Installation of 125 MVAR, 420 kV Bus Reactor at Kala Amb Substation (ISTS)

A. Project at a Glance

1. Title (Name of Scheme)	125 MVAR, 420 kV Bus Reactor at Kala Amb Substation
2. Objective / Justification	To provide Reactive Power Compensation at Kala Amb Substation in Northern Region
3. Scope	➢ 420 kV, 1x125 MVAR Bus Reactor at Kala Amb 400/220 kV Substation along with associated 420kV bus reactor bay
4. Estimated Cost	**About ₹ 35.34 Crore**
5. Estimated impact on tariff for next five years	**₹ 6 Crore/year***
6. Schematic Diagram	**Enclosed at Exhibit-I**
7. Approval of Scheme	➢ Agreed in 39th meeting of Standing Committee on Power System Planning of Northern Region held on 29-30th May, 2017, extract of MoM attached at **Annexure-I**. ➢ Agreed in 40th Northern Region Power Committee (NRPC) meeting held on 28/10/2017, extract of MoM attached at **Annexure-II.** ➢ Agreed in 2nd Meeting of Northern Region Standing Committee on Transmission held on 13/11/2018 , extract of MoM attached at **Annexure-III**. ➢ Agreed in 3rd Empowered Committee on Transmission (ECT) held on 21/12/2018, extract of MoM attached at **Annexure-IV**
8. Time frame	15 months

***** *Considering first year tariff @ 17% ** Levelized tariff may be in the range of 14 %*

Installation of 125 MVAR, 420 kV Bus Reactor at Kala Amb 400/220 kV Substation (TBCB)

1.0 TITLE (NAME OF SCHEME)

125 MVAR, 420 kV Bus Reactor at Kala Amb 400/220 kV Substation (PG-TBCB)

2.0 ESTIMATED COST

The estimated cost of the proposed transmission system: about **₹ 35.34 Cr.**

3.0 125 MVAR, 420 kV Bus Reactor at Kala Amb Substation (implemented under TBCB)

Transmission scheme includes following elements:

- 1x125 MVAR, 420 kV Bus Reactor at Kala Amb 400/220 kV (PG-TBCB) Substation along with 1 no. 420kV bus reactor bay

The schematic of the proposed transmission scheme attached at **Exhibit-I.**

4.0 OBJECTIVE AND JUSTIFICATION

After the Grid Disturbance in July'12, the need for proper reactive power management was emphasized for reliable and secure operation of the grid. The issue of reactive compensation was discussed in 29th meeting of NRPC held on 13/09/2013, wherein, it was deliberated that adequate reactive compensation need to be provided at 400 kV as well as at 220 kV level to contain the high voltages in the grid so as the opening of lines during light load conditions can be avoided.

As, during winter light load conditions in Northern Region, almost all hydro and thermal generations in Himachal Pradesh, Punjab and Haryana remains out of service most of the times and very high voltage is observed especially in Delhi, Haryana and Punjab area. It is anticipated that in future also during winter months, load generation scenario would remain same. Accordingly, studies were carried out to identify the requirement of reactive compensation at 400 kV and 220 kV voltage level after the validation of network details and load generation scenario from STUs. Based on above, number of Bus Reactors at 400 kV & 220 kV respectively were approved including 420kV, 125 MVAR bus reactor at Kala Amb (POWERGRID TBCB) S/s .

For the scope of Kala Amb Bus Reactor, complete diameter (Main-Tie Main bay) js being considered due to special requirement of GIS in line with the decision taken in the 2nd Meeting of Northern Region Standing Committee on Transmission held on 13/11/2018.

5.0 TIME FRAME/IMPLEMENTATION OF THE SCHEME

The project is to be implemented in 15 months from date of investment approval

6.0 CONSENT OF BENEFICIARIES

The transmission system was discussed, finalized in consultation with CEA and state utilities in NR. The system was agreed and approved in 39th meeting of Standing Committee on Power System Planning of Northern Region held on 29-30th May, 2017, 2nd Meeting of Northern Region Standing Committee on Transmission held on 13/11/2018, 40th Northern Region Power Committee (NRPC) meeting held on 28/10/2017 & 3rd Empowered Committee on Transmission (ECT) held on 21/12/2018.

