

भारत सरकार
उत्तर क्षेत्रीय विद्युत समिति
18-ए, शहीद जीत सिंह मार्ग, कटवारिया सराय, नई दिल्ली - 110016
Government of India
Northern Regional Power Committee
18-A, Shaheed Jeet Singh Marg, Katwaria Sarai, New Delhi-110016

पत्रांक: उक्षेविस/अधी.अभि.(वा.)16-क्षे.वि.स.10/ 247-306
No. NRPC / SE(C)/16-RPC / 10/

दिनांक : 04, मई, 2010
Dated : 04th May, 2010

सेवा में,
To,

उत्तरी क्षेत्रीय विद्युत समिति तथा तकनीकी समंवय उप-समिति के सदस्य
(संलग्न सूची के अनुसार)

Members of Northern Regional Power Committee and TCC
(As per list attached)

विषय : तकनीकी समंवय उप - समिति की 15वीं बैठक तथा उत्तरी क्षेत्रीय विद्युत समिति
की 16 वीं बैठक कार्यवृत ।

Subject : 15th meeting of TCC and 16th meeting of Northern Regional Power
Committee – Minutes.

महोदय,
Sir,

तकनीकी समंवय उप-समिति की 15वीं बैठक तथा उत्तरी क्षेत्रीय विद्युत समिति की 16वीं बैठक क्रमशः
14 व 15 अप्रैल, 2010 को नैनीताल 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 15th meeting of TCC and 16th meeting of Northern Regional Power Committee
were held on 15th and 16th April, 2010 respectively at Nainital. A copy of the summary record
of discussions of the meetings is enclosed herewith for favour of information and necessary
action.

संलग्नक: यथोपरि ।
Encl: As above

भवदीय,
Yours faithfully,

अशोक अग्रवाल
04/05/2010

(अशोक कुमार अग्रवाल)
(A. K. Aggarwal)
सदस्य सचिव
Member Secretary

INDEX

Item No.	Description	Page No.
A.1	Minutes of 14 th meeting of TCC of NRPC	2
A.2	Minutes of 15 th meeting of NRPC	4
B.1	Interest calculation for late payment of UI charges for the 3 rd quarter of the year 2009-10:	5
B.2	Interest on late payment of Reactive Energy charges	7
B.3	Delay in release of payment of THDC's bills by PDD, J&K	8
B.4	Power purchase agreement between THDC and Jammu & Kashmir for Koteshwar HEP & Vishnugad Pipalkoti HEP	8
B.5	Non- submission of confirmed, revolving irrevocable LC by PDD,J&K	9
B.6	Delay in release of payment by PPD, J&K	9
B.7	Outstanding Payment towards J&K,PDD	9
B.8	Mobile Testing Kit for on site Testing of Meters/CT/PT	10
C.1	Replacement of porcelain insulators by polymer/anti-fog insulators and cleaning works of porcelain insulators in Northern Region (NR) System.	12
C.2	Installation of Shunt Capacitors	13
C.3	Overview Of Grid Operation	16
C.4	Under Frequency and df/dt Relays	19
C.5	Under-frequency & Drawal Based Semi-automatic Load Disconnection Scheme in Northern Region	20
C.6	Violation of TTC and ATC limits by the Constituent States	20
C.7	Free Governor mode of Operation (FGMO) of generating units in NR wef 1st March 2010.	21
C.8	Program of Addition of Generating Capacity	22
C.9	Status of commissioning of new transmission works	22
C.10	Outage of important System Elements for a Long Period	23
C.11	Delay in commissioning of 220KV Nalagarh-Mohali D/C line	24
C.12	Protection Audit for Up-gradation of Protection System.	24
C.13	Bus Bar Protection at 400-220 kV Sub-Station	25
C.14	Single Phase Auto Reclosure at 400kV and 200kV Transmission Line	25
C.15	Partial Grid disturbances on 2nd January 2010.	26
C.16	Expansion of NR unified load despatch and communication scheme of NR (PHASE-II).	26
C.17	Status of major decisions of NRPC	27

INDEX

Item No.	Description	Page No.
C.18	Follow up actions of inquiry committee of grid incidents and major sub committees / groups	28
C.19	Repeated Faults on 220 KV Lines	28
C.20	Fiber Optic Connectivity to the Substations	29
C.21	RTUs Short listing for Procurement and Interfacing with the Existing SCADA System in Northern Region	30
C.22	System Protection Scheme (SPS) for 2 x 1250 MW, 780 km, HVDC Balia-Bhiwadi	31
C.23	Reimbursement of expenditure towards procurement of SEMs and DCDs upto year 2009	32
D.1	Status of UI charges	33
D.2	Status of Reactive Energy (re) charges	35
D.3	Training of SLDC Operators	35
D.4	Upgradation and modernization (U&M) of NRPC secretariat office/complex:	36
D.5	Membership In NRPC For Rotational Members	37
D.6	Agenda pertaining to transmission system agreed in 28th Standing Committee Meeting of Power System Planning in NR for Concurrence of NRPC	37
D.7	Posting of officers from Constituent Members in NRPC Secretariat	41
D.8	Study visit to Norway	42
D.9	Participation of officers at the meetings Sub-committees of NRPC	43
D.10	Reimbursement of expenditure of NRPC Sectt. for the year 2010-11 by the members of NRPC	44
D.11	Verification of NRPC Fund Account	44
D.12	Verification of Regional Board Fund	45
Annex-I	The list of participants of the TCC meeting	46
Annex-II	The list of participants of the NRPC meeting	49
Annex-III	Status of Commissioning of New Generating Units in 2009-10,2010-11 & 2011-12	52
Annex-IV	The status on other major decisions as taken during TCC & NRPC meetings	55
Annex-V	The transmission system for evacuation & transfer of power from various IPPs	57

NORTHERN REGIONAL POWER COMMITTEE

**SUMMARY RECORD OF DISCUSSIONS
OF
15th MEETING OF TECHNICAL COORDINATION SUB-COMMITTEE
&
16th MEETING OF NORTHERN REGIONAL POWER COMMITTEE**

The 15th meeting of Technical Coordination Sub-committee (TCC) and 16th meeting of Northern Regional Power Committee (NRPC) were held on 15th & 16th April 2010 respectively at Nainital. The list of participants at the TCC and NRPC meetings is enclosed at Annexure-I & II respectively.

PROCEEDINGS OF 15th MEETING OF TCC

Shri A.K. Aggarwal, Member Secretary, NRPC informed that Shri S.C Sabharwal, Member (Trans), PSEB who has taken over as Chairman, TCC w.e.f. 1.4.2010 could not attend the meeting due to prior commitments. He proposed the name of Shri A.K.Kaul, Director (O), DTL to chair the meeting. With the consent of the house, he requested Shri. Kaul, Director (O), DTL to chair the TCC meeting.

Shri R.M.Agrawal, Chief General Manager, UPCL welcomed the TCC Members & other participants. He gave brief overview of the UPCL and power scenario of the Uttarakhand.

Shri A.K. Aggarwal, Member Secretary, NRPC, welcomed TCC Members & other participants. He stated that as per LGBR for the year 2010-11, the anticipated energy shortages in NR would be 11-14% and peak shortages would be 13-15% during May to July, 2010. He impressed upon the Constituents to gear up to meet the shortages and extend cooperation in maintaining the grid discipline to avoid any grid incident. He briefed the members about the issues to be deliberated in the TCC meeting. He thanked Shri J.M. Lal, Managing Director, UPCL and their team of officers for hosting the meeting and making an excellent arrangements for the same as well as for comfortable stay of the participants at Nainital. He welcomed TCC members who were attending the TCC meeting for the first time. Thereafter, he requested Shri A.K.Kaul, Chairman, TCC to address the Sub-Committee.

