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 (43 वीं)/2018/ 12004-98 दिनाँक : 17 अक्टूबर, 2018
No. NRPC/ Comml/ 209/ RPC (43rd)/2018/ Dated: 17th October, 2018

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 43 वीं तथा तकनीकी समंवय उप-समिति की 40 वीं बैठक की कार्यसूची ।

Subject: 43rd meeting of Northern Regional Power Committee and 40th meeting of TCC– Agenda.

महोदय / Sir,

उत्तर क्षेत्रीय विद्युत समिति की 43 वीं बैठक 30 अक्टूबर, 2018 को 1000 बजे हयात रीजेंसी, अमृतसर, पंजाब में आयोजित की जाएगी । एन आर पी सी की बैठक से पहले तकनीकी समन्वय उप-समिति की 40 वीं बैठक दिनांक 29 अक्टूबर, 2018 को 1000 बजे उसी स्थान पर आयोजित होगी ।

बैठकों की कार्यसूची उत्तर क्षेत्रीय विद्युत समिति की वेबसाइट, www.nrpc.gov.in पर उपलब्ध है । इसे आप डाउनलोड कर सकते है । आप से अनुरोध है कि बैठक में सम्मिलित होकर अनुग्रहीत करें । कृपया अपनी सहभागिता की पुष्टि नोडल अधिकारियों को करें ।

The 43rd meeting of Northern Regional Power Committee (NRPC) will be held at 1000 Hrs on 30th October, 2018 at Hyatt Regency, Amritsar, Punjab. NRPC meeting shall be preceded by 40th meeting of Technical Coordination Sub-committee (TCC) at 1000 Hrs on 29th October, 2018 at the same venue. Agenda for the meetings is attached herewith.

A copy of the agenda for the meetings is available on NRPC website, www.nrpc.gov.in. The same may kindly be downloaded. You are requested to make it convenient to attend the meeting. Kindly confirm your participation to the nodal officers.

भवदीय
Yours faithfully,

17/10/18

(एम. ए. के. पी. सिंह)
(M. A. K. P. Singh)
सदस्य सचिव
Member Secretary

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46. Prayagraj Power Generation Co. Ltd.
47. Director, Manikaran Power Ltd., Dwarka, New Delhi-110075(Fax:-011-45768467)

Special Invitee:

i. Member Secretary, WRPC, Mumbai-400 093.
ii. Member Secretary, SRPC, Bangalore-560 009
iii. Member Secretary, ERPC, Kolkata-700 033.
iv. Member Secretary, NERPC, Shillong-793 003.

INDEX

Annexures

उत्तर क्षेत्रीय विद्युत समिति

NORTHERN REGIONAL POWER COMMITTEE

AGENDA
FOR
40th MEETING OF TECHNICAL COORDINATION SUB-COMMITTEE
&
43rd MEETING OF NORTHERN REGIONAL POWER COMMITTEE

Time & Date of TCC meeting: 10:00 Hrs. on 29.10.2018

Time & Date of NRPC meeting: 10.00 Hrs. on 30.10.2018

Venue: Hyatt Regency, Amritsar, Punjab

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 39th meeting of TCC

Minutes of 39th meeting of TCC held on 27th June, 2018, were circulated vide letter No. NRPC/Comml/209/RPC(42nd)/2018/9181-9275 dated 13th August,2018. No comments were received.

Members may kindly discuss and 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 42nd meeting of NRPC

Minutes of 42nd meeting of NRPC held on 28th June, 2018, were circulated vide letter No. NRPC/Comml/209/RPC(42nd)/2018/9181-9275 dated 13th August,2018. No comments were received.

Members may kindly confirm the minutes.

B. OPERATIONAL ISSUES

B.1 Revised System Protection Scheme (SPS) for 765 kV Agra-Gwalior line.

B.1.1 POWERGRID was assured of all possible support by the utilities and was requested to go ahead with the decision of 41st NRPC of utilizing the CB signals from both the end in the logic of SPS so as to ensure more robust and reliable operation of the scheme.

B.1.2 In 149th OCC, it was also informed that a report has to be submitted to CERC on the status of implementation of the SPS scheme. Accordingly, CERC has been intimated the current status of implementation and that a mock testing for the revised 765 kV Agra-Gwalior SPS will be carried out after integration of additional 1000 MW load shedding.

B.1.3 In 151st OCC meeting, POWERGRID informed that substations in Delhi, UP & Haryana were completed and 7 locations in Punjab & 6 locations in Rajasthan were remaining which are expected to be completed by October 2018. The mock testing for the Revised 765 kV Agra- Gwalior SPS will be carried out in November, 18 as communicated to CERC. (only after integration of additional 1000 MW load shedding that is to be carried)

B.1.4 The issue is being also deliberated in the Protection Sub committee of WRPC. The following has been recorded in the 130th PCM of WRPC held on 12.09.2017.

(i) Mock testing of SPS :

Mock testing of SPS for 765kV Agra-Gwalior for load shedding in NR and automatic generation backing down in WR was carried out on 05.01.2017. A test signal for loss of import of 1500MW and above on 765kV Agra-Gwalior 1 & 2 was sent at 16:07hrs. It was reported that the signal was received at KSTPS & VSTPS. However signal was not received at CGPL. The matter was taken up with PGCIL and subsequently it was informed that the private operator lease line used for transmission of the SPS signal was down.

Since there is no OPGW connectivity between Agra to Sasan, hence signal on PLCC was sent from Gwalior to Sasan at 17:07hrs. The signal was received at Sasan. WRLDC have requested PGCIL to update on as what needs to be down to ensure that the lease line links are always healthy. WRLDC have intimated that the 765 kV SPS for Gwalior-Agra at Gwalior end SPS is presently working on PLCC link. In this regard following points need discussion:

a. PGCIL may kindly update the progress of shifting of this SPS scheme at Gwalior end on OPGW.
b. Signal extension to Sasan on OPGW (Presently on PLCC only from Gwalior end) is also pending whose progress may also be updated to WRLDC.
c. As Gwalior end SPS is also acting as Main protection therefore signal extension to all the four generators should also be done through OPGW from Gwalior end also.
d. There is a need of exchange of SPS signal between Gwalior and Agra Substation with each other in view that in case of outage/non-function of one SPS , the other

SPS Scheme should operate and send signal via two paths to generators in WR. (As implemented for 765 kV Raichur-Sholapur SPS scheme)

e. Availability of Spare Card module at Gwalior station in case of failure of card.

(ii) Non-Operation of 765 kV Gwalior-Agra SPS on 12th April 2017 from Gwalior end: WRLDC in the 491st OCC meeting have intimated that on 12th April 2017 at 05:51 Hrs 765 kV GwaliorAgra D/C tripped on R-Y fault. It was observed that SPS has not operated even though one of the SPS condition was satisfied."Sudden reduction of import by NR on Agra-Gwalior I & II by more than or equal to 1000 MW and less than 1500 MW" generates signals for load shedding in NR. Agra-Gwalior SPS was mock-tested in recent past however it's non-operation during the actual crisis was highly undesirable. POWERGRID was requested to apprise OCC the reason for Non-Operation of SPS at Gwalior End, details of action initiated to rectify the issues., current status of OPGW works and the terminal equipment on 765 kV Gwalior- Agra, 765 kV Gwalior-Satna and 765 kV Satna-Sasan, status of SPS signal transfer between Agra and Gwalior over OPGW, availability of Spare Card module at Gwalior station in case of failure of card and ensuring two independent communication channels for SPS and testing these communication channels in each month so as to ensure that in case of Crisis it works. GM, WRLDC, in the 491st OCC, expressed serious concern of non operation of SPS signal at Gwalior end on 12th April at 05:51 hrs on tripping of 765 KV Gwalior-Agra D/c. POWERGRID intimated that, their testing Engineers are looking after the matter of non operation of SPS signal at Gwalior end and informed that SPS device testing would be conducted at Gwalior on 13th May'17.

128th PCM Discussion: PGCIL representative informed that the OPGW laying on Gwalior-Satna section would be completed by July 17 and Sasan-Satna section would be completed by Oct 17. WRLDC representative regarding non sensing/operation of SPS on 12th April 2017, informed that though the loadings on the lines prior to tripping at Agra was more than the SPS condition, the MW flow dropped significantly after the fault which persisted for the duration of un-cleared fault and hence the loss of load was not sensed at Gwalior end. Further WRLDC sought clarification as to whether the redundancy in the SPS by way of sensing the SPS conditions and sending both from Agra end and Gwalior end has been done by PGCIL. PGCIL representative informed that the same has not been done. He further stated that the SPS at Gwalior end was checked and a drift in the MW transducer was observed. The faulty transducer was replaced.

129th PCM Discussion: PCM suggested that the SPS conditions at both Agra and Gwalior end be sensed independently and if SPS conditions at either end are satisfied their shall be independent signal generation and a decision based on the signals generated at both ends should be transmitted to the generators of WR and loads in NR, as the case may be, so that there is adequate redundancy in the SPS. Further as regards to testing the SPS, secondary injection method should be done while carrying out the mock testing of SPS, so that any deviations in the measurements and the measurement circuit for the SPS is also thoroughly checked.

130th PCM discussion: PGCIL representative stated that at present it would be difficult to extend the signal from both Agra and Gwalior ends to all the generators in WR and loads in NR individually. However, the exchange of SPS signal generated on meeting of the SPS condition can be exchanged and sent to generators in WR and loads in NR. Further, PGCIL confirmed that the exchange would be carried out on Fiber communication.

POWERGRID may kindly apprise the Committee about the status of implementation of the scheme.

B.2 System Study for Capacitor Requirement in NR for the year 2019-20.

B.2.1 **38th TCC and 41st NRPC** approved the proposal of getting CPRI to conduct the capacitor requirement study for NR at 11/33 kV level so as to obtain more practical requirement of capacitor in the region.

B.2.2 **39th TCC and 42nd NRPC** approved the Techno Commercial offer of CPRI at **Rs. 32 lakhs (Rs. 20 lakhs for previous study and Rs. 12 lakhs for additional assignment) excluding taxes** for conducting the capacitor study. In the meeting the format for data submission was shared with the members and they were requested to ensure timely submission of the data so that the study may be carried out in the stipulated time frame.

B.2.3 In the **150th OCC meeting**, members expressed concerns on the nature of the format and submitted that the format being lengthy would require some time for better understanding of the format and submission of data accordingly.

B.2.4 To address the concerns of the members of OCC forum, in the **151st OCC meeting**, representative of CPRI made a detailed presentation explaining the format in the meeting and based on the inputs received from the members, the format has been revised and has already been sent to the respective SLDC's through e-mail dated 24.09.2018. CPRI has also shared a video of the presentation explaining the format which can be viewed on Youtube at https://youtu.be/QTXx7owPF3g.

Members were also requested to initially fill the data format for any one 220 kV or 132 kV substation and send it to CPRI (manoharsingh@cpri.in) to check its suitability for utilization in carrying out the study and further action.

B.2.5 Till date no data has been received from any of the state leading to delay in conducting the capacitor study requirement.
All members are once again requested to expedite the submission of data for timely completion of the capacitor study.

B.2.6 Regarding the proposal of capacitor installation by Haryana, Uttar Pradesh, Punjab and Jammu Kashmir through PSDF funding, a separate meeting of Techno-Economic Subgroup (TESG) was held on 28.08.18 (***Minutes attached at Annexure B.2.1***). In the meeting, the proposals of Punjab, Uttar Pradesh, Haryana, Jammu & Kashmir and

rajasthan were recommended by TESG to the Apprasial Committee for considering as "**Deemed returned**" on the non availability of proper justifications for their proposal of capacitor installation. .

All states are advised by the TESG to resubmit their proposal along with the required data in the formats as sought by the TESG in its 44th TESG meeting.

B.3 Reactive compensation at 220 kV/ 400 kV level.

B.3.1 The following reactors were approved in the 39th Meeting of SCPSPNR held on 29th & 30th May 2017:

a) TCR of capacity 500 MVAr at Kurukshetra 400 kV bus.

b) Bus Reactors at 30 no. 220 kV sub-stations and 18 no 400 kV level sub-stations subject to the availability of space ***(Annexure-B3.1)*****.** It was also agreed that these reactors shall be provided by the owner of the substations.

B.3.2 37th TCC and 40th NRPC meeting approved the reactors as agreed in the 39th Meeting of SCPSPNR.

B.3.3 **TCR of 500 MVAr at 400 kV Kurukshetra HVDC S/s:** POWERGRID had informed in the OCC meeting that bids were under technical evaluation and the LoA is expected to be placed by **October 2018** with commissioning schedule of 2 years from the issuance of LOA.

B.3.4 **Reactors in Delhi:** DTL has informed that as submitted to SCPSPNR held on 22.06.2018 and agreed therein, DTL will implement **7 fixed reactors, six 25 MVAr, 220 kV reactors Viz at Mundka, Harsh Vihar, Peeragarhi, Electric lane, Bamnauli, Indraprastha substation and one 125 MVAr, 400 kV reactor at Mundka S/s**. DTL has submitted that these reactors shall be commissioned by **December 2020**. Out of the above, scheme for five reactors at 220 kV level are under approval. DTL representative informed that order for the above 7 (Six 25 MVAr and one 125 MVAr) reactors is expected to be placed by **December 2018**.

B.3.5 **Reactors in Punjab:** PSTCL has informed that the price bid for 400 kV level reactors at Dhuri S/s will be opened on 18.10.2018. As regards 220 kV level reactors to be commissioned at Dhuri and Nakodar substation, tender was opened on 15-06-2018 (technical bid) & is under evaluation. DPR for installation of 400 kV & 220 kV reactors has been submitted for PSDF funding.

B.3.6 **Reactors in Uttarakhand:** PTCUL has informed that for 125 MVAr reactors at kashipur retendering is being done. 80 MVAr reactor at Srinagar has been received at site and shall be commissioned by 31st October 2018.

B.3.7 **Reactors in Rajasthan:** DPR for 3 Nos. each of **25 MVAR reactor (Akal, Bikaner & Suratgarh)** i.e total 75 MVAR reactors has been submitted for PSDF funding on 27.04.2018. Further the reply on observations raised by NLDC has been submitted on

8.07.2018. The installation process of these 3 reactors shall be started on receipt of approval by PSDF.

STU has been advised vide letter dtd. 27.08.2018 to study and send the DPR of already approved 450 MVAR (13*25+1*125MVAR) reactors for PSDF funding even if location had changed.

Regarding status of 150 MVAR (25 MVAr at Barmer and 125 MVAr at Jodhpur), approved in the 39th SCPSPNR, NRPC was informed that reactors at these locations are are included in proposal of 450 MVAr reactors submitted by Rajasthan.

B.3.8 The above reactors has been approved in 39th meeting of SCPSPNR so as to provide adequate reactive compensation at 400kV as well as at 220 kV level to contain the high voltages in the grid to avoid the opening of lines during light load conditions. In view of the same states have been time and again requested to expedite the commissioning of these reactors.

POWERGRID, DTL, PTCUL, Rajasthan and PSTCL may kindly update the status.

B.4 Database of protection settings

B.4.1 As a follow up of one of the recommendations of Enquiry Committee headed by Chairperson, CEA on grid disturbances that took place on 30th and 31st July 2012, Ministry of Power had constituted a 'Task Force on Power System Analysis under Contingencies' in December 2012. The Task Force had submitted its report in August 2013. In a meeting taken by Secretary (Power), GoI on 11.03.2014, it was decided that the report be given wide circulation and its recommendations be implemented in a time bound manner.

B.4.2 Based on the recommendations of the Task Force, it was decided that data regarding settings of relays shall be compiled by the CTU and STUs in their respective network and furnished to RLDC and SLDC respectively with a copy to RPC for maintaining the database. The database was to be kept updated and verified during the audit.

B.4.3 In the 35th TCC/39th NRPC meeting held on 1st/2nd May, 2017, TCC expressed their concern over the non-submission of protection database by the utilities and recommended for engaging a third party for development of Protection database with funding through PSDF in line with ERPC and SRPC.

B.4.4 Chairperson, NRPC, authorized Member Secretary, NRPC to carry out following activities:

i. Formation of group for finalization of detail scope of work of the Project.
ii. Submission of proposal for financing the Project through Power System Development fund (PSDF).
iii. Opening of a separate account in the name of 'NRPC Protection Database Fund' for receiving the grant from PSDF for the Project.
iv. Carry out e-tendering process including tender publication, opening, evaluation

etc. for selecting contractor for implementing the scheme based on scope of work of the Project finalized by the group.

B.4.5 Based on the discussions held in 34th PSC meeting, a core committee was formed to define the comprehensive Scope of the project comprising members from the utilities of NR. First meeting of the group for defining the scope of the project was held on 01.02.2018 and based on the inputs received from the members, Bid Document has been prepared by the NRPC Secretariat.

B.4.6 NRPC Secretariat has also submitted the DPR of the project for PSDF funding based on the draft bidding document. The proposal of NRPC was scrutinized by the Techno-Economic Sub Group and further examined by Appraisal Committee as well as Monitoring Committee.

B.4.7 Appraisal Committee as well as Monitoring Committee has recommended the proposal for the grant of from PSDF funding and also qualified proposal from 100% funding through PSDF. Subsequently, grant from PSDF towards Development of Protection Data Base Management System was sanctioned vide NLDC letter dated 01.08.2018.

B.4.8 Further, the tender has been published on 30th August and the last date for the receipt of the bid was 15th October, 2018. As only two parties has submitted the bid in the stipulated period, retendering has been done and now the Bid submission is up to 14.11.2018 and the same shall now be opened on 15.11.2018. The Bid evaluation committee has been formulated comprising members from NRPC secretariat and NRPC constituents.

This is for the kind information of the members.

B.5 LVRT compliance by wind generation

B.5.1 The issue of non-compliance of the Technical Standards for Connectivity to the Grid, (Amendment), regulations, 2012 by most of the wind generators in Rajasthan was discussed in the 38th TCC and 41st NRPC meeting.

B.5.2 In the meeting it was decided that the must run status of the wind generators should only be granted to LVRT compliant wind generators and non compliant wind generators shall not be scheduled and it should be the responsibility of state SLDC (Rajasthan SLDC in this case) for the implementation of the same. It was also decided that in future all the constituent States shall not give connectivity to the wind generators unless this compliance was fully met.

B.5.3 Rajasthan SLDC was also advised to issue a notice to all the LVRT non-compliant wind generator providing them with one month time for compliance to LVRT, failing which SLDC would be constrained to deny scheduling to the non compliant wind generators.

B.5.4 In 145th OCC meeting, representative of RVPN informed about the office memorandum from MNRE ***(Annexure B5.1).*** In the said OM, the following has been mentioned:

"Concerned WTG manufactures may apply for LVRT testing to any internationally accredited testing body or NATIONAL institute of WIND ENERGY by 15.3.2018, which should include the following:

i An affidavit that the manufacturer would comply with CEA Technical standards for connectivity to the grid.

ii A bank guarantee of Rs 1 crore per model, which would be returned on producing the compliance certificate for LVRT and other technical standards as stipulated by CEA."

B.5.5 In the **147th OCC meeting**, MS, NRPC stated that all the wind generators shall be LVRT compliant for which retro fitment needs to be done & it shall be responsibility of Rajasthan SLDC to get it enforced. Rajasthan was requested to comply with the decision of 38th TCC/41st NRPC meeting & write letters to wind generators communicating the decision of NRPC.

B.5.6 In the **148th OCC meeting,** it was stated that the time period for applying for LVRT testing to any internationally accredited testing body or NIWE stands expired on 15.3.2018. He added that notice should be issued to all Wind generators who have not done the needful. Rajasthan SLDC representative has intimated the same has been issued

B.5.7 As per 38th TCC and 41st NRPC decision, SLDC should not schedule the wind generators who are not LVRT complaint. Also he added that due to LVRT non compliance on part of the wind generators has lead to a near voltage collapse instances but luckily the grid survived.

B.5.8 A meeting of wind turbine manufacturers was held on 05.07.2018 to sort out the issue of LVRT and to get its compliance expeditiously. Further, the assessment of manufacturer wise non complied WTG has been identified and accordingly 638 generators are LVRT compliant & 106 generators do not require LVRT as per regulation. 2641 generators need to be LVRT compliant. The capacity of generators that are non – compliant is 3019 MW. MS, NRPC also informed that the generators will have to make arrangements for cost of installing LVRT.

B.5.9 M/s Suzlon and M/s Inox have filed a petition for waiver of installation of LVRT on account of additional cost involved.

RVPNL maykindly update the status.

B.6 Downstream network by State Utilities from ISTS Stations (Agenda by POWERGRID)

B.6.1 Augmentation of transformation capacity in various existing substations as well as addition of new substations along with line bays for downstream network are under implementation at various locations in Northern Region. For utilization of these

transformation capacities, implementation of downstream 220kV system needs to be commissioned:

S. No.	Substation	Downstream network requirement	Schedule of substation commissioning	Planned system and Implementation Status
1	400/220 kV, 3x315 MVA Samba	2 nos. bays utilized under ISTS. Balance 4 Nos to be utilized	Commissioned	LILO of 220 kV Bishnha – Hiranagar D/c line : under tendering (PMDP) (status as available with CEA) LoA has been issued and Material has reached the site. **Anticipated – Nov'19** **PDD J&K may update.**
2	400/220kV, 2x315 MVA New Wanpoh	6 Nos. of 220 kV bays to be utilized	Commissioned	220 kV New Wanpoh –Mirbazar D/c line: under tendering (PMDP) 220 kV Alusteng- New Wanpoh line **Anticipated – Nov'19** **PDD J&K may update.**
3	400/220kV, 2x315 MVA Parbati Pooling Station	2 Nos. of 220 kV bays to be utilized.	Commissioned	220 kV Charor- Banala D/c line (18 km) : under construction Target completion -**December 2018** as intimated by HPPTCL ***HPPTCL may update.***
4	400/220kV, 2x500 MVA Kurukshetra (GIS)	8 nos. of 220 kV bays to be utilized	Commissioned	LILO of one circuit of Kaul-Pehowa 220 kV D/c line LILO of one circuit of Kaul-Bastara 220 kV D/c line Work awarded. Contractual Completion period upto **31.10.2019** ***HVPNL may update the progress and the plan of utilising 4 number of balance bays.***
5	400/220 kV, 2x500 MVA Bagpat GIS	3 nos. of 220 kV D/C lines to Shamli, Muradnagar	Commissioned	Baghpat- Baraut I energised Baghpat- Baraut II energised Baghpat-Shamli energised Baghpat- Muradnagar-II energised

S. No.	Substation	Downstream network requirement	Schedule of substation commissioning	Planned system and Implementation Status
		and Bagpat commissioned. Balance 5 Nos. of bays to be utilized		Baghpat- Baghpat energised Baghpat- Modipuram New D/C is planned
6	400/220 kV, 2x315 MVA Dehradun	Out of 6 bays, only two bays used. Balance 4 bays to be utilised.	Commissioned	02 bays for Yamuna Basin (Mori substation) 2 bays for proposed S/s at Selakui ***PTCUL may update the progress made.***
7	400/220 kV, 2x315 MVA Sohawal	Out of 6 bays 2 utilised for Sohawal-Sohawal (UP) D/C line, 2 no. of bays utilised for Sohawal-Barabanki D/C line. Balance 2 Nos 220 kV bays to be utilized.	Commissioned	2 nos of bays to be utilized for 220kV New Tanda-Sohawal line .There is a litigation process on & expected to be completed by November 2018 . Sohawal-Behraich and Sohawal-Gonda lines are under construction and expected to be completed by January, 2019. PGCIL requested to provide the estimate for construction of Bays at PGCIL end
8	Shahjahanpur, 2x315 MVA 400/220 kV	Partially utilized. Balance 6 Nos. of 220 kV bays to be utilized.	Commissioned	Shajahnapur-Hardoi commissioned Shajahnapur-Azimpur D/C line is planned, land of substation identified.
9	Moga	Partially utilized. Balance 2 nos. of 220kV bays	Commissioned	Moga–Mehalkalan 220kV D/c line Work completed. Approval from NGT for tree cutting is awaited for balance work to commission line. NGT clearance received and by

S. No.	Substation	Downstream network requirement	Schedule of substation commissioning	Planned system and Implementation Status
		to be utilized.		31.12.2018 work will be completed.
10	Hamirpur 400/220 kV 2x 315 MVA Sub-station (Augmentation by 3x105 MVA ICT)	04 nos. 220 kV downstream lines commissioned under ISTS. Balance two bays to be utilised by HPSEBL	August 2020	2 bays to be utilized for connecting 220/132kV Kangoo substation of HPSEBL by 220 kV Kangoo-Hamirpur D/c line. ***HPPTCL may update the progress.***
11	Kaithal 400/220 kV 1x 315 MVA Sub-station	July 2017 (Shifting of Transformer from Ballabhgarh).	Commissioned	220kV Kaithal(PG)- Neemwala D/c line - Work awarded on 13.7.2018. Tentative completion date 31.12.2019. 220kV S/s Neemwala-Tenders opened on 30.3.2018 & awarded on 13.7.2018. ***HVPNL may update the progress.***

Members may update and expedite the downstream system.

B.6.2 Establishment of new 400/220kV substations in Northern Region:

Sl. No.	Name of Substation	MVA Capacity	Expected Schedule	Downstream connectivity furnished by States
1	400/220kV Dwarka-I GIS	4x 500	Oct'18	**DTL may update.**
2	400/220kV Tughlakabad GIS	4x 500	Oct'18	
3	220/66kV Chandigarh GIS	2x 160	Feb'19	8 nos. of 66kV bays. UT **Chandigarh to update.**
4	400/220kV Jauljivi GIS	2x315	December 2019	2 bays for 220kV AlmoraJauljibi line

Sl. No.	Name of Substation	MVA Capacity	Expected Schedule	Downstream connectivity furnished by States
				2 bays for 220kV Brammah-Jauljibi line **PTCUL to update.**
5	400/220kV Sohna Road GIS	2x500	May'19 (Under TBCB) (8 bays)	**HVPNL to update.**
6	400/220kV Prithla GIS	2x500	May'19 (Under TBCB) (8 bays)	Two nos. of 220kV bays for Prithla(400)-Prithla (HVPNL) 220kV D/c line Four nos. of 220kV bays for LILO of existing 220kV Palwal–Rangala Rajpur D/c line at Prithla (400) (FY 2019-20) Two nos. of 220kV bays for 220kV Prithla (400)–Sector-78, Faridabad S/s D/c (FY-2020-21) **HVPNL to update.**
7	400/220kV Kadarpur GIS	2x500	May'19 (Under TBCB) (8 bays)	**HVPNL to update.**
8	400/220kV Kala Amb GIS	7*105	Commissioned (Jul'17)	HPSEBL has planned one no. of 220kV D/c line from Kala Amb 400/220kV S/s to 220/132kV Kala Amb S/s. Details for remaining 4 nos. of line bays may be provided. **HPSEBL to update**.
9	400/220kV Amargarh GIS	7X105	Oct'18 (Under TBCB) (Sterlite Grid planning to prepone)	JKPDD to confirm for LILO of 220kV D/c Zainkote - Delina line at Amargarh. 20 ckm work completed June-18 **PDD, J&K to update.**

States are requested to update the details of planned downstream network along with implementation status for utilisation of the ISTS substation.

B.7 Funding for the scheme "Provision of STATCOM at Nalagarh & Lucknow in Northern Region" (Agenda by POWERGRID)

B.7.1 Standing Committee on Power System Planning of Northern Region in its 32nd meeting held on 31.08.2013, changed the earlier approved ± 400 MVAr SVC at Nalagarh and Lucknow substations of POWERGRID as ± 300 MVAr STATCOM at each of the location and the same was also approved in the 29th meeting of NRPC held on 13.09.2013.

B.7.2 At the time of the above said approval of NRPC, there was no provision of PSDF funding and thus it was to be funded through internal resources of POWERGRID which would have been recovered through regulatory tariff mechanism.

B.7.3 POWERGRID, subsequently, for the benefit of the constituent approached for PSDF funding for the said scheme. The Appraisal Committee in its 12th meeting held on 16.06.2016 advised POWERGRID to get the approval of NRPC. The same was approved in 39th Meeting of NRPC held on 02.05.2017. Meanwhile, POWERGRID placed the LoA for the scheme on 02.09.2016.

B.7.4 Thereby, when the proposal was placed to the Appraisal Committee in its 18th meeting held on 05.02.2018, the Appraisal Committee rejected PSDF funding for the above scheme on the grounds that LoA for the same has already been placed.

B.7.5 POWERGRID brought an agenda item in the 39th TCC/42nd NRPC meeting and informed the committee members that as the Appraisal Committee has disapproved the PSDF funding of the scheme, the funding for the said scheme shall now be done by POWERGRID through its internal resources to which the TCC members were not in agreement.

B.7.6 42nd NRPC agreed with the recommendations of TCC for not accepting POWERGRID proposal for funding the above scheme through its internal resources & decided to request Appraisal Committee to allow funding for the scheme of STATCOM at Nalagarh & Lucknow as a special case.

B.7.7 NRPC Sectt. on behalf of NRPC/TCC has requested Member Secretary, Appraisal Committee, PSDF to allow funding for the scheme of STATCOM at Nalagarh & Lucknow as a special case and has also advised POWERGRID to take up the matter further with Appraisal Committee. (***Copy of Letter enclosed at Annexure B.7.1***)

POWERGRID may take up the matter with NLDC for PSDF approval.

B.8 Phase nomenclature mismatch between BBMB and some interconnected stations of other power utilities

B.8.1 In the 34th PSC meeting, the issue of mismatch of phase sequence nomenclature of BBMB system interconnected with other utilities was highlighted.

B.8.2 The issue was further deliberated in the 138th OCC meeting held on 23.08.2017, wherein it was observed that nomenclature of phases at BBMB end has inadvertently been marked as:

Phase of the grid	Corresponding nomenclature of the phase at BBMB end
R Phase	B Phase
Y Phase	R Phase
B Phase	Y Phase

B.8.3 To resolve the issue, in the 38th TCC / 41st NRPC meeting it was decided that a committee would be formed to comprising of BBMB constituent states, utilities with which BBMB system is interconnected, NRPC Sectt and POWERGRID.

B.8.4 BBMB drew a draft action plan **(Annexure B.8.1)** which was duly deliberated by the Committee in its 1st meeting held on 04.06.18 and was circulated to all the concerned utilities for their comments. The execution of the action plan is tentatively planned during month of November-December, 2018.

B.8.5 HPSEB and PSTCL are in agreement with the action plan proposed by BBMB. However, NTPC and POWERGRID had some comments on the same. BBMB has agreed with the comments from NTPC and has decided to modify their action plan as per the demands of NTPC.

B.8.6 The reply of BBMB vis-à-vis the comments of POWERGRID were deliberated in the 151st OCC meeting wherein members were of the view that reply of BBMB was generally in order. However, POWERGRID representative stated that the matter pertains with NR-I and NR-II region of POWERGRID and final decision regarding the same is to be taken up at the level Executive Directors of respective regions.

B.8.7 Executive Director of NR-I and NR-II were requested to provide their concurrence to the BBMB action plan vide letter dated 06.10.2018 **(Annexure B.8.2)**, so as to resolve the issue within the time frame as stipulated by NRPC.

POWERGRID & BBMB may kindly update the status.

B.9 Follow up of Major Decisions of NRPC.

S. No.	Name of the Project /Decision taken	Meeting in which Approval was granted/ Decision was taken	Updated Status
1.	Automatic Meter Reading (AMR) for SEMs	13th NRPC meeting held on 24th June 2009.	Total SEM/locations as per LOA, phase-I:1250SEM/220 Locations phase-II:575SEM/150 DCU • No. of Energy meters for which AMR commissioned : 1320 SEM/266 DCU • Total locations for which data is received: 150 Locations • No. of Energy meters for which data is being received at NRLDC: 1065 SEM Percentage availability of data: 82% on SEM basis and 73% on location basis In the 139th OCC meeting on the issue of provision of the prospective plan of 5 minute scheduling in the AMR, POWERGRID representative expressed their inability to get modifications done for 5 minute scheduling They further stated that once the regulation is notified they will take the further necessary action. it was decided in 37th CSC meeting that POWERGRID will complete the project by 31st Oct-2018. However at present out of 1825 nos. only 1409 nos. meters have been integrated. NRPC requested to POWERGRID to expedite work progress to complete AMR integration project by Dec 2018 as agreed in 37th CSE meeting. As per 42 NRPC & 39 TCC minutes of meeting point C.19.1 & C.19.2; it

S. No.	Name of the Project /Decision taken	Meeting in which Approval was granted/ Decision was taken	Updated Status
			was decided that POWERGRID will arrange the demonstration of integration of Elster meter by 15th July-2018. Further, in the 37th CSC meeting, it was intimated by M/s Kalkitech that they have completed all the activities for integration of these meters through AMR and are ready for testing the same and testing is scheduled to be completed by 31.10.2018 In 37th CSC meeting POWERGRID informed that switching work is in progress to connect 70 stations of POWERGRID where minimal cost is required. Work completed at 19 stations., shifted easily with minimal cost. Cost estimate can be submitted only after survey of complete stations.
2.	Provision of Bus Reactors in Northern Region to Control Over Voltages	Provision of Bus Reactors in Northern Region to Control Over Voltages	Out of 17 no. reactors at 15 locations, 12 no. reactors at 10 locations have been Commissioned. The status of remaining 05 reactors was as under; **<u>Nathpa-Jhakri (1x80 MVAr):</u>** To be commissioned by **December 2018**. **<u>Chamera-I (1x125 MVAr):</u>** Charged on **25 August 2018** **<u>Parbati-II (1x125 MVAr) and Parbati-III (1x80 MVAr):</u>** NHPC informed that there is no space at Parbati-III and as such reactors will be installed at Parbati- II. Reactors at Parbati-II will be

S. No.	Name of the Project /Decision taken	Meeting in which Approval was granted/ Decision was taken	Updated Status
			commissioned along with the commissioning of the project in 2018-19. The case for purchase of reactor is **under tendering** process.
3.	Transmission system associated with Kishenganga HEP. Kishenganga – Wagoora 220 kV D/c	33rd Standing Committee Meeting held On 23/12/2013	POWERGRID had informed that completion schedule of Transmission system associated with Kishenganga HEP had been delayed due to unrest in Kashmir. The revised schedule was: • Kishenganga – Wagoora 220kVD/c line - (expected by **November 2018**)
4	Unified Real Time Dynamic State Measurement (URTDSM) Scheme.	Approved in 27th NRPC meeting held on 13th July, 2012 & 30th November, 2012	• Supply: Completed (114 Sub-stations). • PMUs at 112 S/S have been installed and 102 S/S are integrated with NRLDC/SLDCs. • WAMS System Commissioned in NRLDC & SLDCs of Northern Region. • Out of 6 Analytic Software which are being developed by IIT Bombay, 4 have been deployed at NRLDC, Prototype for one application is being tested and remaining one is under development. Installation of Line Parameter Estimation, Vulnerability Analysis of Distance Relay, Supervised Zone-3 Distance Protection, Linear State Estimator is done for NRLDC & Delhi, installation at SLDCs under progress.
5.	Fiber Optic based	18th NRPC meeting held	POWERGRID informed that Work on all packages would be

S. No.	Name of the Project /Decision taken	Meeting in which Approval was granted/ Decision was taken	Updated Status
	communication system in NR and Additional OPGW connectivity in Northern Region under fiber optic expansion project	on 27th November, 2010 and 28th NRPC meeting held in 22nd March, 2013	completed by August 2017. • Fibre Optic Connectivity under Central sector (5193/5203 Kms) has been completed. Uri-Uri-II link (10kms) could not be completed due to severe ROW issues. • OPGW connectivity under State Sector & Additional requirement of Central Sector is under progress and same shall be completed progressively by Dec' 2018 **NR-I & NR-III :-** State Sector Completed - 621 Kms Central Sector (Addi. Req): 1350 Kms out of 1643 completed. **For PG NR-II links:POWERGRID NR-II may update the status**
6.	Rectification of deficiencies coming out of Basic Protection Audit carried out by CPRI in association with POWERGRID	27th NRPC meeting held in November 2013	-
7.	Third party Protection audit of intra-state system / balance system not covered in Basic Protection Audit	27th NRPC meeting held on 30th November, 2012.	Only UPPTCL had not submitted their action plan. UPPTCL: the action plan would be submitted shortly.

S. No.	Name of the Project /Decision taken	Meeting in which Approval was granted/ Decision was taken	Updated Status
8.	Planning, procurement and deployment of Emergency Restoration System.	In the 34th NRPC meetings 20th held on March, 2015	**DTL, PSTCL, UPPTCL and J&K** - 02 nos. of ERS procured. **RRVPNL**: - For procurement of ERS, preparation of Tender documents has been completed and it's under approval. **HVPNL**: - BOQ finalization it's under process. **PTCUL:** - DPR finalization under process **HPSEBL**: – The process of arranging funds for procurement of ERS has been initiated. HPSEBL representative intimated that they were coordinating with PTCUL. He was advised to coordinate with J&K, citing the status of PTCUL **BBMB**: - BBMB representative stated that the issue will be taken up in the Power Sub –Committee as the partner states do not have their ERS from which it was earlier proposed to be utilized. **Note:- CEA (Grid Standards) regulations 2006,** regulation No. 22 stipulates that each transmission licensees shall have an arrangement for restoration of transmission lines of 400 kV and above & strategic 220 kV lines through the use of ERS in order to minimize the outage time of transmission lines in case of tower collapse. Also Ministry of Power has directed that for 5000 ckt km minimum of 2 No.s of

S. No.	Name of the Project /Decision taken	Meeting in which Approval was granted/ Decision was taken	Updated Status
			ERS are required.

B.10 Connectivity to Naitwar Mori HEP (NMHEP) (2X30MW) of SJVN Ltd. in Uttarakhand (Agenda by SJVN)

B.10.1 Connectivity of Naitwar Mori HEP was discussed in the 39th TCC & 42nd NRPC meeting held on 27th & 28th June, 2018, wherein TCC members advised PTCUL for an early finalization of the land for Mori substation so that the LTA can be granted and the construction of the transmission line can be done before the NMHEP commissioning. Further, NRPC concurred with the decisions of TCC and advised PTCUL to finalize the location of Mori substation within 02 months i.e. by the end of August 2018.

B.10.2 A meeting on connectivity of NMHEP was also held on 12.09.2018 at CEA under the Chairmanship of Chief Engineer (PSPA-I), CEA to discuss the issues related to UITP Scheme under implementation by PTCUL for evacuation of power from various Generators. In the meeting SJVNL expressed concern for delay in finalization of land for sub-station, however PTCUL has not given any firm commitment for the finalization of land.

B.10.3 Further, a meeting was also held by SJVNL with Secretary (Energy) GoUK on 19.09.2018 at Dehradun, where in PTCUL raised the issue regarding submission of Bank Guarantee amounting to Rs 3.00 crores for implementation of transmission system at their end and grant of Long Term Access (LTA) by PowerGrid (CTU).

B.10.4 It is to inform that, the Civil and E&M Package of NMHEP has been awarded and the expected commissioning schedule of NMHEP is September, 2021 and for pre-commissioning activities in NMHEP Transmission line would be require by August, 2021.

B.10.5 Keeping in view of above, Members may impress upon the following:

a) To POWERGRID (CTU) for issuing the grant of LTA of NMHEP.

b) To PTCUL for the early finalization of land / location of Mori Substation.

c) To PTCUL for signing of Implementation Agreement & Transmission Agreement to expedite the construction of associated transmission system of NMHEP at the earliest matching with the COD of NMHEP.

Members may kindly deliberate.

B.11 Training programme for Protection System Engineers on Power System Protection (Level 2 and 3)

B.11.1 In the 35th NRPC meeting held in July 2015, while discussing the issue of reimbursement of expenditure of NRPC Sectt. for the year 2015-16, it was suggested that rather than reducing the contribution from each member, the contribution should be kept at same level and additional fund could be used for arranging capacity building Programmes, workshops, brainstorming sessions.

B.11.2 A group was constituted to suggest measures for improvement in protection system among the utilities of Northern Region. The report of the group was approved in 34th TCC/38thNRPC meeting held on 24th/25thOctober, 2016. One of the recommendations of the group was to conduct the three levels of training program on Power System Protection. Level-1 is the basic Training on Protection System for Substation Engineers and same is to be organized by the utility itself. Regarding Level-2 and Level-3 training, it was decided that NRPC Secretariat should arrange the said training.

B.11.3 Accordingly, Training on Protection system Level -2 and Level – 3 were successfully conducted through POWERGRID from 21st to 25th November, 2016 at Shimla and from 19th to 23rd March, 2018 at Udaipur respectively.

B.11.4 In 36th PSC meeting held on 19.09.2018, members requested for 2nd batch of Level-2 and Level-3 training of Protection System Engineers for 50 no. of participants It was proposed that this time training to be organized through OEMs such as ABB, SIEMENS, GE etc. which would include classroom training as well as hands on training on Relays.

B.11.5 **SE(P), NRPC suggested that utility should complete Level 1 training by the month of December 2018 for Protection Engineers participants other than those who have been already availed training in first batch. Utilities should ensure that these Protection Engineers would be spared for Level 2 & Level 3 training also as and when these training is scheduled by NRPC.**

B.11.6 36th PSC recommended for approval of NRPC for 2nd batch of Level-2 and Level-3 training of Protection System Engineers for 50 no. of participants. The training is tentatively proposed during December, 2018 & February 2019 respectively. The expenditure will be booked in NRPC fund.

Members may kindly deliberate and approve.

B.12 Training Programme/Workshop on Protection system Auditors from CPRI.

B.12.1 Protection is one of the key operational aspects of Power system. The revision in the protection settings/schemes after modification of network topologies is essential for reliable operations of the Grid. Hence, it is important that Protection system engineers are

well educated and trained to carry out Protection Audit. It is proposed to organize Training Programme/Workshop on Protection Audit for Protection System Engineers.