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Annexure-I

भारत सरकार / **Government of India**
विद्युत मंत्रालय / **Ministry of Power**
केन्द्रीय विद्युत प्राधिकरण / **Central Electricity Authority**
विद्युत प्रणाली योजना एवं परियोजना मूल्यांकन प्रभाग - I
Power System Planning & Project Appraisal Division-I
सेवा भवन, आर.के.पुरम, नई दिल्ली - **110066**
Sewa Bhawan, R. K. Puram, New Delhi-110066 **[ISO: 9001:2008]**

No. 1/9/39th /PSP&A-I/2017 / 783 -802 **Dated: 28.7.2017**

-As per list enclosed-

विषय: उत्तरी क्षेत्र की विद्युत प्रणाली योजना पर स्थायी समिति की 29-30 मई 2017को आयोजित 39वीं बैठक के कार्यवृत्त

Sub: 39th Meeting of Standing Committee on Power System Planning of Northern Region held on 29-30th May, 2017- Minutes of the meeting

Sir/ Madam,

The 39th meeting of the Standing Committee on Power System Planning of Northern Region was held on 29-30th May, 2017 at NRPC conference Room, NRPC Katwaria Sarai, New Delh.

The Minutes of the meeting has been uploaded on CEA website: www.cea.nic.in (path to access – Home Page -Wing specific document/power system related reports/ Standing Committee on Power System Planning/ Northern region).

Yours faithfully,

28/7/2017

(अवधेश कुमार यादव) /(Awdhesh Kr Yadav)
निदेशक/ Director

(iv) CEA, CTU and HVPNL shall jointly study to evolve the mitigating measures for Dhanonda.

27.0 Reactive Power Compensation Requirement Studies in Northern Region and High voltage at Kurukshetra

27.1 CEA stated that after the Grid Disturbance in July 12, the need for proper reactive power management was emphasised for reliable and secure operation of the grid. The issue of reactive compensation was discussed in 29th meeting of NRPC held on 13/09/2013, wherein, it was deliberated that adequate reactive compensation need to be provided at 400kV as well as at 220 kV level to contain the high voltages in the grid so as the opening of lines during light load conditions can be avoided. Accordingly, in the meeting, it was agreed that the studies may be carried out by CTU for installation of bus reactors at 400kV and 220 kV level.

27.2 CTU stated that they had carried out system studies to identify the requirement of reactive compensation at 400kV and 220kV voltage level. The same was discussed in 32nd meeting of SCPSPNR held on 02/01/2013, wherein, total 11nos. of 125 MVAR bus reactors at 400 kV level were agreed each at Hindaun, Panchkula (PG), Sultanpur, Gorakhpur (UP), Sonepat(PG), Manesar, Kaithal, Kanpur (PG), Jaipur, Bassi and Merta. Out of these, seven reactors have already been commissioned and four are likely to be commissioned by this year. Regarding 220kV bus reactors, it was agreed that the requirement would be firmed up by CTU in consultation with the States after the validation of network details for their respective state. Subsequently, based on the data provided by STUs and data available with CTU for 2018-19, system studies were carried out. Approach to the studies and analysis has been given in detail in the agenda for 39th meeting of SCPSPNR. Studies indicated the requirement of about 400 MVAr of shunt reactors at 220kV level at following stations:

S.No.	Bus Name	State	Reactors Proposed (MVAr)
220 kV			
1	Jind (PG)	Haryana	25
2	Fatehabad (PG	Haryana	25
3	Chamera Pooling Stn.	Himachal Pradesh	2x25
4	Kishenpur	J&K	25
5	Jalandhar	Punjab	2x25
6	Nakodar	Punjab	25
7	Amritsar	Punjab	25
9	Dhuri	Punjab	25
10	Akal	Rajasthan	25
11	Suratgarh	Rajasthan	2x25
12	Bikaner	Rajasthan	2x25
13	Barmer	Rajasthan	25

27.3 CTU further stated that while carrying out the studies, requirement of additional shunt reactors at 400 kV was also observed. Accordingly, studies were also carried out for evolving the requirement of shunt reactors at 400kV level for 2018-19 conditions along with above mentioned additional reactors at 220kV level. Based on the studies, Reactors at following locations at 400kV level are proposed:

S.No.	Bus Name	State	Reactors Proposed (MVAr)
400 kV			
1	Mandola(PG)	DELHI	125
2	Hissar(PG)	HARYANA	125
3	Kala Amb (Under TBCB)	HIMACHAL	125
4	Chamera Pooling Stn. (PG)	HIMACHAL	125
5	Kishenpur(PG)	J&K	125
6	Nakodar	PUNJAB	125
7	Jullandhar(PG)	PUNJAB	125
8	Moga(PG)	PUNJAB	125
9	Dhuri	PUNJAB	125
10	Patiala(PG)	PUNJAB	125
11	Ludhiana(PG)	PUNJAB	125
12	Ajmer(PG)	RAJASTHAN	125
13	Merta	RAJASTHAN	125
14	Ratangarh	RAJASTHAN	125
15	Chittorgarh(PG)	RAJASTHAN	125
16	Suratgarh(PG)	RAJASTHAN	125
17	Parichha	UP	125
18	Allahabad(PG)	UP	125
19	Mainpuri	UP	125
20	Unnao	UP	125
21	Gonda	UP	125
22	Meerut(PG)	UP	125
23	Kashipur	UTTARAKHAND	125
24	Srinagar	UTTARAKHAND	125

27.4 CE, UPPTCL stated that UPPTCL network do not inject reactive power instead, they are absorbing the reactive power. POSOCO stated that there might be some nodes in the UPPTCL system, which are injecting the reactive power but aggregate reactive power injected by UPPTCL stystem is negative. Therefore, there may be requirement to add reactors on those nodes, which are injecting the reactive power into the grid. After deliberations, it was agreed that reactive compensation requirement in the UP system may be studied separately by CEA, CTU and UPPTCL. HVPNL representatives said that overvoltage in off peak conditions is a serious problem for the reliable operation of the grid and should not be ignored.

27.5 POSOCO stated that these studies are carried out considering all the Shunt Capacitors at 220kV and below voltage level switched off, whereas this may not be the case in actual practice. This may also be the reason for high voltages in Nortthern Region, despite having so many reactors in the system. CTU stated that the scenario studied is without considering the shunt capacitors in the system and if we consider capacitor also, the requirement of reactors would increase further.

27.6 CTU stated that transmission system planned for meeting the peak load requirement with reliability criterion. There is a huge difference in their maximum and minimum load demand. Therefore, installation of reactors is the only solution available to control high voltage during ligh load condition.

27.7 RRVPNL stated that studies needs to be carried out considering load growth as per 19th EPS. At Merta S/s, they have already one reactor and space is not avialable for the second reactor. However, they have proposed 125 MVAR reactor at Jodhpur. At

400kV Ratangarh S/s they are already having 175 MVAr reactors (125MVAr-PG+ 50 MVAr - RVPNL). In place of Ratangarh, PGCIL may install/ plan reactor at PGCIL's 400kV Sikar S/s. RRVPNL agreed for installation of one 25 MVar reactor each at 220kV level at Akal, Suratgarh, Bikaner and Barmer (already under process) subject to availability of space at these sub-stations. However, RRVPNL mentioned that they would take up implementation of 220 kV reactors at Akal and Suratgarh in first phase. The second reactor as proposed at Bikaner and Barmer would be considered in the second phase. They would apply for PSDF funding for installation of thses reactors.

27.8 PTCUL stated that they have already put up the proposal for 80 MVAR bus reactor at Srinagar and Kashipur 400kV S/Ss insread of 125 MVAR due to transportation problems and they have proposed PSDF funding for installation of these reactors.

27.9 HVPNL and HPPTCL agreed for the above proposal.

27.10 CTU said that recently PSTCL has informed about the existing 80 MVAR bus reactors at Makhu and Nakodar, in line of which, revised studies have been carried out for Reactive power compensation requirement in Punjab. It has been seen from the studies that after considering 80 MVAR bus reactors at Makhu and Nakodar, the bus reactor at 220 kV at Makhu is not required. However, at Nakodar, requirement of 1 No. of 25 MVAr bus reactor still persists. Therefore, the same is proposed to be installed at Nakodar 220 kV bus.

27.11 CTU further added that during winter light load conditions in Northern Region, almost all hydro and thermal generations in Himachal Pradesh, Punjab and Haryana remains out of service most of the times and very high voltage is observed especially in Delhi, Haryana and Punjab area. It is anticipated that in future also during winter months, load generation scenario would remain same. The revised study for reactive power compensation was carried in consultation with DTL after the validation of network details and load generation scenario. Based on the revised studies with low load conditions, the following requirement of shunt reactors was observed and same was agreed:

S. No.	Bus Name	Voltage Level (kV)	Reactor Proposed
1	Maharanibagh (PG)	400	125
2	Mundka	400	125
3	Mandola (PG)	400	125
4	Narela	220	25
5	R.K Puram-I	220	25
6	Patparganj2	220	2x25
7	Maharanibagh (PG)	220	2x25
8	Bamnoli	220	25
9	Sabji Mandi	220	2x25
10	Gopalpur	220	2x25
11	Indra Prastha	220	2x25
12	Geeta Colony	220	2x25
13	Harsh Vihar	220	2x25
14	Wazirabad	220	2x25
15	Electric Lane	220	2x25
16	Mandola	220	25
17	AIIMS	220	2x25
18	Sarita Vihar	220	25
19	Bawana	220	25

20	Preet Vihar	220	25
21	Mundka	220	25
22	Masjid Moth	220	25

27.12 CTU representative stated that Pole one of Phase-I i.e. 1500MW pole of Champa-Kurukshetra HVDC link was commissioned in March 17 and the same is in operation and Phase-II of the same is to be commissioned shortly. During commissioning as well as operation of HVDC link, increase in the voltage profile at Kurukshetra 400 kV bus was observed. Further as the short circuit strength is low during light load conditions, large variation in voltage is observed with the switching of the filter banks. Also, as per the design of TOVC (Temporary Over Voltage Control) protection, whenever the voltage at Kurukshetra bus increases, the filter banks trips to bring down the voltage and automatic reduction in power flow occurs. This reduction of power flow result into voltage rise at Kurukshetra. Sudden reduction of power flow may also lead to increase the power transfer on Gwalior-Agra 2x S/c lines. Further, after drop in voltage, the filter bank switches on automatically leading to a voltage rise. Due to this, the operation of HVDC link may lead to serious operational constraints. Due to persistent high voltages, the 125 MVAr Bus Reactor is continuously in service. The Champa-Kurukshetra HVDC link is a very important link for import of power from Western Region generations to Northern Region load centres. This link also provides control on inter-regional power transfer. Considering this high voltage at Kurukshetra, system studies were carried out for smooth and reliable operation of HVDC link considering very low load in Northern Region. It has been seen from the studies that with total 1500 MW injection from HVDC link, about 500 MVAr reactive power support would be required to mitigate the operational constraints mentioned above. Therefore, to balance the MVAr requirement on real time basis, it was proposed to provide 500 MVAr TCR (Thyristor Controlled Reactor), which acts as a self-regulating device for Reactive VAR absorption and shall improve voltage regulation at Kurukshetra bus. It is seen from the studies that the operational constraints faced at Kurukshetra HVDC station would be alleviated by using TCR.

27.13 After detailed deliberations, TCR of capacity 500 MVAr was agreed to be installed at Kurukshetra 400 kV bus.

27.14 After further deliberation following was agreed:

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

b) Bus Reactors at 220 kV and 400 kV level at following substations subject to the availability of space. It was also agreed that these reactors shall be provided by the owner of the substations:

S.No.	Bus Name	State	Reactors Proposed (MVAr)
220 kV			
1	Jind (PG)	Haryana	25
2	Fatehabad (PG)	Haryana	25
4	Kishenpur (PG)	J&K	25
5	Jalandhar (PG)	Punjab	2x25
6	Nakodar	Punjab	25

7	Amritsar (PG)	Punjab	25
8	Dhuri	Punjab	25
9	Akal	Rajasthan	25
10	Suratgarh	Rajasthan	2x25
11	Bikaner	Rajasthan	2x25
12	Barmer*	Rajasthan	25
13	Narela	Delhi	25
14	R.K Puram-I	Delhi	25
15	Patparganj2	Delhi	2x25
16	Maharanibagh (PG)	Delhi	2x25
17	Bamnoli	Delhi	25
18	Sabji Mandi	Delhi	2x25
19	Gopalpur	Delhi	2x25
20	Indraprastha	Delhi	2x25
21	Geeta Colony	Delhi	2x25
22	Harsh Vihar	Delhi	2x25
23	Wazirabad	Delhi	2x25
24	Electric Lane	Delhi	2x25
25	Mandola	Delhi	25
26	AIIMS	Delhi	2x25
27	Sarita Vihar	Delhi	25
28	Bawana	Delhi	25
29	Preet Vihar	Delhi	25
30	Mundka	Delhi	25
31	Masjid Moth	Delhi	25
400 kV			
1	Maharanibagh (PG)	Delhi	125
2	Mundka	Delhi	125
3	Mandola(PG)	Delhi	125
4	Hissar(PG)	Haryana	125
5	Kala Amb (TBCB)	Himachal	125
6	Chamera Pooling Stn. (PG)	Himachal	125
7	Kishenpur(PG)	J&K	125
8	Nakodar	Punjab	125
9	Jullandhar(PG)	Punjab	125
10	Moga(PG)	Punjab	125
11	Dhuri	Punjab	125
12	Patiala(PG)	Punjab	125
13	Jodhpur*	Rajasthan	125
14	Sikar (PG)	Rajasthan	125
15	Allahabad(PG)	U.P	125
16	Meerut(PG)	U.P	125
17	Kashipur	Uttarakhand	125
18	Srinagar	Uttarakhand	80