Shri A.K.Kaul, Chairman, TCC welcomed the TCC Members & other delegates. In the opening remarks, he mentioned that as per the Load Generation Balance Report the anticipated peak shortages of Northern Region during the month of May and June, 2010 would be 14.3% and 15% respectively. He, therefore, requested all the constituents to manage the shortages by arranging bi-lateral assistance from outside region and maximization of generation as well as suitable demand management measures and statutory / notified load restrictions.

He expressed concern over poor progress in installation of shunt capacitors by the State utilities. He requested all the State to expedite the installation of capacitors planned during the year 2010-11 in the State system to control the low voltage

problems. He also requested all concerned utilities to make efforts to commission the generating stations of about 7000 MW capacity planned during the current financial year 2010-11 in the Northern Region.

Before concluding, he thanked Shri J.M.Lal, Managing Director, UPCL and his team of officers for hosting and making excellent arrangements for the meeting as well as for stay of the participants at this charming hill station, Nainital.

He then requested Member Secretary, NRPC to take up the agenda for discussions.

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 14th MEETING OF TCC OF NRPC

Member Secretary, NRPC stated that no request for amendment to the minutes of 14th meeting of TCC held at Chandigarh on 23rd December, 2009 circulated vide letter No. NRPC / SE(C) / 15-RPC / 09 / 5449-5519, dated 19th January, 2010 had been received. He therefore proposed for confirmation of the minutes of 14th TCC meeting.

The members confirmed the minutes of 14th meeting of TCC.

P R O C E E D I N G S O F 1 5 ^{t h} M E E T I N G O F N R P C

Shri A.K. Aggarwal, Member Secretary, NRPC informed that Shri H.S.Brar, Chairman PSEB and Chairman, NRPC could not attend the meeting due to prior commitments. He proposed the name of Shri Rajendra Kumar, CMD, DTL to chair the meeting. With the consent of the house, he requested Shri. Rajendra Kumar, CMD, DTL to chair the NRPC meeting.

Shri J.M.Lal, MD, UPCL welcomed all the members of NRPC and other delegates. He thanked NRPC for giving them opportunity to host the meeting. He briefly explained the background of UPCL and PTCUL. He mentioned about the power scenario of Uttarakhand and its plan for meeting the power shortages and electrification,

Shri A.K. Aggarwal, Member Secretary, NRPC welcomed members of Northern Regional Power Committee and other delegates to the meeting. He informed that Shri H.S.Brar, Chairman PSEB had taken over charge of Chairman, NRPC w.e.f. 1.4.2010 on relinquishment of charge by Shri B.R.Sharma, Principal Secretary, PDD, Govt. of J&K. He further stated that during his tenure as Chairman, NRPC, Shri Sharma had played an important role in resolving a number of operational, commercial & administrative issues. He had been a source of inspiration and provided continuous guidance. On behalf of

NRPC, Member Secretary, NRPC thanked Shri Sharma for his valuable contribution during his tenure.

The Committee passed the following resolution in appreciation of the services rendered by Shri B.R.Sharma, Principal Secretary, PDD, Govt. of J&K during his tenure as Chairman, NRPC:

“Northern Regional Power Committee places on record its deep appreciation of the outstanding service rendered by Shri B.R.Sharma, Principal Secretary, PDD, Govt. of J&K during his tenure as Chairman, NRPC. Shri Sharma provided able guidance in various technical, commercial & administrative matters and made valuable contribution as Chairman of the Committee.”

He welcomed Shri S.N.Banerjee, ED, NTPC who were attending the meeting for the first time. He touched upon briefly the power supply position during the last quarter as well as anticipated power supply position during the coming summer months. He also informed the members that 20 training programme on SCADA, EMS, Protection System, Reactive Power Management was organized during the year 2009-10 and about 300 officers from Constituents were benefited in enhancing their expertise.

He thanked Shri J.M. Lal, Managing Director, UPCL and their team of officers for hosting the meeting and making an excellent arrangements for the same as well as for comfortable stay of the participants at Nainital. He requested Shri Rajendra Kumar, Chairman NRPC to address the Committee.

Shri Rajendra Kumar, Chairman, NRPC welcomed the Members of the Northern Regional Power Committee and other delegates to the meeting. He stated that the grid frequency was below 49.2 Hz for 21% of time during the period from 1st to 12 April 2010. The grid frequency had gone below 48.8 Hz many times which was not a healthy situation for safe and secure operation of integrated grid. .

He mentioned as per the Load Generation Balance Report for the year 2010-11, the anticipated peak shortages of Northern Region during the month of May and June, 2010 would be 14.3% and 15% respectively. He requested all the constituents to manage the shortages by arranging bi-lateral assistance from outside region and maximization of generation as well as suitable demand management measures and statutory / notified load restrictions.

Regarding inadequate load relief from UFR, he requested all the States to ensure that all under-frequency relays are in service and none of them is bypassed. They are set at the frequency prescribed by NRPC and should give adequate load relief. He also stressed upon the need for expediting the installation of Under Voltage Load Shedding relays to save the grid from voltage collapse.

He informed the members that the CERC in its draft regulations on Unscheduled Interchange Charges which would be applicable w.e.f. 1.5.2010 had narrowed down the operating frequency band from 49.2 to 50.3 Hz to 49.5 to 50.2 Hz. The ceiling UI rate had also been increased to Rs. 8.70 below 49.5 Hz frequency against the existing Rs. 7.35 below 49.2 Hz. He requested all the members to maintain the grid discipline and avoid overdrawal at low frequency.

Regarding low voltage problems, he expressed deep concern over poor progress in installation of shunt capacitors. The State had not added any capacitor even at critical locations for which NRPC had approved the reimbursement from Reactive pool account. He requested all the State to expedite the installation of capacitors planned during the year 2010-11 in the State system to control the low voltage problems during the coming paddy season.

Referring to the recommendations of the sub-committee constituted to formulate terms of reference for appointing consultant to carry out the protection audit, he stated that the sub- committee had identified the pilot project for protection audit for Delhi system and Western UP sub-system in the first instance in view of the common wealth games. The sub committee had also short listed the vendors for carrying out the protection audit. He requested all the States to expedite the work.

On the generation capacity addition programme of about 7000 MW during the current financial year, he urged all concerned Central & State sector / Private generators to make special efforts to meet the target so that power shortages in Northern Region could be minimized.

Before concluding, he thanked Shri J.M.Lal, Managing Director, UPCL and his team of officers for hosting and making excellent arrangements for the meeting as well as for stay of the participants at this charming hill station, Nainital.

With these remarks, he requested Member Secretary, NRPC to take up the agenda for discussions.

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 15th MEETING OF NRPC

Member Secretary, NRPC stated that no request for amendment to the minutes 15th meeting of NRPC held at Chandigarh on 24th December, 2009 had been received. He therefore proposed for confirmation of the minutes of 15th NRPC meeting.

The members confirmed the minutes of 15th meeting of NRPC.

ITEMS FOR TCC AND NRPC

COMMERCIAL ISSUES

NEW COMMERCIAL ISSUES

B.1 INTEREST CALCULATION FOR LATE PAYMENT OF UI CHARGES FOR THE 3rd QUARTER OF THE YEAR 2009-10

TCC Deliberation

MS, NRPC informed that the interest on late payment/receipt of UI charges during the third quarter (1st October 2009 to 31st December 2009) for the Financial Year 2009-10 have been calculated by NRPC secretariat. The calculations are done as per the Regulation 2009 of CERC on UI charges. The abstract of interest payable / receivable by the entities given below for information of members:

All Figs. In Rs. Lakh

Entity	Interest for Illrd Qtr. of 2009-10	
	Payble	Receivable
CHANDIGARH	0.00000	3.14936
DELHI	0.00000	254.90906
HARYANA	23.19750	0.00000
HP	0.00000	14.89965
PUNJAB	49.14769	0.00000
RAILWAYS	0.00000	0.74132
RAJASTHAN	0.00000	75.15704
UP #	1618.47704	0.00000
UTTARAKHAND	161.21950	0.00000
J&K	209.28974	0.00000
NTPC	0.00000	90.65257
NHPC	0.00000	40.82646
SJVNL	0.00000	14.78438
THDC	0.00000	3.90902
ER	0.00000	178.33693
WR	0.00000	255.52740
TOTAL	2061.33147	932.89319

As per High Court of UP order dated 2.11.2009, the additional UI charges (40%) for the weeks for which weekly UI account was issued after High Court order was not considered for calculation of interest in respect of UP.