B.12.2 In 36th PSC meeting held on 19.09.2018, a proposal from Power System Division of Central Power Research Institute for conducting 3 days Training Programme/Workshop at Bangalore on Protection Audit for Protection System Engineers was discussed.(***Annexure B.12.1*****).** They have proposed training at 10,500 per participant exclusive of taxes. Participants have to make their own boarding and lodging arrangements.

B.12.3 Members expressed that since CPRI has already carried out Protection audit of many Sub stations, CPRI might be more suitable for imparting training on Protection Audit. The trainees would be trained for carrying out Protection Audit in their State as well as in their Region. CPRI would be requested to make available their Guest House facility for interested trainees at their cost.

B.12.4 PSC recommended that the training programme/workshop on Protection audit to be conducted by CPRI and same was tentatively proposed to be conducted during November– December, 2018. The expenditure on training will be booked in NRPC fund.

Members may kindly deliberate and approve.

B.13 Request for allocation of sufficient APM Gas (Agenda by BRPL)

B.13.1 Allocation of APM / other cheap sources of gas for Pragati-I & III, is needed to ensure operation of the said plants at 85% of PLF. These power plants being of State Generating Utilities are required to cater to the demand of the NCT of Delhi on priority basis.
However, on account of inadequate APM gas allocation these plants are not able to run at their full potential. In this regard, following submission may be taken into consideration.

i) PPCL-I and PPCL-III, are of State generating Utilities having a total capacity of 1701 MW. These plants can provide reliable power & peaking power quantum at a reasonable price if sufficient APM gas allocation is provided to these plants. Being gas based power stations, these are load Centre plants.

ii) PPCL-III has two modules of 685 MW each, however, on account of insufficient gas only one module is operational. The same is evident from the fact that since its CoD, the PPCL-III generates power only to the tune of 300 to 650 MW. PPCL-III has F-class machines which result in better efficiency and reduce Energy Charge Rate (ECR).

iii) As such PPCL-III being a new plant can operate efficiently with increased gas allocation.

iv) However, due to non-availability of cheap APM Gas, the aforesaid plants are unable to operate optimally at their full capacity. The same is evident from the Plant wise PLF & FC VC details for the last two years, provided as under:-

	16-17						17-18					
Plants	PLF %	Mus	TC Rs Cr	FC/Unit	VC/Unit	TC/Unit	PLF %	Mus	TC Rs Cr	FC/Unit	VC/Unit	TC/Unit
PPCL-I	65%	520	219	1.14	3.06	4.20	69%	537	249	0.78	3.85	4.63
PPCL-III	17%	610	475	5.24	2.53	7.78	26%	882	559	3.33	3.00	6.34

v) When the schedule is increased for the plant, the ECR shoots up drastically as the expensive RLNG gas is used from spot market to run the plants.

vi) However, when it comes to scheduling from PPCL plants, it lags in the MOD list due to higher ECR on account of expensive fuel utilized to increase the schedule.

vii) Further, it was observed that the month wise availability of APM gas was also decreasing in absolute terms in PPCL plants as under:-

Qty of APM Gas in SCM

Month	PPCL I	PPCL III
Apr-18	1,75,40,000	3,29,47,098
May-18	1,37,10,000	3,15,96,930
Jun-18	98,60,000	3,41,06,440
Jul-18	92,50,000	2,04,62,059

viii) Therefore, if sufficient APM gas is allocated for ensuring PPCL-I & III to operate at 85% PLF, the ECR shall be reduced to approximately Rs 2.221 /kWh from Rs 6.218/kWh, & to Rs 2.513/kWh from Rs. 3.565/kWh respectively (based on July-18 bill data for the station) as is evident from the table below.

Plant	GHR (Kcal/KWh)	LPPF (Rs/SCM)	CVPF (Kcal/SCM)	AUX (%)	ECR
PPCL	2000	28.881	9479.526	2	6.218
PPLC (ONLY APM)	2000	10.316	9479.526	2	2.221

Plant	GHR (Kcal/KWh)	LPPF (Rs/SCM)	CVPF (Kcal/SCM)	AUX (%)	ECR
PPCL -III	1845	17.934	9520	2.5	3.565
PPCL-III (ONLY APM)	1845	12.644	9520	2.5	2.513

B.13.2 Considering the fact that 330 MW PPCL-I & 1370 MW PPCL-III have the potential to generate 12352 MUs annually at 85% PLF, the availability of sufficient APM gas could lead to a potential saving of approximately Rs. 2005 Crs for Delhi.

B.13.3 In fact EPCA has also emphasized in its meetings the need for increase of Gas based generation in Delhi to address the concern of rising pollution levels in Delhi. Post closure

of BTPS internal generation of BTPS would be reduced to Zero and hence there is a need for increase in gas allocation.

B.13.4 In view of the above, NRPC is requested to take up with appropriate agency CEA /MOP / MoPNG for facilitating adequate allocation of APM Gas for Delhi bases Gas plants . It will help in providing clean power in Delhi.

Members may kindly submit their views.

B.14 Acute fuel shortage in power stations (Agenda by BRPL)

B.14.1 Maintaining power supply is becoming challenge without getting full support from Gencos on availability of power & reliability of schedules. It is found that there is no adequate fuel stock with Gencos. There is shortage of Gas as well as Coal.

B.14.2 Shortage of coal is leading to poor availability, frequent revision of DC schedules, whereas Insufficient APM gas availability increases ECR if plants run on RLNG/Liquid fuel.

B.14.3 During last one year, Pan India Coal shortage has been observed resulting in reduced availability for thermal plants. CEA reports also show extremely Low Coal Stock position, going as low as to even one day stock that too during peak summer days. This creates uncertainty as any disruption in supply chain mechanism of coal leads to drastic variation in DC which become unmanageable during real time scheduling leading to forced load shedding.

B.14.4 DISCOM arrange power on day ahead basis and any shortfall from the stations / bilateral sources is met from Power Exchange Day Ahead Market (DAM). The Declared Capacity of (DC) stations on day ahead basis is relied upon to estimate its availability for the next day, as it the best information available at the time. The declared DC on Day ahead basis should be realistic as Discoms day ahead planning entirely depends on DC's certainty. If there is any reduction in DC during real time it becomes unmanageable to arrange such quantum, as power exchanges also have limitations like insufficient availability of power in power exchanges on real time basis & transmission constraints, leading to load shedding.

B.14.5 Gas Stations have been declaring high DC despite having insufficient Gas allocation of APM & RLNG Gas as a result generation at times under RRAS also remains under injection and Discoms have to bear high capacity charges.

B.14.6 Once allocation of power for the next day is confirmed by Genco should ensure that there should not be any major variation which cannot be managed during real time operation (1.5 hrs). In fact there have been incidences wherein schedules have been revised before 1.5 hrs as this increases a DISCOM DSM burden. Request to ensure that beneficiaries get sufficient time.

Members may kindly deliberate on following issues:

a) **Adequate coal stock** to be maintained to run the plants to its full capacity especially during summers

b) **Declared capacity** of plant to be as close as actual so that Discoms can arrange power in a optimized manner for next day accordingly

c) **Reduce number of intraday revisions** in the DC as it would help in ensuring uninterrupted power supply to consumers of Delhi.

d) **RLDC to ensure that sufficient time** is given for arranging power from alternate sources.

e) **RLDC should ensure that Gas plants** are capable of generating power what they declare in DC.

B.15 Violation of Protection standard in case of Inter-Regional lines of voltage 220kV and above

B.15.1 The section 3.e of Grid Standards Regulation of CEA, 2010 states that

"Provide standard protection systems having the reliability, speed, selectivity and sensitivity to isolate the faulty equipment and protect all components from any type of faults, within the specified fault clearance time and shall provide protection co-ordination as specified by the Regional Power Committee

Explanation: For purpose of this regulation "fault clearance time" means the maximum fault clearance time as specified below:

Sr. No.	*Nominal System Voltage (kV rms)*	*Maximum Time (in msec)*
1.	*765 and 400*	*100*
2.	*220 and 132*	*160*

Provided that in the event of non clearance of the fault by a circuit breaker within the limit specified in Table, the breaker fail protection shall initiate tripping of all other breakers in the concerned bus section to clear the fault in the next 200 msec. "

B.15.2 The delayed clearance of faults of Inter-regional lines may prove fatal to the security of the grid. Since, tripping of Inter Regional Lines of voltage 220kV and above are matter of concern to Grid security suitable action needs to be taken. As per the IEGC clause 5.2.r and clause 15.3 of CEA grid standard, DR/EL of all the tripping of 220kV and above level shall be sent within 24 hours of NRLDC.

B.15.3 In 35th and 36th PSC meeting held on 20th June, 2018 and 19th September respectively, it was informed that issue pertains to the violation of Protection standard such as delayed clearance of fault, spurious tripping, DR/EL submission within 24hrs and other events resulting into violation of Protection standard The violation of Protection Standard should be avoided and DR/EL should be sent to NRPC/NRLDC within 24 hours as the tripping analysis for inter-regional lines is very important for safe and reliable operation of Grid. Utilities were requested to submit the DR/EL of all the tripping of 220 kV and above level within 24 hours to NRLDC.

B.15.4 Considering the issue of large amount of data, a whatsapp group of PSC members has been created in which information regarding tripping (name, date, time) and date & time at which details have been submitted could be shared which would help in updating the database regularly and information could be shared amongst all. Further, utilities were advised to share the data on sep-nrpc@nic.in,nrldcso2@posoco.in, nrldcso2@gmail.com.

Members may kindly deliberate.

B.16 General Recommendations/Best Practices in PSC meeting

B.16.1 In the 32nd PSC meeting it was deliberated that there is a need to keep the compilation of the general recommendations of the Protection Sub- Committee for reference. The compiled list of recommendations of PSC was circulated with the agenda of 33rd PSC meeting and also enclosed as ***Annexure B.16.1***.

B.16.2 Members were requested to adhere to these general recommendations and follow the best practices as suggested by PSC. Members were also requested to forward best practices in their utility or any other utility which can be adopted to include in this compilation.

B.16.3 In 35th and 36th PSC meeting held on 20th June, 2018 and 19th September respectively, it was informed that list of general recommendations was formed considering best practices as suggested by PSC but it has been observed that these practices were not being implemented. All the utilities were requested adhere to these recommendations and submit the updated status regarding actions taken in order to implement these general recommendations.

Utilities may update the status regarding actions taken to adhere these general recommendations.

B.17 CERC order on Petition No. 9/SM/2014 and 10/SM/2015

B.17.1 CERC in its order dated 14.06.2016 in Petition no. 9/SM/2014 for investigation of tower collapse and load crash in Northern Region on 30.5.2014 and Petition no. 10/SM/2014 for investigation of Line Outage due to Tower Collapse in Northern Region during April 2015 to June 2015 directed RPC Secretariat to examine the cases of delayed clearance of faults on transmission system during last two years and to submit an analysis report within six month from the date of issue of the order. The status of the delayed clearance of the fault from 01.04.2014 to 01.06.2015 was enclosed as Annex-VI of the agenda of 32nd PSC meeting. In the agenda following action was proposed:

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

taken/being taken were requested to submit the same.

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

B.17.2 In the 32nd PSC meeting, members were requested to submit the reason for delayed clearance of faults and action taken to avoid recurrence, by 15th Dec, 2016 to NRPC Sectt. Again, in the 33rd PSC expressed concern over non-submission of data. Utilities were requested to furnish the information by 07.03.2017, so that the report may be submitted to CERC. Subsequently, vide letter dated 10.07.2017, members of PSC were asked to submit the action taken on the recommendation of the discussions held in last 04 PSC meetings (30th, 31st, 32nd, 33rd) by 25.07.2017).

B.17.3 The issue was again flagged in 34th, 35th and 36th PSC meeting in which all the members were requested to furnish the information as mentioned above at the earliest. The details are yet to be receivd from the utilities except NJHPS, POWERGRID, DTL, NHPC, BBMB, NAPS, UPPTCL (Central zone).

Members may kindly deliberate.

B.18 Status of FGD installation vis-à-vis installation plan at identified TPS.

B.18.1 The timeline for FGDs to be installed was finalized in the 36th TCC (Special) meeting held on 14.09.2017 and the same was approved in the 37th TCC & -- NRPC meeting. Since 144th OCC meeting of NRPC all SLDCs are regularly requested to take update from the concerned generators where FGDs is to be commissioned and submit the progress of FGD installation on monthly basis regularly to NRPC.

B.18.2 CEA held a meeting with generators on 28.08.2018 in which CE, TR&M, CEA informed that the FGD installation deadlines have been advanced for stations falling in NCR and also for the stations above 500 MW capacity or in stations located in the area having population density more than 400 persons per square km or are in critically polluted area.

B.18.3 Many IPPs like NPL are waiting for guidelines from the SERCs regarding the FGD installation cost adjustment. MoP is concerned about the issue and a policy decision is being made about the cost to be adjusted duly and CERC is being directed in this regard to pass an order to the SERCs.

B.18.4 All generators should make serious efforts to meet the deadline of installation of FGD. Updated status of progress of FGD installation is enclosed at ***Annexure-B.18.1***.
Member may kindly discuss.

B.19 Discrepancies in Generation Schedules (Agenda by NTPC):

B.19.1 It is being observed that Generation Schedules of NTPC Gas Stations posted on NRLDC

scheduling web based portal are getting changed post facto w.r.t to real time schedules at the end of the day i.e., schedules are getting changed for the lapsed time blocks. This is happening due to malfunction of NRLDC on-line scheduling software necessitating resolving of discrepancies on post facto basis. The problems have been reported to NRLDC with a copy to NRPC many a times, but the same is not getting resolved. Such post facto changes of schedules creates confusion and difficult to detect at times. Discrepancies in scheduling leads to accounting related problems which has financial impact. A typical case of such discrepancies for 01.10.18 is placed at ***Annexure-B.19.1***. In view of above, NRLDC is requested to resolve the problem in a reliable manner at the earliest.

Member may kindly discuss.

B.20 Minimize gap between supply and demand:

B.20.1 As maximum market prices shoot up to Rs. 18 during peak and average price remained around Rs. 5 to 8 during all India high demand period. Sensitization of NR constituents to evaluate such scenario to keep machines on bar in order to minimize gap between supply and demand.

Member may kindly discuss strategy to contain the price.

B.21 New Construction Scheme of Series Bus Reactor at Mandola & Ballabhgarh and Series Line reactor of Dadri line at Mandola end (Agenda by POWERGRID)

B.21.1 With the growth of the power transmission/generation network phenomenal increase in short circuit level in NCR areas has taken place. During the 32nd and 33rd Standing Committee meetings of Power System Planning of Northern Region held on 31/8/2013 and 23/12/2013, possibility of measures to control the short circuit level was discussed. Based on studies carried out to control the short circuit level, series reactors at various locations were proposed to enable security level as per CEA guideline.

B.21.2 However, considering this would be a new kind of element in the grid, it was agreed that initially two series bus reactors at 400kV Mandola & Ballabhgarh and series line reactors on Dadri- Mandola 400kV D/c line may be taken up and subsequently with the acquired operational experience, series reactors proposed at other locations in the 400kV ring could be considered for implementation.

B.21.3 For Grid safety augmentation involving control of the high short circuit levels in the Delhi/NCR areas, provision of series reactors at following locations was agreed to be implemented by POWERGRID:

Series Bus reactors

i. 1 no. of 12Ω Series Bus Reactor at Mandola 400/220 kV (POWERGRID) Substation along with associated bays.
ii. 1 no. of 12Ω Series Bus Reactor at Ballabhgarh 400/220 kV (POWERGRID) Substation along with associated bays.

Series Line reactors:

i. 1 no. of Series Line reactor of 12Ω in Dadri- Mandola 400kV Ckt-I at Mandola

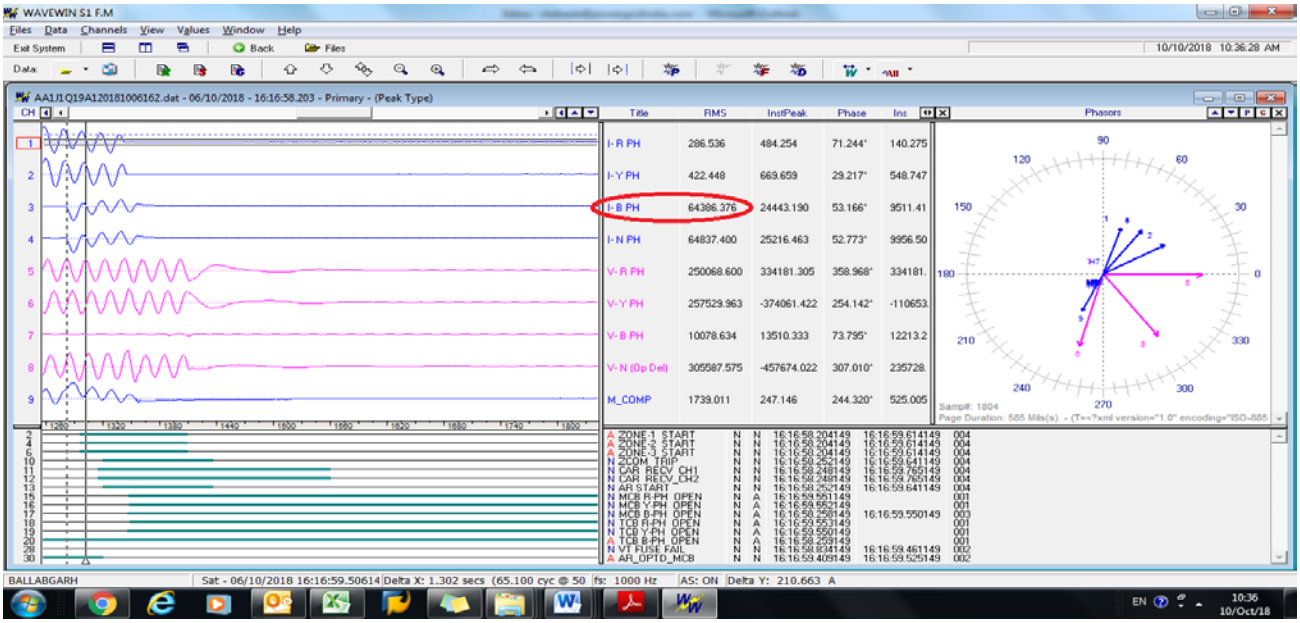
ii. 1 no. of Series Line reactor of 12Ω in Dadri- Mandola 400kV Ckt-II at Mandola

Schedule Commissioning: Feb 2019.

B.21.4 The above works have been agreed during the 32nd and 33rd Standing Committee meetings of Power System Planning of Northern Region held on 31/8/2013 and 23/12/2013. The scheme was also discussed and agreed in the 30th NRPC held 28/02/2014.

B.21.5 The NCR area has a 400kV high capacity D/c (Quad Moose) transmission ring, i.e., Dadri Generating station - Ballabgarh (via Maharanibagh/Greater Noida/Navada) – Tughlakabad - Bamnauli - Jhatikara - Mundka - Bawana - Mandola, which is connected strongly with rest of the grid through high capacity 765kV network at Jhatikara & 400kV network at other buses.

B.21.6 Growth of the network & generation addition has resulted in phenomenal increase in short circuit levels beyond the rated capacity of existing equipment in various buses in NCR area which is endangering gird safety & security. In recent incident of "B" Phase LA failure of Mainpuri Ckt #2, Fault current recorded at Ballabhgarh end was ~ 64.3kA which is immediately required to be addressed in the interest of grid safety & security levels.



The primary functions of a current limiting series reactor are:

- To reduce the flow of current during any short circuit so as to protect the power system apparatus and parts of the system from excessive mechanical stress/overheating/violent failures.

- To reduce the magnitude of voltage disturbances caused by short circuits/time graded/delayed fault clearance.
- To restrict impact by containing fault current and aid the fault to the source of fault location only.
- To reduce the duty imposed on switching and other associated EHV equipment during short circuits.

B.21.7 In view of above it is proposed that honourable NRPC members may deliberate and recommend expediting the early commissioning of series reactor schemes at Mandola & Ballabhgarh for achieving augmentation of Grid safety and security level in the NCR areas.

Put up to members of NRPC for kind information and approval of commissioning of above assets within the current calendar year itself.

B.22 Shut down requirement for 220 kV Sarna-Hiranagar line due to critically damaged foundation caused by change in river flow: (Agenda by POWERGRID)

B.22.1 Foundation of tower location no 66 of 220 kV Sarna-Hiranagar line is severely damaged due to change in river flow. This tower is in critical condition and can collapse any time. The conductor of the line needs to be shifted to new tower. Foundation of new tower was completed ten (10) months back and shut down also got approved on subsequent OCCs with a remark of consent from JKPDD.

B.22.2 Since Feb'18, the matter is being followed up with JKPDD for shut down but consent is not given by JKPDD. Each time the shutdown is rescheduled in OCC meetings. The matter has been brought to the notice of higher officials of JKPDD through mail and written communication also but the consent is still awaited. The matter was also discussed in 149th OCC meeting held on 18.07.18.

B.22.3 The condition of this tower foundation is very critical. In case tower collapses it will hamper the power supply in the Hiranagar area for a long time.

In view of the above it is proposed that shutdown of 220 kV Sarna-Hiranagar line may be allowed for 6days, however, best efforts will be put forth to reduce this outage period.

B.23 Replacement and Cleaning of Insulators of lines in Northern Region

B.23.1 During 27th TCC/30th NRPC meeting held in Feb., 2016 it was suggested to replace conventional insulators with polymer insulators & to build new lines with polymer insulators. However, many shortcomings of Polymer Insulators have come in light such as : they are subjected to chemical changes on the surface due to weathering and form dry band arcing, they suffer from erosion and tracking which may lead ultimately to failure of the insulator, their life expectancy is difficult to evaluate, problems due to eating by rodents etc during storage and notching by birds, polymers have also tendency to develop

algae, fungus and lichens which reduces ph value, lowers hydrophobicity and decolourisation, finally drying the bands leading to breakage of the insulators. In addition to this, aging, which leads to loss of hydrophobicity, tracking and erosion, and eventually to flashover is still one of the main problems with polymeric insulators. Further, as per feedback from CPRI, failure of poor quality polymer insulator can happen within 5 years.

B.23.2 As per recommendations of the Expert Committee of CEA (2007), in areas exposed to heavy fog and medium pollution level antifog disc insulators of creepage distance of 440 mm or higher (corresponding to creepage distance of 22mm/kV for 400 KV lines of the 23 disc) or Porcelain long rod insulators offering equal creepage distance may be employed with insulator profiles as per IEC 60815. Therefore, PSTCL has decided to go in for use of Porcelain Long Rod Insulators instead of Polymer Long Rod Insulator, as they have an established life of 40-50 years against no certainty of life expectancy in case of Polymer Insulators. Other utilities such of Maharashtra, Telangana, Orissa, Goa, Rajasthan etc. are also using Porcelain Long Rod Insulators in their network.

B.23.3 The area in the state of Punjab generally falls under heavy fog and medium pollution Category. To start with replacement of conventional insulators with Porcelain Long Rod Insulators is planned on the following lines and the NIT for the same is in final stage with work expected to be completed before next paddy:

i) 400 kV Talwandi Sabo – Mukatsar D/C.
ii) 400 kV Talwandi Sabo – Nakodar D/C.
iii) LILO of Talwandi Sabo – Nakodar at 400 kV S/Stn Moga.

Rest of the replacement work will be carried out gradually in a phased manner.

B.23.4 The proposal was deliberated in 152nd OCC meeting and was of the view that it is prerogative of PSTCL whether to install Porcelain insulator or Polymer insulator. However, OCC stated that weather conditions (Fog) in Maharashtra and Punjab were not similar and considering the advantages experienced by POWERGRID in their lines having Polymer insulator in Punjab, OCC was of the view that Polymer insulator may be beneficial for Punjab.

NRPC is requested to consider and ratify the use of Porcelain Long Rod Insulator instead of Polymer Long Rod Insulator as brought out above.

B.24 Winter Preparedness: (Agenda by NRLDC)

The issues & challenges along with action plans for safe grid operation during winter months in Northern region have been discussed in 149th & 150th OCC meetings. Major action plans have already been discussed in previous OCC/TCC meetings and summarized below:

Sl. No.	Issues	Action plan	Action by
1	Off-peak to peak demand ratio of NR	Load forecasts & its availability in SCADA	SLDCs

	becomes ~ 0.6 while for some of States this ratio ranges ~0.4-0.5	Portfolio management as per load forecast especially very high ramp up and ramp down period. Minimize generation to technical minimum as per CERC directions during low demand.	
2	Morning & Evening ramp is very steep, ramping of ~15GW within 2 hrs during peak hour demand.	Co-ordination of ramping of generation during morning & evening peak ramping	Gencos & SLDCs
3	Limited Hydro resources & renewable energy	Optimum utilization of Hydro resources for meeting peak hour demand.	NRLDC Gencos & SLDCs
4	High Voltage Due to less demand especially during night hours persistent high voltage has been observed.	Ensuring switching off capacitors & switch on reactors. Ensuring healthiness of all commissioned reactors in the system Monitoring of reactive power through SCADA displays.	NRLDC, SLDCs, Transcos
		Reactive power support (absorption) by generating station as per the capability curve. NRLDC has been monitoring the response of major generator and observations on same has been enclosed in ***Annexure-B.24.1***	Gencos
		Synchronous condenser operation especially of hydro units during night hours for dynamic voltage support. Some of the generators has trial tested last year is listed in ***Annexure-24.2***. Other generators (hydro & gas) also need to share their capability & trial testing plan to operate as synchronous condenser mode. Likelihood of such generator is enclosed as ***Annexure-24.2***	Gencos
		Tap Optimization at 400 kV & above has been done by NRLDC. Same exercise need to be carried out at 220 kV & below levels.	SLDCs
		Opening of EHV lines based on relief possible and also considering security & reliability of system	NRLDC, SLDCs
5	EHV line trip during fog/Smog	Progress on cleaning & polymer replacement of insulator. Last year many EHV lines tripped during fog in Punjab area too. Priority wise cleaning &	Transcos

		replacement may be carried out	
6	Load crash due to inclement weather	Weather forecast based on IMD dedicated site ERS procurement	SLDCs STUs

In addition, regular exercises that need updations or modification are also suggested:

a. Telemetry especially of Generator MVAr/Shunt MVAr, temperature & humidity etc. at various locations shall be available and reliable.
b. SCADA displays updations of following
    a. For online monitoring of reactors (BR, LR, SVC etc.)
    b. LR that can be used as BR when line is not in service
    c. Generating station units wise reactive capability curve & MVAr limit
    d. Mapping of UFR and df/dt
    e. Mapping of SPS and other defense action
c. Documents to be available at control room
    a. Power Map (Geographical & SLD Map)
    b. Reactive power documents if any
    c. Black start/Restoration procedure
    d. Operating procedure if any
    e. Important Grid element

B.25 Switchgear issue of 400 kV Dadri- Gr. Noida- Nawada (Agenda by NRLDC)

Switchgear rating issue for 400 kV Dadri- Gr. Noida- Nawada has been discussed regularly since 2017 in OCC/TCC meetings as well as in Standing Committee meetings as well as in operational feedback from RLDCs. All the agencies (Dadri-NTPC, Gr. Noida, UPPTCL and Nawada, HVPNL) have agreed for an early up gradation of switchgear. However, situation is still same.

At present, 400 kV Gr. Noida- Nawada line needs to be opened on daily basis to control the loading of 400 kV Dadri- Gr. Noida within the switchgear rating of 2 kA. This opening of lines leads to deficiency in Delhi 400 kV ring and thus reduction in reliability.

Therefore, following is needed:

a. Up-gradation of switchgear at Dadri, Gr.Noida & Nawada as early as possible. Timeline need to be ascertained from concerned agencies.
b. Till the switchgear upgradation, the 400 kV bus splitting possibility at Nawada need to be explored. [Keeping both line on different bus with 400/220 kV ICT each].

Similar switchgear issue is also at Mahendragarh (ATL) and Dhanoda (HVPNL) but due to low power order on HVDC Mundra-Mahendragarh at present, it is not getting highlighted. The switchgear upgradation at these stations has also been agreed and is required to be commissioned at the earliest.

B.26 Utilization of 765/400/220 kV Gr. Noida and nearby substations (Agenda by NRLDC)

At present 765/400/220 kV Gr. Noida of UPPTCL has following connectivity:

a. 4 nos of 765 kV ckt i.e. Gr. Noida- Mainpuri, 765 kV Gr. Noida-Agra,765 kV Gr. Noida- Meerut and 765 kV Gr. Noida- Hapur
b. 765/400 kV ICT-1 & 2 of 1500 MVA each
c. 6 nos of 400 kV lines i.e. 400 kV Gr. Noida- Gr. Noida (old) D/C, 400 kV Gr. Noida- Sikandarabad D/C, and 400 kV Gr. Noida- Noida Sec-148 D/C (400 kV Noida Sec-48 S/s is yet to commissioned)
d. 400/220 kV ICT-1 & 2 of 312 MVA each

Following is the situation:

i. 400 kV Gr. Noida- Noida Sector 148 D/C line has been commissioned but the 400 kV S/s & downstream network, essential for utilization of these lines is unavailable.
ii. 765/400/220 kV Gr. Noida has no 220 kV outlet and therefore the 400/220 kV ICTs are idle.

Therefore, early Commissioning of following desired:

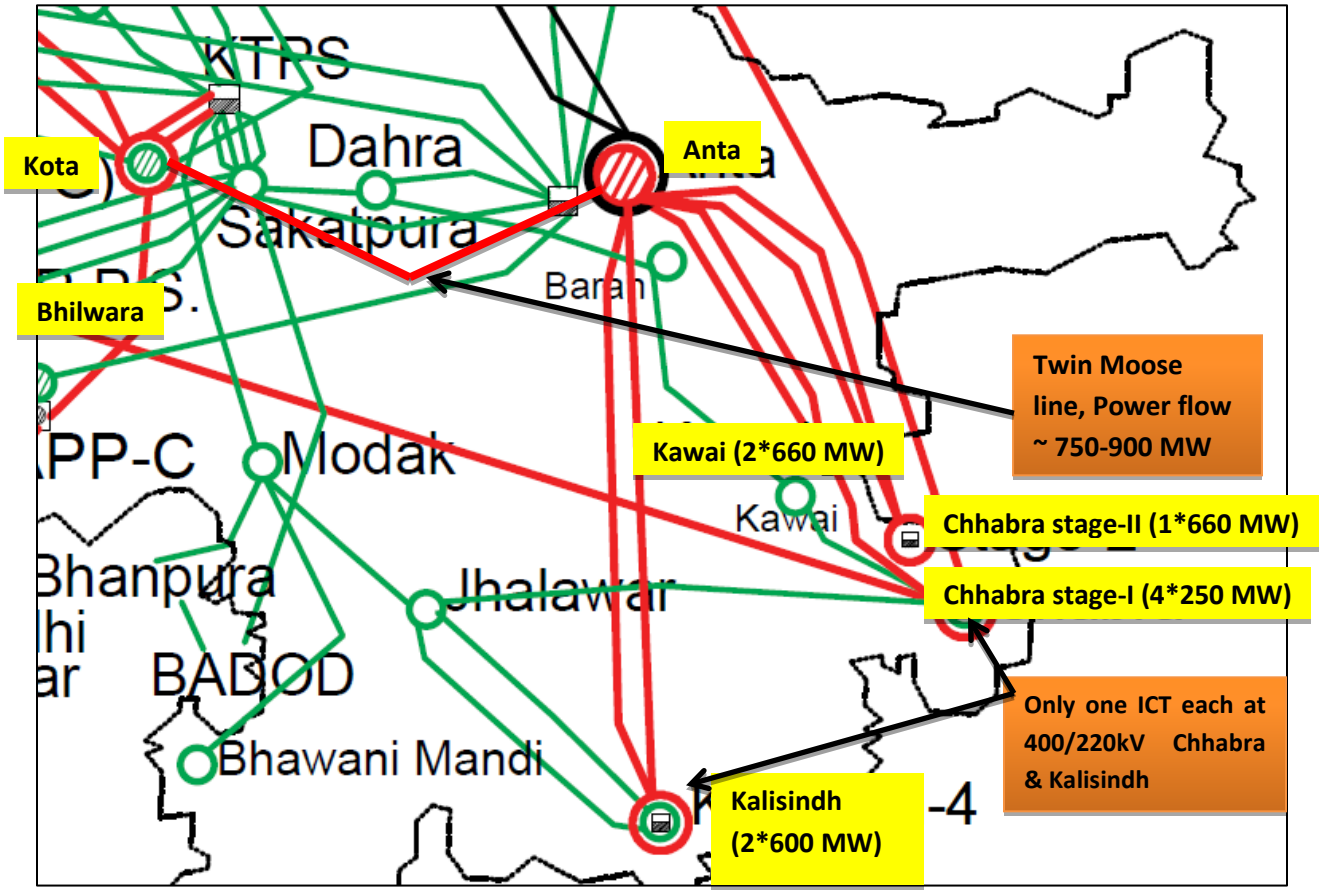
i. 400/220/132 kV Sector 148 substation along with 220 kV, 132 kV outlets.
ii. 220 kV outlet from 765/400/220 kV Greater Noida

The commissioning of above elements would further utilize the infrastructure already available and could also help in reduction in loading at old 400/220kV Greater Noida.

Members may kindly deliberate for planned connectivity/timeline of associated 220 kV network of 400/220 kV Noida Sec-148 & 765/400/220 kV Gr. Noida.

B.27 Loading of 400 kV Kota-Anta (Agenda by NRLDC)

Present connectivity of Kawai- Kalisindh- Chhabra complex is shown below:



A new 400 kV Anta - Kota (twin moose) line has been synchronized on 7th July 2018 and since its synchronization loading of this line remains in range of ~ 600-900 MW which is near to its thermal limit. The commissioning of generation at Chhabra SCTPS would further increase the loading on this line.

The above example shows the importance of approval from Standing Committee on planning for the commissioning of any new elements in the system and therefore, NRLDC has been requesting the same from all the entities.

The very high loading of the line, indicate that more 400/220 kV interconnection from the area are required or more 400 kV line are required from the complex. This aspect needs to be studied by the Rajasthan STU.

Apart from above, following issues are already under discussions in different forums:

- Generation evacuation of ~ 4800 MW from complex through only five nos ckt i.e. 765 kV Anta-Phagi two ckts, 400 kV Chhabra-Hindaun, 400 kV Chhabra-Bhilwara & 400 kV Anta-Kota.
- N-1-1 contingency of 765kV Anta-Phagi lines.
- Availability of only one 400/220 kV ICT at both Chhabra & Kalisindh.

- Under N-1 contingency of 765kV Anta-Phagi, the already fully loaded 400kV Anta-Kota would not be able to carry this extra load.
- System Protection Scheme (SPS) for the complex

Therefore, comprehensive relook for planning/operation is required for this complex.

Members may kindly discuss.

B.28 Grid Events in Northern Region during Jun - Sep 2018: (Agenda by NRLDC)

A total 113 number Grid Events (of CEA Standard based) have occurred in NR in Jun'18 to Sep'18. The number is more than double than the last year (2017) figure for same period.

Monthly GD/GI summary is given below:

Month	Event Category		Event Share (in %)	Fault duration > 100ms/160ms
	GD	GI		
Jun'18	12	24	32%	44%
Jul'18	14	7	19%	29%
Aug'18	19	8	24%	44%
Sep'18	15	14	26%	34%
Total	60	53	100%	39%
GD as % of total		**53%**	**Fault duration > 100ms/160ms for every third event**	
GI as % of total		**47%**		

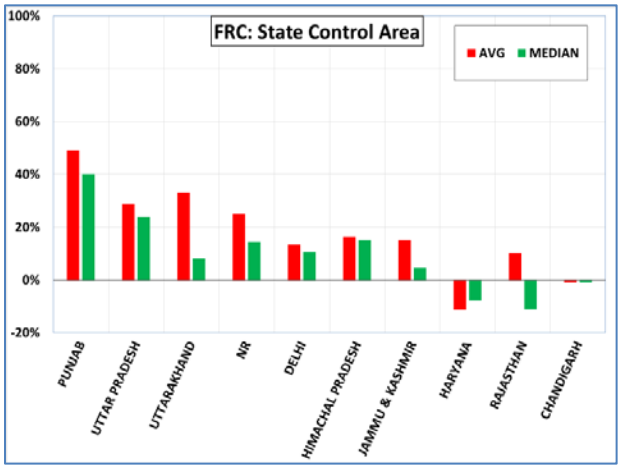
From the above, it could be observed that during the past four month period there is a grid event occurrence in almost every day.

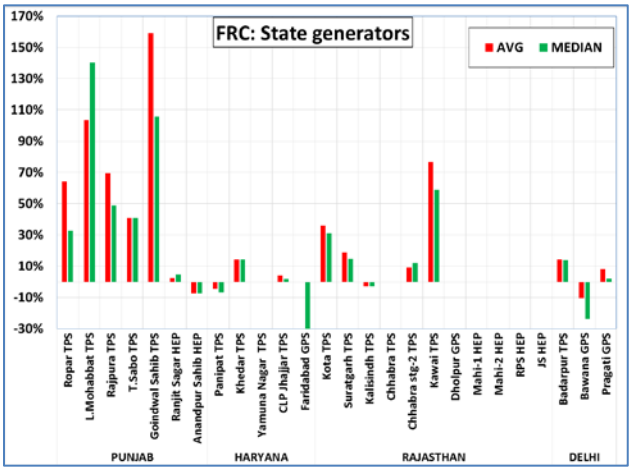
These tripping events have been discussed in various OCC, PSC and other special meetings.

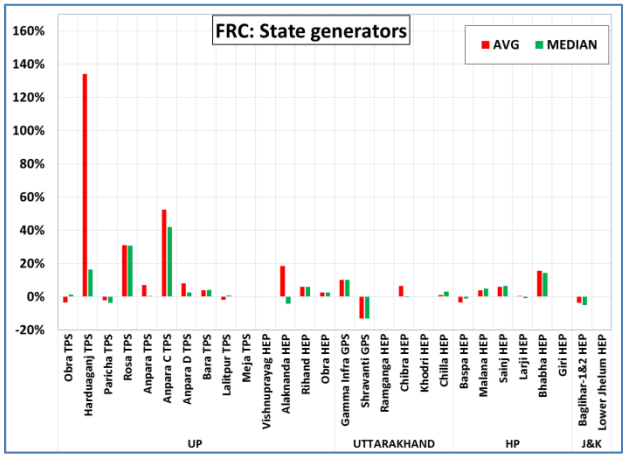
Members may kindly discuss plans for reducing such tripping events and for quality analysis and implementation of remedial measures.

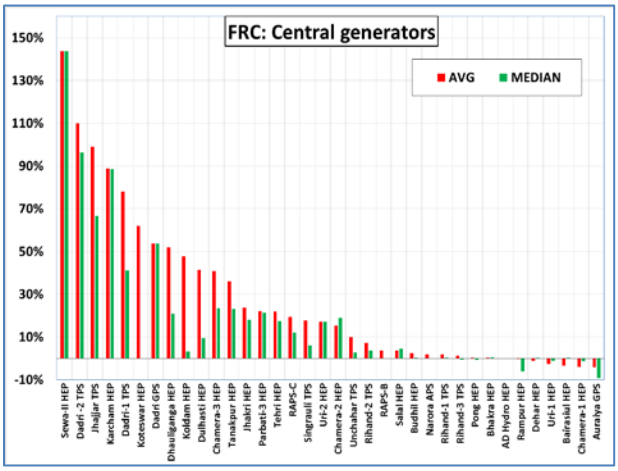
B.29 Frequency response characteristic of NR control area from Jun-Sep'18: (Agenda by NRLDC)

Six FRC based events occurred during Jun-Sep'18. The response as calculated at NRLDC (using SCADA data) is shown in the plots below:









The following could be summarized from above details:

- Among the State control area, Punjab and UP have showed improvement in the FRC. The reason for above could be the improvement in FRC of state control area generators of Punjab and UP.
- Among the central generators, Dadri TPS, Jhajjar TPS, Karcham HEP, Sewa-II HEP have good FRC of more than 50% of ideal response. The response of almost all other hydro stations is less than 30% of ideal response.
- Among the state control area generators, Lehra Mohabbat TPS, Goindwal Sahib TPS, Kawai TPS, Harduaganj TPS showed good response.

Member may kindly discuss the respective Frequency Response Characteristics as analyzed and measures to improve the same.

C. COMMERCIAL and TeST ISSUES

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

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

Utility/Account	Beneficiary	Total Dues including Surcharge (in Rs Cr.)	Remarks
NHPC	PDD, J&K	1006.11	Outstanding dues as on 09.10.2018. NHPC is a public listed company and is answerable to its stake/shareholders and such a huge outstanding balance is also attracting specific attention of the audits.
	UPPCL, UP	778.75	
	PSPCL, Punjab	282.73	
	JdVVNL	20.80	
SJVNL	Govt. of HP & a/c HPSEB	347.65	Details of outstanding dues as on 09.10.2018 in respect of all beneficiaries is enclosed at **Annexure-C1.1**
	PDD J&K	129.93	
	UPPCL	242.94	
THDCIL	BRPL, Delhi	223.11	UP's bill amount works out to approx. 46% of total energy billing. Some of beneficiaries namely, BRPL, BYPL & Punjab are not giving priority to the payment of Late Payment Surcharge. However, BRPL & BYPL are deducting TDS on Late Payment Surcharge (LPSC) bills.
	BYPL, Delhi	272.40	
	PDD, J&K	146.30	
	UPPCL, Uttar Pradesh	951.86	
NPCIL	Discoms of Rajasthan	19	Total outstanding from RAPS is Rs 932 crore and from NAPS is Rs 572 crore.
	BYPL, Delhi	377	
	BRPL, Delhi	163	
	PSEB, Punjab	55	
	PDD, J&K	320	
	UPPCL, Uttar Pradesh	515	
	HPSEB, HP	13	
	UPCL, Uttarakhand	8	

	MPSEB	1	
	HWB, Kota	34	
DSM Charges	ER-NR	264.66	Mismatch due to difference in Energy account of ERPC & NRPC. NRPC to revise the account.
	WR-NR	95.66	
	JAMMU AND KASHMIR	36.96	Since 18.06.2018
	NER-NR	2.68	
	HPPCL	0.26	
	EPPL	0.006	
POWERGRID		Dues (60-90 days)	Dues (>90 days) in crore
	UP	234.03	243.38
	KSK Mahanadi(UP)	42.83	0
	RAJASTHAN (JODHPUR) JDVVN	39.92	0
	PUNJAB	28.54	0
	DELHI (BYPL)	27.84	0
	UTTRAKHAND	25.08	0
	HARYANA	22.18	22.17
	JAMMU AND KASHMIR	21.41	48.06
	TRN ENERGY (UP)	15.27	15.99
	RKM POWERGEN (UP)	12.2	0
	MB POWER	11.62	0
	LANCO BUDHIL HYDRO	0.19	6.12
	HIMACHAL SORANG	0	63.48
	LANCO BUDHIL (PTC)	0	25.12

Members may kindly discuss.