* These reactors are already included under the scheme proposed by RVPNL.

c) STU should ensure that shunt capacitors at 220 kV and below voltage level are switched off during light load conditions.

Annexure-II

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 (40 वीं)/2018/ 535-543 दिनाँक : 11 जनवरी, 2018
No. NRPC/ Comml/ 209/ RPC (40th)/2018/ Dated: 11th January, 2018

सेवा में / To,

उ.क्षे.वि.स. के सभी सदस्य
Members of NRPC/TCC

विषय: उत्तरी क्षेत्रीय विद्युत समिति की 40 वीं तथा तकनीकी समंवय उप-समिति की 37 वीं बैठक का कार्यवृत्त ।

Subject: 40th meeting of Northern Regional Power Committee and 37th meeting of TCC – Minutes.

महोदय / Sir,

उत्तरी क्षेत्रीय विद्युत समिति की 40 वीं बैठक दिनांक 28 अक्तूबर, 2017 को तथा तकनीकी समंवय उप-समिति की 37 वीं बैठक दिनांक 27 अक्तूबर, 2017 को श्रीनगर, जम्मू-कश्मीर में आयोजित की गयी थी । इन बैठकों के कार्यवृत की एक प्रति आपकी सूचना व आवश्यक कार्यवाही हेतु इस पत्र के साथ संलग्न है।

The 40th meeting of Northern Regional Power Committee was held on 28th October, 2017 and 37th meeting of TCC was held on 27th October, 2017 at Srinagar, Jammu & Kashmir. A copy of the minutes of the meetings is enclosed herewith for favour of information and necessary action.

भवदीय/Yours faithfully,

11/1/18

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

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

B.2.9 TCC advised to have representation from CTU also and recommended for the formation of the sub-group for J&K. The meeting would be held in J&K as and when required.

B.2.10 Member Secretary, NRPC informed that in the 39th NRPC meeting, Chairperson, NRPC and Commissioner & Secretary, PDD, Govt. of Jammu & Kashmir had requested POWERGRID to take up the work of system strengthening, capacitor installation and protection system up-gradation in J&K on deposit basis to which POWERGRID representative had agreed stated that detailed discussion, in this regard, would be done, separately, with the concerned J&K officers.

B.2.11 Representative of PDD informed that POWERGRID has already been doing system strengthening work for J&K under PMDP-2 (Prime Minister Development Package-2). POWERGRID informed that scope of work for capacitor installation and protection system up-gradation in J&K was not clear to which PDD informed that it was being implemented by them on their own. POWERGRID representative informed that detailed deliberations on the subject would be done in the meeting of the sub-group being proposed for J&K.

NRPC Deliberations

B.2.12 NRPC approved the recommendations of TCC for conducting the study of capacitor requirement for 2019-20 at 11/33/66 kV level and also for the additional charges which may be levied by CPRI for additional scope of study, to be paid from NRPC fund.

B.2.13 NRPC approved the formation of the sub-group for issues related to J&K comprising members from J&K, NRPC, NRLDC, POWERGRID and CTU to discuss the work of system strengthening, capacitor installation and protection system up-gradation in J&K. The meeting would be held in J&K or any other place as and when required.

B.3 Reactive compensation at 220 kV level.

NRPC Deliberations

B.3.1 Member Secretary, NRPC informed the Committee that the report of POWERGRID on Reactive compensation in Northern Region was deliberated in 34thTCC/38thNRPC meeting held on 24th/25thOctober, 2016 and NRPC had approved the reactors as per the details given at Annexure-I to the agenda note. Delhi and Rajasthan had certain reservations to the recommendations made by POWERGRID. 35th TCC recommended and 39th NRPC approved the proposal of OCC for referring the report by POWERGRID and study by Rajasthan to Standing Committee on Power System Planning of NR.