Representative of UP stated that the interest on late payment of UI charges should be calculated without 40% additional UI charges w.e.f. 1st April, 2009 as per High Court order.

MS, NRPC informed that as decided in the 15th NRPC meeting held on 24.12.2009, NRPC Secretariat had approached CERC for clarification for implementation of High Court order dated 2.11.2009. CERC in its order dated 12.2.2010 stated as follows:

“As regards the clarification sought by the petitioner, we observe that the orders of the Hon’ble High Court are prospective in nature and need to be implemented only with effect from the date of the order. We also observe that the above interim order of the Hon’ble High Court does not prohibit raising of bills in accordance with the provisions of the UI regulations. NRPC may raise the bills accordingly. However, UPPCL shall not be compelled to deposit the additional 40% UI charges in compliance with the order of the High Court.”

Accordingly, NRPC has calculated the interest on UI charges with additional UI upto 2nd November, 2009 and on UI charges without additional UI thereafter.

Representative of HVPN stated that status note on how the UI accounts were regulated and terms of High Court of Allahabad Order should be put up to the house by NRPC Sectt.

MS, NRPC informed that accounts were regulated as per CERC orders which are available on CERC website. He further stated that on the proposal of HVPNL in the matter, NRPC secretariat with the approval of Chairman, NRPC had already communicated to HVPNL that the case could not be discussed in the NRPC meeting as the same was pending in High Court.

NRLDC explained the background and timeline of court cases on UI regulations in detail.

On query of BSES about the schedule of liquidation of UI charges by UP, representative of UP informed that schedule can’t be committed but the outstanding UI charges would be liquidated soon.

NRPC deliberation

MS, NRPC briefly explained the deliberation in the TCC.

Representative of UP reiterated that the interest on late payment of UI charges should be calculated without 40% additional UI charges w.e.f. 1st April, 2009 as per High Court order.

Chairman, NRPC stated that the confusion with regard to the date of implementation in the High Court order had already been clarified by CERC. He appreciated the efforts of J&K and UP for liquidation of huge outstanding in the past. He requested UP to indicate the time frame for liquidation of dues.

Representative of UP stated that it would not be possible for them to commit the date. However, he assured that the outstanding dues would be liquidated as soon as possible.

Chairman, NRPC also requested other utilities who had to pay to the pool to deposit the outstanding dues.

B.2 INTEREST ON LATE PAYMENT OF REACTIVE ENERGY CHARGES

TCC Deliberation

MS informed that the interest for late payment/disbursal of Reactive Energy Charges for third quarters of the year 2009-10 (from 01.10.2009 to 31.12.2009) had been calculated. The abstract of interest payable and receivable on Reactive Energy charges by various States for the above period is as given below:

STATE	Rs.in Lakh	
	Interest for 3 rd Quarter of 2009-10 (from 01.10.2009 to 31.12.2009)	
	Payble	Receivable
CHANDIGARH	0.00000	11.66045
DELHI	2.34388	0.00000
HARYANA	0.00000	43.42149
H.P.	0.00000	6.43157
J&K	174.81731	0.00000
PUNJAB	0.00000	12.46307
RAJASTHAN	0.00000	54.85004
U.P.	0.00000	48.34013
UTTARAKHAND	0.00556	0.00000
TOTAL	177.16675	177.16675

Representative of J&K informed that the amount would be liquidated soon.

NRPC deliberation

MS, NRPC briefly explained the deliberation in the TCC. Members noted the same.

B.3 DELAY IN RELEASE OF PAYMENT OF THDC's BILLS BY PDD, J&K

TCC Deliberation

Representative of THDC informed that an amount of Rs. 24.42 crore was pending against J&K for the energy bills for the month of January to March, 2010. He added that non realization of bills had been affecting the financial position of the company. He also requested J&K to open the LC as per the PPA.

J&K informed that payment for Dec,09 had been made in March, 10 and further payments were being made shortly.

NRPC deliberation

J&K informed that payment could not be released in April 2010 due to ongoing strike of employees in J&K.

Representative of THDC requested for exact time for opening of the LC by J&K. Representative of J&K assured that the same would be opened by April 2010 end.

B.4 POWER PURCHASE AGREEMENT BETWEEN THDC AND JAMMU & KASHMIR FOR KOTESHWAR HEP & VISHNUGAD PIPALKOTI HEP

TCC Deliberation

Representative of THDC informed that J&K had committed in 15th NRPC meeting to sign the PPAs for Koteswar HEP & Vishnugad Pipalkoti HEP in January'10 but they had not yet signed the PPA. He also informed that CoD of Koteswar HEP was expected by Sep-Oct, 2010 and it would not be possible for them to approach CERC for tariff fixation if PPA's were not signed.

THDC requested that NRPC may authorized THDC to request MoP, Gol to divert J & K share of these two projects to other beneficiaries.

J&K informed that the PPA would be signed shortly.

NRPC deliberation

Representative of THDC requested J&K for firm date for signing of the PPA. J&K assured that the PPA would be signed by 28th April, 2010.

B.5 NON- SUBMISSION OF CONFIRMED, REVOLVING IRREVOCABLE LC BY PDD,J&K for SJVNL:

TCC Deliberation

Representative of SJVN informed that the original LC as submitted had already expired and no LC exists for last 4 years, therefore PDD, J&K should furnish fresh confirmed, revolving irrevocable LC from their Bank as per PPA and in accordance with CERC regulations.

J&K agreed to open the LC shortly.

NRPC deliberation

Representative of J&K agreed to inform the concerned agency for expediting the matter.

B.6 DELAY IN RELEASE OF PAYMENT OF SJVNL BY PPD, J&K:

TCC Deliberation

Representative of SJVN informed that Rs. 21 crores was pending towards J&K against energy bills. He added that outstanding of such amount causes failure of MOU setup by MoP. He requested that the amount should be settled in April, 2010.

J&K informed that the amount would be liquidated soon.

NRPC deliberation

J&K informed that payment would be released in April 2010.

B.7 Outstanding Payment of POWERGRID towards J&K(PDD):

TCC Deliberation

Power Grid informed that Rs. 48 crore was outstanding towards J&K including the bill of April, 2010. This includes Rs. 15 crore which was outstanding for more than 60 days.

J&K assured to liquidate the amount shortly.

NRPC deliberation

J&K informed that payment would be released in April 2010.

B.8 Mobile Testing Kit for on site Testing of Meters/CT/PT

TCC Deliberation

MS NRPC informed that as decided in the 15th NRPC meeting held on 24.12.2009 the sub-group constituted for finalizing the technical, commercial and utilization issue of mobile testing kit of CPR had submitted its recommendations. The recommendations were:

- CPRI assured that in case they get confirmed order for testing of more than 660 numbers of CTs/CVTs, then they could examine the possibility of further reduction in the testing cost to Rs. 125000/- from Rs. 150000/ for 3 CT or 3 CVT per day.
- **Compensation amount in the event of default by CPRI or utility owning CTs/CVTs**
 - i) failure by CPRI to carry out the testing as per schedule when utility has already arranged shutdown of transmission system.

CPRI would pay 50% of per day testing charges to the other utilities for each day of default.

- ii) failure by CPRI to complete the testing of 3 CTs or 3 CVTs as per schedule when utility has already arranged shutdown of transmission system.

The utility shall pay only 50% of per day testing charges and the remaining CTs/CVTs shall be tested free of charge by CPRI on their availability for testing.

- iii) Mobile van of CPRI is available at site but utility could not obtain shut down.

The utility shall be required to pay 50% of per day testing charges to CPRI.