C.2 Opening of Letter of Credit (LC)

C.2.1 As per PPA/CERC Regulations beneficiaries have to submit a confirmed, revolving, irrevocable Letter of Credit for an amount equivalent to 105% of average monthly billing of preceding 12 months with appropriate bank as mutually acceptable to parties. The LC shall be kept valid at all the time during the validity of the Power Purchase Agreement. This matter had been discussed regularly in various Commercial Sub-committee meetings as well as TCC and NRPC meetings. However, the following beneficiaries are yet to submit the requisite Letter of Credit for the FY 2017-18.

Utility/ Account	Beneficiary	LC Amount (in Rs Lakh)	Remarks
NHPC	PDD, J&K	LC amount already intimated to beneficiaries	The matter was also discussed in the 39th TCC & 42nd NRPC and 37th Commercial Sub-Committee Meeting of NRPC. Despite various reminders, no action taken till date.
	BRPL, Delhi		
SJVNL	PDD, J&K	HPSEB is yet to provide Letter of Credit as per the Power Purchase Agreement signed for supplying of power from RHPS as well as in respect of the power assigned to them by GoHP.	
	HPSEBL		
	BRPL, Delhi		
	BYPL, Delhi		
THDCIL	BRPL, Delhi		
	PDD, J&K		
NPCIL	Chandigarh	Not submitted LC for full value as required under PPA	LC details of various SEBs where the SEBs have not submitted the LC of required value as stated in PPA is given in **Annexure-C2.1**
	HPSEB		
	HPGCL, Haryana		
	PSPCL Punjab		
	UPPCL, UP		
	TPDDL		
	PDD, J&K	LC not opened	

	BRPL, Delhi		
	BYPL, Delhi		
DSM Pool	UPPCL, UP	1258.79	NRLDC vide letter dated 30th April 2018 and 6th August 2018 has intimated all concerned constituents regarding the amount for which LC is to be opened in accordance with CERC (Deviation Settlement Mechanism and related matters) Regulations, 2014. The matter was also discussed in the last commercial sub-committee meeting as well in TCC/NRPC meeting. Commercial sub-Committee noted the deliberations and advised all defaulting entities to open LC. Despite deliberations in various Commercial Sub-Committee and TCC/NRPC meeting most of the defaulting constituents have still not opened the LC of the required amount.
	UPCL, Uttarakhand	128.22	
	HPSEB, HP	246.61	
	PDD J&K	1722.64	
	EPPCL	2.48	
	Greenko, Budhil	14.14	
	PGCIL	2.06	
	HPPCL	3.19	
	DTL	75.61	
	NFL	1.58	
	Punjab	229.00	
POWER GRID	BYPL	LC not opened	Beneficiaries may renew LC in favour of POWERGRID for the requisite amount
	BRPL		
	PDD J&K		
	Lanco Anpara		
	PTC (Lanco Amarkantak)		
	NDMC	Inadequate LC	
	Railways		
	Lanco Budhil		
	TRN Energy		

Members may kindly discuss.

C.3 Payment of late payment Surcharge by the Beneficiaries of SJVN (Agenda by SJVNL)

C.3.1 CERC regulations provide for charging of LPS on delayed payments released by the beneficiaries beyond due dates. Further, LPS is an integral part of energy bills, which is imposed/charged in view of CERC regulations and provision contained in the Power Purchase Agreement and non-payment of same is violation of CERC regulation & PPA terms, which attracts penal provision for encashment of letter of credit and regulation of power.

C.3.2 While releasing the payment of energy bill, the amount of late payment surcharge is being excluded by the beneficiaries despite the fact that they have delayed in payments.

C.3.3 The beneficiaries particularly GoHP and UPPCL shall be impressed upon to release the LPS amount along with the energy bill payments at the earliest.

C.3.4 In the 39th TCC/ 42nd NRPC meeting, it was agreed that the primary responsibility for making payment including LPS lies with the procuring utility in the state. The procuring utility will coordinate with all concerned departments for payment of bills including LPS.

Members may kindly discuss.

C.4 Computation of Declared capacity of Hydro plants-Decision pending (Agenda by BRPL)

C.4.1 In the 1st special meeting for discoms held on 30th July 2018 the issue regarding computation of PAFM based on DC as per Tariff regulation 2014-19 was discussed, where BRPL raised the issue regarding Mismatch in PAFM. The matter was discussed again in the 37th Commercial Subcommittee meeting.

C.4.2 In the meeting, representative of BRPL stated that as per CERC Tariff Regulations 2014-19 , Declared capacity (in ex-bus MW) for the ith day of the month has been defined as the MW which the station can deliver for at least three (3) hours, as certified by the nodal load dispatch centre after the day is over. BRPL had computed the DC of hydro plants for ith day of month on the basis of DC declared by them for continuous 3 hrs. and PAFM was computed considering this DC for the month of April-18 & May-18. Substantial difference was noted between the PAFM computed by BRPL and PAFM published in the REA for a few power plants like Bairasul, Parbati 3, Salal and Tanakpur HEP.

C.4.3 In the meeting, representative of NRLDC stated that there is no mention of continuous hours for calculating DC in the regulation. He further informed that NRLDC determines DC of hydro plants based on their average MW during peak hours. This practice is being followed by other RLDCs also.

C.4.4 Representatives of various discoms opined that DC should not be taken as average. It was suggested that since the word "at least" is mentioned while defining DC in CERC Tariff Regulations, the minimum MW during peak hours should be taken as DC.

C.4.5 Members of the Commercial sub-committee agreed that NRPC/NRLDC will seek clarifications from CERC on the computation of DC of hydro generating station.

The decision in this regard is still pending. Members may discuss

C.5 Quarterly reconciliation of accounts - SJVN not complying (Agenda by BRPL)

C.5.1 BRPL is regularly sending and requesting quarterly reconciliation statement to SJVN. However SJVN is not practicing the same and not signing the reconciliation statement with BRPL.

C.5.2 BRPL has requested that SJVN may be directed to carry out and sign quarterly reconciliation of the accounts for smooth working.

Members may discuss

C.6 No additional capital investment for plants identified by CEA for retirement (Agenda by BRPL)

C.6.1 With reference to the guidelines issued by MOEF vide its order dated 7th December 2015; the allowable emission norms for coal fired thermal power projects have been drastically slashed. According to the new emission norms set for power units, plants have to install Flue gas de-sulphurisation (FGD) or emission control technology by 2022. BRPL has urged that Generators should identify inefficient plants including plants which are nearing the end of their useful life and no major capital expenditure including the installation of equipments like FGD, up gradation of ESP may be undertaken in these plants.

C.6.2 If plants which are nearing their useful life pursue installation of FGD & Upgradation of ESP, BRPL is concerned that the entire additional capital invested would have to be recovered in a short period of time. This would invariably lead to a tariff shock.

C.6.3 CEA in its national electricity plan (January 2018) has listed plants, which are either inefficient, which don't have adequate space to install FGD or plants which are about to complete their useful life, which need to be retired; the relevant clause has been reproduced below.

"In the base case scenario, a coal based capacity of 22,716 MW (5,927 MW + 16,789 MW) is considered for retirement during 2017-22. This is based upon the assessment made by CEA which consists of 5,927 MW of capacity assuming that the normal trend of past retirement process would continue along with a coal based capacity of 16,789 MW

which doesn't have space for installation of FGD (Flu Gas Desulphurization) system to curb SOx emissions. The list of these units considered for retirement during 2017-22(22,716 MW) is placed at Annexure 5.5 and Annexure 5.5(A) respectively.

Additionally, a coal based capacity of 25,572 MW, has been considered for retirement during 2022-27 which will be completing 25 years of operation by March, 2027. The list of these units is given in Annexure 5.6."

C.6.4 The matter may be taken up in CEA/appropriate forum so that no major capital expenditure like installation of FGD & Upgradation of ESP may be incurred for plants which have been identified by CEA.

C.6.5 Gencos may also be directed to bring the proposal of major investments like FGD to the NRPC forum and seek the concurrence of beneficiaries before approaching CERC.

C.6.6 NRPC must closely monitor and release regular updates with respect to its implementation and ensure participation of effected beneficiaries as well.

Members may discuss

C.7 Bill data to be provided in standard Excel format (Agenda by BRPL)

C.7.1 BRPL had raised this issue in the 1st special meeting for Discoms held on 30th July 2018. The issue was also discussed in the 33rd Commercial subcommittee meeting held on 13th September 2017 wherein it was agreed that all Generating/Transmission companies will provide bills in excel format.

C.7.2 However, BRPL has stated that they are still not receiving bills in excel format from some utilities.

Members may discuss.

C.8 Scheme on 'Merit Order Operation- Flexibility in Generation and Scheduling of Thermal Power Stations to reduce the cost of power to the consumer' by Ministry of Power

C.8.1 Ministry of Power vide its letter dated 17th July 2018 issued a draft concept note on 'Merit Order Operation-Flexibility in Generation and Scheduling of Thermal Power Stations to reduce the cost of power to the consumer'. Comments/Suggestions/objections from all stakeholders were invited till 17th August 2018. Based on the comments received, the scheme was notified on 30th August 2018.

C.8.2 The salient provisions of draft concept are:

a) Optimisation in scheduling of generation to reduce the overall cost of power at the national level.

b) RLDC/NLDC to seek total requisition from all beneficiaries against their total entitlement from different stations of the generating company as per the present system.

c) Based on requisition received from beneficiaries, RLDC/NLDC shall issue Original Schedule (R-0) for the generating stations, as is being done presently, which shall be used for raising bills.

d) Based on total power requisitioned by various beneficiaries of the generating company, RLDC/NLDC shall schedule stations of the generating company, subject to transmission constraints, as per Merit order of the generating company.

e) The station of the generating company having the least ECR shall be fully utilized (upto DC) before scheduling the next station with higher ECR. This is referred to as Merit order operation based Generation Bucket Filling (GBF) scheduling.

f) RLDC/NLDC shall issue actual dispatch schedule (GBF-0) for the generating stations.

g) The net benefit realized from supply of power from stations having lower ECR power to in place of costlier thermal power not scheduled shall be shared by the generating company with its beneficiaries in the ration 50:50.

C.8.3 A presentation on the draft concept note will be made by NRPC Secretariat.

C.9 Reactive Energy charges status

C.9.1 Reactive Energy Charges status as on 10th October-2018 considering week no-25 (due dated of which is 08th Oct 2018) is indicated here in below

All Figures in Rs. Lakhs

S. No.	UTILITY	OPENING BALANCE FROM PREVIOUS YEAR	AMOUNT PAYABLE TO POOL	AMOUNT RECEIVABLE FROM POOL	AMOUNT PAID TO POOL	AMOUNT DISBURSED FROM POOL	PRINCIPAL OUTSTANDING	DELAY PAYMENT INTEREST OUTSTANDING up to 2017-18
1	CHANDIGARH	-55.59	0.00	13.50	0.00	68.95	-0.14	Nil
2	DELHI	1020.59	134.40	11.52	1148.04	4.58	0.00	
3	HIMACHAL PRADESH	-146.62	36.94	36.45	36.94	182.67	-0.41	
4	HARYANA	-1786.40	0.00	240.11	0.00	2025.58	-0.94	
5	JAMMU AND KASHMIR	4885.48	1251.18	0.00	5929.82	0.00	**206.84**	
6	PUNJAB	394.45	246.57	181.73	449.20	37.03	**47.11**	
7	RAJASTHAN	-554.63	0.00	281.27	0.00	834.29	-1.61	
9	UTTARAKHAND	-15.37	72.73	2.64	72.73	16.63	-1.38	
10	UTTAR PRADESH	-2394.03	0.00	974.60	0.00	3361.24	-7.39	

Note: (+)ve figure are Payable to Pool and (-)ve figures are receivable from Pool

C.9.2 All Payable constituents are requested to release outstanding RE charges payments at the earliest so that receivable parties can be paid and to avoid further increase of Delay payment Interest.

Members may discuss.

C.10 Congestion Charges

C.10.1 Congestion charge statement is being issued by NRPC. The amount received in the congestion charges account was disbursed to the receivable parties. Outstanding amount against the entities payable to pool (as on 10' Oct-2018) is indicated here in below.

All Figures in Rs. Lakhs

SL. No.	Constituents	Congestion Charges Payable / Receivable	Congestion Charges Delay Payment Interest	Total Outstanding	Remarks (Outstanding More than 90 days)
1	HARYANA	0	696882	696882	
2	DELHI	0	326379	326379	
3	HIMACHAL PRADESH	85009	178481	263490	**Since 30.12.2017**
4	EPPL	0	73660	73660	
5	JAMMU AND KASHMIR	17992	0	17992	**Since 30.12.2017**

C.10.2 All Payable constituents are requested to release outstanding Congestion Charges payments at the earliest so that, receivable parties cann be paid and to avoid further increase of Delay payment Interest.

C.11 NRLDC Fees and Charges

C.11.1 NRLDC is raising the monthly bills in line CERC Regulations 2015, considering up to Aug-2018 bills (due date of which is 30.09.2018), NRLDC Fee and Charges outstanding as on 30' Sep-2018 is indicated here in below

S No.	Constituents	Amount in Rs.	Remarks
1	PDD J&K	1,42,987	Outstanding against Part payment of July-18
2	NRSS XXXI (B) Transmission Ltd.	23207	Outstanding against July-18
3	NRSS XXXVI Transmission Ltd.	124	Outstanding against July-18
4	POWERGRID UNCHAHAR TRANSMISSION Ltd.	4289	Outstanding against July-18

C.11.2 It is requested to pay the outstanding amount at the earliest.

C.11.3 NRLDC is sending the hard copies of bills to all the users regularly on monthly basis. The bills are also being mailed 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/".

C.12 Reconciliation of Pool Accounts (July-18 to Sep-18)

C.12.1 Reconciliation statement of Deviation Charges and Reactive Energy Charges has been forwarded to entities and uploaded on website by NRLDC on 11.10.2018. The constituents are requested to verify /check the same & comments if any on the same were to be reported to NRLDC by 31.10.2018. In case of non-receipt of any communication it will be presumed that reconciliation statement stands reconciled.

C.13 Status of AGC & Ancillary Services

C.13.1 The Status from week 01 to 26 of financial year 2018-19 is as herein below as per NRPC bills

All Figures in Rs. crore

Week (2018-19)		Surplus in DSM A/C (A)	RRAS Billed			AGC
			Regulation UP (B)	Regulation Down ('C)	Net (D=B-C)	
W-1	(26.03.18-01.04.18)	17.39	11.38	0.02	11.37	1.01
W-2	(02.04.18-08.04.18)	19.78	9.90	0.00	9.90	2.47
W-3	(09.04.18-15.04.18)	10.09	8.38	0.00	8.38	2.15
W-4	(16.04.18-22.04.18)	15.99	9.51	0.00	9.51	1.31
W-5	(23.04.18-29.04.18)	17.99	8.33	0.00	8.33	2.21
W-6	(30.04.18-06.05.18)	13.82	5.75	0.00	5.75	-0.36
W-7	(07.05.18-13.05.18)	29.27	10.20	0.14	10.06	0.00
W-8	(14.05.18-20.05.18)	30.17	12.88	0.16	12.72	0.05
W-9	(21.05.18-27.05.18)	26.24	7.68	0.00	7.68	1.69
W-10	(28.05.18-03.06.18)	21.79	10.91	0.10	10.81	1.46
W-11	(04.06.18-10.06.18)	19.85	11.35	0.02	11.33	1.43
W-12	(11.06.18-17.06.18)	28.09	9.60	0.18	9.42	1.79
W-13	(18.06.18-24.06.18)	43.12	17.48	0.07	17.40	1.85
W-14	(25.06.18-01.07.18)	26.93	13.40	0.05	13.34	0.69
W-15	(02.07.18-08.07.18)	42.67	7.52	0.02	7.50	0.85
W-16	(09.07.18-15.07.18)	43.66	9.51	0.00	9.51	2.31
W-17	(16.07.18-22.07.18)	37.31	13.12	0.01	13.11	2.18
W-18	(23.07.18-29.07.18)	50.13	38.26	0.00	38.25	2.79
W-19	(30.07.18-05.08.18)	50.67	42.24	0.00	42.24	2.61
W-20	(06.08.18-12.08.18)	59.01	43.07	0.00	43.07	1.50
W-21	(13.08.18-19.08.18)	41.79	34.12	0.02	34.10	-0.08
W-22	(20.08.18-26.08.18)	46.63	34.75	0.00	34.75	1.11
W-23	(27.08.18-02.09.18)	43.56	28.22	0.00	28.22	1.24
W-24	(03.09.18-09.09.18)	27.24	25.84	0.00	25.84	0.49
W-25	(10.09.18-16.09.18)	36.65	33.00	0.00	33.00	0.63
W-26	(17.09.18-23.09.18)	29.35	56.05	0.00	56.05	0.38
Total		**829.18**	**512.45**	**0.81**	**511.64**	**33.77**

C.13.2 All dues are settled against RRAS and AGC pool account up to week -22. Settlement for week 23 is under process.

C.14 Reconciliation of STOA (Short Term Open Access) Charges disbursement

C.14.1 NRLDC has sent the reconciliation statement of open access disbursement for the Quarter- 1 of financial year 2018-19 on 20th July2018. The applicants/STU/SLDCs were requested to verify /check the reconciliation statement & comment if any on the same by 16th Aug 2018. The reconciliation statement of the following parties has been received.

Details of replies received from STU/SLDCs regarding disbursment of STU/SLDC charges			
SL No	Name of the STU/SLDC	Statement for reconciliation was sent on dt:	signed copy of Statement for reconciliation was received on dt:
1	Manipur STU/SLDC	19.07.18	30.07.18
2	Himachal Pradesh STU/SLDC	19.07.18	03.08.18
Details of replies received from Applicants regarding refund of STOA charges			
SL No	Name of the Applicant	Statement for reconciliation was sent on dt:	signed copy of Statement for reconciliation was received on dt:
1	IA Hydro Pvt Ltd	19.07.18	28.07.18
2	Sandhya Hydro Power Ltd	19.07.18	10.08.18
3	Jindal India Thermal Power Ltd	19.07.19	24.07.18

C.14.2 In case of non-receipt of any communication it will be presumed that reconciliation statement stands reconciled.

C.15 TDS Reconciliation

C.15.1 TDS verification for FY 2010-11 to FY 2016-17 have been done by NRLDC. After Verification of TDS from Form-26AS, following applicants have been requested to pay the short deposited TDS amount in NRLDC STOA account

Sl. No.	FY	Name of Applicant	Amount to be Deposited (Rs)	Action Taken by NRLDC
1	2013-14	HNGIL	3,25,136	Letters regarding TDS Default were issued on dt: 20.03.17 and dt:01.08.17
2	2015-16	Provestment	6,318	Letters regarding TDS Default were issued on dt: 20.03.17 and dt:01.08.17

C.16 Status of Outstanding STOA Delay Payment Interest: STOA Delay Payment Interest

C.16.1 As per Regulations 19(2) of Open Access Inter State Regulations 2008, the person committing default in payment shall pay simple interest @ of 0.04% for each day of default. The applicant wise the outstanding interest amount (computed till 30.06.2018) is

Applicant Name	Outstanding Interest upto 31st March-2016	Outstanding Interest for FY -17-18 Upto Q-3	Outstanding Interest for FY -17-18 for Q-4	Total Outstanding Interest	Action Taken
Provestment	43613	0	0	43613	Punching of Application Portal Blocked
RPPC	2502273	0	0	2502273	Punching of Application Portal Blocked.

C.17 STATUS of AMR (as on 10.10.2018)

C.17.1 NRLDC informed that LOA was awarded by POWERGRID to M/s Kalkitech vide ref: N1/C&M/11-12/AMR/193(A) (Supply portion) and N1/C&M/11-12/AMR/193(B) (Erection portion) dated 15.02.2012 for installation and commissioning of AMR system on approx.1250 nos. of meters installed at 220 locations of Northern Region. Further, Amendment-III was placed vide Ref: N1/C&M/11-12/AMR/193(B)/Amend-III dtd 21.12.2016 for extension of work of scope from 1250 to 1825 meters.

AMR Status	Total No of Meters/Locations awarded	Total No of Meters/Locations completed	Balance
Phase-1	1250 SEMs/220 locations	1250 SEMs	NIL
Phase-2	575 SEMS/90 locations	159 SEMs	416
Total	1825 SEMs	1409 SEMS	416

C.17.2 It was decided in 42nd TCC meeting that POWERGRID will complete the project by July 2018 and further it was decided in 37th CSC meeting that POWERGRID will complete the project by 31st Oct-2018. However at present out of 1825 nos. only 1409 nos. meters have been integrated. Therefore it is again requested to POWERGRID to complete AMR integration project in expedite mode.

C.17.3 Nos. of locations from where AMR data are received in totality and used for energy accounting for last 04 weeks have been given below:

S.No	Week No	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	**100918-160918**	**205**	**167**	**149**	**18**
2	**170918-230918**	**205**	**171**	**157**	**14**
3	**240918-300918**	**205**	**169**	**161**	**8**
4	**011018-071018**	**205**	**174**	**155**	**21**

C.17.4 The members may appreciate that data from all locations are required for calculation of losses and preparation of weekly regional energy account. Non-availability of data from so many 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.17.5 In the last meeting also; it was decided that POWERGRID should take up the matter with M/s Kalkitech and ensure that AMR data from all sites shall be made to NRLDC lasted by Tuesday Morning. However, there has not been significant improvement in availability of data through AMR.

Members may discuss.

C.18 Integration of AMR System with Elster Meters

C.18.1 As per 42nd NRPC & 39th TCC minutes of meeting point C.19.1 & C.19.2; it was decided that POWERGRID will arrange the demonstration of integration of Elster meter by 15th July-2018. Further, in the 37th CSC meeting, it was intimated by M/s Kalkitech that they have completed all the activities for integration of these meters through AMR and are ready for testing the same. It was decided that POWERGRID and NRLDC will test the integration of these meters by 31st August-2018.

C.18.2 However till date M/s Kalkitech has not demonstrated integration of Elster Make meters. POWERGRID may please update the status regarding integration of Elster make Meters with AMR system.

Sl No.	Station Name	S No.	Station Name
1	Maharanibagh_PGCIL	11	Bahadurgarh
2	Bhiwadi_PGCIL	12	Gorakhpur_PGCIL
3	Ballabhgarh PGCIL	13	Sitargunj PGCIL
4	Mandaula_PGCIL	14	Lucknow PG
5	Gurgoan_PGCIL	15	Manesar PG
6	RaeBarelliy	16	Allahbad_PGCIL
7	Hissar PGCIL	17	BassiPGCIL
8	Dadri_Hvdc_Pgcil	18	Koteshwar pooling
9	Pithorgarh	19	Kaithal PG
10	Kanpur_PGCIL		

C.19 AMR data through Fibre Optic Network

C.19.1 At present, AMR data communications have been successfully shifted on Optical Fibre Communications at following 19 locations of POWERGRID. The SEM data of all these locations are being provided by M/s Kalkitech on regular basis to NRLDC.

C.19.2 Further, POWERGRID informed in the 37th CSC meeting that switching work is in progress to connect 70 stations of POWERGRID where minimal cost is required. And agreed to provide the details of action plan by 05.09.2018 for AMR shifting on optical fibre for each location & meter at POWERGRID premises, where the AMR data can be shifted easily with minimal cost.

C.19.3 Also, as per last TCC & CSC meeting, it was advised to POWERGRID to submit the cost for shifting of AMR data on OPGW network to NRPC Secretariat by August 2018. All utilities were also advised to send details of the coordinators for each site for AMR to GM(AM), NR-1, POWERGRID and NRPC Sectt. within 15 days.

Members may discuss.

C.20 Time drift Correction in SEMS

C.20.1 NRLDC is regularly uploading the discrepancy report on weekly basis indicating the likely 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.

Besides uploading of weekly report the many times the NRLDC metering group is also taking up the matter with concerned over telephonically and/or through e-mail also. However, no improvement is observed.

C.20.2 Further, NRLDC vide its letter Ref. No. NRLDC/MO/2018/108-118 dated 04.01.18, Ref No: NRLDC/MO/2018/372 dated 05.03.2018, Ref No: NRLDC/MO/2018/767-793 dated 14.05.2018 & Ref No: NRLDC/MO/2018/1208-1227 dated 23.07.2018 have circulated the list of SEMs where time correction is required to all the state utilities, SLDCs, POWERGRID Stations, Generation stations and have asked them to submit the reports to NRLDC after necessary time correction.

C.20.3 Summary regarding time correction of SEMs are given below:

S.No	Utility	Total Nos. of Meters installed	Week 24.09.18 - 30.09.18		Week 01.10.18 - 07.10.18	
			Nos. of Meters on which Time-drift has been observed	% of Time Drift Meters	Nos. of Meters on which Time-drift has been observed	% of Time Drift Meters
1	AD Hydro	4	0	0%	0	0%
2	BBMB	242	16	7%	13	5%
3	Budhil HEP	3	1	33%	0	0%
4	CHANDIGARH	16	5	31%	4	25%
5	DTL	42	18	43%	15	36%
6	HPSEB	49	24	49%	18	37%
7	HVPNL	61	18	30%	15	25%
8	J&K	32	20	63%	19	59%
9	KarchamWangtoo	16	0	0%	0	0%
10	Malana HEP-2	7	5	71%	4	57%
11	NHPC	133	29	22%	26	20%
12	NPCIL	46	5	11%	3	7%
13	NTPC	226	22	10%	19	8%
14	PGCIL	710	286	40%	235	33%
15	Phojal-HEP	4	0	0%	0	0%

16	PSPTCL	61	29	48%	18	30%
17	PTCUL	46	27	59%	26	57%
18	RAILWAYS	2	1	50%	2	100%
19	RVPNL	58	30	52%	26	45%
20	SCL	6	0	0%	0	0%
21	SJVNL	32	0	0%	0	0%
22	Sorang HEP	6	0	0%	0	0%
23	STERLITE	10	10	100%	10	100%
24	THDC	16	0	0%	0	0%
25	UPPTCL	105	56	53%	47	45%
Total		1933	602	31%	500	26%

C.20.4 All the constituents are requested to send the time correction report on monthly basis in the format given below at email Id: nrldcos@yahoo.com, nrldcos@hotmail.com.

Location/ Substation	Meter No.	Meter location details	Time as per S/Stn GPS	Time as per meter	Time Drift	Action Taken

C.20.5 Further, POWERGRID has placed an LOA to M/s Kalkitech for time drift correction through AMR system also. However, it is observed that time drift correction through AMR is not happening till date.

C.20.6 POWERGRID may apprise the status of time drift correction through AMR system.

C.21 Reconciliation of old Annual Maintenance Contract (AMC) charges for Alstom System by PTCUL.

C.21.1 This issue of reconciliation of AMC charges by PTCUL has been discussed in following meeting:

a) 39th TCC and 42nd NRPC meeting at Solan HP on 28th June

b) Special meeting between PTCUL, NRLDC & NRPC at Dehradun on 31.08.2017

C.21.2 Even after such protracted discussions, the payment of old AMC for Alstom system is still pending from PTCUL in view of small mismatch in outstanding as per PTCUL and NRLDC. During last 39th TCC meeting, it was decided that PTCUL would reconcile

accounts with NRLDC. However, despite repeated requests /letters, follow ups from NRLDC, the reconciliation is yet to be done by PTCUL. Because of non-payment from PTCUL contract closing is still pending.

C.21.3 Members may like to discuss and convince PTCUL for necessary reconciliation of amount and payment of charges immediately.

C.22 Real Time data telemetry from Renewable Generators

C.22.1 As per CERC approved procedure for "implementation of the framework on forecasting, scheduling and imbalance handling for Renewable Energy(RE) generating stations including Power Parks on Wind and Solar at Inter-State Level" following data points are required from Wind and Solar Power Plants.

Wind Turbine Generating Plants

- Turbine Generation (MW/MVAR)
- Wind Speed (meter/second)
- Generator Status (on/off- line)-this is requires for calculation of availability of the WTG
- Wind Direction (degrees from true north)
- Voltage (Volt)
- Ambient air temperature (deg. C)
- Barometric Pressure (Pascal)
- Relative humidity (in %)
- Air Density (kg/m3)

For Solar generating plants

- Solar Generation Unit/ Inverter-wise (MW and MVAR)
- Voltage at interconnection point (Volt)
- Generator/Inverter Status (on/off-line)
- Global horizontal irradiance (GHI)-Watt per meter square
- Ambient Temperature (o C)
- Diffuse Irradiance- Watt per meter square
- Cloud Cover- (Okta)
- Direct Irradiance- Watt per meter square
- Sun-rise and sunset Timing
- Rainfall (mm)
- Relative humidity (%)
- Performance Ratio

C.22.2 With increasing Renewable generation and necessity for forecasting of Renewable generation, the telemetry from developer's pooling station is required to be available at the concerned load dispatch center. Telemetry of Wind and Solar is very poor from Rajasthan state control area .Rajasthan is requested to please arrange for Telemetry from Wind and Solar for better visibility.

C.22.3 Total Availability from Rajasthan is tabulated below:

State	**Wind**		**Solar**	
	Installed Capacity(MW)	**Telemetered Cap.(MW)**	**Installed Capacity(MW)**	**Telemetered Cap.(MW)**
Rajasthan	4292	926	1995	712

C.22.4 Apart from telemetry, integration of AMR (On OPGW) also needs to take care in case of ISTS connected renewable generators. Moreover, Solar & wind models for PSS/e modeling also need to be provided for every renewable generator connected at 132kV & above.

Members may discuss and finalize the timeline for availability of Telemetry.

C.23 Non redundancy in wideband network to NRLDC

C.23.1 Most of the real-time data to NRLDC is being routed through Ballabgarh / Badarpur substations which are linear section and therefore, failure in this section results in major telemetry loss from RTUs/PMUs to RLDC resulting in difficulty in smooth grid operation/monitoring. Last time on 17th Sep 2018 there was major interruption of real-time data to NRLDC for 05 hrs. Such outages are very detrimental for system security.

C.23.2 During 39th TCC meeting, PGCIL agreed to expedite the process of alternate route, however same is yet to be implemented. Therefore, again, it is requested that PGCIL shall take up provisioning of secondary path between NRLDC and Ballabgarh on top priority.

Members may discuss

C.24 Reliability of Telemetry

C.24.1 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 from newly integrated sub-stations is very poor. Though the telemetry integration is ensured before charging the new element, the reliability of telemetry is not at all ensured. Reliability of telemetry for some of the stations is poor since its integration.

C.24.2 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.

C.24.3 Suspected/Inverted status of switches lead to formation of wrong topology; leads to difficulty in smooth grid monitoring/operation. Members may discuss and ensure reliability of data.

C.24.4 Also the provision of redundant communication was discussed in 13th TeST Meeting held on 24th May, 2018, However, redundant data communication is yet to be ensured at NRLDC after one year of discussion.

C.24.5 Presently, 101 RTU out of 125 are reporting on dual channel. Therefore, redundant communication channels from all RTUs need to be ensured. PGCIL/NTPC/IPPs may update the status.

C.24.6 Similar, situation would be at SLDC level and therefore, all SLDCs/STUs shall also ensure communication redundancy at their control centres.

	Northern Region summary sheet and details of current status of implementation of telemetry system												
										Updated Till:		31.08.2018	
Sl. No.	User Name	Total Nos of Stations		Telemetry not Provided				Telemetry Intemittent				Total non-availability of data in %	
				Total nos of		Non-availability		Total nos of		Non-availability			
		GS	SS	GS	SS	GS	SS	GS	SS	GS	SS	GS	SS
1	Punjab	17	173	-	92	-	53%	-	17	-	10%	-	63%
2	Haryana	5	70	-	13	-	19%	-	1	-	1%	-	20%
3	Rajasthan	20	190	-	-	-	-	1	12	5%	6%	5%	6%
4	Delhi	6	41	-	-	-	-	-	3	-	7%	-	7%
5	UP	20	168	-	-	-	-	1	47	5%	28%	5%	28%
6	Uttarakhand	10	29	-	-	-	-	4	4	40%	14%	40%	14%
7	HP	12	25	-	-	-	-	2	2	17%	8%	17%	8%
8	JK	4	17	-	-	-	-	3	11	75%	56%	75%	56%
9	POWERGRID	-	79	-	-	-	-	-	7	-	9%	-	9%
10	NTPC	14	-	-	-	-	-	5	-	36%	-	36%	-
11	NHPC	14	-	-	-	-	-	4	-	29%	-	29%	-
12	NPCIL	5	-	-	-	-	-	-	-	-	-	-	-
13	NJPC	2	-	-	-	-	-	-	-	-	-	-	-
14	THDC	2	-	-	-	-	-	-	-	-	-	-	-
15	BBMB	6	16	-	-	-	-	-	-	-	-	-	-
16	IPP/JV/Patran	6	2	-	-	-	-	2	1	33%	50%	33%	50%
	TOTAL	143	810	0	105	0%	13%	22	105	15%	13%	15%	26%
	Total (over all)	953		105		11%		127		13%		24%	
	Note:												
	1. Constituentswise details is as furnished by SLDC's / as available at RLDC.												
	2. 'GS' Generating Stations and 'SS' subStations												

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

C.24.7 Members may discuss and finalize timeline for redundancy of communication channel from RTU to NRLDC and from RTUs to SLDCs.

C.25 Status telemetry of TCSC / FSC

C.25.1 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	Ballabgarh	Kanpur	Not reporting
2	Bareilly 400	Meerut	Not reporting
3	Lucknow 400	Gorakhpur	Not reporting
4	Mainpuri	Fatehpur	Not reporting
5	Meerut 400	Koteshwar	Not reporting
6	Gorakhpur	Muzaffarpur	Not reporting
7	Unnao	Bareilly (UP)	Not reporting

C.25.2 Utilities are requested to arrange for integration of telemetry of FSC/TCSC at the earliest.

C.26 Telemetry from Kurukshetra HVDC as per agreed in the separate meeting

C.26.1 In meeting held at Kurukshetra on 12.07.2018, POWERGRID had agreed to provide telemetry of additional data of HVDC as shown below which is still to be completed.

S. No.	Description	Clause in MoM dated 12-07-2018
1	Extinction angle *(inverter and rectifier stations)* and Firing angle *(inverter and rectifier stations)*	17
2	Telemetry of "real-time mode *(bi-polar with both DMR, bi-polar with one DMR, etc.)* of operation" and "instance of changeover"	20

PGCIL may kindly update the status.

C.27 OPGW connectivity &Telemetry status of NHPC stations (Agenda by NHPC)

C.27.1 OPGW connectivity at NHPC Power Stations under Central Sector scheme.

i) **URI-II Power Station:** During 39th TCC & 42nd NRPC Meetings held on 27th and 28th June 2018, TCC advised POWERGRID to resolve the compensation issue at the earliest for commission of OPGW at URI-II Power Station.

POWERGRID may kindly update the status

ii) **Sewa-II and Parbati-III**: During 39th TCC & 42nd NRPC Meetings held on 27th and 28th June 2018 POWERGRID informed that OPGW connectivity for data

telemetry of Bairasiul and Sewa II shall be completed by July 2018 and that at Parbati-III shall be completed by June 2018

POWERGRID may kindly update the status.

C.28 Data Telemetry NRLDC from NHPC Kishanganga HE Project

C.28.1 During 39th TCC & 42nd NRPC Meetings held on 27th and 28th June 2018 POWERGRID informed that they will confirm later regarding installation of Terminal Equipment at Kishanganga HE projects once Fibre is available.

POWERGRID may kindly update the status.

C.29 Replacement of S900 RTUs:

C.29.1 AMC of S900 RTUs , installed under ULDC is valid till July 2018. During 12th TeST Meeting it was decided that PGCIL would replace S900 RTUs at stations owned by PGCIL and for other members/constituents who have given their consent for replacement of their RTUs through POWERGRID, by July 2018.

C.29.2 In 13th TeST meeting POWERGRID informed that they had sent MoU/Agreement for replacement of old S-900 RTUs to all constituents in first week of Feb' 2018. However, only two constituents namely SJVNL & THDC Limited has signed MoU/Agreement. POWERGRID had also informed that award shall be placed only after signing of MoU/Agreement between POWERGRID & respective constituents of Northern Region & deposit of advance payment. The TeST sub-committee expressed concern over delay in procurement process and advised all the concerned constituents to submit the signed copy of MoU to POWERGRID latest by 15th May 2018. It was also decided by the sub-Committee that if any Constituent doesn't submit the signed copy of MoU by 15th May 2018, it will be the concerned Utilities responsibility to make necessary arrangement for procurement on their own so that their RTUs are replaced before expiry of AMC.

C.29.3 In 39th TCC & 42 NRPC meeting POWERGRID informed that they were in process of procurement of 93 Nos. S 900 RTUs as per requirement given by different utilities. HPSEB informed that they would replace S900 RTU on their own.

C.29.4 POWERGRID further informed that NIT has been published on 18-09.2018 as MOU/Agreement have been signed by all Constituents, however payment from NTPC, DTL and IPGCL are still pending.

C.29.5 NRPC Secretariat requested POWERGRID to expedite procurement process and requested to take necessary action to extend AMC of S900 RTUs till their replacement in Northern region

POWERGRID may kindly submit latest status of procurement of new RTUs and AMC extension.

C.30 Training for EMS application:

C.30.1 In the 37th TCC and 40th NRPC meeting held on 27th and 28th October 2017, EMS training was approved. NRPC secretariat had placed order on SIEMENS for hands on Training on EMS applications at respective NR SLDCs. Training for Delhi, BBMB, HP, UP, Punjab and Haryana SLDCs has been completed and 90% payment Rs 1070496/- was released to SIEMENS Training at J&K SLDCs scheduled from 22nd to 26th Oct 2018.

C.30.2 Members may note.

C.31 Issues in installation of OPGW on PKTCL Lines (75.915 km)

C.31.1 NRPC in its 39th meeting approved OPGW based Reliable Communication Scheme for Central Sector to provide voice and data communication for Central Sector stations and IPPs in Northern Region. The Scheme envisages establishment of 7248 Kms of OPGW network along with Communication equipment.

C.31.2 The scheme covers installation of OPGW on transmission lines of POWERGRID and other utilities to meet the requirement of network connectivity of stations under Central Sector and IPP stations. The scheme envisages requirement of OPGW installation on following lines owned by Parbati Koldam Transmission Co. Ltd. (PKTCL), a subsidiary company of Reliance in northern region:

(i) 400 kV Parbati Pooling – Parbati III T/L (part)

(ii) 400 kV Parbati III – Parbati II T/L (part)

(iii) 400 kV Parbati Pooling Station – Koldam T/L (part)

C.31.3 NHPC in 42nd NRPC meeting, had requested for early completion of OPGW installation to provide data & voice connectivity to Parbati III station. Accordingly, POWERGRID had taken up installation of OPGW on 400 kV Parbati Pooling – Parbati III T/L under NR Fiber optic Expansion(Additional requirement) project & completed the installation of OPGW in POWERGRID portion. However, OPGW installation in PKTCL portion is balanced. POWERGRID has taken up with M/s PKTCL for installation of OPGW in their portion of line. PKTCL vide their letter dated 31.07.18 have raised certain issues for OPGW installation on their lines. The issues raised are regarding indemnifying PKTCL towards following on account of installation of OPGW on their line:

(i) any dispute, arbitrations, ROW issues with locals

(ii) Outage /tripping of transmission lines, decrease in availability of PKTCL transmission system

(iii) Loss of revenue etc.

C.31.4 Similar issues came up during OPGW installation on transmission lines of Reliance Power Transmission Ltd (RPTL) in Western Region. These issues are to be resolved immediately so that OPGW installation is taken up by POWERGRID on PKTCL lines for smooth implementation of the scheme.

Members may deliberate.

D. ITEMS FOR NRPC

D.1 Reimbursement of Expenditure of NRPC Sectt. for the FY 2017-18 and FY 2018-19 by the members of NRPC

D.1.1 In the 42nd NRPC meeting, Rs. 10 Lakh per member was approved as the contribution for the financial year 2018-19**.**

D.1.2 In the 40th NRPC meeting held on 28.10.2017, it was decided to contribute the amount of Rs. 10.0 Lakh per member for the year 2017-18 toward reimbursing NRPC expenditure to GoI for the year 2017-18, for meeting the expenditure for meetings at Secretariat and other expenditure as approved by Chairperson, NRPC.

D.1.3 Contribution is still awaited from all members for FY 2018-19 and 12 members for FY 2017-18 as given in Annexure D 1.1

Members are requested to expedite the contribution.

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 at NRPC meetings from time to time.

