be replaced by NR-1	As informed by POWERGRID, time correction done on 03.09.19 but the time drift is not ok
3	NR-3766-A	400 KV Jind(PG)-2 at Kirori(HVPNL)	Kirori(HVPNL)	Time drift approx. 12 hrs	Meter to be replaced by NR-1	As informed by POWERGRID, time correction done on 03.09.19 but the time drift is not ok
4	NP-6659-A	KOTESHWAR POOLING(PG)-I at KOTESHWAR HEP-THDC	KOTESHWAR HEP-THDC	Meter Faulty	Meter to be checked/replaced by NR-1(preferably with L&T make meter)	15.10.19
5	NR-3849-A	220kV Bhanpura at Ranpura-RVPNL	RVPNL	Polarity Problem	Meter polarity to be rectified.	Pending since Feb. 19
6	NR-3806-A	ICT-2 (220 kV) at Bamnauli-DTL	Bamnauli-DTL	Meter Faulty	Meter to be checked/replaced by NR-1	07.11.19
NR-II REGION						
7	NP-1861-A	ICT-1 (132 kV) at Udhampur-PDD	PDD, J&K	Meter is still reading zero	Meter to be checked/replaced by NR-2	Meter replaced on 131019 but still recording 0

					(preferably with L&T make meter)	
8	02 Elster meters	400 kV Kishenpur-PG-1&2 at Baglihar	PDD, J&K	Meter data not received	Software compatible to elster to be provided for downloading of data by NR-2	Pending since 24.06.2014
9	NP-8828-A	220kV Panipat(BBMB)-I at Chajpur-HVPN	HVPN	Meter Faulty	Meter to be rectified/replaced by NR-1(preferably with L&T make meter)	09.04.19
10	NP-1647-A	220/132kV ICT-3(220kV) at Jamalpur-BBMB	BBMB	Meter Faulty	Meter to be rectified/replaced by NR-2(preferably with L&T make meter)	Pending since 07.08.18
11	NP-7140-A	33 kV Shanan at Paddhar-HPSEB	PaddharHPSEB	Meter Faulty	Meter to be checked/replaced by NR-2(preferably with L&T make meter)	Pending since July-18
12	NP-1578-A & NP-1579-A	220kV Jessore at Bairasiul HPS	Bairasiul HPS	Meter Faulty (Both Main & check)	Meter to be checked/replaced by NR-2(preferably with L&T make meter)	Pending since 01.07.19
13	NP-7067-A	400kV URI-I at Uri-II HPS	Uri-II HPS	Meter Faulty	Meter to be checked/replaced by NR-2	Pending since 29.05.19
14	NP-1601-A	GT-1(132 kV) at Kotla HPS	Kotla HPS	Meter Faulty	Meter to be checked/replaced by NR-2(preferably with L&T make meter)	03.10.19
15	NP-1803-A	220 kV Kishenpur-1 at 220kV Sarna-PSEB	Sarna-PSEB	Meter Faulty	Meter to be checked/replaced by NR-2(preferably with L&T make meter)	16.10.19

16	NR-3349-A	220/66kV ICT-1(66kV) at Sangrur-BBMB	Sangrur-BBMB	Time Drift > 04 days	Meter to be replaced by NR-2	19.07.19
17	NR-3459-A	220kV Panipat(T)-3 at Panipat-BBMB	Panipat-BBMB	Meter Faulty	Meter to be checked/replaced by NR-2	07.11.19
NR-3 REGION						
18	NP-5052-A	400kV Fatehpur-PG(Kanpur) at Singrauli STPS	Singrauli STPS	Meter Faulty	Meter to be replaced by NR-3	15.10.19
19	NP-9920-A	400 kV Lucknow(PG)-1 at 400kV Unnao-UPPCL	Unnao-UPPCL	Meter Faulty	Meter to be replaced by NR-3 preferably with L&T	08.11.19

Capcity Building Program for NR Constituents

Program Title: TRAINING AT NORDIC COUNTRIES FOR OFFICERS OF VARIOUS LEVELS FROM NRPC CONSTITUENTS

Countries proposed to be visited: <u>Norway & Finland</u>

Day-to-day program outline*:

Day		Activity	Place of stay
Assemble	**Saturday**	Arrival at PAL, Manesar De-briefing and priming	Pal, Manesar
Day-0	**Sunday**	Departure to Oslo, Norway from IGI Airport, New Delhi	Oslo (Norway)
Day-1	**Monday**	Class room - Smart Energy Markets, Emerging Energy Ecosystem Visit - Statnet (TSO)	Oslo (Norway)
Day-2	**Tuesday**	Visit: NVE (Regulator), Nord Pool	Oslo (Norway)
Day-3	**Wednesday**	Visit: Hydrogen Forum (Hydrogen Fuel Research) Travel to Geilo (road), night stay.	Geilo (Norway)
Day-4	**Thursday**	Travel to Edjford Visit - Sima power plant (unmanned hydro) Travel to Bergen (Road) Bergen to Helsinki (Finland) by Air	Helsinki (Finland)
Day-5	**Friday**	Visit - Finnish DSO, VTT Technical Research Centre (Energy Storage technology)	Helsinki (Finland)
Day-6	**Saturday**	Visit - Offshore wind Departure from Helsinki to IGI Airport, New Delhi	---

- The road journeys will be in chartered bus. The longest road journey will be from Oslo to Geilo of around 3 and 1/2 Hours. The rest of the journeys will be between 1 to 2 Hours (as seen from Google maps).
- The flight from Bergen to Helsinki will take approx. 2 Hours.
- Delhi to Oslo flight is 12 Hours long and Helsinki to Delhi flight is 7 Hours long (approximately).

* *The program outline is tentative and there may be modifications depending on the conditions during the actual execution.*