- With regard to finalization of the schedule of testing of CT/CVT to optimise the utilisation of Mobile testing kit, it was decided that the sub group shall finalize the schedule for testing for the region as a whole and subsequently a nodal officer shall be nominated by each constituent / CTU for co-ordination with CPRI/NRLDC so as to utilize the kit optimally at their area of work.

Representative of HVPN pointed out that testing of 3 CTs or 3 CVTs per days would require two days for testing of one feeder. He informed that two days shutdown would neither be affordable to a utility nor NRLDC would allow such shut

down. He also added that the charges for testing were also very high and approximately 33% of the cost of CTs/CVTs.

NRLDC informed that requirement of shutdown could be planned in advance.

MS, NRPC informed that DG, CPRI would be available in the NRPC meeting to clarify the issues.

TCC therefore referred the matter to NRPC for deliberation.

NRPC deliberation

MS, NRPC briefed the members about the TCC deliberations. He requested DG, CPRI to clarify the issue.

DG, CPRI thanked NRPC for giving them opportunity to present their view point. He stated that the testing charges per day had already been reduced to Rs 150000/- including the transportation cost which was earlier extra. The charges had been arrived at as per norms followed by CPRI. They had not been considering testing charges as major source of revenue generation. Reduction of the testing charges to Rs 125000/- would be difficult as the testing facility launched by CPRI was capital intensive.

MS, NRPC enquired as to whether CPRI would test 3 CTs plus 3 CVTs in a day or only 3CTs or 3CVTs would be tested in a day. Representative of CPRI clarified that they had contemplated testing of 3 CT or 3 CVTs in a day based on international practice. However, based on experience of using the testing kit, the number of CT/CVT could be increased.

Representative of HVPNL expressed that outage of two days period for testing of one feeder was not acceptable. With regard to cost he stated that it was very high. The overhead charges was 120% of employee cost, ROE was 50% for a period of ten years. He proposed that the cost aspect should be referred to CEA for prudence check. He also mentioned that possibility might be explored for availability of grant from Ministry of Power for such facilities.

DG, CPRI clarified that the testing charges was approved by the separate committee in CPRI which was headed by the Member, CEA.

Representative of POWERGRID expressed that keeping in view the large number of CTs and CVTS it would take around 15 to 20 years for testing CTs/CVTs. He suggested that we should look for the simpler, cost economic solution in that matter so that substation personnel can themselves test the CTs/CVTs.

After further discussion, it was decided that the sub-group would again meet and examine the matter further taking in to consideration the suggestion as discussed above.

O P E R A T I O N A L I S S U E S

C.1 Replacement of porcelain insulators by polymer/anti-fog insulators and cleaning works of porcelain insulators in Northern Region (NR) System.

C.1.1 Replacement of Insulators

TCC Deliberation

MS, NRPC informed that in the 15th NRPC meeting held on 24th December 2010, the transmission utilities were requested to expedite and complete the replacement works on the identified lines immediately and also carry out regular cleaning of porcelain insulators, enhance the maintenance of system element and post experienced personnel at important substations, especially during foggy winter nights.

He further informed that in the OCC meetings, the transmission utilities reported that in the partial grid disturbance on 2nd January 2010, there were more tripping on 220 kV lines than on 400 kV lines and that also particularly in Haryana and Punjab areas due to increased level of pollution coupled with heavy fog. STUs have reported that even some of the newly installed anti-fog insulators had also failed in Haryana and Punjab systems.

BBMB had planned to procure the polymer insulators for their transmission lines through POWERGRID. The STUs could also give their requisition immediately to POWERGRID if they so desire to procure polymer insulators through them.

He further informed that POWERGRID had submitted additional requirement for replacement of porcelain insulators with polymer in respect of 34 Nos. 400 kV, 220 kV and HVDC lines.

POWERGRID had proposed the replacement works on complete stretches of lines especially in case of evacuation lines from generating stations and critical 400 and 220 kV lines which are affected frequently during winter foggy condition. MS, NRPC requested STUs to also submit the details of additional lines on which they are planning to provide polymer/anti-fog insulators.

On query from representative of HVPNL, POWERGRID informed that total estimated cost of replacement works for 34 Nos. of additional lines would be around Rs. 100 crores.

On query from a representative of HVPNL regarding utilization of porcelain insulators taken out from the transmission lines, POWERGRID stated that these insulators would be used on the new transmission line which are not passing through pollution areas and affected by fog. Accordingly, the credit for same would be given while working out the cost of the lines. DTL also informed that they have a large numbers of un-utilized porcelain insulators which can be used in the transmission line where polymer is not necessary to be installed .

NRPC Deliberation

MS, NRPC briefed the NRPC members regarding the progress of replacement works with polymer insulators. NRPC members agreed with the proposal of POWERGRID for additional replacement works with polymer insulators in respect of 34 Nos. of transmission lines. It was also decided the STUs would also identify additional critical lines experiencing frequent tripping during foggy weather conditions and submit the details along with the timeframe for replacement works to NRPC. It was also decided that the State Utilities should strategically plan and coordinate the activities of procurement and implementation of replacement works so as to avoid shutdown during peak period/season and complete the works before the onset of next winter.

It was also decided that the POWERGRID would explore the possibility of alternative technology like silicon coating on the existing porcelain insulators and implement as a pilot project (to examine techno-economic feasibility) on transmission lines passing through light, medium and heavy pollution areas.

C.1.2 Cleaning of Insulators

Members noted the status.

C.2 Installation of Shunt Capacitors

C.2.1 During the year 2009-10

C.2.2 During the year 2010-11

TCC Deliberation

MS, NRPC informed that during 13th meeting held on 27th June 2009, it was decided that each constituent State would install capacitors as per the requirement of their State. 5000 MVAR were the assessment for the Northern Region for the year 2009-10. Against this, only 10% of the capacitors had been installed by Punjab (551 MVARs) and Rajasthan (43 MVARs). The status of new capacitor installation vis-à-vis planned capacitors during the year 2009-10 is given below:

S.No.	State	Capacitor addition planned during 2009-10 (MVAR)	Capacitor actually installed during the year 2009-10 (MVAR)	Short fall (MVAR)
1	Chandigarh	30	0	30
2	Delhi	0	0	0
3	Haryana	816	0	816
4	Himachal Pradesh	37	0	37
5	J & K	1124	0	1124
6	Punjab	743	551	192
7	Rajasthan	484	43	441
8	UP	1449	0	1449
9	Uttarakhand	233	0	233
	TOTAL	4916	593	4323

He further informed that in the 14th and 15th meetings of NRPC held on 19th September and 24th December 2009, NRPC approved 20% of the total requirement of capacitors in each State during 2009-10 to be commissioned at critical locations for reimbursement from reactive pool account subject to certain conditions.

He further stated that the State Utilities had not commissioned the capacitors at approved critical locations before 31st March 2010 and had also not submitted the certified invoices to avail the reimbursement from reactive pool account.

MS, NRPC stated that during 15th NRPC meeting held on 24th December 2009, it was decided that the concerned utilities should take immediate action for procurement and commissioning of the capacitors as required in their system during the year 2010-11 (7532 MVARs for the NR). The State wise requirement of the capacitors for the year 2010-11 was given at Annexure-IV of the agenda. The State Utilities should submit the detailed schedule of procurement and commissioning. The State Utilities should also furnish information regarding defective capacitors as on 31st March 2010 and their revival schedule to the NRPC Secretariat.

Representative of Rajasthan requested that the date for commissioning and submission of certified invoices for installation of capacitors might be extended up to 30th June, 2010 as there was delay in procurement due to poor response from the vendors.

Representative of Uttarakhand power utilities had also expressed similar difficulties in procuring capacitors and also requested for extension of time till 30th June, 2010.

Representative of HPSEB stated that in view of the huge requirement of about 8000 MVARs capacitor during 2010-11, it would be more appropriate to procure the capacitors centrally by one entity and make it available to the State Utilities.