D.2.2 The contribution for previous years is still awaited from following members:

Sl. No.	Constituent Member	Amount (Rs.)
	Financial Year 2016-2017	
2.	AVVNL, Jaipur	7.0 Lakh
3.	J&K PDD, Srinagar	
4.	PVVNL, Varanasi	
	Financial Year 2015-2016	
1	J&K State Power Development Corp. Ltd., Srinagar	11.0 Lakh
2	Paschimanchal VVNL, Meerut	
3	GMR Energy Trading Limited, New Delhi	
	Financial Year 2014-2015	
2	J&K State Power Development Corp. Ltd., Shrinagar	11.0 Lakh
3	Dakshinanchal VVNL, Agra	
4	Bajaj Energy Pvt. Ltd., Noida	
	Financial Year 2012-2013	
1	Purvanchal VVNL, Varansi	10.0Lakh

D.3 Membership in NRPC for Rotational Members

D.3.1 Government of India, Ministry of Power under the provision of Section 2, Subsection 55 of the Electricity Act 2003 had established the Northern Regional Power Committee in place of erstwhile Northern Regional Electricity Board vide its resolution dated 25.05.2005 and subsequent amendments dated 29.11.2005 and 09.05.2008. Under this resolution, one member representing the electricity traders operating in the Northern Region is to be nominated as a member of NRPC by rotation

D.3.2 In the 39th TCC/42nd NRPC, it was informed that name of JSW Power Trading Company was recommended for membership on NRPC for the year 2018-19 by CEA. Representative of JSW Energy informed that JSW PTC is not existence anymore and the membership of NRPC for inter-state electricity trader may be offered to some other trader.

D.3.3 Subsequently, the name of Manikaran Power Ltd was recommended for membership by CEA. Accordingly, Manikaran Power Ltd. has been nominated as trader member of NRPC for the year 2018-19.

D.3.4 In the last few years there has been significant interest and private investment in the power transmission sector. In the interest of strengthening and facilitating the function of planning related to inter-state and intra-state transmission system, Sterlite Power Transmission Limited has requested that private transmission licensees should also be invited to participate in the RPC meetings.

Members may deliberate.

D.4 Roster for Hosting NRPC Meetings

D.4.1 In order to have better interaction among the constituent members and to evolve better understanding and coordination among them, NRPC meetings are hosted by the constituent members in rotation as per the roster approved in the Special Meeting of NR Power Utilities held on 27th March 2006.

D.4.2 Since 2006, the number of members of NRPC has increased significantly. In order to ensure that all members get an equal opportunity to host the meeting, the following modified roster is proposed:

1.Member IPP	9. Punjab	17. Member Trader/PTC
2.NPCIL	10.Member IPP	18. Delhi
3.J&K	11. Rajasthan	19.Member IPP
4.THDC	12. POWERGRID	20. BBMB
5.Member IPP	13. UT of Chandigarh	21. Uttarakhand

6. Haryana	14.Member IPP	22. HP
7. SJVN	15. NHPC	
8. NTPC	16. UP	

Roster for Members IPP is as followed:

1.Adani Power	6.LPGCL
2.APCPL	7.NPL
3.CLP	8.PPGCL
4.JSW Power	9.RPSCL
5.LAPL	10.TSPCL

D.4.3 Final host for a meeting would be decided by Member Secretary, NRPC in consultation with Chairperson, NRPC and announced at the previous meeting. In case of a state being a host, the NRPC members from that state would decide among themselves as to which particular member would host the meeting.

Members may kindly deliberate.

D.5 Capacity Building Program on Transition to 5 Minute Balancing & Scheduling-International Experiences

D.5.1 Internationally, various market resolution is maintained as per the policy making and design objectives catering to respective needs. Certain markets have opted for simple design with "low resolution" i.e. they capture few of the underlying physical properties of the system which they leave to system operators to handle. Others adopted a market design with "high resolution", to factor the physical reality of power system into the process of price formation on the market itself.

D.5.2 A capacity building program is proposed for constituents of NRPC. The proposed program would include:

- Market design for implementing 5-minute trading, despatch and scheduling.
- Understanding of overall market design of Australia/USA market design with high resolution.
- Trading system in high resolution market.
- IT integration and appropriate facilitative mechanisms.
- Real time/Balancing markets.
- Scheduling and Despatch with High resolutions.

D.5.3 The funding for the proposed program would be sought from PSDF after approval of NRPC.

Members may kindly approve.

D.6 Renovation of Recreation centre at NRPC Secretariat

D.6.1 The equipment present in the Recreation Centre at NRPC Secretariat are very old and non-functional. Hence, it is proposed to procure fitness equipment which will be installed at Recreation Centre as it's very important to give sometime for exercise in one's busy schedule. Physical activity or exercise can improve mental and physical health and reduce the risk of developing several diseases related to health, sugar, blood pressure etc. It would also have immediate and long-term health benefits.

D.6.2 The equipment to be purchased will be decided by Canteen Committee as approved in 17th TCC/18th NRPC meeting held on 26th and 27th Nov, 2010. The expenditure of around 5 lakh for the same is proposed to be met from NRPC fund.

Members may kindly deliberate.

D.7 HOSTING OF NEXT MEETINGS OF NRPC / TCC

As per agreed roster for hosting of meetings, the next meetings of TCC (41st) & NRPC (44th), which would become due in Feb/March, 2019 are to be hosted by Member IPP (Adani Power Ltd).

POWER SYSTEM OPERATION CORPORATION LIMITED
National Load Despatch Centre
Office Address: B-9, 1st Floor, Qutub Institutional Area, Katwaria Sarai, New Delhi - 110016
Tel: 011-26524521, 26536959 Fax: 011-26524525, 26536901

Ref: NLDC-PSDF/TESG-44th meeting/2018-19/ Dated September, 2018

To,

As per distribution list

Subject: PSDF- Minutes of 44th meeting of the Techno-Economic Subgroup (TESG) held on 28th August, 2018

44th meeting of the Techno Economic Sub Group (TESG) of PSDF was held on **28th August, 2018.** The meeting was chaired by Chief Engineer (NPC), CEA.

List of the participants is enclosed as **Annexure-I.**

1. Shri Pardeep Jindal, CE (NPC), CEA welcomed the members of the TESG. He informed that the meeting has been convened to examine the proposals for installation of capacitors submitted by the State Transmission and Distribution Utilities. The proposals have been examined several times in the earlier meetings of TESG. These entities have been told to submit the study reports based on which the requirement of capacitors could be assessed.

The proposals for installation of capacitors get covered under para 5.1 (b) of PSDF Guidelines for improvement of voltage profile in the Grid. The relevant clause is reproduced below:

" 5.1(b) Installation of shunt capacitors, series compensators and other reactive energy generators including reactive energy absorption, dynamic reactive support etc. ***for improvement of voltage profile in the Grid****."*

2. Regarding background of these capacitor schemes, the Member Secretary, TESG informed the following:

2.1 The matter was also discussed during 12th meeting of the Appraisal Committee held on 31.5.2016, wherein it was suggested that the RPCs may be approached to carry out an assessment at regional level by engaging expert agencies like CPRI. Accordingly, the RPCs were requested vide letter dated 22.6.2016 (**Annexure-II)** to carry out the assessment of requirement of capacitors at regional level. NRPC and SRPC had engaged CPRI for assessing the requirements of capacitors in their regional grids. It was observed that both these reports have studied the capacitor requirement at transmission level only.

2.2 However, it was noted that many proposals (DPRs) for capacitor installation received from the DISCOMs of NR and SR for funding from PSDF, are at variance from the above CPRI reports.

2.3 The proposals for capacitor installation were further examined during 34th meeting of TESG in detail, and it was decided to seek following inputs from the project entities for further processing of DPRs:

i. Study report based on which the requirement has been projected

ii. Location wise details of existing capacitor banks with their age and healthiness report

iii. Present voltage profile at 11 kV / 33 kV

iv. Projected voltage levels after installation of capacitors

v. Schematic for automatic power factor correction

vi. SLDC report

vii. STU approval

viii. Basis of cost estimates

ix. Grant from any other scheme of GOI (IPDS, DDUGVY)

2.4 The above details were sought Vide letter dated 23.10.2017 **(Annexure-III).** The status of submission of the inputs by the entities was again examined in the 38th meeting of TESG held on 26.2.2018. A reminder letter dated 21.5.2018 (**Annexure-IV)** was sent to the entities for expediting the submission of the above inputs.

3. A total of twenty-four (24) proposal (enclosed at **Annexure V)** with an estimated cost of Rs 2833 crore were examined by the TESG. It was suggested that for the DPRs on capacitors, state should carry out their comprehensive assessment, both at transmission and distribution level, for the entire state/or at least for one distribution/transmission circle, so as to optimize total capacitor requirement. This was agreed by TESG, as it would not only optimize the locations and expenditure but also would help the States in maintaining grid voltages in effective manner. The same was decided to be communicated to the states, accordingly. The state-wise record of discussion, in respect of their capacitor schemes, is given below:

4. **Punjab** (1 scheme)

PSTCL: Installation of 35 nos.,66 kV 10.86MVAR HT shunt capacitor at various 220kV substations (Proposal No. 60)

Estimated cost Rs 8.35 crore

Date of submission of DPR: 24th Jun-2015

PSTCL vide their letter dated 8.6.2018 have informed that the information sought by the TESG was being collected from field offices and would be submitted after compilation.

The proposal has been pending since last three years. It was decided that entity shall be asked to furnish the requested inputs by 15th Sept, 2018. In case the inputs are not provided by15th Sept, 2018, the proposal shall be recommended to the Appraisal Committee for considering the DPR as 'deemed returned'.

However, the entity has the option to submit afresh DPR after carrying out the necessary comprehensive studies taking into consideration the capacitor requirement for both at transmission and distribution level and comprising of the inputs sought by TESG vide letter at **Annexure III**.

5. Maharashtra (3 schemes)

i. MSETCL: Installation of Capacitor Banks at HV & EHV level at various EHV substations under Parli Circle, Aurangabad Zone & Akola Circle, Amravati zones (Proposal No. 130)

Estimated cost Rs 18.08crore

Date of submission of DPR: 14-Feb-17

ii. MSETCL: Installation of Capacitor Banks at HV level at various EHV substations under Aurangabad, Amravati, Karad, Nasik, Nagpur and Pune zone (Proposal No. 175)

Estimated cost Rs 79.32crore

Date of submission of DPR: 9-Aug-17

The above DPRs submitted by MSETCL vide their letter dated 4.6.2018 in respect of proposal nos. 130 and 175, were examined by the TESG. The observations of TESG are as below:

a) Capacitors have been proposed even when the voltages were higher than the nominal voltage, both at 132 kV and 220 kV.

b) There are multiple DPRs from the TRANSCO and DISCOMs. The requirement needs to be optimized and assessment should be carried out in a comprehensive manner together for transmission and distribution, for the entire State or at least for one distribution/ transmission circle.

It was decided that the observations of TESG, shall be communicated to MSETCL and they would also be called for discussion in CEA.

iii. MSPDCL: Reactive Power Management by Installing Capacitor Bank at 33/22/11 kV Substation (Proposal No. 217)

Estimated cost Rs 381.57 crore

Date of submission of DPR: 23-Apr-18

The proposal (217) was examined in 42nd meeting of TESG. **It was noted that inputs sought from the entity have not been received so far and MSPDCL would be reminded for the same.**

6. Telangana (2 schemes)

i. TSTRANSCO: Installation & Commissioning of Capacitors Banks at EHT Substations (Proposal No. 092)

Estimated cost Rs 4.79 crore

Date of submission of DPR: 2-Jun-16

ii. TSSPDCL: Installation and Commissioning of 247 Nos. shunt capacitor banks at various 33/11kV sub-stations (Proposal No. 131)

Estimated cost Rs 28.13 crore

Date of submission of DPR: 14-Feb-17

TSTRANSCO letter dated 3.8.2018 and TSSPDCL letter dated 26.5.2018 were deliberated by TESG. The observations are as below:

a) Under para 5 of the letter of TSTRANSCO, it is mentioned that the proposal is for improvement of power factor at various EHT substations. Hence, the voltage profile study for installation of capacitors is not required.

b) TSSPDCL has informed that present voltage profile on 11 kV side is 10.58 kV to 11.21 kV. The capacitor banks are proposed where the power factor is less than 0.95.

The proposals for installation of capacitors get covered under para 5.1 (b) of PSDF Guidelines for improvement of voltage profile in the Grid. Thus it was noted that the objective of the DPRs is not in accordance with PSDF Guidelines. **Therefore, the proposals shall be recommended to the Appraisal Committee for considering the DPR as 'deemed returned' and the entity shall be communicated accordingly**.

However, the entity has the option to submit afresh DPR after carrying out the necessary comprehensive studies taking into consideration the capacitor requirement for both at transmission and distribution level and comprising of the inputs sought by TESG vide letter at **Annexure III**. Accordingly, STU may do necessary co-ordination.

7. Uttar Pradesh (7 schemes)

Following DPRs have been submitted by the DISCOM of Uttar Pradesh as mentioned below:

Sl. No	Proposal No.	Name of Entity	Date of Submission	Name of Scheme	Estimated cost in Rs crore
1	068	MVVNL	17-Oct-15	Installation of 11kV Auto switched capacitor bank at various 33/11kV substation	294.25
2	171	MVVNL	26-Jul-17	Provision of 11kV Auto Switched capacitor bank at various 33/11kV substations	158.17
3	120	DVVNL	10-Nov-16	Provision of 11kV Auto Switched Capacitor Bank at various 33/11 kV substations	374.97

4	160	PuVVNL	5-Jun-17	Provision of 11kV Auto Switched Capacitor Bank at various 33/11 kV substation of Varanasi.	536.50
5	168	PVVNL	20-Jul-17	Provision of 11kV Auto Switched Capacitor Bank at various 33/11 kV substations	179.40
6	169	DVVNL	21-Jul-17	Provision of 11kV Auto Switched Capacitor Bank at various 33/11 kV substations	161.20
7	170	PuVVNL	21-Jul-17	Provision of 11KV Auto Switched capacitor bank at various 33/11 kV Substations	237.90

MVVNL, vide letter dated 30.12.2017 from Director (Dist), UPPCL had informed that MVVNL had been assigned to coordinate for all the DISCOMs of UP. Subsequently, 40th meeting of TESG was held on 17.4.2018 with representative from MVVNL to examine the proposals of the DISCOMs of UP. After the meeting, MVVNL vide their letter dated 3.5.2018 had sought more time.

Subsequently, a meeting with Director, UPPCL and other senior officers of MVVNL was held on 3rd August, 2018 in the office of CE (NPC), CEA. During this meeting, a draft report prepared by MVVNL was discussed.

For the purpose of justification of capacitors at distribution level, UP has also shown the results of measurements of voltages, before and after installation of capacitors, carried out by MVVNL for few locations. However, it was observed that the results were incoherent and as such UP officials were asked to repeat these measurements.

It was suggested that a comprehensive capacitor requirement at distribution substations in each circle with complete details of the voltage levels, transformer capacity, existing/under-construction capacitors, etc, as given in Annexure-VII, justification of the same and basis of cost estimates should be included in the DPR. It was also observed that UP had informed in the meeting held on 03-08-2018, that they would prepare DPRs afresh and submit for PSDF grant.

In view of this, it was decided that the proposals (7 Nos.) under consideration would be recommended to the Appraisal Committee for considering as 'deemed returned' and the entities shall be communicated, accordingly.

8. Tamil Nadu (5 schemes)

Following DPRs have been submitted by TANTRANSCO as mentioned below:

Sl. No	Proposal No.	Date of Submission	Name of Scheme	Estimated cost in Rs crore
1	181	11-Sep-17	Installation of 13 sets of 110kV, 24MVAR Shunt Capacitor Banks at various Sub-station in TNEB.	17.59
2	184	11-Oct-17	Installation of 33 sets of 11kV, 2.4 MVAR Capacitor Banks (79.2MVAR) and 49 sets of 22kV, 2.4 MVAR Capacitor Banks (117.6MVAR) in various substations in Coimbatore region	18.74

3	221	10-May-18	Design, Detailed Engineering , Supply, Erection, Testing and Commissioning of 59 sets of 22kV, 2.4 MVAR Capacitor Banks and 42 sets of 11kV, 2.4 MVAR Capacitor Banks in various substations in Erode region in Tamil Nadu.	24.06
4	236	29-Jun-18	Design, Detailed Engineering , Supply, Erection, Testing and Commissioning of 1 set 24MVAR, 110kV Capacitor Banks and 15 sets of 22kV, 2.4 MVAR Capacitor Banks (36MVAR) in various substations in Trichy, Villupuram, Madurai, Tirunelveli and Chennai (South) in Tamil Nadu.	18.84
5	237	29-Jun-18	Design, Detailed Engineering , Supply, Erection, Testing and Commissioning of 2 set 24MVAR, 110kV Capacitor Banks and 31 sets of 22kV, 2.4 MVAR & 1.2 MVAR Capacitor Banks (74.4 MVAR) in various substations in Vellore region in Tamil Nadu.	10.18

The inputs furnished by the entity vide letters dated 15.2.2018, 9.4.2018 & 18.6 2018 (for proposal no. 181 & 184) and study report of CPRI carried out by SRPC was examined. The observations of TESG are as below:

(i) There is mismatch between the capacitor requirement suggested by the study conducted by CPRI for capacitor assessment in SR and proposed capacitor requirement in the DPRs submitted by TANTRANSCO. The CPRI report recommends capacitor requirement at 48 locations where as Tamil Nadu DPR requires 14 locations. The quantum and locations are different in these reports. In the CPRI study, it is observed that the voltage at various buses falls down after installation of capacitor in the simulation. As such there could be simulation error in these studies. Also, the CPRI study recommends placement of capacitor at buses where voltage is already in comfortable range.

(ii) The requirement from all the regions needs to be optimized and assessment carried out in a comprehensive manner for the entire State or at least for both transmission and distribution requirements for one distribution circle/region in Tamil Nadu.

In view of the above, Tamil Nadu may submit a comprehensive DPR considering above observations, latest by 15th Oct, 2018. In case, the details are not provided by15th Oct, 2018, the proposal shall be recommended to the Appraisal Committee for considering the DPR as 'deemed returned'.

However, the entity has the option to submit afresh DPR after carrying out the necessary comprehensive studies taking into consideration the capacitor requirement for both at transmission and distribution level and comprising of the inputs sought by TESG vide letter at **Annexure III**. Accordingly, STU may do necessary co-ordination.

9. Proposals from J&K, Haryana, Rajasthan, Mizoram, Nagaland and Manipur (1 each – total 6 schemes)

J&K, Haryana, Rajasthan, Mizoram, Nagaland and Manipur have submitted one proposal each as per the details as given below:

Sl. No	Proposal No.	Name of Entity	Date of Submission	Name of Scheme	Estimated cost in Rs crore
1	033	PDD J&K	18-Dec-14	Capacitors at 132/33 kV substations , existing and upcoming	223.88
2	65	HVPNL, Haryana	21-Sep-15	To improve the voltage profile in the Grid by compensating reactive power.	37.25
3	105	RRVPNL, Rajasthan	5-Aug-16	Installation of 33KV Shunt Capacitor banks in Rajasthan Power System.	29.30
4	139	Mizoram	16-Mar-17	Installation of Reactive Power Solution at 132kv Substation in Mizoram.	16.88
5	133	Nagaland	23-Feb-17	Installation of Automatic Reactive power Solution at 66/33kV, 66/11kV & 33/11kV Substations.	27.47
6	204	MSPCL, Manipur	12-Jan-18	Installation of Reactive Power Solution on 33/11kV Substation in Manipur.	56.81

TESG observed that there has been no response to the various letters seeking the study reports from the utilities of J&K, Haryana, Rajasthan, Mizoram and Nagaland as in the table above. Therefore, **TESG decided that the proposals shall be recommended to the Appraisal Committee for considering as 'deemed returned'**.

A reminder shall be sent to Manipur for furnishing the required details by 15th Oct, 2018. In case the details are not provided by15th Oct, 2018, the proposal shall be recommended to the Appraisal Committee as deemed returned.

10. A letter dated 29.5.2018 from SRPC (**Annexure-VI)** regarding observations of TESG conveyed vide NLDC letter dated 21.5.2018(at Annexure III) was also discussed. It was decided that a note on the observations of SRPC would be prepared by NPC Division, and the same can be discussed in next meeting of the Appraisal Committee. SRPC/CPRI may also be invited during these discussions.

11. CE(NPC) thanked to all the TESG members and other participants present in the meeting, for fruitful discussion.

***

Annexure - I

PSDF_44th Meeting of the Techno Economic Subgroup						
Venue: NRPC					Date: 28-08-2018	
Sl.No	Name	Designation	Organization	Mobile No.	Email.ID	Sign
1.	Ashok Joshi	DGM	PGCIL	9910378057	ajoshi@powergridindia.com	
2.	P.S. Das	DGM	POWERGRID	9433041837	psdas@powergridindia.com	
3.	Irfan Ahmad	Director	NPC, CEA.	9818332410	irfancea@yahoo.com	
4.	PARDEEP JINDAL	CE (NPC)	CEA	9818768460	jindal_pardeep@yahoo.co.in	
5.	N. NALLARASAN	DGM	POSOCO, NLDC	8527077022	nallarasan@posoco.in	
6.	Sanjay Srivast..	CE(PSETD)	CEA	9811220464	san.srivastava@gov.in	
7.	Saurabh Mishra	DD (NPC)	CEA	7827433175	cenpccea@gmail.com	
8.	K. Satish Kumar	AD (NPC)	CEA	8309498854	cenpccea@gmail.com	
9.	Deepanshu Rastogi	AD(NPC)	CEA	9789957461	cenpccea@gmail.com	
10.	T. Bheemesh	Sr. Engr.	POSOCO, NLDC	9599118547	tbheemesh@posoco.in	
11	R.U. Bansal	Consultant	NLDC-POSOCO	9717296956	bansal2511@gmail.com	

POWER SYSTEM OPERATION CORPORATION LIMITED
National Load Despatch Centre
Office Address: B-9, 1st Floor, Qutub Institutional Area, Katwaria Sarai, New Delhi - 110016
Tel: 011-26524521, 26536959 Fax: 011-26524525, 26536901

Ref: NLDC-PSDF/GENERAL/2016-17/ 428 Dated 22nd June, 2016

To,

Member Secretary, NRPC, Delhi
Member Secretary, ERPC, Kolkata
Member Secretary, WRPC, Mumbai
Member Secretary, SRPC, Bengaluru
Member Secretary, NERPC, Shillong

Subject: PSDF- Funding of the schemes of the state utilities for installation of capacitors in the state network at transmission / distribution network

Sir,

This is with regard to the schemes of the state utilities for installation of capacitors in the state network at transmission / distribution network for funding from PSDF.

After examination of the schemes submitted by UP, Haryana, Punjab and Gujarat by the Techno-Economic Subgroup in the meeting held on 7th and 8th January, 2016, vide letter dated 10.1.2016 NRPC and WRPC were requested to assess capacitor requirements in the state network at the regional level to facilitate evaluation of the schemes.

In this regard, vide email dated 27.5.2016, NRPC had informed that they were engaging CPRI for the task.

The matter was deliberated by the Appraisal Committee during the meeting held on 31.5.2016. The Committee was of the view that approach followed by NRPC may be followed by other RPCs also. It would assist in fast disposal of the schemes regarding capacitor requirements.

In view of the above, as decided by the Appraisal Committee, it is requested that assessment of capacitor requirement may be carried out at regional level by engaging expert agency like CPRI. A list of the schemes for capacitor requirements is enclosed as annexure-I for your kind information.

Thanking you

Yours faithfully

(K.V.S.Baba)
MS-Appraisal Committee &
ED, NLDC

Copy for kind information to:

Chairperson, CEA / JS (TRANS) MOP / Director (OM) MOP / Chief Engineer (NPC) CEA/ CEO-POSOCO

Annexure-I

Schemes for requirement of capacitors					
Sl. No	Name of State/Entity	Name of Entity & unique ID	Date of Submission of Scheme by the entity	Name of Scheme	Estimated cost by entity (Rs. Crore)
I	II	III	IV	V	VI
1	Punjab	PSTCL (60)	24-Jun-15	Installation of 35 nos.,66kV 10.86MVAR HT shunt capacitor at various 220kV substations(60)	8.35
2	Haryana	HVPNL(65)	21-Sep-15	To improve the voltage profile in the Grid by compensating reactive power. (065)	37.25
3	Uttar Pradesh	MVVNL (068)	17-Oct-15	Installation of 11kV Auto switched capacitor bank at various 33/11kV substation(68)	294.25
4	PDD J&K	PDD J&K(033)	18-Dec-14	Capacitors at 132/33 kV substations , existing and upcoming (033)	223.88
5	Gujarat	MGVCL (050)	5-Mar-15	Dynamic reactive power compensation for improvement of voltage profile in the grid (050)	37.15
6	Gujarat	UGVCL(053)	9-Mar-15	Shunt capacitors (053)	54.80
7	Gujarat	DGVCL (071)	10-Dec-15	Installation of reactive power compensation system on 11kV feeders	21.73
8	Maharashtra	MESTCL	20-May-16	Installation of Capacitor Banks at HV & EHV level at various EHV substations under Nashik & Pune zones in MSETCL. (086)	19.49
9	West Bengal	WBSETCL	2/3/2016	Improvement of State transmission System by proper Reactive power Management with an objective to improve voltage profile by installation of switchable reactor & shunt capacitor in the State as well as National Grid. (088)	48.45
10	Telangana	TSTRANSCO	6/2/2016	Installation & Commissioning of Capacitors Banks at EHT Substations in TSTRANSCO(092)	4.79
Total					750.14

पावर सिस्टम ऑपरेशन कार्पोरेशन लिमिटेड

राष्ट्रीय भार प्रेषण केंद्र

कार्यालय पता: बी-९,1st फ्लोर,कुतुब इंस्टीटुसिनल एरिया कटवारिया सराय, नई दिल्ली-११००१६

फोन नंबर: 011-26524521, 26536959 फ़ैक्स: 011-26524525, 26536901

Ref: NLDC-PSDF//2017-18/ 723 **Dated 23rd October, 2017**

To,

As per distribution list

Subject: PSDF – Observations of the Techno Economic Sub Group with regard to the proposals for installation of capacitors

Sirs,

Seventeen proposals for installation of capacitors submitted by the entities as per the enclosed annexure were examined during 34th meeting of Techno Economic Sub Group (TESG) of PSDF held on 29.09.2017. The extract of MOM of the meeting is reproduced below.

"The entities have been submitting the proposals for installation of capacitors in the distribution system. Seventeen such proposals were also reviewed by the sub group.

a) The capacitor banks are proposed to be installed at 11/33/66 kV level.

b) For examination of these proposals following details would be required.

i. study report based on which the requirement has been projected

ii. location wise details of existing capacitor banks with age and healthiness report

iii. Present voltage profile at 11 kV / 33 kV

iv. projected voltage levels after installation of capacitors

v. schematic for automatic power factor correction

vi. SLDC report

vii. STU approval

viii. Basis of cost estimates

ix. Grant from any other scheme of GOI (IPDS, DDUGVY)

Observations of PSE&TD Division, CEA on the schemes of Uttar Pradesh (PVVNL, DVVNL, PuVVNL) is enclosed as ***Annexure-X.***

It was observed that as per function of RPCs, as given in their Resolution (as given in 6.7) they carry out capacitor requirement studies and it was noted that the progress of installation of capacitors by various constituent States are also be discussed in the RPC meetings. The sub group may therefore, seek input from concerned RPCs about quantum of capacitors installed in each State, in the region in the last 10/15 years.

The sub group was of the view that further examination may be carried out after submission of the above details by the entity. Accordingly, the entities shall be asked to furnish the same. Regarding the assessment report of the RPC, the concerned RPCs shall be requested."

P/2—

It is requested to do the needful for compliance of the observations of the TESG.

Thanking you

Yours faithfully

(R.K.Bansal)
Convener Techno Economic Subgroup &
Consultant-NLDC

Distribution list:

1. Chief Engineer (RE),Power and Electricity Department Mizoram, cerggvymizo@gmail.com
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9. Chief Engineer, Transmission Corporation of Telangana Ltd. cetransmissionts@gmail.com
10. Chief General Manager (Projects),TSSPDCL, Telangana. cgmproj@tssouthernpower.com
11. Chief Manager, Paschimanchal Vidyut Vitran Nigam Ltd. semmpvvl@gmail.com
12. Superintending Engineer, Purvanchal Vidyut Vitran Nigam Ltd. rggvypuvvnl@gmail.com

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Copy for information to:

1. Chairperson, CEA
2. CEO-POSOCO
3. Member Secretary – NRPC/ ERPC/ WRPC / SRPC / NERPC
4. Chief Engineer (NPC), CEA
5. ED – NLDC, POSOCO

Summary of proposals for installation of capacitors for PSDF funding

Annexure-IV

Sl. No	Name of State/Entity	Name of Entity & unique ID	Date of Submission of Scheme	Name of Scheme	Estimated cost (Rs. Crore)	KV 11/33/66	MVAR Rating	QTY
I	II	III	IV	V	VI	VII	VIII	IX
1	Mizoram	Dop, Mizoram	16-Mar-17	Installation of Reactive Power Solution at 132kv Substation in Mizoram. (139)	16.88	36	2700 kvar to 4800	16
2	Punjab	PSTCL (60)	24-Jun-15	Installation of 35 nos.,66kV 10.86MVAR HT shunt capacitor at various 220kV substations(60)	8.35	66	10.86	35
3	Haryana	HVPNL(65)	21-Sep-15	To improve the voltage profile in the Grid by compensating reactive power. (065)	37.25	11	2.6 to 4.5	117
4	Uttar Pradesh	MVVNL (068)	17-Oct-15	Installation of 11kV Auto switched capacitor bank at various 33/11kV substation(68)	294.25	33	1.5 to 15	1104
5	PDD J&K	PDD J&K(033)	18-Dec-14	Capacitors at 132/33 kV substations , existing and upcoming (033)	223.88	33	05 to 20	100
6	Rajasthan	RRVPNL	5-Aug-16	Installation of 33KV Shunt Capacitor banks in Rajasthan Power System. (105)	29.30	33	5	81
7	Uttar Pradesh	DVVNL (UP)	10-Nov-16	Provision of 11kV Auto Switched Capacitor Bank at various 33/11 kV substation. (120)	374.97	33/11	05 to 10	1093
8	Maharashtra	MSETCL	14-Feb-17	Installation of Capacitor Banks at HV & EHV level at various EHV subatations under Parli Circle, Aurangabad Zone & Akola Circle, Amravati zones in MSETCL. (130)	18.08	33	1 to 15	225
9	Telangana	TSTRANSCO	2-Jun-16	Installation & Commissioning of Capacitors Banks at EHT Substations in TSTRANSCO(092)	39.87	33	05 to 14.4	258
10	Telangana	TSSPDCL	14-Feb-17	Installation and Commissioning of 247 Nos. shunt capacitor banks at various 33/11kV sub-stations of Southern Power Distribution Company of Telangana Ltd. (TSSPDCL) (131)	28.13	33/11	01 to 2	247
11	Uttar Pradesh	PVVNL (UP)	2-Jun-2017	Provision of 11kV Auto Switched Capacitor Bank at various 33/11 kV substation of Meerat. (159)	538.00	11	03 to 12.5	1494
12	Uttar Pradesh	PuVVNL (UP)	5-Jun-2017	Provision of 11kV Auto Switched Capacitor Bank at various 33/11 kV substation of Varanasi. (160)	536.50	33/11	03 to 10	1574
13	Uttar Pradesh	PVVNL (UP)	20-Jul-2017	Provision of 11kV Auto Switched Capacitor Bank at various 33/11 kV substation of Meerat. (168)	179.40	33/11	5 to 10	811
14	Uttar Pradesh	DVVNL (UP)	21-Jul-2017	Provision of 11kV Auto Switched Capacitor Bank at various 33/11 kV substation . (169)	161.20	33/11	5	639
15	Uttar Pradesh	PuVVNL (UP)	21-Jul-2017	Provision of 11KV Auto Switched capacitor bank at various 33/11 KV Substation.(170)	237.90	11	5 to 10	883
16	Uttar Pradesh	MVVNL (UP)	26-Jul-2017	Provision of 11kV Auto Switched capacitor bank at various 33/11kV substation. (171)	158.17	11	5 to 10	527
17	Maharashtra	MSETCL	9-Aug-2017	Installation of Capacitor Banks at HV level at various EHV subatations under Aurangabad, Amravati, Karad, Nasik, Nagpurand Pune zone in MSETCL. (175)	79.32	33/22	02 to 5	1180

Annexure-X

केन्द्रीय विद्युत प्राधिकरण

Central Electricity Authority

विद्युत प्रणाली अभियांत्रिकी एवं प्रौद्योगिकी विकास प्रभाग

Power System Engineering & Technology Development Division

विषय: **New schemes received from Uttar Pradesh (PVVNL, DVVNL, PuVVNL) -regarding.**

Please refer to POSOCO's letter No. NLDC-PSDF/General/2017-18/430 dated 28.07.17 on the subject vide which following proposals for "Provision of 11 kV Auto Switched capacitor bank at various 33/11 kV substations" received from following entities hava been forwarded for review:

1. Purvaanchal Vidyut Vitaran Nigam Ltd. (PuVVNL)-Project proposal No. PSDF/PVVNL-09/July-17/168
2. Dakshinanchal Vidyut Vitaran Nigam Ltd. (DVVNL) - Project proposal No. PSDF/PVVNL-09/July-17/169
3. Pashcimanchal Vidyut Vitaran Nigam Ltd. (PVVNL)- Project proposal No. PSDF/PVVNL-09/July-17/170

The above proposals have been examined and following observations are made:

1. Basis of arriving at cost of all items used for complete capacitor bank project may be provided.

2. Study on the basis of which quantity of transformers for installation of capacitor banks has been identified should be submitted.

3. If any similar project of installation of capacitor bank has been carried out in the past by the utility, details of technical and economical advantages achieved afterwards may be provided.

4. Format A2, Para 2.6: Duration of the project has been indicated as 12 Months and during some of the Months no activity has been indicated. Timeline of activities may be reviewed for judicious utilization of project time.

5. **DVVNL Proposal:** Formulae given in DPR for reduction of losses is not correct and does not include power factor of the system after installation of capacitors ($P.F_2$). The same may be corrected.

222
29/9/17

6. While the DVVNL proposal is for 3960 kVAR, 12.65 kV capacitor bank to be installed on 5, 8 & 10 MVA, 33/11 kV transformers (as seen from cost breakup table), other kVAR rating of capacitor bank and MVA capacity of transformer has been specified in the scope (para 1.0), principal parameters (para 4.1) & assembly (para 5.2) given under technical specification for capacitor bank. This may be reconciled. Similar discrepancy in respect of proposals from PuVVNL & PVVNL may also be rectified.

7. Under para 2.1 of technical specification, IS 3070 has been indicated for lightning arrestor. In this regard, it is informed that few parts of IS 3070 has been superseded by IS 15086. Relevant parts of both IS 3070 and IS 15086 may be indicated in the list of Indian Standards.

8. Short circuit withstand current and its duration for capacitors may also be included under principal parameters (para 4.1) in technical specification.

9. Under para 5.3 of technical specification, thickness of CRCA sheet for container has been specified as "not less than 1.6 mm". As per common industry practice and for better quality, CRCA sheet thickness may be specified as "not less than 2 mm".

10. Para 5.5 (f)-"Temperature Variation": Range of ambient temperature may be corrected as '-5 deg C to +50 deg C' in line with the service conditions specified in para 3.0.

11. Proposal by PuVVNL does not contain detailed DPR including technical specification for capacitor bank. The same should form part of the proposal.

28.9.17

(योगेन्द्र कुमार स्वर्णकार)

निदेशक

मुख्य अभियंता (NPC), CEA

पत्र सं: CEA/PSETD/210/571 दिनांक:: 28.09.17

पावर सिस्टम ऑपरेशन कार्पोरेशन लिमिटेड
राष्ट्रीय भार प्रेषण केंद्र
कार्यालय पता: बी-९,1st फ्लोर,क़ुतुब इंस्टीटुसिनल एरिया कटवारिया सराय, नई दिल्ली-११००१६
फोन नंबर: 011-26524521, 26536959 फ़ैक्स: 011-26524525, 26536901

Ref: NLDC-PSDF/TESG/2018-19/ ३५८ **Dated 21st May, 2018**

To,

As per distribution list

Subject: Proposals for installation of capacitors

Sir

The proposals for installation of capacitors submitted by the entities are under examination by the Techno Economic Sub Group (TESG) of PSDF. As on date, nineteen proposals are under examination. The list of proposals is enclosed as annexure-I. The proposals have been deliberated by TESG in its various meetings held at regular intervals and were discussed in details in its 34th meeting held on 29.09.2017. TESG had sought certain inputs and clarifications during this meeting. The extract of the MOM of this meeting were circulated vide letter dated 23.10.2017 (enclosed as annexure-II) for seeking the inputs.

The status of submission of the inputs was further reviewed by TESG during 38th meeting held on 26.2.2018. Extract of the MOM is reproduced below.

2. Proposals for installation of capacitors

The entities have been submitting the proposals for installation of capacitors in the distribution system. Nineteen such proposals were also reviewed by the sub group. During 36th meeting held on 12.01.2018, the sub group had sought following information from the entities:

a) The capacitor banks to be installed at 11/33/66 kV level.
b) For examination of these proposals following details would be required.
  i. study report based on which the requirement has been projected
  ii. location wise details of existing capacitor banks with age and healthiness report
  iii. Present voltage profile at 11 kV / 33 kV
  iv. projected voltage levels after installation of capacitors
  v. schematic for automatic power factor correction
  vi. SLDC report
  vii. STU approval
  viii. Basis of cost estimates
  ix. Grant from any other scheme of GOI (IPDS, DDUGVY)

The sub group had also observed that as per function of RPCs, as given in their Resolution (as given in 6.7) they carry out capacitor requirement studies and it was noted that the progress of installation of capacitors by various constituent States are also be discussed in the RPC meetings. The sub group may therefore, seek input from concerned RPCs about quantum of capacitors installed in each State, in the region in the last 10/15 years.

The sub group was of the view that further examination may be carried out after submission of the above details by the entity.

Accordingly, as deiced by the sub group, NLDC had sought above inputs from the entities vide letter dated 23.10.2018. However, inputs were furnished only by TSTRANSCO and TANGEDCO.

NRPC and SRPC have furnished a study report of CPRI for assessment of capacitor requirement of the entities in the respective regions. These reports deal only at transmission level (132 kV and 220 kV voltage level). The requirement at distribution level (33 kV and 11 kV level) is not available in these reports.

The sub group examined the inputs furnished by TSTRANSCO and TANGEDCO. It was observed that most of the details sought with respect to points (a) and (b) above were not provided.

The inputs submitted by MVVNL were examined by TESG on 17.4.2018 and sought certain clarifications. MVVNL, vide their letter dated 3.5.2018 have sought time for furnishing the requested inputs. It was informed during the meeting that MVVNL would be coordinating with the other DISCOMs of Uttar Pradesh. Therefore, MVVNL is requested to coordinate with the other DISCOMs for submissions of the inputs.

All the entities are requested to do the needful on priority as per the observations of the TESG.