B.3.2 He briefed the Committee about the decision of Standing Committee on Power System Planning of NR.

In the 39th Meeting of SCPSPNR held on 29th & 30th May 2017 following was agreed:

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

b) Bus Reactors at 30 Nos. 220 kV sub-stations and 18 Nos 400 kV level sub-stations subject to the availability of space (Annexure II to the Agenda note). It was also agreed that these reactors shall be provided by the owner of the substations.

B.3.3 Member Secretary, NRPC briefed that the TCR of 500 MVAr at 400 kV Kurukshetra bus had been approved by the standing Committee in view of the prevailing high voltage conditions at Kurukshetra which leads to curtailing power transfer capability through Champa- Kurukshetra HVDC.

B.3.4 NRPC requested POWERGRID to commission TCR of capacity 500 MVAr at Kurukshetra 400 kV bus at the earliest as apart from providing voltage relief it would also help in stabilization of Champa –Kurukshetra HVDC.

B.3.5 NRPC advised all the utilities to commission the reactors as given in Annexure II to the Agenda note at the earliest and to submit the detailed action plan with the timeline in the next OCC meeting. NRPC further pointed that these reactors are essential for maintaining the voltage level of the grid and needs to be commissioned within 26 months.

B.3.6 POWERGRID informed that the reactors proposed at the ISTS stations would be done under Tariff Based Competitive Bidding (TBCB) and the timeline for the same cannot be provided. However, POWERGRID assured of commissioning the TCR at Kurukshetra at the earliest.

B.4 Reliable Communication Scheme under Central Sector for NR.

TCC Deliberations

B.4.1 Member Secretary, NRPC informed the Committee that 39th NRPC had approved, implementation of following Communication Schemes:

1) Reliable Communication Scheme under Central Sector for Northern Region comprising 5474 Km of OPGW along with communication equipments and associated items at an estimated cost of Rs. 137 Cr.

2) Replacement of OPGW along with communication equipments installed under ULDC phase-I at an estimated cost of Rs. 59 Crs as a part of Reliable Communication Scheme under Central Sector for Northern Region.

B.4.2 He further mentioned that, based on NRPC approval POWERGRID has prepared the Detailed Project Report. As per DPR, quantities along with cost of the project are as under:

a) Reliable Communication Scheme under Central Sector for Northern Region consisting of 5428 Km of OPGW along with communication equipments and associated items at a cost of Rs. 177 Cr.

I/3021/2018 1262-1277

सत्यमेव जयते

भारत सरकार
Government of India
विद्युत मंत्रालय
Ministry of Power
केन्द्रीय विद्युत प्राधिकरण

Central Electricity Authority

विद्युत प्रणाली योजना एवं मूल्यांकन-I प्रभाग
Power System Planning & Appraisal-I Division

-As per list enclosed-

विषय: उत्तरी क्षेत्र की ट्रांसमिशन पर स्थायी समिति की दूसरी बैठक के विषय में

Sub: 2nd Meeting of Northern Region Standing Committee on Transmission- Minutes of Meeting

Sir/ Madam,

2nd Meeting of Northern Region Standing Committee on Transmission was held on 13.11.2018 (Tuesday) at 11:30hrs at NRPC, New Delhi. Minutes of meeting are available on CEA website: www.cea.nic.in (path to access – Home Page –Wing- Power System-PSPA-I- Standing Committee on Power System Planning- Northern Region).

Yours faithfully,

रवीन्द्र गुप्ता 30/11/2018

(Ravinder Gupta)
Chief Engineer (PSPA-I)

15.1 CTU stated that Grant of LTA has been discussed & agreed for injection of power in Southern Region and drawl of power in other regions including Northern Region as per deliberations held in 27th Connectivity/LTA meeting of Southern region held on 24/10/2018 as detailed below.

TABLE 5

S. No.	Application No.	Applicant	Location	Date of Application	Status of connectivity	LTA Sought (MW)	Date of Start of LTA
1	1200001694	Mytrah Energy (India) Private Limited	Palakkad, Kerala	31/08/2018	Stage-II grantee	300 (NR target)	29/02/2020

15.2 Members noted the same.

16.0 Finalization of switching Scheme for GIS substations

16.1 CTU stated that generally double circuit lines are terminated in separate diameter to avoid tripping of both lines under tie breaker stuck condition (if terminated in the same diameter). This guideline is also being specified in RfP documents for Inter State transmission system under TBCB projects. In line with above, for 765 & 400kV substations, one and a half breaker switching scheme is followed by POWERGRID.