Representative of HVPNL agreed to take initiative for procurement of capacitors on behalf of the all the State Utilities after receipt of the request from respective State utility giving full details. However, they would confirm the same in due course. He further requested that keeping in view the urgency of capacitor installation, another 20% of the total requirement of capacitors during 2010-11 for reimbursement from reactive pool account may be approved by NRPC.

GM, NRLDC stated that the incentive for reimbursement from reactive pool account should be given to only those State Utilities who order and commission the complete requirement of capacitors in their system.

Representative of BSES requested that 20% of the total requirement of capacitor in Delhi system during 2010-11 should also be reimbursed from reactive pool account.

NRPC Deliberation

MS, NRPC briefed the members regarding the deliberations of TCC. Members expressed serious concern on the poor progress of installation of capacitors by the respective State Utility in their system during the year 2009-10. They also expressed the need to expedite the revival of defective capacitors by each State Utilities. After detailed deliberation, the following decisions were approved by the NRPC:

- The date for submission of certified invoices for reimbursement of 20% of the total requirement of capacitors in each State during 2009-10 to be commissioned at critical locations for reimbursement from reactive pool account had been extended up to 30th June 2010.
- 20% of the total invoice amount for installation of capacitors as agreed in NRPC in each State/UT during 2010-11 (total 7500 MVARs in the Northern Region) would be reimbursed from reactive pool account subject to availability of funds in the pool account. The 90% of the amount would be released on submission of certified invoices and 10% after submission of certificate of commissioning of capacitors from SLDC Head. In case of limited fund availability in Reactive Pool account, the reimbursement would be done on first come first served basis.
- HVPNL would confirm for processing of the procurement of capacitors planned during 2010-11 on behalf of each State Utilities.

- A small group to monitor the procurement, installation and commissioning of capacitors in Northern Region States would be set up. The group would comprise of members from DTL, UPPTCL, POWERGRID, NRLDC, Punjab, Rajasthan and Haryana.

C.3 OVERVIEW OF GRID OPERATION

C.3.1 Power Supply Position

TCC deliberations:

GM, NRLDC gave detailed presentation overview of grid operation of Northern Region. He reported that the frequency during the month of Nov to March this year, was generally good. Following concerns were specifically mentioned

- Low Frequency in Grid during April, 2010
- Excessive Overdrawal
- Inadequate planning-Sale/Purchase
- Low PLF of newly commissioned units
- Large capacity under outages in NR
- Inadequate relief from UFR – as per SCADA
- Telemetry Issues

Low Frequency: It was reported that from the 1st April 2010, grid frequency was deteriorating and on some of the days it had remained below 49.2 Hz for more than 80 % of time. The trends of regional thermal, hydro & nuclear generation were explained. The sharp decline in thermal generation after 31st March 2010 and low hydro generation (only 100 MUs per day) was reported.

Following specific reasons for the same were given

1. **Excessive Overdrawal by state Control Areas:** Overdrawals of all the states were reported during the month of April 2010. It was noted by the committee that generally almost all the states in NR were overdrawing at low frequencies. Overdrawal pattern at frequency <49.2 Hz are summarized as under (during 1st to 12 April 2010)

State Control Area	Max OD at freq below 49.2 Hz (MW)	General OD range during freq <49.2 Hz (MW)
UP	1426	600 to 1000
Punjab	1190	600 to 1000
Haryana	935	200 to 600
J&K	726	100 to 300
Rajasthan	636	200 to 500
Uttrakhand	447	200 to 350
HP	341	100 to 250
Chandigarh	98	40 to 80

2. **Inadequate Planning for meeting load and sale/Purchase under STOA:** Members of committee noted that number of state control Areas were selling power under short-term Open Access (STOA) and at the same time overdrawing from the Grid. **It was also mentioned that many state control areas have purchased little power under STOA despite availability of corridors and are heavily overdrawing. This clearly indicates failure on their part to effectively plan for meeting their load.**

3. **Availability of Margins in the Corridor:** NRLDC informed that the inter-regional imports which were in the range of 90 to 100 MUs per day during the winter months had now declined to in the range of 50 MUs per day. It was mentioned that adequate margins were available and state control areas should make full use of it and should not overdraw from grid. NRLDC reported that presently even considering export/import and TTC of neighboring regions, more than 2000 MW corridors would be available. It was further informed that corridors are available at this moment for the coming summer months also and states having shortage shall plan in advance so that they could utilize the inter-regional corridor through advance STOA route.

4. **Low PLF of newly commissioned generating units:** It was reported that newly commissioned unit in NR had low PLF and the units had not stabilized yet.

Sl. No.	Unit Name	Capacity (MW)	Commissioning Month	PLF during March-2010	PLF during April-2010 (till 9 th April)
1	Chabra unit-1	250	Apr-09	47.83	19.56
2	Raj West Unit 1	135	Aug-09	63.40	62.64
3	Dadri (Th) unit 5	490	Dec-09	12.31	36.73
4	RGTPP unit 1	600	Dec-09	42.32	91.13
5	Rosa unit-1	300	Dec-09	46.69	68.42
6	Barsingsar unit-1	125	Oct-09	0.0	0.0

5. **Large Capacity under outage in NR:** It was reported that 4000-5000 MW thermal generation capacity was under planned and forced outage during April, 2010 which during April 2009 was in the range of 1500 to 2000 MW.

- 6. Inadequate Telemetry:** Non availability of telemetry is a serious issue. Generally all newly commissioned generating stations of more than 2000 MW was not reporting to SLDC/NRLDC. Apart from these generating stations, numerous other grid stations also did not have telemetry. It was decided that adequate measures should be taken before commissioning of new units/sub-stations so that telemetry would be available to the control centres in time.

NRPC deliberation

GM, NRLDC apprised the members about the critical situation of NEW Grid during the month of April when mostly all the constituent states are overdrawing from the Grid even at low frequency. He added that there had been protest by western and other disciplined regions.

Representative of Haryana stated that even if northern region is not collectively overdrawing much from the grid, the grid frequency remains low. He expressed that there is a need that the overdrawal from Northern Region and other regions may be analyzed. UPPCL also expressed similar views.

GM, NRLDC stated that data are regularly analyzed and it can be seen that NR constituents are overdrawing from the grid more frequently. He also stated that due to meshed network, in most of the cases, it is very difficult to cut the feeders to restrict overdrawal as it overloads the other feeders. He also requested SLDC to cut their radial feeders to restrict overdrawal.

Representative of HPSEB stated that due to high growth rate and low capacity addition the demand and supply gap had been increased and self discipline and electrical disconnection are the only measures to restrict overdrawals. He also stated that the rate of UI governs the market price at power exchange and the move of CERC to narrow the operating frequency band would further increase the price of electricity market at power exchange level.

Chairman, NRPC stated that there was a need for additional power requirement due to huge gap between demand and supply. However he stated that the Grid security is of paramount importance and we must manage the load as per the availability. The administrative problems of the States need to be tackled by the respective States authorities at their own level. NRPC had to confine itself with a focus on grid security issues within the technical and regulatory boundaries. He suggested that the suitable resolution could be passed by NRPC in the matter. Members agreed with the suggestion of Chairman, NRPC and passed the following resolution:

“NRPC resolved that every constituent States should restrict to their drawal from the grid within their drawal schedule when the system frequency falls below 49.5 Hz. The states should carry out requisite load shedding when frequency falls below 49.2 Hz. to limit their overdrawal.”

C 4 Under Frequency and df/dt Relays

TCC deliberations:

C 4.1 Performance

MS, NRPC apprised the members regarding the performance of UFR in providing load relief in the grid. The concerned utilities were requested to provide at least the desired relief in the system through UFRs operation. The concerned utilities were also requested to ensure that in the figures of reported load relief through UFRs operation the load of those feeders having UFR installed on it and which were already under scheduled load shedding should not be clubbed.

GM, NRLDC stated that as per SCADA data recorded at NRLDC very low relief was being recorded through UFR. To substantiate their view analysis for 8th & 9th April 2010 was reported. After discussion, it was agreed that for relief form UFR for 9th & 14th April 2010 should be analyzed by all the states who shall submit full data.