Thanking you

Yours faithfully

(R.K.Bansal)
Convener Techno Economic Subgroup &
Consultant-NLDC

Encls.:a/a

Annexure-I

POWER SYSTEM DEVELOPMENT FUND					
					All Figures in Rs Crore
Sl. No	**Name of State/Entity**	**Name of Entity & unique ID**	**Date of Submission**	**Name of Scheme**	**Estimated cost by entity**
1	Mizoram	DoP, Mizoram	16-Mar-17	Installation of Reactive Power Solution at 132kv Substation in Mizoram. (139)	16.88
2	Punjab	PSTCL (60)	24-Jun-15	Installation of 35 nos.,66kV 10.86MVAR HT shunt capacitor at various 220kV substations(60)	8.35
3	Haryana	HVPNL(65)	21-Sep-15	To improve the voltage profile in the Grid by compensating reactive power. (065)	37.25
4	Uttar Pradesh	MVVNL (068)	17-Oct-15	Installation of 11kV Auto switched capacitor bank at various 33/11kV substation(68)	294.25
5	PDD J&K	PDD J&K(033)	18-Dec-14	Capacitors at 132/33 kV substations , existing and upcoming (033)	223.88
6	Rajasthan	RRVPNL	5-Aug-16	Installation of 33KV Shunt Capacitor banks in Rajasthan Power System. (105)	29.30
7	Uttar Pradesh	DVVNL (UP)	10-Nov-16	Provision of 11kV Auto Switched Capacitor Bank at various 33/11 kV substation. (120)	374.97
8	Maharashtra	MSETCL	14-Feb-17	Installation of Capacitor Banks at HV & EHV level at various EHV substations under Parli Circle, Aurangabad Zone & Akola Circle, Amravati zones in MSETCL. (130)	18.08
9	Telangana	TSTRANSCO	2-Jun-16	Installation & Commissioning of Capacitors Banks at EHT Substations in TSTRANSCO(092)	4.79
10	Telangana	TSTRANSCO	14-Feb-17	Installation and Commissioning of 247 Nos. shunt capacitor banks at various 33/11kV sub-stations of Southern Power Distribution Company of Telangana Ltd. (TSSPDCL) (131)	28.13
11	Nagaland	DOP, Nagaland	23-Feb-17	Installation of Automatic Reactive power Solution at 66/33kV, 66/11kV & 33/11kV Substations. (133)	27.47

12	Uttar Pradesh	PuVVNL (UP)	5-Jun-17	Provision of 11kV Auto Switched Capacitor Bank at various 33/11 kV substation of Varanasi. (160)	536.50
13	Uttar Pradesh	PVVNL (UP)	20-Jul-17	Provision of 11kV Auto Switched Capacitor Bank at various 33/11 kV substation of Merat. (168)	179.40
14	Uttar Pradesh	DVVNL (UP)	21-Jul-17	Provision of 11kV Auto Switched Capacitor Bank at various 33/11 kV substation . (169)	161.20
15	Uttar Pradesh	PuVVNL (UP)	21-Jul-17	Provision of 11KV Auto Switched capacitor bank at various 33/11 KV Substation.(170)	237.90
16	Uttar Pradesh	MVVNL (UP)	26-Jul-17	Provision of 11kV Auto Switched capacitor bank at various 33/11kV substation. (171)	158.17
17	Maharashtra	MSETCL	9-Aug-17	Installation of Capacitor Banks at HV level at various EHV substations under Aurangabad, Amravati, Karad, Nasik, Nagpurand Pune zone in MSETCL. (175)	79.32
18	Tamilnadu	TANTRANSCO	11-Sep-17	Installation of 13 sets of 110kV, 24MVAR Shunt Capacitor Banks at various Sub-station in TNEB. (181)	17.59
19	Tamilnadu	TANTRANSCO	11-Oct-17	Installation of 33 sets of 11kV, 2.4 MVAR Capacitor Banks (79.2MVAR) and 49 sets of 22kV, 2.4 MVAR Capacitor Banks (117.6MVAR) in various substations in Colmbatore region in Tamilnadu. (184)	18.74

Distribution list:

Head of Organization	Nodal Office
Engineer In-charge Power and Electricity Department Mizoram Power House Complex, Electric Veng. Aizawl-796001	Chief Engineer (RE) Power and Electricity Department Mizoram "Kawlphetha" E-in-C office, Power & Electricity Department, New Capital Complex, Aizawl-796001
Chairman Cum Managing Director Punjab State Transmission Corporation Ltd. The Mall Patiala- 147001	Dy, Chief Engineer/ TS Design Punjab State Transmission Corporation Ltd. 3rd Floor, Opp. Kali Mata Mandir, Shakti Sadan, Patiala- 147001
Managing Director Haryana Vidyut Prasaran Nigam Shakti Bhawan, Sector-6, Panchkula- 134109	Chief Engineer Haryana Vidyut Prasaran Nigam Shakti Bhawan, Sector-6, Panchkula- 134109
Managing Director Madhyanchal Vidyut Vitran Nigam ltd. 4-A, Gokhale Marg, Lucknow- 226001 (UP)	
Development Commissioner Power System & Operation Wing JKPDD Summer (May – October) Lottery Building, Behind Civil Secretariat, Srinagar Winter (November-April) Gris Station Complex, Janipur Jammu Pin- 190010/180007	Chief Engineer /Chief Engineer PDD Complex Bemina / Narwal Bala Jammu Srinagar/ jammu 190010/180004
Chairman Cum Managing Director Rajasthan Rajya Vidyut Prasaran Nigam Ltd. Vidyut Bhawan, Janpath, Jyoti Nagar, Jaipur-302005	Chief engineer (PP&D) Rajasthan Rajya Vidyut Prasaran Nigam Ltd. Vidyut Bhawan, Janpath, Jyoti Nagar, Jaipur-302005
Managing Director Dakshinanchal Vidyut Vitran Nigam Ltd.- Agra Urja Bhawan, 220KV Substation, Bye Pass Raod, Sikandra Bad- 282007, Agra	SE (MM) Dakshinanchal Vidyut Vitran Nigam Ltd.- Agra Urja Bhawan, 220KV Substation, Bye Pass Raod, Sikandra Bad- 282007, Agra
Chairman Cum Managing Director Maharashtra State Electricity Transmission Co. Ltd. 8th Floor, 'Prakashganga', Plot no: C-19, E-Block Bandra-Kurla Complex, Bandra (E), Mumbai- 400051	Chief engineer Maharashtra State Electricity Transmission Co. Thane Belapur Road, Airoli, Navi Mumbai-400708
Chairman Cum Managing Director Transmission Corporation of Telangana Ltd. Vidyut Soudha, Khairtabad- 500082 Hydrabad	Chief Engineer, Transmission Transmission Corporation of Telangana Ltd. Room No: 119'A' Block, Vidyut Soudha, Khairtabad- 500082 Hydrabad
Chairman and Managing Director Southern Power Distribution Company of Telangana Ltd. 6-1-50, Corporate Office, Mint Compound, Hydrabad- 500063	Chief General Manager (Projects) Southern Power Distribution Company of Telangana Ltd. 4th Floor, Corporate Office, Mint Compound, Hydrabad- 500063

Chief Engineer (Transmission & Generation) Power & Electricity Department, Govt. of Nagaland. Electricity House, Lower A.G. Kohima – 797001	Superintending Engineer Power & Electricity Department, Govt. of Nagaland. Electricity House, Lower A.G. Kohima – 797001
Managing Director Purvanchal Vidyut Vitran Nigam Ltd-Varanasi Vidyut Nagar,PO DLW,Varanasi 2210004 Phone- 9415222222	Superintending Engineer Purvanchal Vidyut Vitran Nigam Ltd-Varanasi Vidyut Nagar,PO DLW,Varanasi 2210004
Managing Director Paschimanchal Vidyut Vitran Nigam Ltd.-Meerut Victoria Park,Meerut-250002	Chief Manager Paschimanchal Vidyut Vitran Nigam Ltd.-Meerut Urja Bhawan,Victoria Park,Meerut-250002
Managing Director Dakshinanchal Vidyut Vitran Nigam Ltd. Agra Urja Bhawan, 220kV substation, Bye Pass Road, Sikandara, Agra- 282007	SE(MM) DVVNL Agra Dakshinanchal Vidyut Vitran Nigam Ltd. Agra Urja Bhawan, 220kV substation, Bye Pass Road, Sikandara, Agra- 282007
Managing Director Purvanchal Vidyut Vitran Nigam Ltd. Varansi Vidyut Nagar, PO DLW, Varansi- 2210004	Superintending Engineer Purvanchal Vidyut Vitran Nigam Ltd. Varansi Vidyut Nagar, PO DLW, Varansi- 2210004
Managing Director Madhyaanchal Vidyut Vitran Nigam Ltd. Lucknow 4-A, Gokhale Marg, Lucknow-226001	Superintending Engineer Madhyaanchal Vidyut Vitran Nigam Ltd. Lucknow, 4-A, Gokhale Marg, Lucknow-226001
Chairman Cum Managing Director Maharashtra State Electricity Transmission Co. Ltd. 8th Floor, 'Prakashganga', Plot no: C-19, E-Block Bandra-Kurla Complex, Bandra I,	Chief Engineer, TR. (O&M) Maharashtra State Electricity Transmission Co. Ltd. 4th Floor, 'Prakashganga', Plot no: C-19, E-Block Bandra-Kurla Complex, Bandra I, Mumbai- 400051
Principal Secretary / Chairman Tamilnadu Transmission Corporation Ltd. 10th Floor,NPKRR Maaligai, 144 Anna Salai, Chennai-600002	Chief Engineer/Transmission Tamilnadu Transmission Corporation Ltd. 6th Floor, NPKRR Maaligai, 144 Anna Salai, Chennai-600002

Copy to:

1. Chief Engineer (NPC), CEA
2. GM-NLDC, POSOCO

Annexure-V

POWER SYSTEM DEVELOPMENT FUND(PSDF)

Schemes for Installation of capacitors

Sl. No	Name of State/Entity	Name of Entity & unique ID	Date of Submission	Name of Scheme	Estimated cost by entity (Rs. Crore)
I	II	III	IV	V	VI
1	Punjab	PSTCL (60)	24-Jun-15	Installation of 35 nos.,66kV 10.86MVAR HT shunt capacitor at various 220kV substations(60)	8.35
2	Maharashtra	MSETCL	14-Feb-17	Installation of Capacitor Banks at HV & EHV level at various EHV subatations under Parli Circle, Aurangabad Zone & Akola Circle, Amravati zones in MSETCL. (130)	18.08
3	Maharashtra	MSETCL	9-Aug-17	Installation of Capacitor Banks at HV level at various EHV subatations under Aurangabad, Amravati, Karad, Nasik, Nagpurand Pune zone in MSETCL. (175)	79.32
4	Maharashtra	MSPDCL	23-Apr-18	Reactive Power Management by Installing Capacitor Bank at 33/22/11 KV Substation. (217)	381.57
5	Telangana	TSTRANSCO	2-Jun-16	Installation & Commissioning of Capacitors Banks at EHT Substations in TSTRANSCO(092)	4.79
6	Telangana	TSSPDCL	14-Feb-17	Installation and Commissioning of 247 Nos. shunt capacitor banks at various 33/11kV sub-stations of Southern Power Distribution Company of Telangana Ltd. (TSSPDCL) (131)	28.13
7	Uttar Pradesh	MVVNL (068)	17-Oct-15	Installation of 11kV Auto switched capacitor bank at various 33/11kV substation(68)	294.25
8	Uttar Pradesh	MVVNL (UP)	26-Jul-17	Provision of 11kV Auto Switched capacitor bank at various 33/11kV substation. (171)	158.17

POWER SYSTEM DEVELOPMENT FUND(PSDF)					
Schemes for Installation of capacitors					
Sl. No	**Name of State/Entity**	**Name of Entity & unique ID**	**Date of Submission**	**Name of Scheme**	**Estimated cost by entity (Rs. Crore)**
9	Tamilnadu	TAN TRANSCO	11-Sep-17	Installation of 13 sets of 110kV, 24MVAR Shunt Capacitor Banks at various Sub-station in TNEB. (181)	17.59
10	Tamilnadu	TAN TRANSCO	11-Oct-17	Installation of 33 sets of 11kV, 2.4 MVAR Capacitor Banks (79.2MVAR) and 49 sets of 22kV, 2.4 MVAR Capacitor Banks (117.6MVAR) in various substations in Colmbatore region in Tamilnadu. (184)	18.74
11	PDD J&K	PDD J&K(033)	18-Dec-14	Capacitors at 132/33 kV substations , existing and upcoming (033)	223.88
12	Haryana	HVPNL(65)	21-Sep-15	To improve the voltage profile in the Grid by compensating reactive power. (065)	37.25
13	Rajasthan	RRVPNL	5-Aug-16	Installation of 33KV Shunt Capacitor banks in Rajasthan Power System. (105)	29.30
14	Mizoram	Dop, Mizoram	16-Mar-17	Installation of Reactive Power Solution at 132kv Substation in Mizoram. (139)	16.88
15	Nagaland	DOP, Nagaland	23-Feb-17	Insatallation of Automatic Reactive power Solution at 66/33kV, 66/11kV & 33/11kV Substations. (133)	27.47
16	Uttar Pradesh	DVVNL (UP)	10-Nov-16	Provision of 11kV Auto Switched Capacitor Bank at various 33/11 kV substation. (120)	374.97
17	Uttar Pradesh	PuVVNL (UP)	5-Jun-17	Provision of 11kV Auto Switched Capacitor Bank at various 33/11 kV substation of Varanasi. (160)	536.50
18	Uttar Pradesh	PVVNL (UP)	20-Jul-17	Provision of 11kV Auto Switched Capacitor Bank at various 33/11 kV substation of Meerat. (168)	179.40
19	Uttar Pradesh	DVVNL (UP)	21-Jul-17	Provision of 11kV Auto Switched Capacitor Bank at various 33/11 kV substation . (169)	161.20
20	Uttar Pradesh	PuVVNL (UP)	21-Jul-17	Provision of 11KV Auto Switched capacitor bank at various 33/11 KV Substation.(170)	237.90
21	Manipur	MSPCL	12-Jan-18	Installation of Reactive Power Solution on 33/11kV Substation in Manipur. (204)	56.81

POWER SYSTEM DEVELOPMENT FUND(PSDF)					
Schemes for Installation of capacitors					
Sl. No	**Name of State/Entity**	**Name of Entity & unique ID**	**Date of Submission**	**Name of Scheme**	**Estimated cost by entity (Rs. Crore)**
22	Tamilnadu	TAN TRANSCO	10-May-18	Design, Detailed Engineering , Supply,Erection, Testing and Commissioning of 59 sets of 22kV, 2.4 MVAR Capacitor Banks and 42 sets of 11kV, 2.4 MVAR Capacitor Banks in various substations in Erode region in Tamilnadu. (221)	24.06
23	Tamilnadu	TAN TRANSCO	29-Jun-18	Design, Detailed Engineering , Supply,Erection, Testing and Commissioning of 1 set 24MVAR, 110kV Capacitor Banks and 15 sets of 22kV, 2.4 MVAR Capacitor Banks (36MVAR) in various substations inTrichy, Villupuram, Madurai, Tirunelveli and Chennai (South) in Tamilnadu. (236)	18.84
24	Tamilnadu	TAN TRANSCO	29-Jun-18	Design, Detailed Engineering , Supply,Erection, Testing and Commissioning of 2 set 24MVAR, 110kV Capacitor Banks and 31 sets of 22kV, 2.4 MVAR & 1.2 MVAR Capacitor Banks (74.4 MVAR) in various substations inVellore region in Tamilnadu. (237)	10.18
				Total	**2833.74**

Annexure -VI

फ़ैक्स/स्पीड पोस्ट /FAX/SPEEDPOST

भारत सरकार केंद्रीय विद्युत प्राधिकरण दक्षिण क्षेत्रीय विद्युत समिति बेंगलूरु - 560 009		Government of India Central Electricity Authority **Southern Regional Power Committee** Bengaluru - 560 009	
Web site: www.srpc.kar.nic.in	e-mail: mssrpc-ka@nic.in	Ph: 080-22287205	Fax: 080-22259343
सं/No. SRPC/SE-II/2018/ 3289-90		दिनांक / Date	29.05.2018

Member Secretary, Appraisal Committee
NLDC
NEW DELHI

Sub: PSDF – Observations of the Techno Economic Group with regard to the proposals of installation of Capacitors – reg

Sir,

Convener, TESG & Consultant, NLDC vide letter dated 21.5.2018 had furnished extracts of the 38th meeting of TESG held on 26.02.2018 and requested for needful on priority, with regard to the observations.

It had been stated that NRPC and SRPC have furnished a Study Report of CPRI for assessment of capacitor requirement of the entities in the respective regions. These reports deal only at transmission level (132 kV and 220 kV voltage level). The requirement at distribution level (33 kV and 11 kV level) is not available in these Reports.

The following may kindly be noted in this regard:-

- MS, Appraisal Committee and ED, NLDC vide letter dated 22.06.2016 had stated as follows : *'In view of the above, as decided by the Appraisal Committee, it is requested that assessment of **capacitor requirement may be carried out at regional level** by engaging expert agency like CPRI. .....'*
- It can be clearly seen that Appraisal Committee had suggested assessment of capacitor requirement assessment **at regional level and not at distribution / sub-transmission level**. It is felt that TE Sub-group seeking

Consultant, PSDF
4/6

requirement at 33 kV and 11 kV cannot be at variance with what was agreed by the higher level Appraisal Committee.

- The assessment of capacitor requirements to be carried out at regional level by engaging CPRI was recommended in the Special TCC Meeting held on 02.08.2016 and in 29th TCC Meeting held on 26.08.2016. This was approved in the 31st SRPC Meeting held on 27.08.2016. In the said Meetings and subsequent Meetings, there was representation from NLDC but it was never pointed out that capacitor assessment was to be carried out at distribution / sub-transmission level. TCC / SRPC had followed the Procedure outlined by the Appraisal Committee and as communicated by NLDC.
- Para 14.2 of Transmission Planning Criteria of CEA states as follows:

  'Shunt Capacitors

  14.2.1 Reactive Compensation shall be provided as far as possible in the low voltage systems with a view to meet the reactive power requirements of load close to the load points, thereby avoiding the need for VAr transfer from high voltage system to the low voltage system. In the cases where ***network below 132 kV/220 kV voltage level is not represented*** *in the system planning studies,* ***the shunt capacitors required for meeting the reactive power requirements of loads shall be provided at the 132 kV/220 kV buses for simulation purpose.'***

  It can thus be kindly seen from CEA's Transmission Planning Criteria that since basic network below 220 kV / 132 kV is still not reliable, the shunt capacitor required for meeting the reactive power requirements of load shall be arrived at 132 kV / 220 kV.

- Non-availability of reliable/verified network below 220 kV /132 kV is well known, as can be kindly seen from the following Regulations/ approved procedures of Hon'ble CERC:

  Para 3.4 of Detailed Procedure for relieving Congestion in real time Operation states as follows:

  '3.4 Power System model to be considered for simulation studies

3.4.1 EHV transmission network shall ***be normally modeled down to 220 kV level*** *with exceptions for generating units connected at 132 kV and for North Eastern Region, it shall be modeled down to 132 kV.*

.....

3.4.3 ***Load shall be generally lumped at 220 kV*** *or 132 kV, as the case may be Actual system data wherever available shall be used for power system modeling. In cases where* ***data is not available, standard data*** *as given in the CEA Manual on Transmission Planning Criteria shall be considered.'*

Similarly, CERC (Sharing of inter-State transmission charges and losses) Regulation, 2010, para 7(1)(b) states, *'The Basic Network* ***shall not contain any electricity system, electrical plant or line below 132 kV*** *except where generators are connected to the grid at 110 kV. Power flow into a lower voltage system from the voltage levels indicated in the definition of the Basic Network shall be considered as load at that sub-station. Power flow from a lower voltage system into the electricity systems at the voltage levels shall be considered as generation at that sub-station.'*

- As can be kindly inferred from the above, reactive study report at **regional level** can be carried out at 220 kV /132 kV. Developing network at 11/22/33 kV level has its own set of difficulties such as huge quantum of nodes, T connections; imbalance loads etc. Thus, seeking the capacitor requirement at 33 kV /11 kV by TESG is not understood please.
- A Meeting to finalize the study procedure was conducted on 29.11.2016 at SRPC, Bengaluru with participation from CPRI & SRLDC also. It was clearly noted in this Meeting that there was limited SCADA availability at DISCOM level and lower voltage level of STU network. Data would be required to be collected from the log books which would require detailed validation. CPRI had informed that NRPC study was being undertaken at 132 kV level and availability of validated data was a major drawback in preparing the base case. In view of the limitations in data availability and also the

observations of CPRI, it had been agreed that the studies would be carried out at 132 kV level.

- POSOCO was aware of the voltage levels at which the studies were being carried out. Seeking capacitor assessment report at 33 kV / 11 kV at this juncture may not be in line with the decision taken by the Appraisal Committee.
- As per the inputs from STU/DISCOMs, capacitor assessment at 33 kV and 11 kV can be worked out through heuristic approaches from the 132 kV level. Many a times, standard thumb rules are being utilized for capacitor installation in the distribution S/S.
- Further, TESG has sought the quantum of capacitor installed in each state, in the region, in the last 10/15 years. It is felt that what is important is the healthy capacitors on bar at the time of the study.

MS Appraisal Committee and ED, NLDC vide letter dated 4th January 2018 had stated that the proposal would be considered for PSDF funding based on the report of CPRI by SRPC and details sought by the sub-group.

It is therefore requested that you may kindly look into these issues raised and proposals of SR constituents be kindly considered favorably in line with the decision of the Appraisal Committee and the provisions cited in CEA/CERC standards/regulations.

धन्यवाद /Thanking you,

भवदीय / Yours faithfully

(एस.आर. भट्ट/**S.R. BHAT**)
सदस्य सचिव / Member Secretary

Copy for kind information to: Chief Engineer, NPC, CEA, New Delhi

Telangana. 92 Revise

TRANSMISSION CORPORATION OF TELANGANA LIMITED
VIDYUT SOUDHA :: HYDERABAD – 500 082. Off: PABX:040-23396000
Website:Transco.telangana.gov.in CIN No:U40102TG2014SGC094248

From
Chief Engineer/Transmission
TSTRANSCO, Vidyut Soudha,
Hyderabad

To
The Executive Director, NLDC
B-9, Qutub Institutional Area
Katwaria Sarai,
New Delhi – 110 016.

Lr.No.CE(Tr)/SE(Tr)/DE(SS)/ADE-3/F. PSDF-CB-16/D.No.85 /18 Dt:14 .02.2018.

Sir,

Sub:- TSTRANSCO- Sanction of Power system Development Fund (PSDF) as grant for the scheme viz., "Detailed Project Report for 16 Nos Capacitor Banks – Sanction-Requested - Regarding.

Ref:- 1) SRPC/SE-II/2017/7444 Dt: 28.12.2017
2) NLDC-PSDF/GENERAL/016-17/1019 Dt:04.01.2018
3) SRPC/SE-II/2018/431-34 Dt:16.01.2018

***

SRPC vide 1st cited letter have informed that the proposals of capacitors installation of Andhra Pradesh, Telengana, Kerala and Tamilnadu can be considered based on the CPRI report.

Further, vide reference 3rd cited, it was informed that "The *proposals would be considered for PSDF funding based on the report of CPRI furnished by SRPC and details sought by the Sub Group"*

Accordingly, the detailed project report (DPR) for 16 Nos capacitor banks for an amount of Rs.4.24 Crores is herewith submitted for sanction of PSDF grant, duly appending SRPC recommendations.

Encl: 1)Detailed Project Report.(16 Nos Capacitor Banks)

Yours faithfully

12/2/18
Chief Engineer/Transmission(FAC)

Copy to:
The CEO/POSOCO / B-9, Qutub Institutional Area,
Katwaria Sarai New Delhi – 110 016.
The Member Secretary /SRPC/29, Race Course Road, Bangalore- 560009

Energy saved is energy produced // Electricity save is electricity produced

20/2/18

Consultant, PSDF, Sh. R.K.B
21/2

FORMAT OF INFORMATION REQUIRED FOR CAPACITOR PROPOSAL **Annexure-VII**

S. No	Name of 33/11 kV SS	Transformer Rating (MVA)	Rating of existing capacitor banks (MVAR)	Healthiness of existing capacitor banks	Capacitor bank under construction (MVAR)	Scheme under which the Capacitors at (6) are sanctioned	Variation in the HV side Voltage (Range of variation in kV)	Variation in the LV side Voltage (Range of variation in kV)	Proposed capacitor rating (MVAR)	Expected LV Voltage after and before placement of proposed capacitor in kV	Name of 132/66/ 33 kV SS
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)

Annexure B.3.1

Reactors approved in the 39th Standing Committee held on 29th&30th May 2017

Sl.No.	Bus Name	State	Reactors Proposed(MVAr)	Implementing agency
220Kv				
1	Jind(PG)	Haryana	25	TBCB
2	Fatehabad(PG)	Haryana	25	TBCB
3	Kishenpur(PG)	J&K	25	TBCB
4	Jalandhar(PG)	Punjab	2X25	TBCB
5	Nakodar	Punjab	25	PSTCL
6	Amritsar(PG)	Punjab	25	TBCB
7	Dhuri	Punjab	25	PSTCL
8	Akal	Rajasthan	25	RVPNL
9	Suratgarh	Rajasthan	2X25	RVPNL
10	Bikaner	Rajasthan	2X25	RVPNL
11	Barmer	Rajasthan	25	RVPNL
12	Narela	Delhi	25	DTL
13	R.K.Puram-I	Delhi	25	DTL
14	Patparganj 2	Delhi	2X25	DTL
15	Maharanibagh	Delhi	2X25	DTL
16	Bamnoli	Delhi	25	DTL
17	SabjiMandi	Delhi	2X25	DTL
18	Gopalpur	Delhi	2X25	DTL
19	Indraprastha	Delhi	2X25	DTL
20	Geeta Colony	Delhi	2X25	DTL
21	Harsh Vihar	Delhi	2X25	DTL
22	Wazirabad	Delhi	2X25	DTL
23	Electric Lane	Delhi	2X25	DTL
24	Mandola	Delhi	25	DTL
25	AIIMS	Delhi	2X25	DTL
26	SaritaVihar	Delhi	25	DTL
27	Bawana	Delhi	25	DTL
28	PreetVihar	Delhi	25	DTL
29	Mundka	Delhi	25	DTL
30	Masjid Moth	Delhi	25	DTL

400kV				
1	Maharanibagh(PG)	Delhi	125	TBCB
2	Mundka	Delhi	125	DTL
3	Mandola(PG)	Delhi	125	TBCB
4	Hissar(PG)	Haryana	125	TBCB
5	Kala Amb(TBCB)	Himachal	125	TBCB
6	Chamera Pooling Stn.(PG)	Himachal	125	TBCB
7	Kishenpur(PG)	J&K	125	TBCB

8	Jullandhar(PG)	Punjab	125	TBCB
9	Moga(PG)	Punjab	125	TBCB
10	Dhuri	Punjab	125	PSTCL
11	Patiala(PG)	Punjab	125	TBCB
12	Jodhpur	Rajasthan	125	RRVPNL
13	Sikar(PG)	Rajasthan	125	TBCB
14	Allahabad(PG)	U.P	125	TBCB
15	Meerut(PG)	U.P	125	TBCB
16	Kashipur	Uttarakhand	125	PTCUL
17	Srinagar	Uttarakhand	80	PTCUL

File No. 293/8/2017-Wind
Government of India/ भारत सरकार
Ministry of New and Renewable Energy/ नवीन और नवीकरणीय ऊर्जा मंत्रालय
(Wind Power Division)
****

Block No.14, CGO Complex,
Lodhi Road, New Delhi – 110 003
Dated: 01.03.2018

OFFICE MEMORANDUM

Subject: Compliance of WTG models to applicable CEA Technical standards for Connectivity to the Grid (as amended from time to time) as stipulated in the MNRE Guidelines/ procedure for Revised List of Models and Manufacturers (RLMM)- Reg.

The issues and difficulties faced by WTG manufacturers to obtain Statement of Compliance (SoC)/ Conformity Statement (CS) for demonstrating the compliance of applicable CEA Technical standards for Connectivity to the Grid (as amended from time to time) for their WTG models within the stipulated time were examined by this Ministry and the following course of action would be adopted for WTG models which were unable to get LVRT compliance certificate from accredited testing agencies:

1. Self-Certification for compliance of CEA technical Standard will be accepted for the inclusion of WTG manufacturers/ models in the RLMM list until 31.03.2019 for all the wind turbine models irrespective of the capacity subject to the following conditions:

a. Concerned WTG manufacturers may apply for LVRT testing to any internationally accredited testing body or National Institute of Wind Energy (NIWE) by 15th March 2018, which should include the following:
   i. An affidavit that the manufacturer would comply with CEA Technical standards for Connectivity to the Grid by 31.03.2019
   ii. A bank guarantee of Rs. 1 Crore per model, which would be returned on producing the Compliance Certificate for LVRT and other technical standards as stipulated by CEA.

   A copy of the above mentioned application may also be sent to MNRE.

b. WTG models for which the manufacturers had provided the self-certification must obtain a certificate from NIWE, Chennai for demonstrating the compliance of applicable CEA Technical standards for Connectivity to the Grid (as amended from time to time); NIWE will carry out the lab simulation for each of the WTG model testing their capabilities of complying to applicable standards and issue a certificate to that effect.
c. During the self-certification period, RLMM list will have two tables; one for wind turbines having valid SoC/CS as per CEA technical standards as stipulated in MNRE guidelines and another table for the wind turbines for which self-

certification along with NIWE's simulation results confirming compliance of CEA technical standards.

d. Based on report of MNRE/ NIWE/ any authorised agency of MNRE for monitoring of compliance to LVRT and related standards, if it is noted that the OEM has submitted the wrong declaration of self-certification then,
   i. The wind turbines connected to wind farm will be disconnected
   ii. The OEM will be barred from installing turbines in India for the period of five years
   iii. Penalty to an extent of Rs. 2 Crores will be imposed.

2. The Stall regulated wind turbines and the wind turbines with capacity of less than 500 kW which are connected at voltage level at 22 kV/ 11 kV and below, in the distribution generation (part of mixed feeder) are exempted from submitting SoC/ CS for demonstrating their compliance to CEA Technical standards for Connectivity to the Grid (as amended from time to time) as stipulated in the MNRE guidelines/ procedure including LVRT requirements.

3. This issues with the approval of Competent Authority.

1/3/2018

(B.K. Panda)
Director (Wind)

To,

All the Concerned

Copy for information to:

1. PS to Hon'ble Minister
2. Sr.PPS to Secretary
3. PPS to Additional Secretary
4. JS &FA/ JS (BPY)
5. DG, NIWE
6. Director (GU)/ Director (BKP)/ Director (NIC) to upload in MNRE website
7. Scientist 'C'(AHB)/ Scientist 'C'(PKD)

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

No. NRPC/OPR/106/04/2018/ 1742-744 **Dated:** 05.10.2018
08

To,

Member Secretary,
Appraisal Committee,
Power System Development Fund (PSDF),
NLDC, POSOCO,
B-9, Qutub Institutional Area, Katwaria Sarai,
New Delhi-110 016

Subject: - PSDF funding for the scheme of "Provision of STATCOM at Nalagarh & Lucknow in Northern Region".

Sir,

In the 32nd meeting of Standing Committee on Power System Planning of Northern Region held on 31.08.2013, the earlier approved ± 400 MVAr SVC at Nalagarh and Lucknow substations of POWERGRID was changed as ± 300 MVAr STATCOM at each of the location and the same was also approved in the 29th meeting of NRPC held on 13.09.2013.

As informed by POWERGRID, at the time of the above said approval for STATCOM, there was no provision of PSDF funding and thus it was to be funded through internal resources of POWERGRID. Here it would not be out of place to mention that PSDF got operational with effect from 09.06.2014, the date of notification of Central Electricity regulatory Commission (Power System Development Fund) Regulations, 2014.

Subsequently, for the benefit of the constituent states, POWERGRID approached for PSDF funding of the said scheme. The proposal was put up to Appraisal Committee for its recommendation. The Appraisal Committee in its 12th meeting held on 16.06.2016 advised POWERGRID to get the approval of NRPC. The same was approved in 39th Meeting of NRPC held on 02.05.2017. Meanwhile, POWERGRID placed the LoA for the scheme on 02.09.2016.

18-ए, शहीद जीत सिंह मार्ग, कटवारिया सराय, नई दिल्ली- 110016 फोन:011-26513265 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: 011-26513265 Fax: 011-26865206 e- mail: ms-nrpc@nic.in Website: www.nrpc.gov.in

When the proposal was placed to the Appraisal Committee in its 18th meeting held on 05.02.2018, the Appraisal Committee rejected PSDF funding for the above scheme on the grounds that LoA for the same has already been placed.

Subsequent to that, POWERGRID brought an agenda item in the 39th TCC/42nd NRPC meeting and informed the committee members that as the Appraisal Committee has disapproved the PSDF funding of the scheme, the funding for the said scheme shall now be done by POWERGRID through its internal resources.

After detailed deliberations in the 39th TCC meeting held on 27.06.2018, the members were not in agreement with POWERGRID proposal regarding funding of the scheme through its internal resources.

NRPC in its 42nd meeting held on 28.06.2018, agreed with the recommendations of TCC & decided to request Appraisal Committee to allow funding for the scheme of STATCOM at Nalagarh & Lucknow as a special case.

Therefore, Appraisal Committee is requested to kindly consider the scheme of "Provision of STATCOM at Nalagarh & Lucknow in Northern Region" as a special case for PSDF funding post placement of LoA.

Sincerely,

(M A K P Singh)
Member Secretary, NRPC

Copy for information to:

1. Chief Engineer, NPC, CEA, NRPC Building, New Delhi

Copy to:

1. COO, CTU, POWERGRID, Saudamini, Plot No. 2, Gurugram – 122 001:- **with a request to take up the matter further with Appraisal Committee**

भाखड़ा ब्यास प्रबन्ध बोर्ड

पी एवं सी निदेशालय

एस.एल.डी.सी. कॉम्पलैक्स, 66 के.वी. उप केन्द्र इंडस्ट्रीयल एरिया फेस-I, चण्डीगढ
दूरभाष-0172-2652054, फैक्स-0172-2652054

प्रेषक,

निदेशक/ पी एंड सी,
बीबीएमबी, चंडीगढ़ ।

प्रेषिती,

अधीक्षण अभियंता / आपरेशन
एन आर पी सी, दिल्ली ।

क्रमांक: 1260-68 /डीपीसी/M-1ए दिनांक: 25-06-18

विषय: **Work plan proposed on behalf of BBMB for correction of phase nomenclature mismatch between BBMB and other Interconnected substation of PGCIL, PSTCL, HPSEB, and NTPC.**

उपरोक्त विषय से संबन्धित बीबीएमबी एवं पीजीसीआईएल, पीएसटीसीएल, एचपीएसईबी तथा एनटीपीसी के interconnected सबस्टेशनों के बीच Phase Nomenclature Mismatch को ठीक करने हेतु वर्क प्लान आगामी कार्यवाही हेतु संलग्न है जी ।

संलग्न: उप्रोक्तानुसार

आर के चन्दन
(ई॰ आर के चंदन)
निदेशक/ पी एंड सी,
बीबीएमबी, चंडीगढ़ ।

प्रतिलिपि:-

1. ओएसडी to अध्यक्ष/बीबीएमबी, माननीय अध्यक्ष/बीबीएमबी को सूचना हेतु ।
2. संयुक्त सचिव to सदस्य(विद्युत), माननीय सदस्य(विद्युत) को सूचना हेतु ।
3. विशेष सचिव, बीबीएमबी, चंडीगढ़ ।
4. मुख्य अभियन्ता / पारेषण प्रणाली, बीबीएमबी, चंडीगढ़ ।
5. मुख्य अभियन्ता/उत्पादन, बीबीएमबी, नंगल ।
6. निदेशक/विद्युत विनियम, बीबीएमबी, चंडीगढ़ ।
7. उप मुख्य अभियंता/ओ एण्ड एम, बीबीएमबी, पानीपत / भिवानी ।
8. अधीक्षण अभियंता/देहर पावर हाउस, बीबीएमबी, सलापड़ ।
9. अधीक्षण अभियन्ता/कनाल पावर हाऊस, नंगल ।

भाखड़ा ब्यास प्रबन्ध बोर्ड

पी एवं सी निदेशालय

एस.एल.डी.सी. कॉम्पलैक्स, 66 के.वी. उप केन्द्र, इंडस्ट्रीयल एरिया फेस-I, चण्डीगढ
दूरभाष-0172-2652054, फैक्स-0172-2652054

भारत्वा ब्यास
राष्ट्र गौरव

To

Superintending Engineer / Operation,
NRPC, Delhi.

Memo No. 1260-68/M-1A Dated: 25.06.2018

Sub: Work plan proposed on behalf of BBMB for correction of phase nomenclature mismatch between BBMB and other interconnected substation of PGCIL, PSTCL, HPSEB, and NTPC.

On the subject matter, BBMB has already submitted its proposal dated 04.06.2018 for correction of phase nomenclature mismatch in the 1st meeting of Committee held on 04.06.2018, under the Chairmanship of Member Secretary, NRPC and discussed the proposal in detail. BBMB was asked to submit the work plan in this regard within 15 days.

The work will be started from Dehar Power House and entire work shall be completed in Five phases. The work of Dehar Power House shall be completed in three phases. The work of Panipat substation shall be done in one phase. Similarly, work at Bhiwani substation shall also be completed in another one phase. Sites where work is involved shall be inspected by the officer in charge of each utility and manpower & material shall be arranged prior to starting of work so that 1st to 5th phase work may be completed in five days. The entire work plan is discussed as Annexure-1 (DPH), Annexure-2 (Panipat) and Annexure-3 (Bhiwani). Single Line Diagram of Dehar Power House, Panipat and Bhiwani substation are enclosed.

Further, it is specifically informed that any information on the subject cited matter shall be put up to the Power Sub Committee of BBMB after final approval of a proposed work plan by Committee formed for correction of Phase nomenclature mismatch of BBMB and interconnected Stations.

DA/ As above

आर.के.चन्दन
(Er. R.K. Chandan)
Director / P&C,
BBMB, Chandigarh
(Member of Committee)

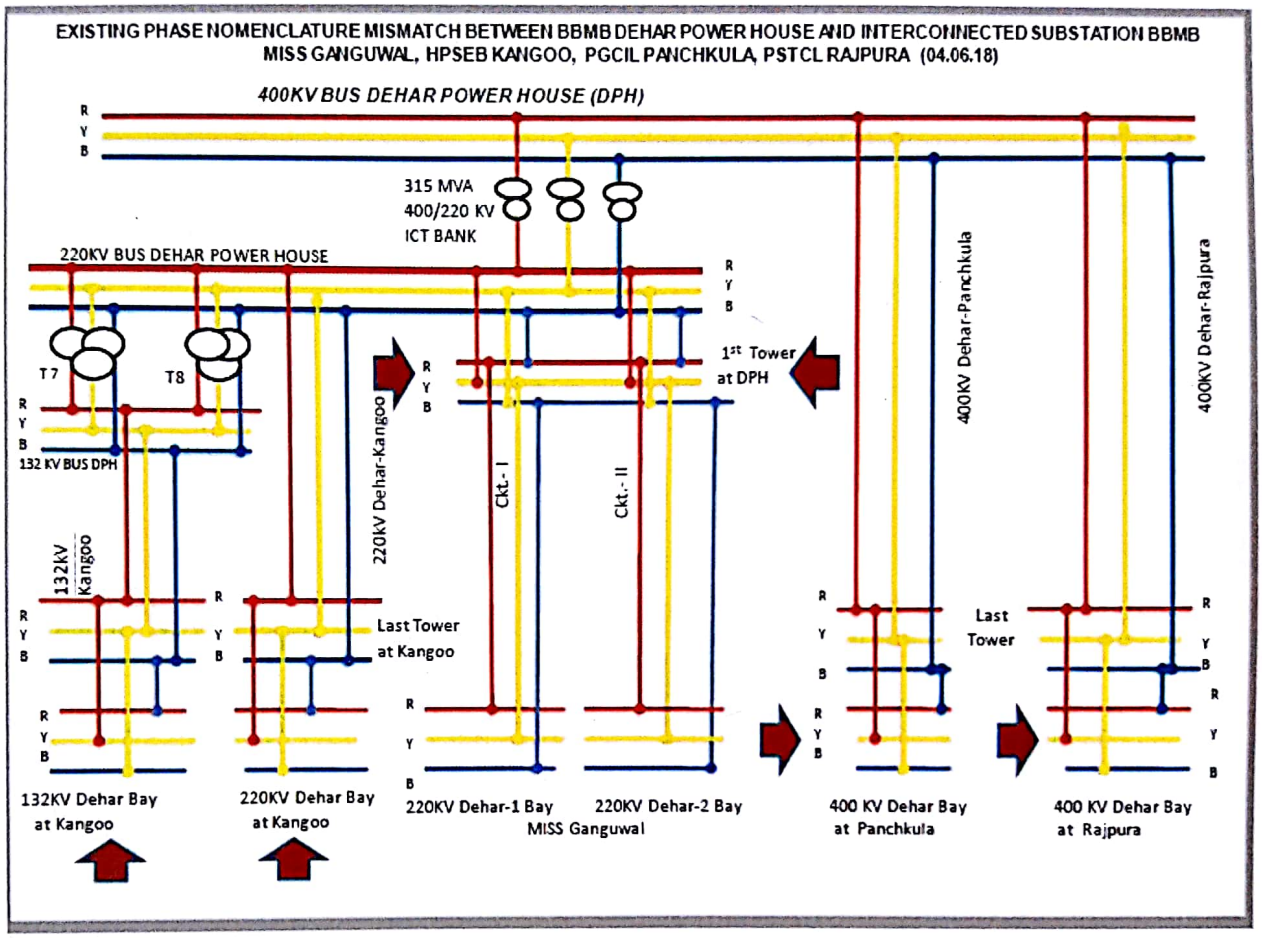
CC:-

1. OSD to Chairman for information of Worthy Chairman BBMB.
2. JS to Member (P) for information of Worthy Member (P) BBMB.
3. Special Secretary BBMB, Chandigarh.
4. Chief Engineer / TS, BBMB, Chandigarh.
5. Chief Engineer / Generation, BBMB, Nangal.
6. Director / Power Regulation, BBMB, Chandigarh.
7. Dy. CE / O&M, BBMB, Panipat / Bhiwani.
8. SE / DPH, BBMB, Slapper.
9. SE/CPH, BBMB, Nangal

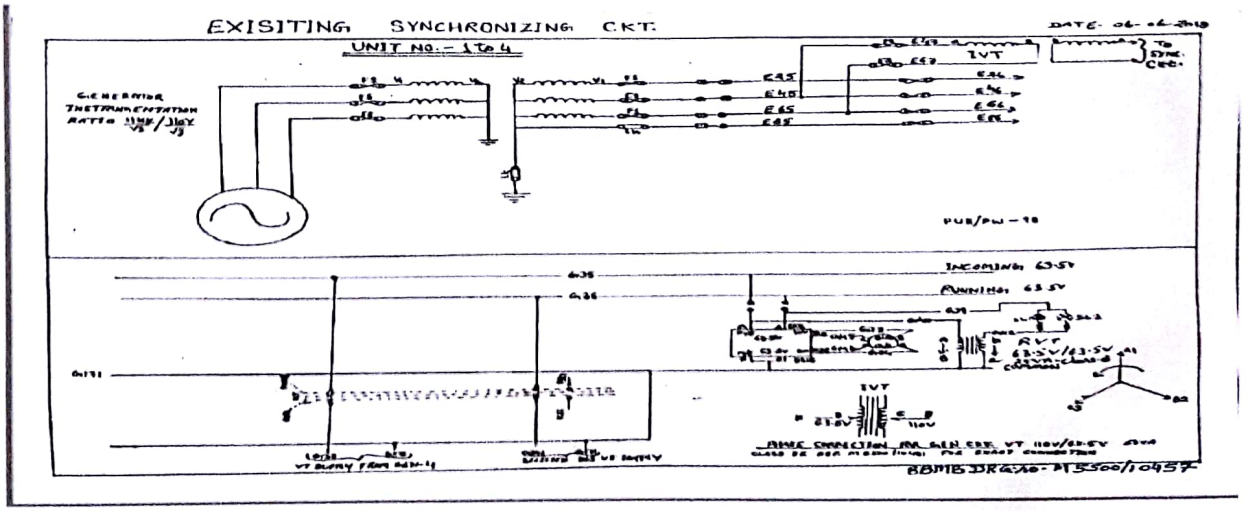
Annexure-1(DPH)