16.2 In the 42nd meeting of SCPSPWR held on 17.11.2017, members had decided that in view of the complexities involved in the interfacing of GIS modules of different manufacturers, the complete diameter (with 3 circuit breaker bays) shall be installed in the beginning itself even though the third circuit breaker would be used for an upcoming feeder in future. This would not only facilitate ease of integration of future transmission elements, as and when they are planned, but would also enhance system reliability.

16.3 Recently in Nagapattinam 400kV GIS substation case, CERC has not allowed the capitalization of unutilized (future) GIS bays. Matter was again taken up with CERC to allow capitalization considering complexities involved in GIS substations. CERC suggested for construction of full diameter (Present-Tie-Future bay), only if there is concrete plan for utilization of future bay.

16.4 As per the clause 15.7 of CEA Manual on Transmission Planning Criteria, 'One and half breaker' scheme should be used for 400kV and 765kV sub-stations and it should be continued to be used for all the 400 kV and 765 kV S/s. Accordingly, in cases where there is no plan in near future to utilize the bays, POWERGRID proposed to construct 2 diameters with double breaker switching scheme (in place of one & half CB scheme) & continue to operate as Double CB scheme and it will not be possible to convert them in one & half CB scheme in future, due to GIS complexities mentioned above.

16.5 After deliberations, in view of the complexities involved in the interfacing of GIS modules of different manufacturers, it was agreed that the complete diameter (with 3 CB bays) shall be installed in the beginning itself even though the third CB would be used for an upcoming feeder in future..

17.0 Improvement in Reliability with outdoor AIS bus bar in GIS S/s

17.1 CTU stated that it has been observed that during failure of any GIS switchgear or GIB, long duration outage is involved in restoration of GIS bay due to proprietary nature of GIS equipment & skilled efforts are needed. Many a time since limited quantity of spares are procured, restoring of the bay takes more time (example of Maharanibagh GIS) as

Annexure-IV

No. 15/3/2018-Trans-Pt(1)
Government of India
Ministry of Power
Shram Shakti Bhawan, Rafi Marg, New Delhi-110001
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Dated, 8th Jan, 2019

OFFICE MEMORANDUM

Subject: Minutes of the 3rd meeting of the Empowered Committee on Transmission (ECT) held on 21.12.2018- reg.

The undersigned is directed to forward herewith the Minutes of the 3rd meeting of the Empowered Committee on Transmission (ECT) held on 21.12.2018 under the chairmanship of Secretary (Power), for information and further necessary action.

(Bihari Lal)
Under Secretary(Trans)
E-mail: transdesk-mop@nic.in
Tele-fax: 23325242

To

1. The Chairperson, CEA, New Delhi.
2. Member (PS), CEA, New Delhi.
3. Joint Secretary (Trans), MoP, New Delhi.
4. CMD, POWERGRID, Gurugram.
5. COO, CTU-Plg, POWERGRID.
6. CEO, RECTPCL, New Delhi.
7. CEO, PFCCL, New Delhi.

Copy to: PPSs/PSs to Secretary(Power)/ JS(Trans)/ Director(Trans), M/o Power.

5.3 CTU indicated that 9 months time from now is very short for implementation of a 765/400kV ICT, therefore completion schedule may be reconsidered

5.4 ECT concurred the recommendations of NCT for awarding the elements under RTM by POWERGRID with the compressed schedule of practically feasible time period of 12 months.

6. ICT Augmentation works at Bhadla (PG) associated with 1630 MW LTA granted at Bhadla.

S. No.	Scope of the Transmission Scheme	Capacity/Ckm	Estd. Cost (Rs. Cr.)
1.	Additional 3x500 MVA, 400/220kV 5th, 6th& 7thICT at Bhadla Pooling station.	3x500 MVA, 400/220kV 400 kV ICT bay-3 220 kV ICT bay-3	105

6.1 LTA of 830 MW (280 MW by Aug 2019, 550 MW by Oct 2020) and 800 MW (250 MW by September 2019, 500 MW by September 2020 & 50 MW by October 2020) have been granted at Bhadla with augmentation of 5th ICT and 6th& 7th ICT respectively at Bhadla.

6.2 The above ICTs are required in the time frame of August 19/ September 19. Therefore, NCT recommended the above scheme for implementation through RTM with compressed time schedule of 8/ 9months.