As per decision taken in the 14th NRPC meeting held on 19th September, 2009, the concerned utilities were requested to monitor the operation of UFRs on-line through SCADA system. BBMB and HP had intimated that they were able to map the relief of UFRs through the load variation in the ICT which are already mapped in SCADA system. Other State utilities were requested to implement the same.

MS, NRPC requested UPPTCL to take corrective actions regarding defective and in-operative UFRs installed in their system. During 49th OCC meeting UP agreed to look into the matter.

All utilities were requested to submit the data of operation of UFRs and df/dt relays on monthly basis as per formats to NRPC secretariat.

C 4.2 Installation of Additional 30 % UFRs and df/dt Relays

MS, NRPC informed that as per the decision of the 7th NRPC meeting held on 20th December, 2007 each State utility had to install additional 30% UFRs so that sufficient load relief would be available. However, progress of installation of additional UFRs was not satisfactory. The concerned utilities were requested to submit the action plan for installation of 30% UFRs and df/dt relays in their system to NRPC Secretariat as per the formats. Rajasthan and HPSEB had submitted the details. Haryana stated that 6 additional df/dt relays had been installed in their system. Haryana was requested to send the location and setting for the relays.

NRPC Deliberation

Members of NRPC emphasized that each utility should ensure functionality of UFRs and df/dt relays in their system and also expedite installation of 30% UFRs & df/dt relays so as to provide desired load relief for safe and secure operation of the grid. They also advised the concerned utilities to submit operational details of UFRs and df/dt relays to the NRPC Secretariat as per their format on regular basis.

C.5 Under-frequency & Drawal Based Semi-automatic Load Disconnection Scheme in Northern Region (Agenda of NRLDC)

TCC deliberation

MS, NRPC informed that as per decision taken in 15th NRPC meeting held on 24th December 2009, the scheme for under frequency and drawal based semi-automatic load disconnection scheme as proposed by NRLDC should be revised in consultation with the State Utilities. NRLDC informed that comments from PSEB, Rajasthan and DTL had been incorporated in Semi-automatic Load Disconnection Scheme in Northern Region. HVPNL representative expressed reservations on the scheme. Other States agreed for need of such scheme. NRLDC expressed that the issue has been deliberated in various OCC as well as TCC/RPC level and still States can give suggestions for any modification in the implementation part of the scheme provided the objectives of the scheme are taken care of.

NRPC deliberation

MS, NRPC briefed members about the TCC deliberations. The representative of Haryana stated that they would have law and order problem in their state if the scheme would be implemented. Chairman, NRPC requested all the State to communicate modification in the scheme in writing by 10th May 2010 for implementation of same.

C.6 Violation of TTC and ATC Limits by the Constituent States

TCC Deliberation

MS, NRPC informed that as per 15th NRPC meeting held on 24th December 2009, NRPC Secretariat had requested the CEA to furnish their views on the gap between the transmission capacity and transmission capability.

In 47th OCC meeting held on 20th Feb.2010, NRLDC had desired that in the new scenario, TCC/ATC need to be assessed by respective SLDC for their control area.

Representative of NRLDC informed that they had conducted various workshops and had also appraised the CERC in this respect.

They further added that now SLDCs should also indicate the TTC/ATC of their control Area considering intra-state network/inter connection with ISTS and load – generation balance. This should be informed to the NRLDC alongwith the data used for study. NRLDC after conducting further study would forward the same to NLDC for conducting all India studies. Members expressed that it was absolutely necessary but adequate incentives should be given to the SLDC operators.

After deliberations, TCC Members desired that capacity building shall be done at all levels so that transfer capability is assessed with good insight of keeping system security in mind as well as utilizing the transmission capacity to the maximum level.

NRPC Deliberation

NRPC noted the TCC deliberations and agreed for the requirement of more emphasis on this very technical subject.

C.7 Free Governor mode of Operation (FGMO) of generating units in NR wef 1st March 2010.

TCC Deliberation

MS, NRPC informed that in 15th NRPC meeting held on 24th December 2009, the constituents were requested to comply with the CERC directions regarding the implementation of restricted Free Governor Mode of Operation in various types of thermal and hydro units and also to submit the action plans to NRPC and NRLDC.

Representative of NTPC informed that software part of implementation had been completed whereas implementation of hardware control would be completed by June 2010.

A representative of BBMB stated that they had activated FGMO in their generation units but GM, NRLDC expressed that as per the data captured by them governor action was not visible. It was decided that the all utilities should submit information about their readiness so that the same could be monitored by RLDC.

It was decided that all the utilities should submit the information regarding implementation of FGMO to NRLDC and NRPC Secretariat.

NRPC Deliberation

Member noted the status.

C.8 Program of Addition of Generating Capacity

TCC Deliberation

MS, NRPC stated that during the financial year 2009-10, 4270MW generating capacity had been added and anticipated capacity addition during the years 2010-11 and 2011-12 would be about 7502 MW 9310 MW respectively in Northern Region

The status of commissioning of new generating units as updated by the constituents is enclosed at Annexure-III

NRPC Deliberation

Member noted the status.

C.9 Status of commissioning of new transmission works

TCC Deliberation

The status of commissioning of major critical transmission works as updated by the respective utilities in TCC is as under:

Name of system element	Status
POWERGRID	
400 kV Kankroli– Jodhpur line	Commissioned
Bhinmal sub-station	Work completed by POWERGRID. RVPNL would connect two feeders by April 2010 and another two feeders thereafter by June 2010. POWERGRID.will complete the work before the complitation of work by RVPNL
Outlets from Kota (POWERGRID) sub-station	Work completed by POWERGRID.. Bays will be provided for connecting feeders as and when required by RVPNL.
500 kV HVDC Balia- Bhiwadi	Test charge on 31 st March , 2010 COD in June,2010

MS, NRPC informed that the target date for commissioning of the most of the transmission works as submitted by UPPTCL and given in the agenda was beyond

March 2011. He requested the UPPTCL to furnish the progress of each transmission works regularly to NRPC Secretariat for deliberation in OCC meeting and for apprising thereafter to the NRPC members.

Representative of HPSEB stated that they were not able to draw the share of power from the generating projects located in Uttarakhand under outage of 400 kV Rishikesh-Roorkee line. He requested PTCUL to strengthen their system. It was decided that this issue would be discussed separately in NRPC Secretariat for which a detailed background note would be submitted by HPSEB, PTCUL and UPPTCL.

NRPC Deliberation

Members noted the status.

C.10 Outage of important System Elements for a Long Period

TCC Deliberation

MS, NRPC stated that some of the system elements had been out of service for a long time particularly in UPPTCL system and making the whole system weak. Updated status of the same is given as under:

Uttar Pradesh	
50 MVAR, 400 kV Bus Reactor at Sarojini Nagar, Lucknow	<ul style="list-style-type: none"> • Out since 10th July, 2008. • Beyond economical repair (BER). • Procurement action initiated • Work would be completed by March 2011
400/220 kV, 240 MVA ICT-2 at Obra	<ul style="list-style-type: none"> • Out since 09-08-2002, ICT failed. • Purchase order for ICT placed on M/s BHEL. • Delivery of ICT expected in September, 2010 and commissioning in Dec 2010.
50 MVAR, 400 kV, Bus Reactor at Bareilly.	<ul style="list-style-type: none"> • Out since 5th Aug., 2007. • UPPTCL decided to install a new bus reactor (the defective one is BER). • Procurement action initiated • Work would be completed by March 2011
50 MVAR, 400 kV, Bus Reactor at Sultanpur	<ul style="list-style-type: none"> • procurement action initiated, to be replaced by March,2011.

Non availability of reactor due to circuit breaker problem at Anpara TPS	<ul style="list-style-type: none"> • CB was faulty since Dec, 2007. • CB had been repaired and would be replaced on opportunity shutdown.
Delhi Transco Limited (DTL)	
400/220 kV ICT- IV, Bawana	<ul style="list-style-type: none"> • Out since 28.07.2009. • New ICT would be commissioned by May, 2010.