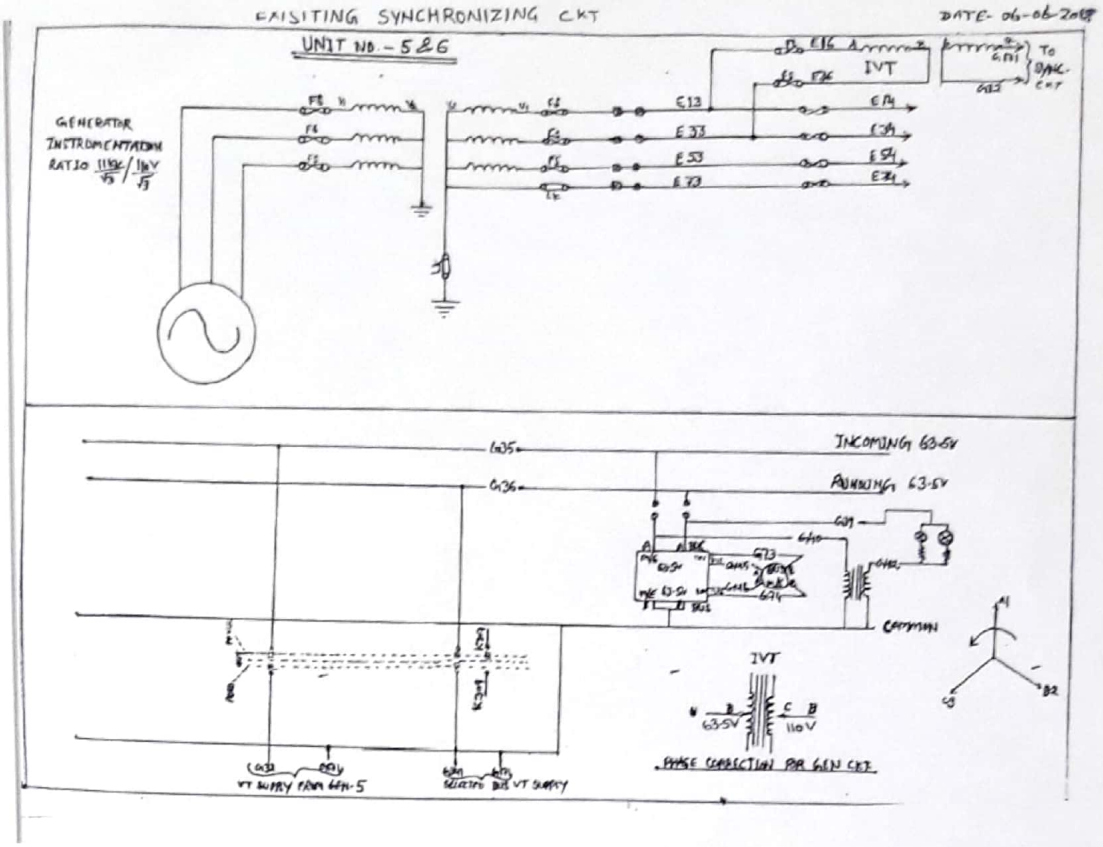
1. Work plan for Dehar Power House - Change on the primary side of concerned connectivity points at PGCIL, PSTCL, HPSEB and BBMB: -

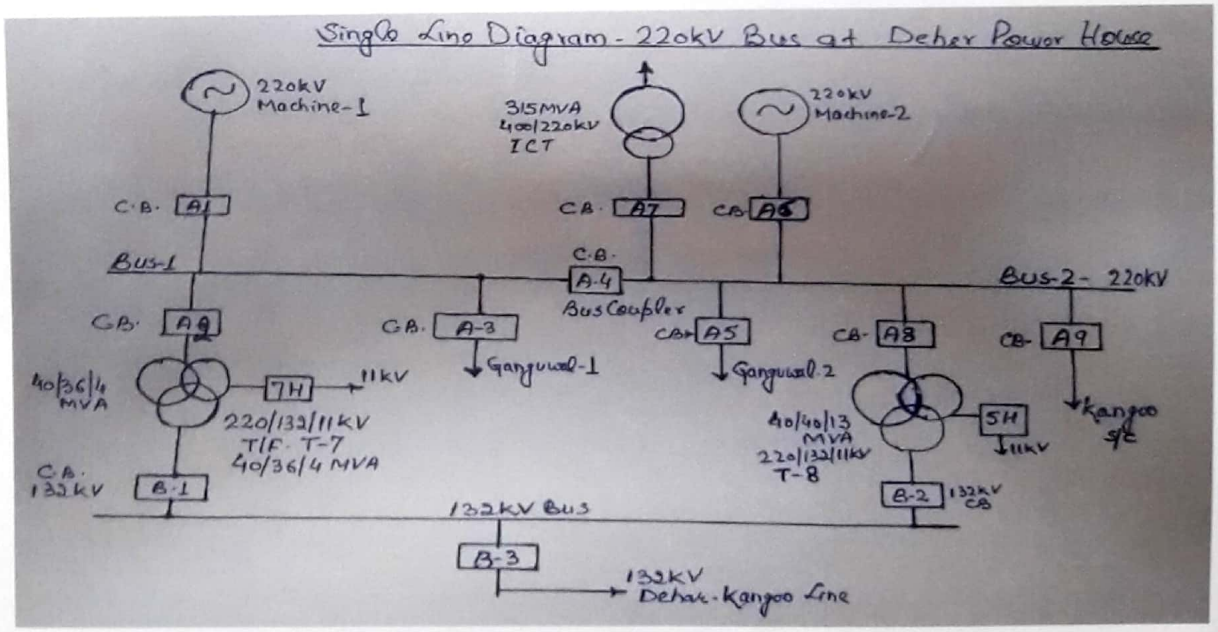
Phase nomenclature of R, Y, B at Dehar Power House is equal to Y, B, R of PGCIL Panchkula / PSTCL Rajpura /HPSEB Kangoo /MISS BBMB Ganguwal as depicted in SLD below:-



SLD for existing synchronization drawing / scheme for 400kV, 220kV Generating machines and 220kV system is given below for reference:-







For correction of phase nomenclature mismatch, the work has been divided in to three phases for Dehar Power House as below:-

a.) **1st Phase for 220kV Bus-1:**

i.) **Work Planned:** On 1st day, *R, Y, B phase of bay of 220kV Dehar-Ganguwal Ckt.-1 will be reconnected with R, Y, B phase of the line on the 1st tower of*

220kV BBMB Dehar- BBMB Ganguwal Ckt. -1 at Dehar Power House by S.D.O. T/L Sub Division DG Line, BBMB Ganguwal under the control of R.E. Ganguwal & Kotla PHs BBMB Ganguwal.

ii.) **Shutdown Required:** 220kV Bus-1 shall be taken out of service by taking out 220kV Machine No. 1 (C.B. A-1), 220kV Dehar-Ganguwal Ckt. 1 (C.B. A-3), 220kV Bus Coupler (C.B. A-4), 40/36/4MVA, 220/132/11kV T/F T-7 (C.B. A-2 & B-1) from 08:00Hrs to 17Hrs. Remaining system shall be in service.

iii.) **Load shedding required:-** Load on 132kV Kangoo shall be restricted to 50% (maximum 40MVA) load. (132kV Dehar-Kangoo line and 11kV system of Dehar Power House shall remain charged through 40/40/13MVA, 220/132/11kV T/F T-8 connected on 220 kV Bus-II).

iv.) **Restoration of system:-** On completion of the above work, restoration of system will be done in coordination with SLDC BBMB Chandigarh as briefed below:-

220kV Bus-1 will be charged independently by charging of 220kV Dehar-Ganguwal Ckt. No. 1 from Ganguwal end. After charging of 220kV Bus-1, 220kV Machine No. 1 shall be synchronized with 220kV system of grid with same phase nomenclature at DPH and Ganguwal. ***The synchronization of the Machine No. 1 will be done without change in the existing synchronization scheme / drawing as referred above.*** Generation of Machine no. 1 will be evacuated through 220 kV Dehar-Ganguwal Ckt.1. 40/36/4 MVA, 220/132/11kV T/F T-7 (220kV C.B. A-2, & 11kV C.B. 7H) charged only from 220/11 kV side i.e C.B. A-2 & C.B. 7H for auxiliary supply of Dehar Power House. The 220 kV Bus Coupler (C.B. A-4) & 132 kV breaker (B1) of T/F T-7 shall remain out of service till further completion of 2nd phase of work for 220 kV Bus-2.

b.) 2nd Phase for 220kV Bus-2 at Dehar PH:

i.) **Work Planned:** On 2nd day, R, Y, B phase of bay of 220 kV Dehar-Ganguwal Ckt.-2 will be reconnected with R, Y, B phase of the line on the 1st tower of 220kV BBMB Dehar- BBMB Ganguwal Ckt. -2 at DPH by S.D.O. T/L Sub Division DG Line, BBMB Ganguwal. Also R, Y, B phase of bay of 220 kV Kangoo- Dehar S/C and 132kV Kangoo- Dehar S/C will be reconnected with R, Y, B phase of the line on the last tower of 220kV BBMB Dehar- HPSEB Kangoo S/C and 132kV Dehar-Kangoo S/C at Kangoo substation by HPSEB.

ii.) **Shutdown Required:-** 220kV Bus Coupler (C.B. A-4) & 40/36/4MVA, 220/132/11kV T/F T-7 (C.B. A-2 & B-1) are already out of service. Further, 220kV Bus-2 shall be taken out of service by taking out 220kV Machine No. 2 (C.B. A-6), 220kV Dehar-Ganguwal Ckt.-2 (C.B. A-5), 315MVA, 400/220kV ICT

(C.B. A-7), 40/40/13MVA, 220/132/11kV T/F T-8 (C.B. A-8 & B-2) and 220kV Dehar-Kangoo S/C (C.B. A-9) from 08:00Hrs to 17Hrs. Remaining system shall be in service. 11kV system of Dehar Power House shall remain charged through 40/36/4MVA, 220/132/11kV T/F T-7 connected on 220 kV Bus-I.

iii.) **Load shedding required**:- There shall be no supply to Kangoo from DPH till completion of 2nd phase. HPSEB shall make arrangement of 132kV supply from alternate source. However, 315MVA, 400/220kV ICT will remain under shutdown.

iv.) **Restoration of system:**- On completion of the above work, restoration of system will be done in coordination with SLDC BBMB Chandigarh / HPSEB Kangoo as briefed below:-

220kV Bus-2 will be charged independently by charging of 220kV Dehar-Ganguwal Ckt. No. 2 from Ganguwal end. After charging of 220kV Bus-2, 220kV Machine No. 2 will be synchronized with 220kV system of grid with same phase nomenclature at DPH and Ganguwal. ***The synchronization of the Machine No. 2 will be done without change in the existing synchronization scheme / drawing.*** Generation of Machine no. 2 will be evacuated through 220kV Dehar-Ganguwal Ckt.2. After that 220kV Dehar-Kangoo S/C will be charged from DPH through C.B. A-9. HPSEB will synchronize the 220kV Kangoo S/C with DPH at Kangoo end with same phase nomenclature at both ends. Then, Bus Coupler (C.B. A-4) and 315MVA ICT (C.B. A-7) will be put in service. At last HPSEB will synchronize the 132kV Kangoo S/C with DPH at Kangoo end with same phase nomenclature at both ends.

c.) 3rd Phase for 400kV System at Dehar Power House:-

i.) **Work Planned:** R, Y, B Phase conductors of 400kV Dehar – Panchkula line shall be reconnected to R, Y, B phase of Panchkula-Dehar bay at Panchkula by the PGCIL at the last tower of this line before entering into 400kV Substation Panchkula by PGCIL Panchkula. R, Y, B Phase conductors of 400kV Dehar-Rajpura line shall be reconnected to R, Y, B phase of Rajpura-Dehar bay at Rajpura by the PSTCL at the last tower of this line before entering into 400kV Substation Panchkula by PSTCL Rajpura.

ii.) **Shutdown Required:** 400kV system shall be taken out (under shutdown) by taking out 315MVA, 400/220kV ICT, 400kV Bus Reactors (2x63.5MVAR) , 400kV Dehar - Rajpura line, 400kV Dehar-Panchkula line and 400kV Dehar Generating Machines No. 3, 4, 5 and 6 from 08:00Hrs to 17Hrs.

iii.) **Load shedding required**:- No load shedding on 3rd day. However, 315MVA, 400/220kV ICT will remain under shutdown.

iv.) **Restoration of system:-** On completion of the above work, restoration of 400kV system will be done in coordination with SLDC BBMB Chandigarh / PGCIL Panchkula / PSTCL Rajpura as briefed below:-

400kV Bus-1 & 2 shall be charged through any one of 400kV line i.e. Rajpura or Panchkula (Say Rajpura). Then, 400kV Bus Reactors shall be charged at Dehar end. After that 400kV Panchkula - Dehar line shall be synchronized with 400kV Grid system at Panchkula end. 315MVA, 400/220kV ICT shall be charged. ***400kV Dehar machines No. 3, 4, 5, 6 shall be synchronized with 400kV Buses / grid with same phase nomenclature at DPH and PGCIL Panchkula / PSTCL Rajpura without any changes in the existing synchronization drawing / scheme.***

2.) Officer's for Coordination:

a.) S.E. DPH Circle Slappar shall monitor the entire job of Dehar Power House. Xen / EMD DPH Slapper will associate to S.E./DPH.

b.) S.E./CPH, BBMB Nangal will monitor the job of reconnecting R, Y, B phase of bay of 220kV Dehar-Ganguwal Ckt.- 1 & 2 on the 1st tower of 220kV BBMB Dehar-BBMB Ganguwal Ckt. -1 & 2 at Dehar Power House on 1st & 2nd day.

c.) Xen, 400kV T/L Division BBMB Dhulkot will coordinate with PGCIL Panchkula / PSTCL Rajpura for 400kV lines.

d.) Power Controller BBMB Chandigarh will arrange shutdowns / restoration of system after completion of each phase work.

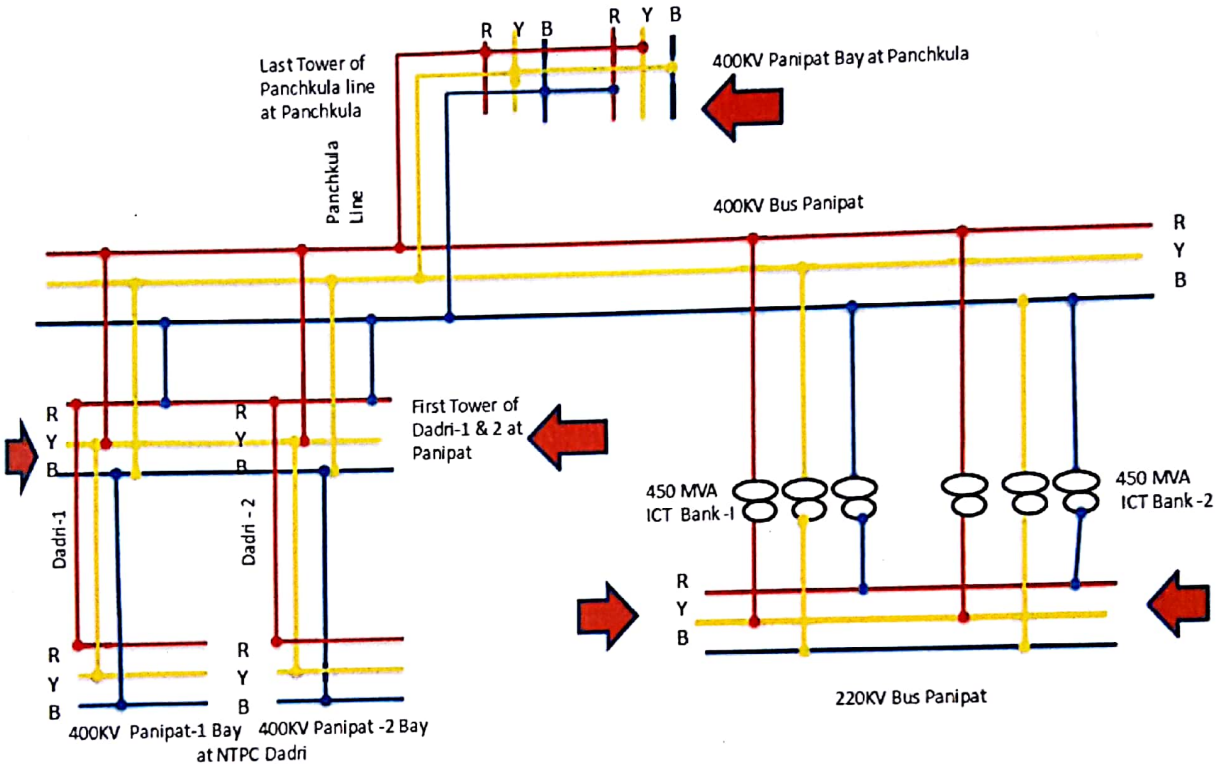
S.E. DPH Circle, Slappar
(Member of Committee)

Director/P&C, BBMB, Chandigarh
(Member of Committee)

1. Work plan for 400kV Substation BBMB Panipat - Change on the primary side of concerned connectivity points at PGCIL Panchkula and BBMB Panipat: -

Phase nomenclature of R, Y, B for 400kV system at BBMB Panipat is equal to Y, B, R of PGCIL Panchkula / NTPC Dadri / 220kV Bus BBMB Panipat as depicted in SLD below:-

EXISTING PHASE NOMENCLATURE MISMATCH BETWEEN BBMB PANIPAT AND INTERCONNECTED SUBSTATION OF PGCIL PANCHKULA, NTPC DADRI AND 220KV SYSTEM AT BBMB PANIPAT (04.06.2018)



In 4th phase for correction of phase nomenclature mismatch (Panipat substation) will be completed in one day as below:-

i.) **Work Planned:** R, Y, B Phase conductors of 400kV Panipat - Dadri-1 & 2 shall be reconnected to R, Y, B phase of Panipat-Dadri-1 & 2 bays at BBMB Panipat on 1s tower of 400kV Panipat-Dadri-1 & 2 lines at Panipat by PGCIL (both lines belongs to PGCIL). R, Y, B phase conductor of 400kV Panipat - Panchkula line shall be reconnected to R, Y, B phase of Panchkula- Panipat bay at Panchkula end on last tower of 400kV Panipat-Panchkula line by PGCIL. R, Y, B phase output (220kV) from ICT Bank -1 & 2 has been connected on common points of 220kV Bus-1 & 2 isolators of ICT Bank-1 & 2 as incoming supply. R, Y, B phase output from 220kV Bus-1 & 2 isolators of ICT Bank-1 & 2 shall be reconnected with R, Y, B phases of 220kV system bus-1 & 2 by BBMB. CT secondary of 220kV ICT Bank-1 & 2 shall also be rewired as per corrected phase nomenclature.

ii.) **Shutdown Required:**

a.) Total 400kV system of Panipat substation shall remain under shutdown for one day (08:00Hrs to 17Hrs) i.e. 450MVA, 400/220kV ICT Bank-1 & 2, 80MVAR Bus Shunt Reactor, 400kV Panipat-Panchkula line, 400kV Panipat-Dadri-1 & 2.

b.) 220kV Bus-1 will also remain under shutdown during 08:00 Hrs to 12:00Hrs for reconnecting R, Y, B phase output from 220kV Bus-1 isolators of ICT Bank-1 & 2 of with R, Y, B of 220kV system bus-1. All the 220kV lines/feeders shall be fed from Bus-2.

c.) 220kV Bus-2 will also remain under shutdown during 13:00 Hrs to 17:00Hrs for reconnecting R, Y, B phase output from 220kV Bus-2 isolators of ICT Bank-1 & 2 of with R, Y, B of 220kV system bus-2. All the 220kV lines/feeders shall be fed from Bus-1.

iii.) **Load shedding required:-** Both the 450MVA ICTs at Panipat shall remain under shutdown. Hence, load shedding shall be required accordingly.

iv.) **Restoration of system:-** On completion of the above work, restoration of system will be done in coordination with SLDC BBMB Chandigarh / PGCIL Panchkula / NTPC Dadri as briefed below:-

400kV Bus- 1 shall be charged through 400kV Dadri-2 line (C.B. X-8). Then, 400kV Bus Reactors (C.B. X-9) shall be charged at Panipat end. After that 400kV Panipat - Panchkula line shall be charged from Panipat end (C.B. X-1 & Tie C.B. X-7) only. Then, Panipat-Panchkula line will be synchronized from Panchkula end. ICT Bank-1 & 2 shall be charged 1st through 220kV side and then from 400kV side. At last, 400kV Panipat-Dadri-1 will be charged.

2. Officer's for Coordination:

i.) S.E. O&M Circle BBMB Panipat shall monitor the entire job of Panipat substation. Xen / O&M Division BBMB Panipat and Dy. Director/P&T Cell BBMB Panipat will associate to S.E. O&M Circle BBMB Panipat.

ii.) Xen, 400kV T/L Division BBMB Dhulkot will coordinate with PGCIL for 400kV Panchkula line and Dadri-1 & 2 lines.

iii.) Power Controller BBMB Chandigarh will arrange shutdowns / restoration of system after completion of each phase work.

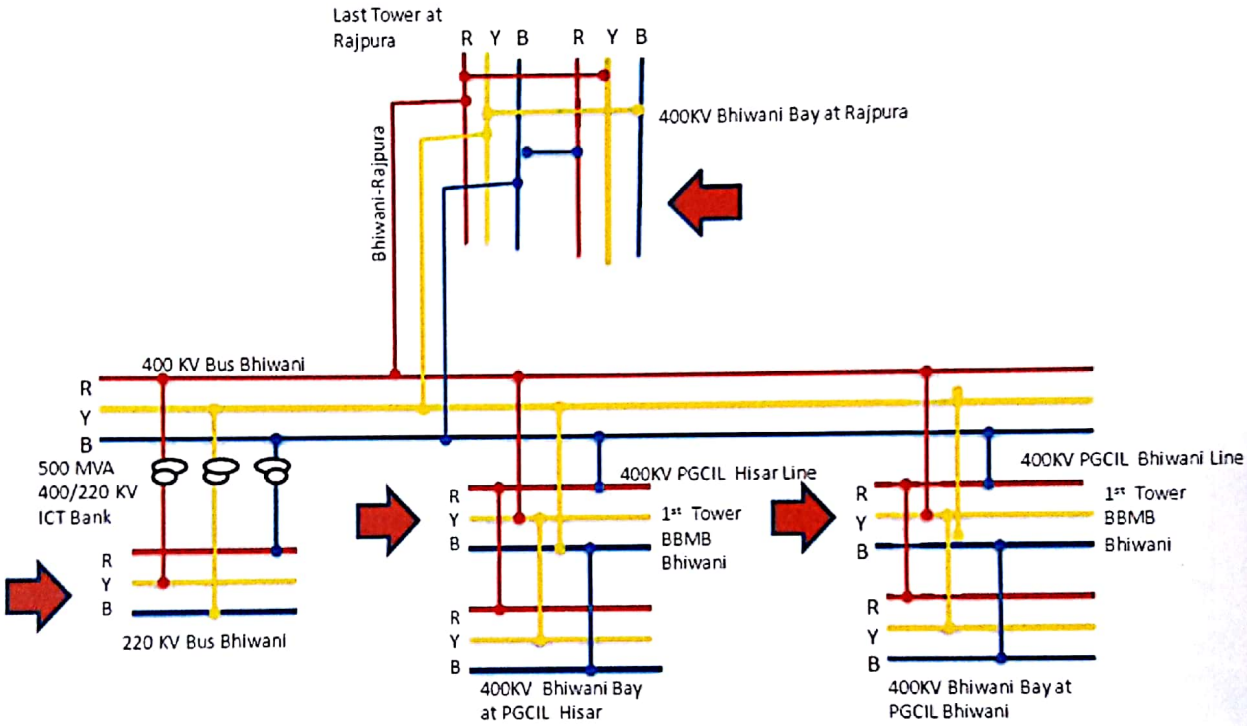
S.E. DPH Circle, Slappar
(Member of Committee)

Director/P&C, BBMB, Chandigarh
(Member of Committee)

3. Work plan for 400kV Substation BBMB Bhiwani - Change on the primary side of concerned connectivity points at PGCIL Hisar & Bhiwani and BBMB Bhiwani: -

Phase nomenclature of R, Y, B for 400kV system at BBMB Bhiwani is equal to Y, B, R of PGCIL Hisar & Bhiwani / PSTCL Rajpura / 220kV Bus BBMB Bhiwani as depicted in SLD below:-

EXISTING PHASE NOMENCLATURE MISMATCH BETWEEN BBMB BHIWANI AND INTERCONNECTED SUBSTATION OF PGCIL HISAR, PGCIL BHIWANI AND 220KV SYSTEM AT BBMB BHIWANI (04.06.2018)



In 5th phase for correction of phase nomenclature mismatch (Bhiwani substation) will be completed in one day as below:-

i.) **Work Planned:** R, Y, B Phase conductors of 400kV BBMB Bhiwani – PGCIL Hisar, 400kV BBMB Bhiwani – PGCIL Bhiwani shall be reconnected to R, Y, B phase of 400kV BBMB Bhiwani-PGCIL Hisar Bay and 400kV BBMB Bhiwani-PGCIL Bhiwani Bay at BBMB Bhiwani on 1s tower of 400kV BBMB Bhiwani – PGCIL Hisar and PGCIL Bhiwani line at Bhiwani by PGCIL (both lines belongs to PGCIL).

R, Y, B phase conductor of 400kV Bhiwani-PSTCL Rajpura shall be reconnected to R, Y, B phase of Rajpura - Bhiwani bay at Rajpura end on the last tower of 400kV Bhiwani-Rajpura line by PSTCL.

R, Y, B phase output (220kV) from ICT Bank has been connected on common points of 220kV Bus-1 & 2 isolators of ICT Bank as incoming supply. R, Y, B phase

output from 220kV Bus-1 & 2 isolators of ICT Bank shall be reconnected with R, Y, B phases of 220kV system bus-1 & 2 by BBMB.

CT secondary of 220kV ICT Bank shall also be rewired as per corrected phase nomenclature.

ii.) **Shutdown Required:**

a.) 400kV system of Bhiwani substation shall remain under shutdown for from 08:00Hrs to 17:00Hrs i.e. 500MVA, 400/220kV ICT Bank, 50MVAR Bus Shunt Reactor, 400kV Bhiwani-Rajpura line including 50MVAR line Shunt Reactor, 400kV Bhiwani-PGCIL Hisar line, and 400kV BBMB Bhiwani-PGCIL Bhiwani line.

b.) 220kV Bus-1 will also remain under shutdown during 08:00 Hrs to 12:00Hrs for reconnecting R, Y, B phase output from 220kV Bus-1 isolators of ICT Bank of with R, Y, B of 220kV system bus-1. All the 220kV feeders shall be fed from Bus-2.

c.) 220kV Bus-2 will also remain under shutdown during 13:00 Hrs to 17:00Hrs for reconnecting R, Y, B phase output from 220kV Bus-2 isolators of ICT Bank of with R, Y, B of 220kV system bus-2. All the 220kV feeders shall be fed from Bus-1.

iii.) **Load shedding required:-** 500MVA ICT Bank at Bhiwani will remain under shutdown. Hence, load shedding shall be required accordingly.

iv.) **Restoration of system:-** On completion of the above work, restoration of system will be done in coordination with SLDC BBMB Chandigarh / PGCIL Panchkula / PSTCL Rajpura as briefed below:-

400kV Bus- 1 & 2 shall be charged through 400kV PGCIL Hisar line. Then, 50MVAR, 400kV Bus Reactors shall be charged. After that 400kV BBMB Bhiwani – PGCIL Bhiwani line shall be charged from Bhiwani end only. Then, 400kV BBMB Bhiwani – PGCIL Bhiwani line will be synchronized with BBMB Bhiwani system from PGCIL Bhiwani end. 500MVA, 400/220kV ICT Bank will be charged 1st through 220kV side and then from 400kV side. At last, 400kV Bhiwani-Rajpura will be charged.

2.) Officer's for Coordination:

a.) S.E. O&M Circle BBMB Bhiwani shall monitor the entire job of Bhiwani substation. Xen / O&M Division BBMB Bhiwani and Dy. Director/P&T Cell BBMB Bhiwani will associate to S.E. O&M Circle BBMB Bhiwani.

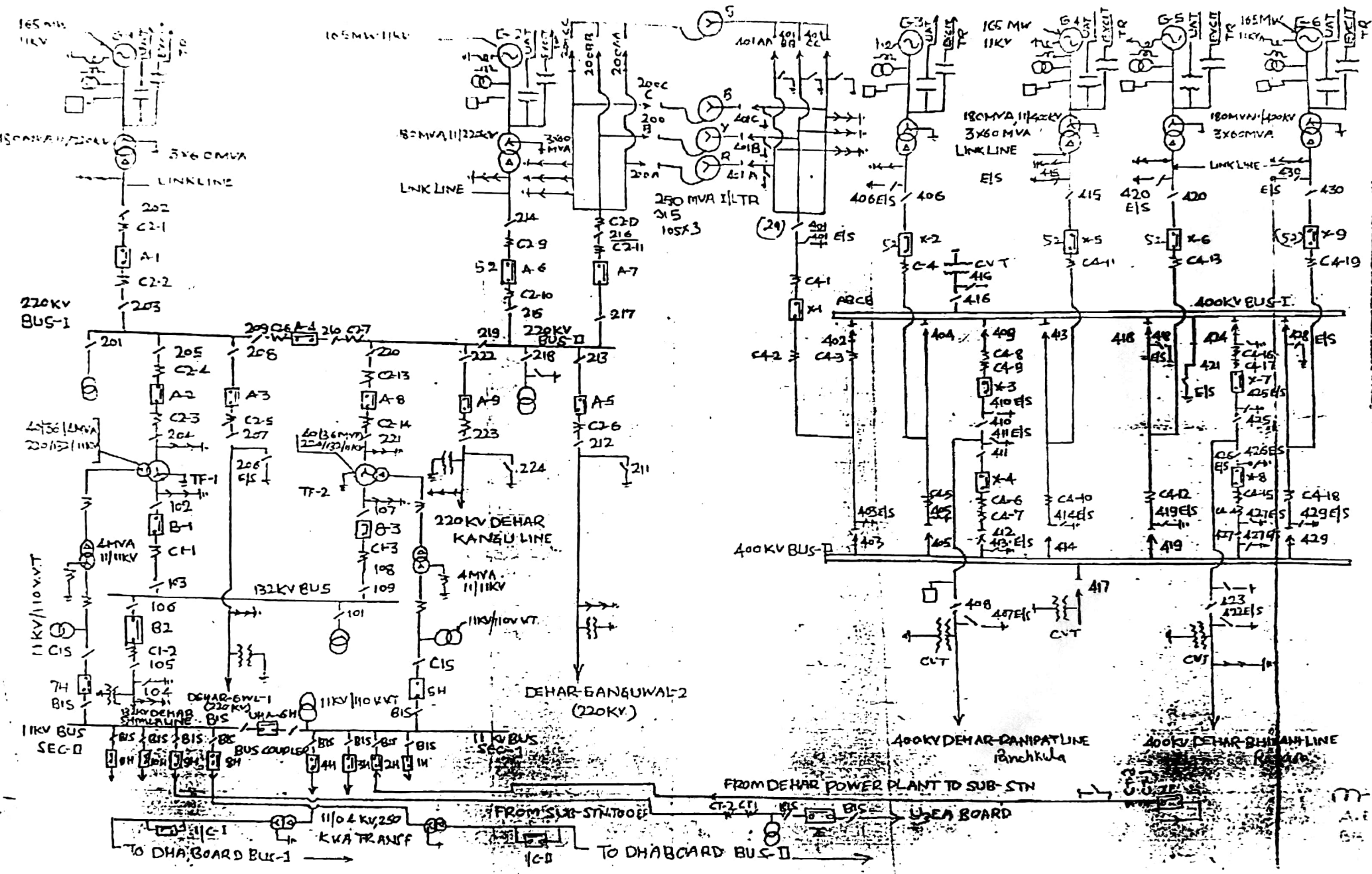
b.) Xen, 400kV T/L Division BBMB Dhulkot will coordinate with PGCIL for 400kV PGCIL Hisar / Bhiwani and Rajpura lines.

iv.) Power Controller BBMB Chandigarh will arrange shutdowns/ restoration of system after completion of each phase work.

S.E. DPH Circle, Slappar
(Member of Committee)

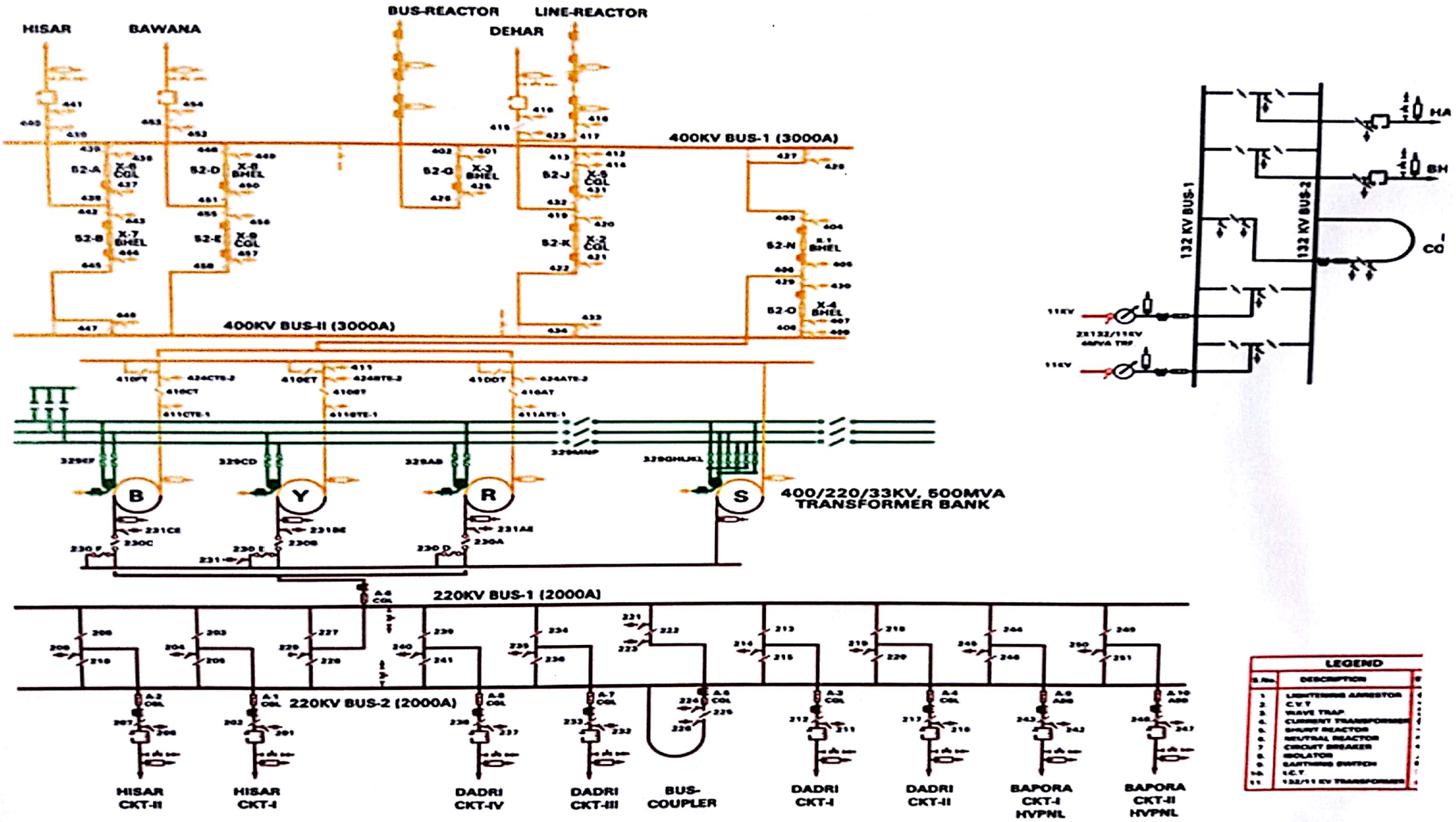
Director/P&C, BBMB, Chandigarh
(Member of Committee)

KEY DIAGRAM OF DEHAR POWER PLANT



KEY DIAGRAM OF 400 KV GRID SUB STATION BBMB PANIPAT

KEY DIAGRAM OF 400KV SUB STATION BBMB BHIWANI



सत्यमेव जयते

भारत सरकार

Government of India

विद्युत मंत्रालय

Ministry of Power

उत्तर क्षेत्रीय विद्युत समिति

Northern Regional Power Committee

सं.: उ.क्षे.वि.स./प्रचालन/106/01/2018/11740-41 दिनांक: 06/10/2018

To

1. Executive Director,
   POWERGRID (NR-I),
   B-9, Qutub Institutional area,
   Katwarai Sarai,
   New-Delhi - 110016

2. Executive Director,
   POWERGRID (NR-II),
   Grid Bhawan,
   Rail Head complex,
   Jammu- 180012

Subject: Rectification of Phase nomenclature mismatch of BBMB and interconnected stations – Reg.

Sir,

The Protection Sub-Committee while discussing multiple element tripping at 400/220/132kV Dehar HEP of BBMB in its 34th meeting held on 21.04.2017 recommended inter-alia that BBMB should modified nomenclature of phase sequencing at Dehar as Y-B-R instead of R-Y-B. The issue was further deliberated in the 138th OCC meeting held on 23.08.2017, wherein it was observed that nomenclature of phases at BBMB end has inadvertently been marked as outlined below:

Phase of the grid	Corresponding nomenclature of the phase at BBMB end
R Phase	B Phase
Y Phase	R Phase
B Phase	Y Phase

The BBMB was asked to rectify the nomenclature issue at their end accordingly.

However, BBMB raised concern that the issue could not be resolved in one go, as coordination would be required from all the concerned utilities to carry out this activity and requested NRPC to form a committee comprising of BBMB and its partner states, utilities with which BBMB has interconnection, NRPC Secretariat and POWERGRID for the same. NRPC in its 41st meeting held on 28th February, 2018 approved the proposed formation of the committee and advised BBMB to ensure resolve the issue within six months.

BBMB drew a draft action plan which was duly deliberated by the Committee in its

Contd...

1st meeting held on 04.06.18. The action plan was circulated to all the concerned utilities for -their comments. The execution of the action plan is tentatively planned during month of November-December, 2018.

HPSEB and PSTCL agreed with action plan, however, PSTCL was of the view that 400kV Dehar-Rajpura line is owned by PGCIL and hence the work is to be executed by them. Comments on the action plan were also received from NTPC and POWERGRID (**Annexure-I**). BBMB has agreed with the comments from NTPC and has given their reply (**Annexure-II**) on the comments of POWERGRID.

The reply of BBMB vis-à-vis the comments of POWERGRID were deliberated in the 151st OCC meeting wherein members were of the view that reply of BBMB was generally in order. However, POWERGRID representative stated that the matter pertains with NR-I and NR-II region of POWERGRID and final decision regarding the same is to be taken up at the level Executive Directors of respective regions.

In view of the above, it is requested that the concurrence to the BBMB action plan on correction of Phase nomenclature mismatch between BBMB and other interconnected substations may please be conveyed at the earliest so as to resolve the issue within the time frame as stipulated by NRPC.

Sincerely,

(M.A.K.P. Singh)
Member Secretary

Annexure 1

Comments from NTPC

From: Karan Tripathi <karantripathi@ntpc.co.in>
To: tabishadeel <tabishadeel@ntpc.co.in>
Cc: Chandra Bhushan Ojha Ojha <CHANDRABHUSHANOJHA@NTPC.CO.IN>, Shailesh Dheman Dheman <shaileshdheman@ntpc.co.in>, Diwakar Kaushik <diwakarkaushik@ntpc.co.in>, Pradipta Kumar Mishra Mishra <PRADIPTA@NTPC.CO.IN>
Sent: Fri, 27 Jul 2018 19:04:43 +0530 (IST)
Subject: Re: BBMB phase nomenclature

Dear Sir,

The issue was deliberated in OCC meeting also by NTPC.

In response to BBMB's request, is proposed that 400kV Panipat Switchyard may be charged from Panipat - Dehar line instead of Dadri - Panipat.

Charging a transmission line through a Generating end is generally not a followed practice as any inadvertant tripping of Dadri 400kV station may also result in loss of Thermal units, Gas units and HVDC power. This is also in concern to the phase modification work carried out at Panipat end.

Regards,

Karan Tripathi
Manager (EMD)
Electrical Lab
NCPS Dadri

Comments from POWERGRID

Respected Sir,

In reference to the subject matter, it is to submit that:

Jumpers need to be interchanged at the dead end towers terminating at BBMB stations only. If this is done, there will be no need to do any re-connection work at other sites.

For example: if dead end tower jumpers of all 132, 220 & 400 kV line at BBMB Dehar are re-connected then there will be no need to make any change at the other ends connected to Dehar PH.

In this regard, BBMB may be communicated to review please. This is for your kind information please.

Thanks and Regards.

Praveen Kumar

Manager
RTAMC, NR-II, JAMMU.

ANNEXURE 8 REPLY OF BBMB ON COMMENTS RECEIVED FROM POWERGRID , NTPC, PSTCL

Sub: Correction of Phase mismatches nomenclature.

Please refer your mail dated Aug 7, 2018 on the subject matter, through which comments dated 01.08.18 of rtamc jammu <rtamcjammu@powergrid.co.in, NTPC and PSTCL have been forwarded.

In this regard, comments of BBMB are as under:-

1. *PGCIL has commented that "Jumpers need to be interchanged at the dead end towers terminating at BBMB stations only. If this is done, there will be no need to do any re-connection work at other sites. For example: if dead end tower jumpers of all 132, 220 & 400 kV line at BBMB Dehar are re-connected then there will be no need to make any change at the other ends connected to Dehar PH. In this regard, BBMB may be communicated to review please".*

BBMB proposal is framed to make the compliance of directions of NRPC to correct phase mismatch nomenclature between BBMB and PGCIL/PSTCL/HPSEB. PGCIL proposal is not in accordance to the NRPC directions.

If dead end tower jumpers of all 132, 220 & 400 kV line at BBMB Dehar are re-connected i.e. existing R, Y, B phase of PGCIL/PSTCL/HPSEB are reconnected with R, Y, B phase of Dehar P.H., then there shall be mismatch of phase identification of line conductors (identified with existing R, Y, B phase identification plate/strip on each tower) and the bay phase of the line (Y, B, R) at both ends.