6.3 CTU indicated that 9 months time from now is very short for implementation of a 400/220kV ICT, therefore completion schedule may be reconsidered

6.4 ECT concurred the recommendations of NCT **for RTM** with the compressed schedule of practically feasible time period of 12 Months.

7. ICT Augmentation works at existing Bhiwani (PG) ISTS S/S associated with LTA applications from SEZs in Rajasthan:

S. No.	Scope of the Transmission Scheme	Capacity /ckm	Estd. Cost (Rs. Cr.)
1.	Augmentation with 765/400kV, 1x1000MVA, transformer (3rd) at Bhiwani (PG) S/s	1x1500MVA, 765/400kV, 765kV ICT bay-1 400kV ICT bay-1	65
		Total Rs (in Crore)	**65**

7.1 The scheme has been proposed to take care of ICT overloading at Bhiwani (PG) under N- 1 contingency with increased flow on Phagi –Bhiwani 765kV D/c line after implementation of Ajmer –Phagi 765kV D/c line (September 2020).

7.2 NCT recommended the scheme for implementation through TBCB with implementation **schedule of September 2020.**

7.3 As the scheme is augmentation of existing sub-station, **ECT recommended the scheme for through RTM by POWERGRID**.

8. 125 MVAR bus reactor at Kala Amb substation

8.1 To control high voltage in the Northern grid, the provision of reactive compensation, was discussed and approved in the 39th meeting of Standing Committee on Power System Planning of Northern Region held on 29-30thMay, 2017 which involved installation of bus

reactors at various 220kV & 400kV buses. Further, in the 2nd ECT installation of bus reactors at various substations of POWERGRID in Northern Region was recommended for implementation through RTM by POWERGRID as a part of the scheme NRSS-XL. The scheme which was agreed in the 39th meeting of SCPSPNR also involved installation of 125 MVAr bus reactor at Kala Amb substation. The Kala Amb substation is under implementation through TBCB.

The scope of works is as follows:

S. No.	Scope of the Transmission Scheme	Capacity /km	Estd. Cost (Rs. Cr.)
1.	1x125 MVAR, 420 kV Bus Reactor at Kala Amb	1x125 MVAR, 420kV bus reactor 420kV reactor bay– 1	16

8.2 NCT was of opinion that the scheme is basically technical up gradation at existing ISTS (implemented through TBCB route by M/s POWERGRID). **NCT recommended the above scheme for implementation through RTM.**

8.3 ECT concurred the recommendations of NCT for awarding the elements **under RTM.**

9. 12ohm series reactor at 400kV Mohindergarh S/s of M/s Adani:

9.1 The scheme to control Fault Level in Northern Region (Phase-II) was discussed and approved in the 39th meeting of Standing Committee on Power System Planning of Northern Region held on 29-30 May, 2017 and in the 2ndECT the scheme was recommended for implementation through RTM by Powergrid. The scheme which was agreed in the 39th meeting of SCPSPNR also involved installation of 12ohm Series Line reactors in Mohindergarh– Dhanonda 400kV D/c line Ckt I & II at Mohindergarh end. Mohindergarh substation is owned by M/s Adani Power limited.

The scope of works is as follows:

S. No.	Scope of the Transmission Scheme	Estd. Cost (Rs. Cr.)
1.	12ohm Series Line reactors in Mohindergarh– Dhanonda 400kV D/c line (Ckt I & II) at Mohindergarh end	50

9.2 NCT was of opinion that the scheme involves works at existing ISTS HVDC station (of M/s Adani Power limited). The above works falls under the category of technical up-gradation.

9.3 NCT recommended the above scheme for implementation through RTM**.**

9.4 After deliberations ECT concurred the recommendations of NCT for awarding the elements **under RTM** by owner of the substation, i.e. M/s Adani Power limited

10. 2 Nos. of 220kV bays at 3x315 MVA, 400/220kV Samba (Jatwal) (PG) S/s:

10.1 The scheme for providing 2 nos. of 220kV bays at 3x315 MVA, 400/220kV Samba (Jatwal) (PG) S/s for termination of Samba (Jatwal) (PG) –Samba(JKPDD) 220kV D/c line under ISTS was agreed in 1st meeting of NR SCT held on 11.09.2018.

The scope of works is as follows:

Exhibit-I

SCHEMATIC FOR 125 Mvar BUS REACTOR AT KALA AMB (TBCB)

Reactive Power Compensation (Mvar)

Sub Station	400 kV	220 kV
KALA AMB (TBCB)	125	–