The concerned organizations were requested to bring back these elements on priority basis.

NRPC Deliberation

Members noted the status.

C.11 Delay in commissioning of 220KV Nalagarh-Mohali D/C line

TCC Deliberation

MS, NRPC informed that PSEB had reported that stringing of line on one tower was left as the farmer had taken the court stay till the harvesting period of crop. The next date for hearing was on 19th April 2010. The case was likely to be resolved shortly as land owner had earlier taken compensation at the time of stubbing of tower.

NRPC Deliberation

Members noted the status.

C.12 Protection Audit for Up-gradation of Protection System.

TCC Deliberation

MS, NRPC informed that as per the decision taken in 15th NRPC meeting held on 24th December 2009, the sub-committee had submitted a report which covers the identification of pilot scheme, and eligible consultants for the protection audit. The report also indicates the scope of work for carrying out protection studies and audit. The pilot project recommended for protection audit was for Delhi and Western U.P. subsystem with a suggestion to complete the same before the Common Wealth Game so as to ensure secure, reliable and safe system of power supply for Delhi. It was decided by the TCC members that DTL and UPPTCL would take appropriate action for upgrading of protection system based on the protection audit before the Common Wealth Games. It was also decided that keeping in view the short timeframe available, DTL and UPPTCL might call limited Bids for Pilot Projects from the identified consultant as recommended by the expert group in their report.

Representative of DTL agreed to carry out these activities whereas a representative of UPPTCL stated that they would confirm the same after getting their management approval.

NRPC Deliberation

Members concurred with the decision of the TCC.

C.13 Bus Bar Protection at 400-220 kV Sub-Stations

TCC Deliberation

MS, NRPC informed that in the 12th NRPC meeting held on 22nd April 2009, it was decided that the constituent should provide bus-bar protection on all 400 kV and 220 kV substation and ensure their healthiness for security of the Grid. He requested all the constituents to update the required information as per the prescribed format to NRPC.

Representative of HVPNL stated that as per the guidelines of, Central Board of Irrigation and Power, bus-bar protection should have to be provided in case there are more than 4 feeders in substation. In view of the earlier decision of NRPC, it was suggested to all STUs and CTU to make provision of bus-bar protection on all substations (220 kV and above) for safety and security of the Grid.

NRPC Deliberation

NRPC members agreed with the decision of TCC.

C.14 Single Phase Auto Reclosure at 400kV and 200kV Transmission Line

TCC Deliberation

MS, NRPC informed that in 13th NRPC meeting held on 27th June 2009, it was decided that all the lines 220 kV and above voltage level would be provided with single phase auto re-closure facility.

In 15th NRPC meeting held on 24th December 2009, representative of PSEB stated that the scheme would be functional by the end of May 2010.

Representative of UPPTCL intimated that single phase auto re-closure had been made functional at Moradabad of 220 kV NAPS-Moradabad line. He further informed that at Simbhaoli, the scheme was there but not in operation on NAPS-Simbhaoli lines.

Representative of NPCIL stated that they would switch on the single phase auto re-closure scheme from their end on getting the status in writing from UPPTCL for which the UPPTCL has agreed to communicate the same in writing immediately.

NPCIL also requested UPPTCL to resolve the issue of low voltage in NAPP area by providing adequate capacitors. UPPCL agreed to look into the issue and the status would also be informed to NRLDC/NRPC.

Representative of UPPTCL informed they had revived the defective capacitors in Khurja, Atrauli and Bulandshaher area and also installing new capacitors in and around NAPP areas.

NRPC Deliberation

Members noted the TCC Deliberation.

C.15 Partial Grid disturbances on 2nd January 2010

TCC Deliberation

MS, NRPC informed that Northern Region experienced a partial grid disturbance on 2nd January 2010 at 0301hrs and again at 2154hrs. Power supply in Punjab, North Haryana, Himachal Pradesh, J&K and UT Chandigarh subsystem was affected. He further informed that Central Electricity Authority had constituted a committee under the Chairmanship of Member (GO&D), CEA to inquire into the grid disturbance incident and ascertain the cause of grid disturbance and suggest remedial measures to avoid reoccurrence of such incident. The report of the committee was under finalization.

NRPC Deliberation

Members noted the information.

C.16 EXPANSION OF NR UNIFIED LOAD DESPATCH AND COMMUNICATION SCHEME of NR (PHASE-II).

TCC Deliberation

MS, NRPC informed that in the 15th NRPC meeting held on 24th December 2009, it was decided that USMG would monitor the implementation of Phase-II of the ULDC scheme so as to complete the implementation of scheme by September 2012. He further stated that while monitoring the status of action plan of the utilities in 25th USMG meeting held on 5th February 2010 the constituents expressed that in view of the complexity involved as well as to achieve fast and uniform implementation, it would be desirable to appoint POWERGRID as a Turnkey implementer. He also informed the TCC members that as per the

decision taken in the 15th NRPC meeting POWERGRID could be appointed as a Turnkey implementer/consultant/review consultant by the respective utilities.

Representative of BBMB emphasized the need for implementation of ULDC Phase II scheme on the same line as of Phase-I so as to avoid any integration issues.

Representative of HVPNL stated that they had already decided to implement scheme on their own and were in the process of appointing a consultant for the same. He added that for integration they would appoint POWERGRID as review consultant.

Representative of DTL stated that they would implement the scheme after appointing the consultant. He added that for integration they would appoint POWERGRID as review consultant.

Representative of UPPTCL, RVPNL, and PTCUL informed that they would appoint POWERGRID as a Turnkey implementer.

Representative of HPSEB stated that they would take the decision of appointment of consultant shortly.

Each constituent shall send the request letter to POWERGRID for obtaining the offer for turnkey implementation/consultant/review consultant.

It was decided that each power utility would submit a detailed action plan indicating the timeline for each activities to NRPC Secretariat so as to complete the implementation of ULDC Phase-II by September 2012.

NRPC Deliberation

MS, NRPC briefed members about the TCC deliberations.

After detailed deliberation, it was decided that POWERGRID would be appointed as turnkey implementer/main or review consultant for each State as they decide. It was also decided that constituents would submit a detailed action plan indicating the timeline for each activities to NRPC Secretariat so that it could be monitored in USMG meetings.

C.17 Status of major decisions of NRPC

TCC Deliberation

MS, NRPC informed the members about the status of various major decisions of NRPC. The status as updated by the constituents in TCC is enclosed at Annex-IV

NRPC Deliberation

Members noted the status. POWERGRID intimated that the 125 MVAR bus reactor which had to be provided to SJVNL on loan basis was not possible as bus reactor with GIS connectivity was not available with them.

C.18 Follow up actions of inquiry committee of grid incidents and major sub committees / groups

TCC Deliberation

C.18.1 Report of Inquiry committee on disturbance on 7th - 9th March, 2008

MS, NRPC informed members about the current status of implementation of recommendation of Inquiry committee on grid disturbance of 7th-9th March, 2008.

Members noted the status.

C.18.2 Frequent tripping of Pragati GT

MS, NRPC requested DTL and Pragati Power Corporation Limited to update the status on corrective action taken by them as per the recommendation of the group to NRPC Secretariat.

Representative of DTL and Pragati Power Corporation Limited agreed to submit the updated information regularly to NRPC Secretariat.

C.18.3 Report of the Group on 400kV Panipat, Muradnagar and Mau

MS, NRPC requested UPPTCL and BBMB to submit action taken report on the recommendation made by the group to NRPC Secretariat. He also informed that NRPC had to submit corrective action taken report by each constituent to MoP.

The representative of UPPTCL and BBMB agreed to submit the updated information regularly to the NRPC Secretariat.

NRPC Deliberation

Members noted the status.