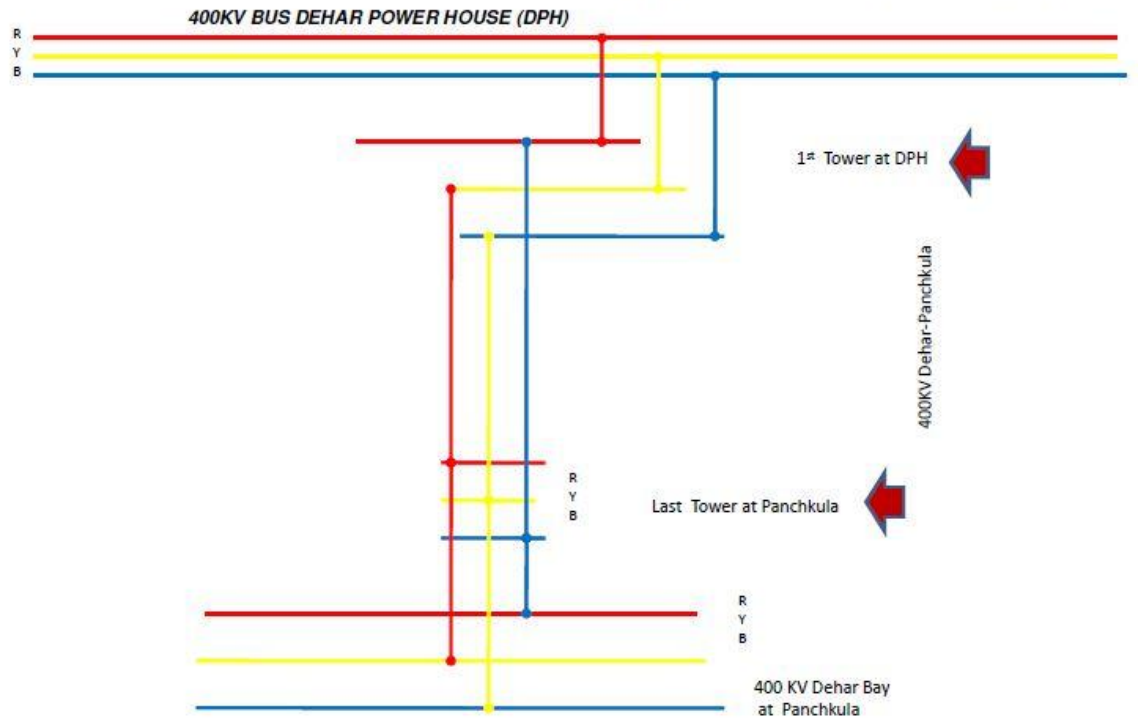
In this regard, proposed SLD (attached) for 400kV Dehar- Panchkula Line as per PGCIL proposal to interchange jumpers at Dead End Tower (1st Tower of the line at Dehar end) to correct phase nomenclature between PGCIL Panchkula and BBMB Dehar P.H. In this way, line conductor marked as Red, Yellow, Blue phase by identification plate/strip on each tower shall be connected with Y, B, R phase of bay at both end. Thus existing line phase identification marking (R, Y, B) and existing bay phase identification marking (Y, B, R) shall differ.

Hence, for proper correction of phase mismatch nomenclature, jumpers need to be interchanged at the locations where R, Y, B phases are connected with Y, B, R phase by PGCIL at Panchkula substation for Dehar-Panchkula line and Panipat – Panchkula line, Panipat substation for Panipat-Dadri Ckts, Bhiwani substation for BBMB Bhiwani-PGCIL Hisar and PGCIL Bhiwani. Work at Rajpura substation shall be mutually decided by PSTCL and PGCIL. Whereas works of phase correction at Kangoo end shall be done by HPSEB for 220kV & 132kV Dehar-Kangoo Ckts.

2. BBMB agrees with NTPC comments. Hence, 400kV BBMB Panipat Bus will be charged through from 400kV Panipat – Panchkula line instead of 400kV Panipat – Dadri after correction of phase nomenclature of 400kV system BBMB Panipat.

3. As per PSTCL, 400kV Dehar-Rajpura line is owned by PGCIL and hence the work is to be executed by them. Matter has been taken with PGCIL Patiala and only they can tell whether work is possible or not in present conditions." Hence, NRPC may take up the matter with PGCIL.

PROPOSED SLD FOR 400KV DEHAR – PANCHKULA LINE AS PER PGCIL PROPSAL TO INTERCHANGE JUMPERS AT DEAD END TOWER (1ST TOWER AT DEHAR END) TO CORRECT PHASE NOMENCLATURE BETWEEN PGCIL PANCHKULA & BBMB DEHAR P.H.



केन्द्रीय विद्युत अनुसंधान संस्थान
(भारत सरकार की सोसाइटी, विद्युत मंत्रालय)
प्रो सर सी. वी. रामन रोड़, सदाशिवनगर डाक घर, पो. बा. सं. 8066, बेंगलूर - 560 080
CENTRAL POWER RESEARCH INSTITUTE
(A Govt of India Society under Min. of Power)
Prof. Sir C.V. Raman Road, Sadashivanagar P.O., P.B. No. 8066, Bangalore - 560 080, India
वेबसाइट/website : http://www.cpri.in

No.

04. Sept., 2018

To,
Member Secretary
Northern Regional Power Committee,
Central Electricity Authority,
18-A, Shaheed Jeet Singh Marg,
Katwaria Sari,
Delhi -110016

Dear Sir,

Sub: Protection Audit-Workshop/Training Programme.

Drawing your kind attention on the discussion held in Power Systems Division on 24 August 2018 at CPRI regarding organsing the Protection Audit training programme for the Utilities under NRPC at Bangalore.

First of all we are thankful for your interest in this training programme & we are hereby pleased to submit the offer for same.

1.0 INTRODUCTION:

Government of India has established the Northern Regional Power Committee (NRPC) Comprising of power systems and generating units of union territory of Chandigarh, states of Haryana, Himachal Pradesh, Jammu and Kashmir, Punjab, Rajasthan, Uttarapardesh, Uttrakhand and Delhi. To facilitate the stability and smooth operation of the integrated grid and economy & efficiency in the operation of power system in the Northern region, NRPC is involved by undertaking regional level operation analysis for improving grid performance,

facilitating inter-state/inter-regional transfer of power, and planning for maintaining proper voltages through reactive compensation studies for the states coming in Northern region.

Protection is one of the key operational aspect of power systems operation. The revision in protection setting /schemes for modification in network topologies is essential for reliable operation of power systems. The NPRC coordinates with all transmission utilities of Northern Grid for any revision in Protection schemes/setting and auxiliary protection function. Therefore periodic audit of these protection sachems/setting/protection functions and auxiliary protection is an healthy practice for enhancing the protection reliability.

In the recent past, CPRI carried out protection audit for RVPNL, BBMB, UPPTCL, PSTCL, Power grid western region, Goa Electricity Board NHPC, Torrent Power, Essar Power, Nellore Power Plant, Indrasagar, Rosa Power, Panki Power etc.

In this context, *Power Systems Division of Central Power Research Institute* (CPRI) is pleased to submit an offer for conducting a protection audit programme for Power Utilities under NRPC.

2.0 Topics to be covered.

The topics to be covered in brief during the three (03) days training programme are as under:

Day1- Protection Audit of main Protection for Power Transformer, Lines, Bus bars, reactors & Short circuit Studies.

Day-2: Protection Audit of main Protection for Alternators

Day-3: Protection Audit of Backup Protections & Auxiliary Protection functions Demonstration of Protection in Lab. & Lab. visits

The actual daily schedule may change as per the availability of Experts.

3.0- Training Fee

Training Fee for Central /State Govt. Power Utilities/ Electricity Boards Personnel is as under:

Fee Per Day/Participant Rs.	Days	Total Without GST Rs.	Total with GST@18% Rs.
3,500	3	10,500	12,390

The fee is to be paid in favour of "CPRI, through online transaction mode as per following details:

Name of beneficiary-Central Power Research Institute
Branch SBI, CPRI
IFSC Code: SBIN0010370
Account No: 10356553310.

4.0: Travel and Accommodation

- Bengaluru is well connected by Road, Rail and Air
- Participants have to make their own travel arrangements
- Guest house accommodation on twin sharing basis can be provided on chargeable basis subject to availability
- CPRI is situated in between Mekhri Circle and Yeshwanthpur.
  Near Indian Institute of Science (commonly known as Tata Institute)

5.0 Venue:

CCAR Auditorium, Central Power Research Institute
Prof. Sir. C V Raman Road,
Sadashivanagar P O,
Bengaluru 560 012

I hope the above, training offer meets the protection audit requirement of NRPC, if any additional requirement are there, and same may be communicated to CPRI

Thank you

Yours sincerely,

04th Sept 18

(K. S. Meera)
Additional Director, Power Systems Division

--~~**Annex-VII**~~--

General recommendations/best practices agreed in PSC

1. High set setting of back up over current setting for ICTs should have 100-200ms time delay for prevention of tripping during transient fault feeding.

2. Interim arrangement as an alternative to Bus Bar protection can be Implemented wherein time setting of Bus coupler connected in between main Buses may be reduced to 100 msec. (operating time) and reverse reach of feeders may be reduced to 2 Km. and with time of operation as 160 msec. With above settings, in case of actual Bus fault, Bus coupler operation will isolate the faulty Buses from other main Buses and feeders will also trip. This operation will reduce the fault duration and the healthy Buses will remain intact.

3. As agreed in 14th PSC meeting held on 10.05.2011, for new line of length less than 10 km(Short Line) differential protection should be implemented.

4. When breaker controlling the transmission line is under lock out, it is not advisable to interrupt the changing current through an isolator. PSC recommended the following practice to be adopted in such cases.

   (i) De-energize the bus connecting the line with lockout CB and then open the isolator.

   (ii) If due to some reason it is not possible to open the isolator in above mentioned way, then open the isolator so that no charging current is interrupted through the isolator and the charging current is diverted to other parallel path. Such switching sequence could be possible in case of breaker and half scheme or Double breaker Scheme, which is as follows:

      - Open the line from remote end first with direct trip (DT) disabled. With this now line remains charged from the end where CB has problem.
      - In case of breaker and half scheme open the isolator so that charging current is diverted to the parallel path and after that open the CB of parallel path.
      - In case of double breaker scheme open the isolator of the lockout breaker diverting the charging current to other CB and then open the CB.
      - In case of double main and transfer scheme open the isolator of lockout breaker so that divert the charging current through transfer bus coupler and then open the line through TBC circuit breaker.

   (iii) PSC also recommended that while vacating a bus in such cases, the operators need to check the switching arrangement for individual feeders so as to avoid unintended loss of any feeder.

5. Availability of standalone automatic downloading facility in the sub-station for DR (disturbance recorder) output, to be ensured.

6. Centralized Event Logger should be available at each station. It is helpful during analysis of multiple elements tripping at the station. STU/SLDC may kindly take data from all the station within its control area and send the final report to RLDC/RPC

7. Auto reclosure facility should be enabled in all 220kV lines of NR constituents

8. Maintenance of PLCC in case of LILO of Line: (i) In case of shifting of the PLCC from one sub-station to other, the utility executing the LILO work would ensure that the panel is not older or obsolete and if it is so then new panel would be installed at the sub-station.

   (ii) Regular and day-to-day maintenance of the PLCC panels would be carried by the organization which owns the substation.

9. Operating procedure should also be formulated for one time activity like PMU installation, changes in the element etc

10. Sensitive base filter setting in each HVDC Bipole needs to be checked and revised accordingly

11. Distance protection should be blocked in case of VT fuse failure and back up over current protection should be automatically enabled.

12. Input from line VT should be taken for distance protection of line instead of bus VT to avoid complete station outage in case of wrong setting.

Sr. No.	Developer	Name of Project	Sector	State	NCR/Non-NCR	Unit No	Unit Capacity	DATE of COMMISSIONING (MM/DD/YYYY)	SPM Norms (mg/Nm3)	Current SPM (mg/Nm3)	ESP Plan	ESP Status	NOx Norms (mg/Nm3)	Current NOx (mg/Nm3)	Nox plan	NOx Status	Sox Norms (mg/N	Current Sox (mg/N	Old FGD Phasing Plan for	FGD Phasing Plan	Whether FGD Installed	FGD Commissioned	FGD Status	Tar Date of FS Start	Tar Date of FS Complete	Tar Date of Tender Spec	Tar Date of NIT Issue	Tar Date of Bid Open	Tar Date of Bid Award	Tar Date of FGD Comm.
1	CHINA LIGHT POW	MAHATMA GANDHI	Private	Haryana	NCR	1	660	**12-01-2012**			SPM Compliant								1-31-2019	31/12/2019	N	Y	FGD Installed and is Under Renovation							
2	CHINA LIGHT POW	MAHATMA GANDHI	Private	Haryana	NCR	2	660	**11-04-2012**			SPM Compliant								1-31-2019	31/12/2019	N	Y	FGD Installed and is Under Renovation							
3	HGPCorpn	PANIPAT TPS	State Se	Haryana	NCR	6	210	**31-03-2001**											4-30-2021	31/12/2019	N	0	Developer wants exemption							
4	HGPCorpn	PANIPAT TPS	State Se	Haryana	NCR	7	250	**28-09-2004**			28-02-2021								2-28-2021	31/12/2019	N	0	Feasbility Study Under Progress							
5	HGPCorpn	PANIPAT TPS	State Se	Haryana	NCR	8	250	**28-01-2005**			31-12-2020								12-31-2020	31/12/2019	N	0	Feasbility Study Under Progress							
6	HGPCorpn	RAJIV GANDHI TPS	State Se	Haryana	NCR	1	600	**31-03-2010**			30-04-2022								4-30-2022	31/12/2019	N	0	Feasbility Study Completed.							
7	HGPCorpn	RAJIV GANDHI TPS	State Se	Haryana	NCR	2	600	**01-10-2010**			28-02-2022								2-28-2022	31/12/2019	N	0	Feasbility Study Completed.							
8	HGPCorpn	YAMUNA NAGAR T	State Se	Haryana	NCR	1	300	**01-11-2007**			31-12-2021								12-31-2021	31/12/2019	N	0	Feasbility Study Completed.							
9	HGPCorpn	YAMUNA NAGAR T	State Se	Haryana	NCR	2	300	**29-03-2008**			31-10-2021								10-31-2021	31/12/2019	N	0	Feasbility Study Completed.							
10	NTPC	INDIRA GANDHI ST	Central	Haryana	NCR	1	500	**31-10-2010**			SPM Compliant	SPM Compliant				Award in September 18			10-31-2020	31/12/2019	N	0	Bid awarded on 30 Jan 2018							
11	NTPC	INDIRA GANDHI ST	Central	Haryana	NCR	2	500	**05-11-2011**			SPM Compliant	SPM Compliant				Award in September 18			4-30-2020	31/12/2019	N	0	Bid awarded on 30 Jan 2018							
12	NTPC	INDIRA GANDHI ST	Central	Haryana	NCR	3	500	**07-11-2012**			SPM Compliant	SPM Compliant				Award in September 18			2-29-2020	31/12/2019	N	0	Bid awarded on 30 Jan 2018							
13	GVK Power Ltd.	GOINDWAL SAHIB	Private	Punjab	Non-NCR	1	270	**14-02-2016**											4-30-2020	30/04/2020	N	0	EOI was invited vide newspaper advrt. On 18.06.2018							
14	GVK Power Ltd.	GOINDWAL SAHIB	Private	Punjab	Non-NCR	2	270	**15-03-2016**											2-29-2020	28/02/2020	N	0	EOI was invited vide newspaper advrt. On 18.06.2018							
15	L&T Power Develop	Nabha TPP (Rajpura	Private	Punjab	NCR	1	700	**24-01-2014**	50	<50	SPM Compliant	SPM Compliar	300	450	01-04-2021	SNCR to	200	1610	4-30-2021	31/12/2019	N	0	NIT expected in Oct' 18				Oct-18	Nov-18	Dec-18	
16	L&T Power Develop	Nabha TPP (Rajpura	Private	Punjab	NCR	2	700	**06-07-2014**	50	<50	SPM Compliant	SPM Compliar	300	464	01-02-2021	SNCR to	200	1620	2-28-2021	31/12/2019	N	0	NIT expected in Oct' 18				Oct-18	Nov-18	Dec-18	
17	PSEB	GH TPS (LEH.MOH.	State Se	Punjab	NCR	1	210	**29-12-1997**			30-04-2022								4-30-2022	31/12/2019	N	0	Administrative approval is under process.							
18	PSEB	GH TPS (LEH.MOH.	State Se	Punjab	NCR	2	210	**16-10-1998**			30-04-2022								4-30-2022	31/12/2019	N	0	Administrative approval is under process.							
19	PSEB	GH TPS (LEH.MOH.	State Se	Punjab	NCR	3	250	**03-01-2008**			28-02-2022								2-28-2022	31/12/2019	N	0	Administrative approval is under process.							
20	PSEB	GH TPS (LEH.MOH.	State Se	Punjab	NCR	4	250	**31-07-2008**			28-02-2022								2-28-2022	31/12/2019	N	0	Administrative approval is under process.							
21	Talwandi Sabo Pow	TALWANDI SABO T	Private	Punjab	NCR	1	660	**17-06-2014**			SPM Compliant								2-28-2021	31/12/2019	N	0	Feasiblity Study Carried Out. PPA issues pending with regulator							
22	Talwandi Sabo Pow	TALWANDI SABO T	Private	Punjab	NCR	2	660	**25-10-2015**			SPM Compliant								12-31-2020	31/12/2019	N	0	Feasiblity Study Carried Out. PPA issues pending with regulator							
23	Talwandi Sabo Pow	TALWANDI SABO T	Private	Punjab	NCR	3	660	**29-03-2016**			SPM Compliant								10-31-2020	31/12/2019	N	0	Feasiblity Study Carried Out. PPA issues pending with regulator							
24	Adani Power Ltd.	KAWAI TPS	Private	Rajasthan	Non-NCR	1	660	**28-05-2013**			N								8-31-2020	31/08/2020	N	0	NIT to be issued soon.				Oct-18	Dec-18	Jan-19	Aug-20
25	Adani Power Ltd.	KAWAI TPS	Private	Rajasthan	Non-NCR	2	660	**24-12-2013**			N								6-30-2020	30/06/2020	N	0	NIT to be issued soon.				Oct-18	Dec-18	Jan-19	Jun-20
26	RRVUNL	CHHABRA TPP	State Se	Rajasthan	Non-NCR	1	250	**30-10-2009**	50	80	31-12-2021	Tender Specif	300	311	31-12-2022	Tender S	600	779	12-31-2021	31/12/2021	N	0	Tender Specification under process			Sep-18				
27	RRVUNL	CHHABRA TPP	State Se	Rajasthan	Non-NCR	2	250	**04-05-2010**	50	94	31-10-2021	Tender Specif	300	590	31-12-2022	Tender S	600	784	10-31-2021	31/10/2021	N	0	Tender Specification under process			Sep-18				
28	RRVUNL	CHHABRA TPP	State Se	Rajasthan	Non-NCR	3	250	**14-09-2013**	50	65	31-08-2021	Tender Specif	300	355	31-12-2022	Tender S	600	975	8-31-2021	31/08/2021	N	0	Tender Specification under process			Sep-18				
29	RRVUNL	CHHABRA TPP	State Se	Rajasthan	Non-NCR	4	250	**30-06-2014**	50	55	31-08-2021	Tender Specif	300	415	31-12-2022	Tender S	600	896	8-31-2021	31/08/2021	N	0	Tender Specification under process			Sep-18				
30	RRVUNL	CHHABRA TPP	State Se	Rajasthan	Non-NCR	5	660	**04-04-2017**	30	67	30-04-2020	Tender Specif	100	340	31-12-2022	Tender S	100	1790	4-30-2020	30/04/2020	N	0	NIT under process				Nov-18			
31	RRVUNL	KALISINDH TPS	State Se	Rajasthan	Non-NCR	1	600	**02-05-2014**	50	43		SPM Compliar	300	254	31-12-2022	Tender S	200	1828	6-30-2021	30/06/2021	N	0	NIT under process				Nov-18			
32	RRVUNL	KALISINDH TPS	State Se	Rajasthan	Non-NCR	2	600	**06-06-2015**	50	46		SPM Compliar	300	212	31-12-2022	Tender S	200	1256	4-30-2021	30/04/2021	N	0	NIT under process				Nov-18			
33	RRVUNL	KOTA TPS	State Se	Rajasthan	Non-NCR	5	210	**26-03-1994**	100	113	31-12-2022	Tender Specif	600	375	31-12-2022	Tender S	600	576	12-31-2022	31/12/2022	N	0	Tender Specification under process			Sep-18	Sep-18			
34	RRVUNL	KOTA TPS	State Se	Rajasthan	Non-NCR	6	195	**30-07-2003**	100	102	31-12-2022	Tender Specif	600	375	31-12-2022	Tender S	600	565	12-31-2022	31/12/2022	N	0	Tender Specification under process			Sep-18	Sep-18			
35	RRVUNL	KOTA TPS	State Se	Rajasthan	Non-NCR	7	195	**30-08-2009**	50	47		SPM Compliar	600	240	31-12-2022	Tender S	600	780	10-31-2022	31/10/2022	N	0	Tender Specification under process			Sep-18	Sep-18			
36	RRVUNL	SURATGARH TPS	State Se	Rajasthan	Non-NCR	1	250	**10-05-1998**	100	96		SPM Compliar	600	325	31-12-2022	Tender S	600	880	12-31-2022	31/12/2022	N	0	Tender Specification under process			Sep-18				
37	RRVUNL	SURATGARH TPS	State Se	Rajasthan	Non-NCR	2	250	**28-03-2000**	100	85		SPM Compliar	600	492	31-12-2022	Tender S	600	948	10-31-2022	31/10/2022	N	0	Tender Specification under process			Sep-18				
38	RRVUNL	SURATGARH TPS	State Se	Rajasthan	Non-NCR	3	250	**29-10-2001**	100	92		SPM Compliar	600	322	31-12-2022	Tender S	600	911	8-31-2022	31/08/2022	N	0	Tender Specification under process			Sep-18				
39	RRVUNL	SURATGARH TPS	State Se	Rajasthan	Non-NCR	4	250	**25-03-2002**	100	87		SPM Compliar	600	242	31-12-2022	Tender S	600	925	6-30-2022	30/06/2022	N	0	Tender Specification under process			Sep-18				
40	RRVUNL	SURATGARH TPS	State Se	Rajasthan	Non-NCR	5	250	**30-06-2003**	100	90		SPM Compliar	600	298	31-12-2022	Tender S	600	890	4-30-2022	30/04/2022	N	0	Tender Specification under process			Sep-18				
41	RRVUNL	SURATGARH TPS	State Se	Rajasthan	Non-NCR	6	250	**29-08-2009**	50	44	28-02-2022	Tender Specif	300	360	31-12-2022	Tender S	600	919	2-28-2022	28/02/2022	N	0	Tender Specification under process			Sep-18				
42	Lalitpur Power Gen	LALITPUR TPS	Private	Uttar Pardesh	Non-NCR	2	660	**08-01-2016**											2-28-2021	28/02/2021	N	0	Petition was filed with UPERC for approval capital cost for installation of FGD and other associated systems. UPERC directed to approach CEA.							
43	Lalitpur Power Gen	LALITPUR TPS	Private	Uttar Pardesh	Non-NCR	3	660	**01-04-2016**											10-31-2021	31/10/2021	N	0	Petition was filed with UPERC for approval capital cost for installation of FGD and other associated systems. UPERC directed to approach CEA.							
44	Lalitpur Power Gen	LALITPUR TPS	Private	Uttar Pardesh	Non-NCR	1	660	**26-03-2016**											12-31-2020	31/12/2020	N	0	Petition was filed with UPERC for approval capital cost for installation of FGD and other associated systems. UPERC directed to approach CEA.							
45	Lanko Anpara Pow	ANPARA C TPS	Private	Uttar Pardesh	Non-NCR	1	600	**12-10-2011**			SPM Compliant								8-31-2022	31/08/2022	N	0	Tender Specification made							
46	Lanko Anpara Pow	ANPARA C TPS	Private	Uttar Pardesh	Non-NCR	2	600	**18-01-2012**			SPM Compliant								6-30-2022	30/06/2022	N	0	Tender Specification made							
47	NTPC	DADRI (NCTPP)	Central	Uttar Pardesh	NCR	1	210	**21-12-1991**			SPM Compliant								12-31-2020	31/12/2019	N	N	Dry Sorbent Injection (DSI) SYSTEM TO BE INSTALLED							
48	NTPC	DADRI (NCTPP)	Central	Uttar Pardesh	NCR	2	210	**18-12-1992**			SPM Compliant								10-31-2020	31/12/2019	N	N	Dry Sorbent Injection (DSI) SYSTEM TO BE INSTALLED							
49	NTPC	DADRI (NCTPP)	Central	Uttar Pardesh	NCR	3	210	**23-03-1993**			SPM Compliant								8-31-2020	31/12/2019	N	N	Dry Sorbent Injection (DSI) SYSTEM TO BE INSTALLED							
50	NTPC	DADRI (NCTPP)	Central	Uttar Pardesh	NCR	4	210	**24-03-1994**			SPM Compliant								6-30-2020	31/12/2019	N	N	Dry Sorbent Injection (DSI) SYSTEM TO BE INSTALLED							
51	NTPC	DADRI (NCTPP)	Central	Uttar Pardesh	NCR	5	490	**25-01-2010**			SPM Compliant	SPM Compliant				Awarded on June 18			4-30-2020	31/12/2019	N	N	Awarded on 01 Feb 18. Work in progress						Jan-18	
52	NTPC	DADRI (NCTPP)	Central	Uttar Pardesh	NCR	6	490	**16-07-2010**			SPM Compliant	SPM Compliant				Awarded on June 18			2-29-2020	31/12/2019	N	N	Awarded on 01 Feb 18. Work in progress						Jan-18	
53	NTPC	RIHAND STPS	Central	Uttar Pardesh	Non-NCR	1	500	**31-03-1988**			SPM Compliant	SPM Compliant				Combustion tuning after			2-28-2022	28/02/2022	N	N	NIT In Sep 18				Sep-18			
54	NTPC	RIHAND STPS	Central	Uttar Pardesh	Non-NCR	2	500	**05-07-1989**			SPM Compliant	SPM Compliant				Combustion tuning after			12-31-2021	31/12/2021	N	N	NIT In Sep 18				Sep-18			
55	NTPC	RIHAND STPS	Central	Uttar Pardesh	Non-NCR	3	500	**31-01-2005**			SPM Compliant	SPM Compliant				NIT In Sep' 18			10-31-2021	30/10/2021	N	N	Award in 31-08-2018						Aug-18	
56	NTPC	RIHAND STPS	Central	Uttar Pardesh	Non-NCR	4	500	**24-09-2005**			SPM Compliant	SPM Compliant				NIT In Sep' 18			4-30-2021	30/04/2021	N	N	Award in 31-08-2018						Aug-18	
57	NTPC	RIHAND STPS	Central	Uttar Pardesh	Non-NCR	5	500	**25-05-2012**			SPM Compliant	SPM Compliant				NIT In Sep' 18			2-28-2021	28/02/2021	N	N	Award in 31-08-2018						Aug-18	
58	NTPC	RIHAND STPS	Central	Uttar Pardesh	Non-NCR	6	500	**17-10-2013**			SPM Compliant	SPM Compliant				NIT In Sep' 18			12-31-2020	31/12/2020	N	N	Award in 31-08-2018						Aug-18	
59	NTPC	SINGRAULI STPS	Central	Uttar Pardesh	Non-NCR	1	200	**14-02-1982**			31-12-2021								12-31-2021	31/12/2021	N	N	NIT IN LOT-3 PLANNED IN OCT 2018							
60	NTPC	SINGRAULI STPS	Central	Uttar Pardesh	Non-NCR	2	200	**25-11-1982**			31-12-2021								12-31-2021	31/12/2021	N	N	NIT IN LOT-3 PLANNED IN OCT 2018							
61	NTPC	SINGRAULI STPS	Central	Uttar Pardesh	Non-NCR	3	200	**28-03-1983**			31-08-2021								8-31-2021	31/08/2021	N	N	NIT IN LOT-3 PLANNED IN OCT 2018							
62	NTPC	SINGRAULI STPS	Central	Uttar Pardesh	Non-NCR	4	200	**02-11-1983**			31-08-2021								8-31-2021	31/08/2021	N	N	NIT IN LOT-3 PLANNED IN OCT 2018							
63	NTPC	SINGRAULI STPS	Central	Uttar Pardesh	Non-NCR	5	200	**26-02-1984**			30-04-2021								4-30-2021	30/04/2021	N	N	NIT IN LOT-3 PLANNED IN OCT 2018							
64	NTPC	SINGRAULI STPS	Central	Uttar Pardesh	Non-NCR	6	500	**23-12-1986**			28-02-2021	Under R&M				Combustion tuning after			2-28-2021	28/02/2021	N	N	NIT In Sep 18				Sep-18			
65	NTPC	SINGRAULI STPS	Central	Uttar Pardesh	Non-NCR	7	500	**24-11-1987**			31-12-2020	Under R&M				Combustion tuning after			12-31-2020	31/12/2020	N	N	NIT In Sep 18				Sep-18			
66	NTPC	UNCHAHAR TPS	Central	Uttar Pardesh	Non-NCR	1	210	**21-11-1988**			31-12-2022								12-31-2022	31/12/2022	N	N	NIT IN LOT-3 PLANNED IN SEP 2018							
67	NTPC	UNCHAHAR TPS	Central	Uttar Pardesh	Non-NCR	2	210	**22-03-1989**			31-12-2022								12-31-2022	31/12/2022	N	N	NIT IN LOT-3 PLANNED IN SEP 2018							
68	NTPC	UNCHAHAR TPS	Central	Uttar Pardesh	Non-NCR	3	210	**27-01-1999**			31-10-2022								10-31-2022	31/10/2022	N	N	NIT IN LOT-3 PLANNED IN SEP 2018							
69	NTPC	UNCHAHAR TPS	Central	Uttar Pardesh	Non-NCR	4	210	**22-10-1999**			31-10-2022								10-31-2022	31/10/2022	N	N	NIT IN LOT-3 PLANNED IN SEP 2018							
70	NTPC	UNCHAHAR TPS	Central	Uttar Pardesh	Non-NCR	5	210	**28-09-2006**			30-04-2022								4-30-2022	30/04/2022	N	N	NIT IN LOT-2 PLANNED IN JULY 2018							
71	NTPC	UNCHAHAR TPS	Central	Uttar Pardesh	Non-NCR	6	500	**31-03-2017**			31-08-2020								8-31-2020	8-31-2020	N	N	Price bid submitted on 29.06.2018.							
72	Prayagraj Power Ge	PRAYAGRAJ TPP	Private	Uttar Pardesh	Non-NCR	1	660	**25-12-2016**			SPM Compliant								4-30-2020	30/04/2020	N	0	Feasibility Study is under process. Requsted for FGD implementation date to be postponed by 5-6 years.							
73	Prayagraj Power Ge	PRAYAGRAJ TPP	Private	Uttar Pardesh	Non-NCR	2	660	**06-09-2015**			SPM Compliant								6-30-2020	30/06/2020	N	0	Feasibility Study is under process. Requsted for FGD implementation date to be postponed by 5-6 years.							

74	Prayagraj Power Ge	PRAYAGRAJ TPP	Private	Uttar Pardesh	Non-NCR	3	660	**22-05-2017**			29-02-2020								2-29-2020	29/02/2020	N	0	Feasibility Study under progress									
75	Rosa Power Supply	ROSA TPP Ph-I	Private	Uttar Pardesh	Non-NCR	1	300	**10-02-2010**			31-12-2021								12-31-2021	31/12/2021	N	0	Tendering Under Process									
76	Rosa Power Supply	ROSA TPP Ph-I	Private	Uttar Pardesh	Non-NCR	2	300	**26-06-2010**			31-12-2021								12-31-2021	31/12/2021	N	0	Tendering Under Process									
77	Rosa Power Supply	ROSA TPP Ph-I	Private	Uttar Pardesh	Non-NCR	3	300	**28-12-2011**											10-31-2021	31/10/2021	N	0	Tendering Under Process									
78	Rosa Power Supply	ROSA TPP Ph-I	Private	Uttar Pardesh	Non-NCR	4	300	**28-03-2012**											10-31-2021	31/10/2021	N	0	Tendering Under Process									
79	UPRVUNL	ANPARA TPS	State Se	Uttar Pardesh	Non-NCR	1	210	**24-03-1986**			31-10-2022								10-31-2022	31/10/2022	N	0	Administrative approval is under process.									
80	UPRVUNL	ANPARA TPS	State Se	Uttar Pardesh	Non-NCR	2	210	**28-02-1987**			31-08-2022								8-31-2022	31/08/2022	N	0	Feasiblity Study Under Progress									
81	UPRVUNL	ANPARA TPS	State Se	Uttar Pardesh	Non-NCR	3	210	**12-03-1988**			30-06-2022								6-30-2022	30/06/2022	N	0	Feasiblity Study Under Progress									
82	UPRVUNL	ANPARA TPS	State Se	Uttar Pardesh	Non-NCR	4	500	**19-07-1993**	100	239	30-04-2022	Engagement o	600	411		Nox comp	200	675	4-30-2022	30/04/2022	N	0	Engagement of agency for pre-award services is in process									
83	UPRVUNL	ANPARA TPS	State Se	Uttar Pardesh	Non-NCR	5	500	**04-07-1994**	100	265	28-02-2022	Engagement o	600	431		Nox comp	200	687	2-28-2022	28/02/2022	N	0	Engagement of agency for pre-award services is in process									
84	UPRVUNL	ANPARA TPS	State Se	Uttar Pardesh	Non-NCR	6	500	**08-06-2015**	50	45	SPM Compliant	SPM Compliar	300	222		Nox comp	200	629	6-30-2021	30/06/2021	N	0	Bid opening planned in Sept'18						Sep-18			
85	UPRVUNL	ANPARA TPS	State Se	Uttar Pardesh	Non-NCR	7	500	**06-03-2016**	50	47	SPM Compliant	SPM Compliar	300	228		Nox comp	200	649	4-30-2021	30/04/2021	N	0	Bid opening planned in Sept'18						Sep-18			
86	UPRVUNL	HARDUAGANJ TPS	State Se	Uttar Pardesh	NCR	8	250	**27-09-2011**											12-31-2021	31/12/2019	N	0	Administrative approval is under process.									
87	UPRVUNL	HARDUAGANJ TPS	State Se	Uttar Pardesh	NCR	9	250	**25-05-2012**											10-31-2021	31/12/2019	N	0	Administrative approval is under process.									
88	UPRVUNL	OBRA TPS	State Se	Uttar Pardesh	Non-NCR	9	200	**26-10-1980**											8-31-2022	31/08/2022	N	0	Feasiblity Study Under Progress									
89	UPRVUNL	OBRA TPS	State Se	Uttar Pardesh	Non-NCR	10	200	**14-01-1979**			31-10-2022								10-31-2022	31/10/2022	N	0	Feasiblity Study Under Progress									
90	UPRVUNL	OBRA TPS	State Se	Uttar Pardesh	Non-NCR	11	200	**31-12-1977**			31-12-2022								12-31-2022	31/12/2022	N	0	Feasiblity Study Under Progress									
91	UPRVUNL	OBRA TPS	State Se	Uttar Pardesh	Non-NCR	12	200	**28-03-1981**			30-06-2022								6-30-2022	30/06/2022	N	0	Feasiblity Study Under Progress									
92	UPRVUNL	OBRA TPS	State Se	Uttar Pardesh	Non-NCR	13	200	**21-07-1982**			30-04-2022								4-30-2022	30/04/2022	N	0	Feasiblity Study Under Progress									
93	UPRVUNL	PARICHHA TPS	State Se	Uttar Pardesh	Non-NCR	3	210	**29-03-2006**			30-04-2022								4-30-2022	30/04/2022	N	0	Administrative approval is under process.									
94	UPRVUNL	PARICHHA TPS	State Se	Uttar Pardesh	Non-NCR	4	210	**28-12-2006**			30-04-2022								4-30-2022	30/04/2022	N	0	Administrative approval is under process.									
95	UPRVUNL	PARICHHA TPS	State Se	Uttar Pardesh	Non-NCR	5	250	**24-05-2012**			28-02-2022								2-28-2022	28/02/2022	N	0	Administrative approval is under process.									
96	UPRVUNL	PARICHHA TPS	State Se	Uttar Pardesh	Non-NCR	6	250	**11-03-2013**			31-12-2021								12-31-2021	31/12/2021	N	0	Administrative approval is under process.									
97	NTPC	Meja STPP	Central	Uttar Pardesh	Non-NCR	1	660	**30-03-2018**													N	0	FGD will award in LOT-1A of NTPC									

Sr. No.	Developer	Name of Project	Sector	State	Region	Unit No	Unit Capacity	DATE of COMMISSIONING (MM/DD/YYYY)	ESP Phasing plan for implementatio	Current SPM (mg/Nm3)	SPM Norms (mg/Nm3)	Current Status
1	NTPC	KAHALGAON TPS	Central	Bihar	ER	1	210	**31-03-1992**	12-31-2022			0
2	NTPC	KAHALGAON TPS	Central	Bihar	ER	2	210	**17-03-1994**	12-31-2022			0
3	NTPC	KAHALGAON TPS	Central	Bihar	ER	3	210	**24-03-1995**	12-31-2022			0
4	NTPC	KAHALGAON TPS	Central	Bihar	ER	4	210	**18-03-1996**	12-31-2022			0
5	NTPC	NABI NAGAR TPP	Central	Bihar	ER	2	250	**04-04-2017**	12-31-2022			
6	NTPC & Biha	MUZAFFARPUR TPS	Central	Bihar	ER	3	195	**31-03-2015**	12-31-2022			0
7	NTPC & Biha	MUZAFFARPUR TPS	Central	Bihar	ER	4	195	**24-03-2017**	12-31-2022			
8	D.V.C	BOKARO `A` TPS	Central	Jharkhand	ER	1	500	**22-03-2016**	6-30-2022			0
9	TenughatVN	TENUGHAT TPS	State Se	Jharkhand	ER	1	210	**14-04-1994**	12-31-2020			0
10	Ind barath	IND BARATH TPP	Private	Odisha	ER	1	350	**25-02-2016**	3-31-2022			0
11	NTPC	TALCHER STPS	Central	Odisha	ER	5	500	**13-05-2004**	12-31-2022			0
12	NTPC	TALCHER STPS	Central	Odisha	ER	6	500	**06-02-2005**	12-31-2022			0
13	OPGCLtd	IB VALLEY TPS	State Se	Odisha	ER	1	210	**02-06-1994**	9-30-2021			The original design is for achieving 50 mg/Nm3. Flu gas conditioning system will be implemented for further SPM reduction. Feasibility study completed by consultant Blach & Veach. Thew expected date of award of Environment retrofit EPC contract is by 28 Dec. 2018.
14	OPGCLtd	IB VALLEY TPS	State Se	Odisha	ER	2	210	**22-10-1995**	9-30-2021			0
15	D.P.L.	D.P.L. TPS	State Se	West Bengal	ER	6	110	**03-07-1985**	3-31-2022			0
16	D.P.L.	D.P.L. TPS	State Se	West Bengal	ER	7	300	**24-11-2007**	6-30-2022			0
17	D.P.L.	D.P.L. TPS EXT.	State Se	West Bengal	ER	8	250	**31-03-2014**	3-31-2022			0
18	D.V.C	MEJIA TPS	Central	West Bengal	ER	1	210	**01-03-1996**	12-31-2022			0
19	D.V.C	MEJIA TPS	Central	West Bengal	ER	2	210	**24-03-1997**	12-31-2022			0
20	D.V.C	MEJIA TPS	Central	West Bengal	ER	3	210	**25-03-1998**	12-31-2022			0
21	D.V.C	MEJIA TPS	Central	West Bengal	ER	4	210	**12-10-2004**	12-31-2022			0
22	D.V.C	MEJIA TPS	Central	West Bengal	ER	5	250	**01-10-2007**	12-31-2022			0
23	D.V.C	MEJIA TPS	Central	West Bengal	ER	6	250	**31-03-2007**	12-31-2022			0
24	D.V.C	MEJIA TPS	Central	West Bengal	ER	7	500	**30-09-2010**	9-30-2021			0
25	D.V.C	MEJIA TPS	Central	West Bengal	ER	8	500	**26-03-2011**	9-30-2021			0
26	NTPC	FARAKKA STPS	Central	West Bengal	ER	1	200	**01-01-1986**	12-31-2022			0
27	NTPC	FARAKKA STPS	Central	West Bengal	ER	4	500	**25-09-1992**	12-31-2022			0
28	NTPC	FARAKKA STPS	Central	West Bengal	ER	5	500	**16-02-1994**	12-31-2022			0
29	NTPC	FARAKKA STPS	Central	West Bengal	ER	6	500	**07-03-2011**	12-31-2022			0
30	WBPDC	KOLAGHAT TPS	State Se	West Bengal	ER	1	210	**16-01-1993**	6-30-2022			Unit-3 completed in 2018, then unit-2 & finally unit-1
31	WBPDC	KOLAGHAT TPS	State Se	West Bengal	ER	2	210	**13-08-1990**	3-31-2021			Unit-3 completed in 2018, then unit-2 & finally unit-1
32	WBPDC	KOLAGHAT TPS	State Se	West Bengal	ER	3	210	**16-12-1985**	9-30-2021			0
33	WBPDC	KOLAGHAT TPS	State Se	West Bengal	ER	4	210	**24-01-1984**	3-31-2022			0
34	WBPDC	KOLAGHAT TPS	State Se	West Bengal	ER	5	210	**28-12-1993**	6-30-2021			0
35	WBPDC	KOLAGHAT TPS	State Se	West Bengal	ER	6	210	**17-03-1991**	12-31-2021			0

36	WBPDC	SAGARDIGHI TPS	State Se	West Bengal	ER	1	300	**20-07-2008**	12-31-2020			Tentative Order Placement: Nov. 2018, Tentative Material Received: June 2019, Date of Retrofitting: Aug.-Sep. 2020
37	WBPDC	SAGARDIGHI TPS	State Se	West Bengal	ER	2	300	**21-12-2007**	3-31-2021			Tentative Order Placement: Nov. 2018, Tentative Material Received:April 2020 Date of Retrofitting: July-Aug. 2020
38	WBPDC	SANTALDIH TPS	State Se	West Bengal	ER	5	250	**07-11-2007**	3-31-2021			Tentative Order Placement: May 2018 Tentative Material Received:May 2019 Date of Retrofitting:Nov-Dec. 2019
39	WBPDC	SANTALDIH TPS	State Se	West Bengal	ER	6	250	**29-06-2011**	12-31-2021			Tentative Order Placement: May 2018, Tentative Material Received:April 2020 Date of Retrofitting:Aug-Sep. 2020
40	HGPCorpn	PANIPAT TPS	State Se	Haryana	NR	7	250	**28-09-2004**	2-28-2021			1. The overhauling of ESP fields in respect of unit- 7 & 8 has already been carried out nad now all the ESP fields are in working order. Afger the overhauling of ESP, the value of SPM is within rooms. The ammonia Flue Gas Conditioning (AFGC) system will also be commissioned shortly. 2. Action has also been initaited for installation of FGD to control SOx levels which will further reduce the SPM levels. Necessary action for retrofitting of ESP, if required, shall be taken after installantion of FGD.
41	HGPCorpn	PANIPAT TPS	State Se	Haryana	NR	8	250	**28-01-2005**	12-31-2020			1. The overhauling of ESP fields in respect of unit- 7 & 8 has already been carried out nad now all the ESP fields are in working order. Afger the overhauling of ESP, the value of SPM is within rooms. The ammonia Flue Gas Conditioning (AFGC) system will also be commissioned shortly. 2. Action has also been initaited for installation of FGD to control SOx levels which will further reduce the SPM levels. Necessary action for retrofitting of ESP, if required, shall be taken after installantion of FGD.

42	HGPCorpn	RAJIV GANDHI TPS	State S	Haryana	NR	1	600	**31-03-2010**	4-30-2022			Two nos. ESP fields in respect of unit-1 are not in servuce and case for rectification of these fields from OEM i.e. SEC, Chiena is under final stage of award. The work shall be got executed fuing forthcoming annual overhauling of unit. 2. The overhauling of ESP in respect of unit-2 has already been carried out and all the ESP fields are in working order. 3. Action has also been initiated for installation of FGD to contorl SOx levels which will further reduce the SPM levels. Necessary action for retrofitttting of ESP, if required, shall be taken after installation of FGD.
43	HGPCorpn	RAJIV GANDHI TPS	State S	Haryana	NR	2	600	**01-10-2010**	2-28-2022			0

44	HGPCorpn	YAMUNA NAGAR TPS	State Se	Haryana	NR	1	300	**01-11-2007**	12-31-2021			The work for revival of ESP field of Unit-1 & 2 has been awarded to M/s GE power India Ltd. The work of unit-1 has already been completed on 05.05.2018 and SPM values are within limits. The complete material for unit-2 received at stie and work shall be executed during forthcoming annual overhauling. The firm has been asked for a guarantee of 50mg/ Nm 3 as SPM values after revival of field. Further, installation of FGD will also have additional reduction in SPM values.
45	HGPCorpn	YAMUNA NAGAR TPS	State Se	Haryana	NR	2	300	**29-03-2008**	10-31-2021			0
46	NTPC	INDIRA GANDHI STPP	Central	Haryana	NR	1	500	**31-10-2010**	10-31-2020			complied with ESP norms
47	NTPC	INDIRA GANDHI STPP	Central	Haryana	NR	2	500	**05-11-2011**	4-30-2020			0
48	NTPC	INDIRA GANDHI STPP	Central	Haryana	NR	3	500	**07-11-2012**	2-29-2020			0
49	PSEB	GH TPS (LEH.MOH.)	State Se	Punjab	NR	1	210	**29-12-1997**	4-30-2022			0
50	PSEB	GH TPS (LEH.MOH.)	State Se	Punjab	NR	2	210	**16-10-1998**	4-30-2022			0
51	PSEB	GH TPS (LEH.MOH.)	State Se	Punjab	NR	3	250	**03-01-2008**	2-28-2022			0
52	PSEB	GH TPS (LEH.MOH.)	State Se	Punjab	NR	4	250	**31-07-2008**	2-28-2022			
53	JSW Rajwes	JALIPA KAPURDI TPP	Private	Rajasthan	NR	1	135	**16-10-2009**	12-31-2022			
54	JSW Rajwes	JALIPA KAPURDI TPP	Private	Rajasthan	NR	2	135	**08-07-2010**	12-31-2022			
55	JSW Rajwes	JALIPA KAPURDI TPP	Private	Rajasthan	NR	3	135	**02-11-2011**	8-31-2022			
56	JSW Rajwes	JALIPA KAPURDI TPP	Private	Rajasthan	NR	4	135	**23-11-2011**	8-31-2022			
57	JSW Rajwes	JALIPA KAPURDI TPP	Private	Rajasthan	NR	5	135	**05-02-2013**	4-30-2022			
58	JSW Rajwes	JALIPA KAPURDI TPP	Private	Rajasthan	NR	6	135	**03-03-2013**	4-30-2022			
59	JSW Rajwes	JALIPA KAPURDI TPP	Private	Rajasthan	NR	7	135	**16-03-2013**	12-31-2021			
60	JSW Rajwes	JALIPA KAPURDI TPP	Private	Rajasthan	NR	8	135	**28-02-2013**	12-31-2021			
61	NEYVELI LI(	BARSINGSAR LIGNITE	Central	Rajasthan	NR	1	125	**28-06-2010**	8-31-2020			
62	NEYVELI LI(	BARSINGSAR LIGNITE	Central	Rajasthan	NR	2	125	**25-01-2011**	4-30-2020			
63	RRVUNL	CHHABRA TPP	State Se	Rajasthan	NR	1	250	**30-10-2009**	12-31-2021			0
64	RRVUNL	CHHABRA TPP	State Se	Rajasthan	NR	2	250	**04-05-2010**	10-31-2021			0
65	RRVUNL	CHHABRA TPP	State Se	Rajasthan	NR	3	250	**14-09-2013**	8-31-2021			0
66	RRVUNL	CHHABRA TPP	State Se	Rajasthan	NR	4	250	**30-06-2014**	8-31-2021			0
67	RRVUNL	CHHABRA TPP	State Se	Rajasthan	NR	5	660	**04-04-2017**	4-30-2020			
68	RRVUNL	KOTA TPS	State Se	Rajasthan	NR	5	210	**26-03-1994**	12-31-2022			0
69	RRVUNL	KOTA TPS	State Se	Rajasthan	NR	6	195	**30-07-2003**	12-31-2022			0
70	RRVUNL	SURATGARH TPS	State Se	Rajasthan	NR	6	250	**29-08-2009**	2-28-2022			0
71	Bajaj Power	BARKHERA TPS	Private	Uttar Pardes	NR	1	45	**06-11-2011**	9-30-2021			
72	Bajaj Power	BARKHERA TPS	Private	Uttar Pardes	NR	2	45	**28-01-2012**	3-31-2021			
73	Bajaj Power	KHAMBARKHERA TPS	Private	Uttar Pardes	NR	1	45	**17-10-2011**	9-30-2021			
74	Bajaj Power	KHAMBARKHERA TPS	Private	Uttar Pardes	NR	2	45	**28-11-2011**	9-30-2021			
75	Bajaj Power	KUNDARKI TPS	Private	Uttar Pardes	NR	1	45	**10-01-2012**	9-30-2021			
76	Bajaj Power	KUNDARKI TPS	Private	Uttar Pardes	NR	2	45	**29-02-2012**	3-31-2021			
77	Bajaj Power	MAQSOODPUR TPS	Private	Uttar Pardes	NR	1	45	**03-11-2011**	9-30-2021			
78	Bajaj Power	MAQSOODPUR TPS	Private	Uttar Pardes	NR	2	45	**21-01-2012**	3-31-2021			
79	Bajaj Power	UTRAULA TPS	Private	Uttar Pardes	NR	1	45	**21-02-2012**	9-30-2021			

80	Bajaj Power	UTRAULA TPS	Private	Uttar Pardes	NR	2	45	**19-03-2012**	3-31-2021			
81	NTPC	RIHAND STPS	Central	Uttar Pardes	NR	1	500	**31-03-1988**	2-28-2022			0
82	NTPC	RIHAND STPS	Central	Uttar Pardes	NR	2	500	**05-07-1989**	12-31-2021			0
83	NTPC	RIHAND STPS	Central	Uttar Pardes	NR	3	500	**31-01-2005**	10-31-2021			0
84	NTPC	RIHAND STPS	Central	Uttar Pardes	NR	4	500	**24-09-2005**	4-30-2021			0
85	NTPC	SINGRAULI STPS	Central	Uttar Pardes	NR	1	200	**14-02-1982**	12-31-2021			0
86	NTPC	SINGRAULI STPS	Central	Uttar Pardes	NR	2	200	**25-11-1982**	12-31-2021			0
87	NTPC	SINGRAULI STPS	Central	Uttar Pardes	NR	3	200	**28-03-1983**	8-31-2021			0
88	NTPC	SINGRAULI STPS	Central	Uttar Pardes	NR	4	200	**02-11-1983**	8-31-2021			0
89	NTPC	SINGRAULI STPS	Central	Uttar Pardes	NR	5	200	**26-02-1984**	4-30-2021			0
90	NTPC	SINGRAULI STPS	Central	Uttar Pardes	NR	6	500	**23-12-1986**	2-28-2021			0
91	NTPC	SINGRAULI STPS	Central	Uttar Pardes	NR	7	500	**24-11-1987**	12-31-2020			Statuatory limts being complied
92	NTPC	UNCHAHAR TPS	Central	Uttar Pardes	NR	1	210	**21-11-1988**	12-31-2022			0
93	NTPC	UNCHAHAR TPS	Central	Uttar Pardes	NR	2	210	**22-03-1989**	12-31-2022			0
94	NTPC	UNCHAHAR TPS	Central	Uttar Pardes	NR	3	210	**27-01-1999**	10-31-2022			0
95	NTPC	UNCHAHAR TPS	Central	Uttar Pardes	NR	4	210	**22-10-1999**	10-31-2022			0
96	NTPC	UNCHAHAR TPS	Central	Uttar Pardes	NR	5	210	**28-09-2006**	4-30-2022			0
97	NTPC	UNCHAHAR TPS	Central	Uttar Pardes	NR	6	500	**31-03-2017**	8-31-2020			
98	Prayagraj Po	PRAYAGRAJ TPP	Private	Uttar Pardes	NR	3	660	**22-05-2017**	2-29-2020			
99	Rosa Power	ROSA TPP Ph-I	Private	Uttar Pardes	NR	1	300	**10-02-2010**	12-31-2021			0
100	Rosa Power	ROSA TPP Ph-I	Private	Uttar Pardes	NR	2	300	**26-06-2010**	12-31-2021			0
101	UPRVUNL	ANPARA TPS	State Se	Uttar Pardes	NR	1	210	**24-03-1986**	10-31-2022			0
102	UPRVUNL	ANPARA TPS	State Se	Uttar Pardes	NR	2	210	**28-02-1987**	8-31-2022			0
103	UPRVUNL	ANPARA TPS	State Se	Uttar Pardes	NR	3	210	**12-03-1988**	6-30-2022			0
104	UPRVUNL	ANPARA TPS	State Se	Uttar Pardes	NR	4	500	**19-07-1993**	4-30-2022			0
105	UPRVUNL	ANPARA TPS	State Se	Uttar Pardes	NR	5	500	**04-07-1994**	2-28-2022			0
106	UPRVUNL	ANPARA TPS	State Se	Uttar Pardes	NR	7	500	**06-03-2016**	4-30-2021			0
107	UPRVUNL	OBRA TPS	State Se	Uttar Pardes	NR	10	200	**14-01-1979**	10-31-2022			0
108	UPRVUNL	OBRA TPS	State Se	Uttar Pardes	NR	11	200	**31-12-1977**	12-31-2022			0
109	UPRVUNL	OBRA TPS	State Se	Uttar Pardes	NR	12	200	**28-03-1981**	6-30-2022			R&M under progress
110	UPRVUNL	OBRA TPS	State Se	Uttar Pardes	NR	13	200	**21-07-1982**	4-30-2022			0
111	UPRVUNL	PARICHHA TPS	State Se	Uttar Pardes	NR	3	210	**29-03-2006**	4-30-2022			0
112	UPRVUNL	PARICHHA TPS	State Se	Uttar Pardes	NR	4	210	**28-12-2006**	4-30-2022			0
113	UPRVUNL	PARICHHA TPS	State Se	Uttar Pardes	NR	5	250	**24-05-2012**	2-28-2022			0
114	UPRVUNL	PARICHHA TPS	State Se	Uttar Pardes	NR	6	250	**11-03-2013**	12-31-2021			0
115	APGENCO	Dr. N.TATA RAO TPS	State Se	Andhra Prad	SR	7	500	**08-10-2009**	12-31-2020			0
116	APGENCO	RAYALASEEMA TPS	State Se	Andhra Prad	SR	1	210	**31-03-1994**	12-31-2021			0
117	APGENCO	RAYALASEEMA TPS	State Se	Andhra Prad	SR	2	210	**25-02-1995**	9-30-2021			0
118	APGENCO	RAYALASEEMA TPS	State Se	Andhra Prad	SR	3	210	**25-01-2007**	9-30-2020			0
119	APGENCO	RAYALASEEMA TPS	State Se	Andhra Prad	SR	4	210	**20-11-2007**	6-30-2021			0
120	APGENCO	RAYALASEEMA TPS	State Se	Andhra Prad	SR	5	210	**31-12-2010**	6-30-2020			0
121	APPDCL	DAMODARAM SANJEE	State Se	Andhra Prad	SR	1	800	**28-08-2014**	12-31-2020			0
122	APPDCL	DAMODARAM SANJEE	State Se	Andhra Prad	SR	2	800	**17-03-2015**	12-31-2019			0
123	NTPC	SIMHADRI	Central	Andhra Prad	SR	3	500	**29-03-2011**	9-30-2022			0
124	NTPC	SIMHADRI	Central	Andhra Prad	SR	4	500	**30-03-2012**	12-31-2022			0
125	Jindal (Pvt (	TORANGALLU TPS EX	Private	Karnataka	SR	1	300	**23-04-2009**	6-30-2022			0
126	Jindal (Pvt (	TORANGALLU TPS EX	Private	Karnataka	SR	2	300	**24-08-2009**	9-30-2022			0

127	KPCL	RAICHUR TPS	State Se	Karnataka	SR	1	210	**29-03-1985**	3-31-2021			FGD will reduce SPM level also. Various technical proposal received against EOI, same are under consideration. KPCL has engaged a consultant to explore the technologies to meet the new norms. The consultant has submitted feasibilty report/ DPR. The same has been pu up to HQ.
128	KPCL	RAICHUR TPS	State Se	Karnataka	SR	2	210	**02-03-1986**	6-30-2021			0
129	KPCL	RAICHUR TPS	State Se	Karnataka	SR	3	210	**30-03-1991**	9-30-2021			FGD will reduce SPM level also. Various technical proposal received against EOI, same are under consideration.
130	KPCL	RAICHUR TPS	State Se	Karnataka	SR	4	210	**29-09-1994**	12-31-2021			0
131	KPCL	RAICHUR TPS	State Se	Karnataka	SR	5	210	**31-01-1999**	3-31-2022			FGD will reduce SPM level also. Various technical proposal received against EOI, same are under consideration.
132	KPCL	RAICHUR TPS	State Se	Karnataka	SR	6	210	**22-07-1999**	6-30-2022			0
133	KPCL	RAICHUR TPS	State Se	Karnataka	SR	7	210	**11-12-2002**	9-30-2022			0
134	KPCL	RAICHUR TPS	State Se	Karnataka	SR	8	250	**26-06-2010**	12-31-2022			0
135	KPCL	YERMARUS TPP	State Se	Karnataka	SR	2	800	**29-03-2017**	12-31-2022			
136	NTPC	KUDGI	Central	Karnataka	SR	2	800	**23-03-2017**	9-30-2022			
137	NLC + TANG	TUTICORIN (JV) TPP	Central	Tamil Nadu	SR	1	500	**10-03-2015**	12-31-2021			Administrative approval proposal under scrutiny
138	NLC + TANG	TUTICORIN (JV) TPP	Central	Tamil Nadu	SR	2	500	**09-07-2015**	6-30-2020			0
139	TANGEDCO	METTUR TPS	State Se	Tamil Nadu	SR	1	210	**04-01-1987**	3-31-2021			
140	TANGEDCO	METTUR TPS	State Se	Tamil Nadu	SR	2	210	**01-12-1987**	6-30-2021			
141	TANGEDCO	METTUR TPS	State Se	Tamil Nadu	SR	3	210	**22-03-1989**	9-30-2021			
142	TANGEDCO	METTUR TPS	State Se	Tamil Nadu	SR	4	210	**27-03-1990**	12-31-2021			
143	TANGEDCO	NORTH CHENNAI TPS	State Se	Tamil Nadu	SR	1	210	**25-10-1994**	12-31-2022			0
144	TANGEDCO	NORTH CHENNAI TPS	State Se	Tamil Nadu	SR	2	210	**27-03-1995**	6-30-2022			0
145	TANGEDCO	NORTH CHENNAI TPS	State Se	Tamil Nadu	SR	3	210	**24-02-1996**	3-31-2022			0
146	NTPC	RAMAGUNDEM STPS	Central	Telangana	SR	2	200	**29-05-1984**	3-31-2022			0
147	NTPC	RAMAGUNDEM STPS	Central	Telangana	SR	4	500	**26-06-1988**	6-30-2022			0
148	NTPC	RAMAGUNDEM STPS	Central	Telangana	SR	5	500	**26-03-1989**	9-30-2022			0
149	NTPC	RAMAGUNDEM STPS	Central	Telangana	SR	6	500	**16-10-1989**	9-30-2022			0
150	NTPC	RAMAGUNDEM STPS	Central	Telangana	SR	7	500	**26-09-2004**	12-31-2022			0
151	TSGENCO	KAKATIYA TPS	State Se	Telangana	SR	1	500	**27-05-2010**	3-31-2020			0
152	TSGENCO	KOTHAGUDEM TPS (N	State Se	Telangana	SR	11	500	**26-06-2011**	9-30-2019			Feasibility study is in progress by BHEL
153	Bharat Alum	BALCO TPS	Private	Chhatisgarh	WR	1	300	**04-06-2015**	9-30-2021			0
154	Bharat Alum	BALCO TPS	Private	Chhatisgarh	WR	2	300	**24-03-2016**	6-30-2021			0
155	NTPC	KORBA STPS	Central	Chhatisgarh	WR	1	200	**28-02-1983**	12-31-2022			0
156	NTPC	KORBA STPS	Central	Chhatisgarh	WR	2	200	**31-10-1983**	12-31-2022			0
157	NTPC	KORBA STPS	Central	Chhatisgarh	WR	4	500	**31-05-1987**	12-31-2022			0
158	NTPC	KORBA STPS	Central	Chhatisgarh	WR	5	500	**25-03-1988**	12-31-2022			0
159	SKS Power (	Binjkote TPP	Private	Chhatisgarh	WR	1	300	**25-04-2017**	9-30-2020			
160	GIPCL	SURAT LIG. TPS	Private	Gujarat	WR	3	125	**12-04-2010**	9-30-2020			

161	GIPCL	SURAT LIG. TPS	Private	Gujarat	WR	4	125	**23-04-2010**	12-31-2020			
162	GMD Corpn.	AKRIMOTA LIG TPS	State Se	Gujarat	WR	1	125	**31-03-2005**	9-30-2020			
163	GMD Corpn.	AKRIMOTA LIG TPS	State Se	Gujarat	WR	2	125	**19-12-2005**	12-31-2020			
164	GSECL	KUTCH LIG. TPS	State Se	Gujarat	WR	1	70	**29-03-1990**	12-31-2021			Order for feasibility study and DPR issued on 08-02-2018 and consultant has submitted draft feasibility report, DPR expected by Sep., 2018.
165	GSECL	KUTCH LIG. TPS	State Se	Gujarat	WR	2	70	**25-03-1991**	12-31-2021			0
166	GSECL	KUTCH LIG. TPS	State Se	Gujarat	WR	3	75	**31-03-1997**	12-31-2021			0
167	GSECL	KUTCH LIG. TPS	State Se	Gujarat	WR	4	75	**01-10-2009**	12-31-2020			
168	GSECL	UKAI TPS	State Se	Gujarat	WR	3	200	**21-01-1979**	12-31-2021			completed on 26-04-2016
169	GSECL	UKAI TPS	State Se	Gujarat	WR	4	200	**28-03-1979**	12-31-2021			completed on 04-05-2017
170	GSECL	UKAI TPS	State Se	Gujarat	WR	5	210	**30-01-1985**	12-31-2021			completed on 28-03-2017
171	GSECL	UKAI TPS	State Se	Gujarat	WR	6	500	**05-03-2013**	3-31-2022			complied with ESP norms
172	GSECL	WANAKBORI TPS	State Se	Gujarat	WR	1	210	**23-03-1982**	12-31-2021			completed on 07-03-2017
173	GSECL	WANAKBORI TPS	State Se	Gujarat	WR	2	210	**15-01-1983**	12-31-2021			completed on 08-05-2018
174	GSECL	WANAKBORI TPS	State Se	Gujarat	WR	3	210	**15-03-1984**	12-31-2021			completed on 27-11-2017
175	GSECL	WANAKBORI TPS	State Se	Gujarat	WR	4	210	**09-03-1986**	12-31-2021			Offer asked from various vendors for upgradation of ESP by replacement of rectifier transformer.
176	GSECL	WANAKBORI TPS	State Se	Gujarat	WR	5	210	**23-09-1986**	12-31-2021			0
177	GSECL	WANAKBORI TPS	State Se	Gujarat	WR	6	210	**18-11-1987**	12-31-2021			0
178	GSECL	WANAKBORI TPS	State Se	Gujarat	WR	7	210	**31-12-1998**	12-31-2021			complied with ESP norms
179	MPPGCL	AMARKANTAK EXT TP	State Se	Madhya Prad	WR	5	210	**15-06-2008**	3-31-2021			0
180	MPPGCL	SANJAY GANDHI TPS	State Se	Madhya Prad	WR	1	210	**26-03-1993**	3-31-2021			Order placed on FITCHNER Consulting Ltd. For Implementation Plan fror FGD and other equipment in April.NIT to be Floated in June 2018. Order will be placed by Dec 2018. Completion by June 2021
181	MPPGCL	SANJAY GANDHI TPS	State Se	Madhya Prad	WR	2	210	**27-03-1993**	3-31-2021			0
182	MPPGCL	SANJAY GANDHI TPS	State Se	Madhya Prad	WR	3	210	**28-02-1999**	6-30-2021			0
183	MPPGCL	SANJAY GANDHI TPS	State Se	Madhya Prad	WR	4	210	**23-11-1999**	6-30-2021			0
184	MPPGCL	SANJAY GANDHI TPS	State Se	Madhya Prad	WR	5	500	**18-06-2007**	3-31-2021			0
185	MPPGCL	SATPURA TPS	State Se	Madhya Prad	WR	10	250	**22-03-2013**	3-31-2021			0
186	MPPGCL	SATPURA TPS	State Se	Madhya Prad	WR	11	250	**25-12-2013**	3-31-2021			0
187	NTPC	VINDHYACHAL STPS	Central	Madhya Prad	WR	1	210	**10-10-1987**	12-31-2022			0
188	NTPC	VINDHYACHAL STPS	Central	Madhya Prad	WR	2	210	**23-07-1988**	12-31-2022			0
189	NTPC	VINDHYACHAL STPS	Central	Madhya Prad	WR	3	210	**03-02-1989**	12-31-2022			0
190	NTPC	VINDHYACHAL STPS	Central	Madhya Prad	WR	4	210	**26-12-1989**	12-31-2022			0
191	NTPC	VINDHYACHAL STPS	Central	Madhya Prad	WR	5	210	**31-03-1990**	12-31-2022			0
192	NTPC	VINDHYACHAL STPS	Central	Madhya Prad	WR	6	210	**01-02-1991**	12-31-2022			0
193	NTPC	VINDHYACHAL STPS	Central	Madhya Prad	WR	9	500	**27-07-2006**	9-30-2021			0
194	NTPC	VINDHYACHAL STPS	Central	Madhya Prad	WR	10	500	**08-03-2007**	9-30-2021			0
195	MAHAGENC	BHUSAWAL TPS	State Se	Maharashtra	WR	4	500	**07-03-2012**	3-31-2021			0
196	MAHAGENC	BHUSAWAL TPS	State Se	Maharashtra	WR	5	500	**30-03-2012**	3-31-2021			0
197	MAHAGENC	CHANDRAPUR STPS	State Se	Maharashtra	WR	8	500	**29-03-2015**	3-31-2021			0

198	MAHAGENC	KHAPARKHEDA TPS	State Se	Maharashtra	WR	1	210	**26-03-1989**	3-31-2021			ESP upgradation is already under process.
199	MAHAGENC	KHAPARKHEDA TPS	State Se	Maharashtra	WR	2	210	**08-01-1990**	3-31-2021			Mahagenco will implement FGD installation first. If SPM level still remains high in some units, then ESP upgradation may be considered.
200	MAHAGENC	KHAPARKHEDA TPS	State Se	Maharashtra	WR	3	210	**31-05-2000**	3-31-2021			0
201	MAHAGENC	KORADI TPS	State Se	Maharashtra	WR	7	210	**13-01-1983**	3-31-2021			Mahagenco will implement FGD installation first. If SPM level still remains high in some units, then ESP upgradation may be considered.
202	MAHAGENC	KORADI TPS	State Se	Maharashtra	WR	10	660	**28-12-2016**	12-31-2020			0
203	MAHAGENC	NASIK TPS	State Se	Maharashtra	WR	4	210	**10-07-1980**	3-31-2021			0
204	MAHAGENC	NASIK TPS	State Se	Maharashtra	WR	5	210	**30-01-1981**	3-31-2021			0
205	MAHAGENC	PARAS TPS	State Se	Maharashtra	WR	3	250	**31-05-2007**	3-31-2021			
206	MAHAGENC	PARAS TPS	State Se	Maharashtra	WR	4	250	**27-03-2010**	3-31-2021			
207	MAHAGENC	PARLI TPS	State Se	Maharashtra	WR	4	210	**26-03-1985**	3-31-2021			0
208	MAHAGENC	PARLI TPS	State Se	Maharashtra	WR	6	250	**16-02-2007**	3-31-2021			0
209	MAHAGENC	PARLI TPS	State Se	Maharashtra	WR	7	250	**10-02-2010**	3-31-2021			0
210	MAHAGENC	PARLI TPS	State Se	Maharashtra	WR	8	250	**30-03-2016**	3-31-2021			0
211	NTPC	MOUDA TPS	Central	Maharashtra	WR	2	500	**29-03-2013**	12-31-2022			0
212	NTPC	MOUDA TPS	Central	Maharashtra	WR	3	660	**28-03-2016**	12-31-2022			0
213	NTPC	MOUDA TPS	Central	Maharashtra	WR	4	660	**18-03-2017**	12-31-2020			
214	NTPC	SOLAPUR	Central	Maharashtra	WR	1	660	**07-04-2017**	12-31-2020			
215	Ratan Power	NASIK (P) TPS	Private	Maharashtra	WR	1	270	**25-02-2014**	3-31-2021			0
216	Ratan Power	NASIK (P) TPS	Private	Maharashtra	WR	2	270	**15-02-2017**	3-31-2021			
217	Ratan Power	NASIK (P) TPS	Private	Maharashtra	WR	3	270	**14-04-2017**	12-31-2022			
218	Ratan Power	NASIK (P) TPS	Private	Maharashtra	WR	4	270	**19-05-2017**	12-31-2022			
219	Ratan Power	NASIK (P) TPS	Private	Maharashtra	WR	5	270	**30-05-2017**	12-31-2022			
220	TATA Power	TROMBAY TPS	Private	Maharashtra	WR	5	500	**25-01-1984**	3-31-2018			

Annexure-B19.1

Station : Anta for 01.10.2018

Block No	Time	DC	Total SG	SG to be corrected	Remark
1	00:00	260	241	**246**	**Revision No. 80 @ 21:22 hrs SG changed retrospectively from block No. 1 to 86. Hence SG to be done as per revision No. 79**
2	00:15	260	254	**260**	
3	00:30	260	254	**260**	
4	00:45	260	254	**260**	
5	01:00	260	254	**260**	
6	01:15	260	254	**260**	
7	01:30	260	254	**260**	
8	01:45	260	254	**260**	
9	02:00	261	255	**261**	
10	02:15	261	255	**261**	
11	02:30	261	235	**241**	
12	02:45	261	251	**256**	
13	03:00	263	253	**259**	
14	03:15	263	254	**260**	
15	03:30	263	254	**260**	
16	03:45	263	254	**260**	
17	04:00	265	256	**262**	
18	04:15	265	257	**263**	
19	04:30	265	258	**263**	
20	04:45	265	220	**225**	
21	05:00	265	254	**259**	
22	05:15	265	254	**260**	
23	05:30	265	255	**261**	
24	05:45	265	256	**262**	
25	6:00	263	257	**263**	
26	6:15	263	220	**225**	
27	6:30	263	253	**259**	
28	6:45	263	254	**260**	
29	7:00	263	248	**254**	
30	7:15	263	249	**254**	
31	7:30	263	248	**253**	
32	7:45	263	249	**254**	
33	8:00	261	247	**252**	
34	8:15	261	247	**252**	
35	8:30	261	247	**252**	
36	8:45	261	247	**252**	
37	9:00	259	245	**250**	
38	9:15	259	245	**250**	

39	9:30	259	246	**251**	
40	9:45	259	248	**254**	
41	10:00	257	247	**253**	
42	10:15	257	248	**253**	
43	10:30	257	249	**254**	
44	10:45	257	212	**216**	
45	11:00	277	174	**178**	
51	12:30	382	202	**207**	
52	12:45	382	220	**225**	
53	13:00	379	220	**225**	
54	13:15	379	257	**263**	
55	13:30	379	294	**301**	
56	13:45	379	332	**339**	
57	14:00	376	364	**372**	
58	14:15	376	363	**371**	
59	14:30	376	362	**370**	
60	14:45	376	361	**369**	
61	15:00	373	360	**367**	
62	15:15	373	355	**361**	
63	15:30	373	360	**367**	
64	15:45	373	361	**368**	
65	16:00	375	364	**371**	
66	16:15	375	365	**371**	
67	16:30	375	364	**371**	
68	16:45	375	326	**333**	
69	17:00	378	326	**333**	
70	17:15	378	326	**333**	
71	17:30	378	371	**378**	
72	17:45	378	371	**378**	
73	18:00	380	329	**336**	
74	18:15	380	373	**380**	
75	18:30	380	373	**380**	
76	18:45	380	374	**380**	
77	19:00	383	377	**383**	
78	19:15	383	377	**383**	
79	19:30	383	377	**383**	
80	19:45	383	377	**383**	
81	20:00	386	380	**386**	
82	20:15	386	380	**386**	
83	20:30	386	380	**386**	
84	20:45	386	342	**348**	
85	21:00	386	304	**310**	
86	21:15	386	266	**272**	
87	21:30	386	229	**249**	

88	21:45	386	192	**225**	

Station : Auraiya for 01.10.18

Date	Time	Block	DC	SG	**Remark**
01-10-2018	01:00	4	630.00	309.71	SG till 14th revision 01:23 was 315 MW
01-10-2018	01:15	5	630.00	309.71	
01-10-2018	01:30	6	630.00	309.71	
01-10-2018	03:15	13	630.00	299.89	SG was 305 MW till 03:10 9th revision
01-10-2018	03:30	14	630.00	272.36	SG was 277 MW till 03:10 9th revision.
01-10-2018	03:45	15	630.00	208.45	SG was 212 MW till 03:10 9th revision.
01-10-2018	05:45	23	630.00	269.40	In 27 th revision at 5:37 Hrs SG was 274 MW
01-10-2018	06:00	24	630.00	196.64	In 27 th revision at 5:37 Hrs SG was 200 MW,
01-10-2018	06:45	27	624.00	234.99	In 30th revision at 06:34 hrs was 239 MW.
01-10-2018	12:15	49	610.00	204.51	SG was 208 MW in 50th revision at 12:10
01-10-2018	12:30	50	610.00	201.07	SG was 204 MW at 12:38 52nd revision
01-10-2018	12:45	51	610.00	268.92	SG was 273 MW at 12:38 52nd revision
01-10-2018	13:00	52	610.00	262.51	SG was 267 MW at 12:38 52nd revision
01-10-2018	13:30	54	640.00	278.31	SG was 283.05 MW at 13:21 55th revision
01-10-2018	13:45	55	640.00	364.84	SG was 371MW at 13:21 55th revision
01-10-2018	14:15	57	610.00	443.49	SG was 451 MW at 13:53 57th revision
01-10-2018	14:30	58	610.00	443.49	
01-10-2018	14:45	59	610.00	369.36	SG was 375 MW in 59 th revision at 14:39 Hrs
01-10-2018	15:45	63	610.00	380.50	SG was 387 in 62nd revision at 15:35 Hrs
01-10-2018	16:00	64	610.00	492.58	SG was 501 in 62nd revision at 15:35 Hrs
01-10-2018	16:15	65	610.00	489.63	SG was 498 MW in 63rd revision at 16:03
01-10-2018	16:45	67	610.00	469.35	SG was 472 MW in 65th revision 16;44 hrs
01-10-2018	17:00	68	610.00	461.29	SG was 463.8 MW in 65th revision 16;44 hrs
01-10-2018	17:15	69	610.00	461.29	SG was 563.8 in 66th revision at 17:03 Hrs
01-10-2018	19:15	77	615.00	609.96	SG was 615 MW, in 75th revision at 20:02 Hrs.
01-10-2018	19:30	78	615.00	609.96	
01-10-2018	19:45	79	615.00	609.96	
01-10-2018	20:00	80	615.00	609.96	
01-10-2018	20:45	83	615.00	461.81	SG was 464.32 in 77th revision at 20:40 Hrs

Annexure- B.24.1

S.No.	Generators	As per SCADA data	MVAr absorption limit s per capability curve (Unit wise)	Remarks
1	Rajpura TPS	-50 to -200	-210	Margin available/Scope of improvement/Response not continuous
2	Talwandi Saboo TPS	Data not reliable	-198	
3	Khedar TPS	-50 to-100	-180	
4	CLP Jhajjar TPS	-100to -140	-198	
5	Suratgarh TPS	Data not reliable	-75	Telemetry issues
6	Chhabra TPS	Data not reliable	-75	Margin available/Scope of improvement /Response not continuous
7	Kawai TPS	-100 to -120	-198	
8	Kalisindh TPS	-100 to -120	-180	
9	Bara TPS	Data not reliable	-198	
10	Rosa TPS	Data not reliable	-90	
11	Anpara-C TPS	~ -50	-150	
12	Lalitpur TPS	~ -50	-198	
13	Dadri NCR	Data not reliable	-147	Telemetry issues
14	Jhajjar TPS	~ -100	-150	Margin available/Scope of improvement /Response not continuous
15	Singrauli TPS	~ -20-50	-150	
16	Rihand TPS	Data not reliable	-150	
17	Unchahar TPS	-20	-63	
18	Tanda TPS		-33	
19	Anta	-20		
20	Auraiya	Data not reliable		
21	Faridabad	-25		

It has been observed that telemetry of MVAr of generating units either not reliable or intermittent since long and it has been reported in regular OCC/TCC meeting also. Therefore, to expedite the rectification of MVAr telemetry, some action plan may also be discuss so that monitoring of MVAr response from generator and subsequent feedback can be shared for further improvement of generator response in reactive power management or voltage regulation.

All are requested to please check or validate the telemetry of units MVAr with field data and rectify the telemetry as soon as possible.

Annexure-B.24.2

S.No.	Generator	Trial tested	Remarks
1	Tehri Unit# 1	30.Nov 2017	At time, only one unit can operate
2	Tehri Unit # 2		
3	Chamera-2 Unit#		Issues in MVAr absorption limit
4	Chamera-2 Unit#		
5	Larji unit#2		More units can be tested

Pong BBMB has been operating in synchronous condenser mode during night hrs in Winter.

S.No.	Generator	Trial tested	Remarks
1	RSD		
2	Delhi GTs		
3	Tehri other units		
4	Chamera other units		
5	Uttarakhand gas		
6.	Kishenganga HEP		

Annexure-C.1.1

Outstanding of SJVN as on 09/10/2018 (Rs Crore)

Sr. No.	Name of Beneficiary	Outstanding beyond 60 days	LPS amount	Total	Yet to be due
1	Chandigarh	-	-	-	4.06
1	BRPL	-	-	-	7.88
2	BYPL	-	74.82	74.82	2.14
3	TDDPL	-	-	-	5.50
4	HPPC	-	-	-	11.13
5	HPSEB Ltd.	0.03	7.53	7.56	12.47
6	Govt. of HP	25.81	314.28	340.09	118.27
7	J&K	118.68	11.26	129.93	48.68
8	PSPCL	0.10	2.27	2.38	56.32
9	UPPCL	96.11	146.83	242.94	92.99
10	UPCL	-	-	-	15.10
11	Ajmer VVNL	-	-	-	5.56
12	Jaipur VVNL	-	-	-	8.12
13	Jodhpur VVNL	5.30	-	5.30	12.74
14	DTL(Arrears 2004-08)	-	12.05	12.05	-
	Grand Total	246.03	569.05	815.08	400.95

RAWATBHATA RAJASTHAN SITE									Annexure C.2.1		
DETAIL OF LC AS ON 30-09-2018											
S.No.	**SEB Name**	**LC NO**	**Opening Date**	**LC AMOUNT**	**Max. revolution allowed in a month**	**Total monthly Available LC Amt**	**Validity**	**OPERATIONAL PERIOD**	**Avg.billing**	**105 % of billing**	**Excess/ short**
1	CPDD, Chandigarh	0506217LC0000032	31-Mar-2018	3.35	1.00	3.35	31-Mar-2019	MONTHLY	4.26	₹4.47	**-1.12**
2	HPSEB, Shimla	0071818LC0000008	24-Sep-2018	3.32	1.00	3.32	31-May-2019	MONTHLY	4.11	₹4.32	**-1.00**
3	UPCL, Dehradun	0111/LC0003318	1-Apr-2018	6.94	1.00	6.94	31-Mar-2019	MONTHLY	6.46	₹6.79	**0.15**
4	HPGCL, DHaryana	,532950000110	12-Sep-2018	1.90	4.00	7.61	12-Sep-2019	WEEKLY	**17.74**	**18.63**	**-3.96**
	HPGCL, UHaryana	,0038950009013	12-Jun-2018	1.77	4.00	7.06	1-Jun-2019	WEEKLY			
5	J&K PDD, Jammu	LC NOT OPENED							16.97	₹17.82	**-17.82**
6	PSPCL, Punjab	0390ILC000517 / 2017	26-Sep-2017	7.98	4.00	31.92	16-Sep-2018	WEEKLY	35.57	₹37.35	**-5.43**
7	UPPCL (COMMON LC AT NAPS)	6288ILC00000919	5-Jul-2018	2.40	5.00	12.00	4-Jul-2019	10,16,20,25 & Last day of month	38.40	₹40.32	**-28.32**
8	DELHI TPDDL	41961LC003618	28-Mar-2018	4.42	1.00	4.42	28-Mar-2019	MONTHLY	4.71	₹4.94	**-0.52**
9	DELHI BRPL	LC NOT OPENED							6.74	₹7.08	**-7.08**
10	DELHI BYPL	LC NOT OPENED							3.90	₹4.09	**-4.09**
11	*RAJASTHAN JVVNL	6655ILCDP180009	14-May-2018	5.65	6.00	33.87	31-Mar-2019	05,10,15,20,25 & Last day of month	37.26	₹37.17	**0.00**
	*RAJASTHAN JVVNL	6600ILCP180003	4-Oct-2018	0.55	6.00	3.30	31-Mar-2019	05,10,15,20,25 & Last day of month			
12	*RAJASTHAN AVVNL	3178118LC0000099	7-Apr-2018	3.95	6.00	23.71	31-Mar-2019	05,10,15,20,25 & Last day of month	26.12	₹26.06	**0.01**
	*RAJASTHAN AVVNL	3178118LC0000306	5-Oct-2018	0.39	6.00	2.35	31-Mar-2019	05,10,15,20,25 & Last day of month			
13	*RAJASTHAN JDVVNL	3178118LC0000138	13-Apr-2018	4.52	6.00	27.10	31-Mar-2019	05,10,15,20,25 & Last day of month	29.77	₹29.69	**0.00**
	*RAJASTHAN JDVVNL	3178118LC0000305	5-Oct-2018	0.43	6.00	2.59	31-Mar-2019	05,10,15,20,25 & Last day of month			
						169.54					

Annexure D.1.1

Annual contribution awaited from following constituents for FY 2017-18

Sl. No.	Constituent Member	Amount (Rs.)
1	UT of Chandigarh, Chandigarh	10.0 lakh
2	Haryana Power Generation Company Ltd., Panchkula	
3	Dakshin Haryana Bijli Vitaran Nigam Ltd., Hisar	
4	J&K Power Development Department, Srinagar	
5	J & K State Power Development Corp. Ltd., Srinagar	
6	Madhyanchal Vidyut Vitran Nigam Ltd., Lucknow	
7	Uttarakhand Power Corporation Ltd., Dehradun	
8	Rosa Power Supply Company Ltd., Shahjahanpur	
9	Lanco Anpara Power Ltd., Gurgaon	
10	Shree Cement Limited, Bewar	
11	Prayagraj Power Generation Co Ltd., Allahabad	
12	Lalitpur Power Generation Company Limited, Noida	
	TOTAL	**1.20 crore**