C. 19 Repeated Faults on 220 KV Lines

TCC Deliberation

POWERGRID stated that due to repeated faults on 220 kV system, the various ICTs of POWERGRID were getting heavily stressed. A specific case of frequent

faults on 220 kV HVPNL lines emanating from Bahadurgarh grid substation was reported. POWERGRID requested State Utilities to strengthen their protection and PLCC system and also ensure the availability and healthiness of Carrier Aided Protection Schemes.

After deliberation, it was decided that a group of officers from HVPNL and POWERGRID would visit the system in and around Bahadurgarh grid substation and would submit a report to NRPC Secretariat.

NRPC Deliberation

Members noted the status

C.20 Fiber Optic Connectivity to the Substations

TCC Deliberation

MS, NRPC informed that POWERGRID had proposed to install OPGW on its transmission lines under construction so as to provide wide band connectivity to 400 kV and above substations/power plants.

Representative of POWERGRID explained that in Northern Region, out of 60 nos. of substations and power plants in the Central Sector, only 23 nos. are either connected or going to be connected with wide band communication network after implementation of Fiber Optic network under Microwave Replacement project of Northern Region. Further, in the next three years 24 nos. of substation were scheduled for commissioning. He further stated that PLCC being used for data and speech communication to meet the RLDC operational requirement, had limitation due to limited bandwidth, frequency congestion and restriction of two hops in tandem due to deterioration in quality of data transmission. Further, to support upcoming technology and other data communication requirement it would be essential to connect various substations/power plants with wide band communication by OPGW. He intimated that additional cost of OPGW in place of one earth wire on lines under construction was less than Rs. One lakh per km against Rs. 2.5 lakh per km for the existing lines.

Representative of HVPNL suggested that POWERGRID should explore the possibilities of use of network and sharing of cost with telecommunication companies since the scheme could comprise of larger part of communication system. This would, thereby, reduce the cost of the scheme for use in the power sector. On query from POWERGRID, HVPNL was of the view that if the telecommunication companies did not share the cost then the power utility would share the full cost. However, the decision in this regard would be taken after POWERGRID explore the suggested possibilities for minimizing the cost of the proposal.

TCC members decided that POWERGRID would revert back to NRPC with details based on sharing of cost between power and telecommunication sectors.

NRPC deliberation

MS, NRPC briefed the members about TCC deliberation. POWERGRID further, informed that many new system protection schemes are being formulated as per the requirement for which high bandwidth (minimum 64 Kbps) communication channels are required. Such requirements could be met with fiber optic connectivity. Accordingly, there was a need to provide the connectivity of upcoming sub-stations of POWERGRID through fiber optic by providing OPGW on new lines. It would be prudent if OPGW is provided along with the construction of transmission line which is economical as compared to laying OPGW on existing lines. POWERGRID emphasized that States like HVPNL and RVPNL had already planned OPGW over their lines.

After deliberations on the issue, members opined that POWERGRID could examine the possibility of use/leasing of Optic fibers by telecom companies including POWERGRID Telecom Deptt. and the revenue earned through this arrangement could be shared with the beneficiaries of Transmission system.

C.21 RTUs Short listing for Procurement and Interfacing with the Existing SCADA System in Northern Region

TCC Deliberation

MS, NRPC informed that to facilitate the constituents for procuring RTUs, a committee was constituted with following objective:

- a) Examine suitability/compatibility of RTU offered by perspective vendors for integration into the system supplied by M/s Areva and at the same time meeting the future requirements of RTUs in NR.
- b) Based on the above examination & analysis, list out the vendors of RTUs who can offer suitable RTUs which will smoothly get integrated with the existing SCADA system in NR.

The committee after several rounds of deliberations finalized the test procedures for testing the RTUs and also the vendors :

Following 8 RTU vendors were able to interface their RTUs with the existing system successfully and were found suitable for integration with the existing ULDC system in Northern Region:

S.No.	Make	RTU Model
1	ABB	RTU 560
2	BPL	A-200
3	Chemtrol	Callisto-NX
4	CGL	Xcell(Rack:081
5	GE	D25
6	Siemens	SICAM AK1703ACP
7	Synergy	HUSKY RTU 6049-E70
8	Dongfang	DF1331

Following vendors were considered to be conditionally passed. Constituents were advised to select vendors subject to demonstrating the deficiencies as brought out in the report.

S.No.	Make	RTU Model
1	Areva	Micom C264
2	MB Control	ACE 3600
3	Easun Reyrolle	ER 1000

NRLDC stated that the vendors had been selected for meeting the immediate future requirement of the RTUs. The specifications may be reviewed after one or two year when there is future requirement.

TCC approved the report of subcommittee and it was decided that constituents may procure the RTUs quickly as per requirement so that data is made available to the Control Centres at the earliest. The efforts shall be made so that data is made available at Control Centres matching with the commissioning of the new stations by giving this work adequate priority.

NRPC deliberation

Members appreciated the work done by the committee and advised constituents to take necessary action to procure RTUs as recommended in the report.

C.22 System Protection Scheme (SPS) for 2 x 1250 MW, 780 km, HVDC Balia-Bhiwadi

TCC Deliberation

MS, NRPC informed that Commissioning of one of the poles of HVDC Balia-Bhiwadi was under advance stage of completion and the same will be operational by June 2010.

Looking at the importance of system security and to avoid any contingency in the grid operation in real time, a SPS had been proposed for taking automatic corrective action in case of outage of forthcoming HVDC Balia-Bhiwadi link.

The proposed scheme had been planned to be implemented in the two phases. The first phase of the scheme had been designed by integrating the proposed scheme with the existing SPS for HVDC Rihand-Dadri bipole and 400 kV Muzaffarpur-Gorakhpur D/C so as to utilize the existing infrastructure and load groups and further considering that simultaneous occurrence any of two of these contingency may be rarest. However, in the phase-2 of the proposed scheme, three additional load groups (E, F and G) would be added and further additional backing down of generations in the eastern region would be done as capability of Balia-Bhiwadi being 2500 MW against the 1500 MW of Rihand-Dadri and consequently a bigger contingency.

It has been proposed that the cost of HVDC Balia-Bhiwadi SPS would be recovered by POWERGRID from the constituents through transmission tariff as it was done for SPS for HVDC Rihand- Dadri bipole and 400 kV Muzaffarpur-Gorakhpur D/C.

The proposal was also discussed in 49th OCC meeting held on 09th April,2010 where in UP, Rajasthan, Haryana and Punjab were requested to identify the loads for group-E, F and group-G, depending on the availability of radial load and wide band communication.

NRPC deliberation

Members agreed for above and decided that the cost of HVDC Balia-Bhiwadi SPS would be recovered by POWERGRID from the constituents through transmission tariff .

C 23 Reimbursement of expenditure towards procurement of SEMs and DCDs upto year 2009

TCC Deliberation

MS, NRPC informed that POWERGRID envisaged one time reimbursement of expenditure towards procurement of SEMs and DCDs till date, including services portion i.e. RS 1.60 lakhs and balance after completion of works and submission of the Bill by the contractor. This includes 15% overheads of POWERGRID.

Regarding sharing of reimbursement of expenditure towards procurement of SEMs and DCDs representative of POWERGRID expressed that sharing of expenditure would be done in the same manner as that of sharing of transmission Charges in accordance with the CERC tariff Regulation. He further stated that no O&M charges would be recovered and 15% overhead would be only one time charge.

Representative of RVPNL agreed with the proposal of POWERGRID.

Representative of HPSEB opined that overhead charges should be 8% or otherwise the cost should be recovered as per CERC tariff Regulations.

Representative of HVPNL stated that as per CEA Metering Regulation, 2006 the installation of meter was responsibility of CTU and no overhead charges should be applicable. Other utilities also endorsed the same views as suggested by HVPNL.

TCC decided to refer the matter to NRPC.

NRPC Deliberation

MS, NRPC informed about the views of TCC members.

After deliberation in NRPC, POWERGRID agreed to recover the expenditure towards procurement of SEMs and DCDs based on CERC Regulations on terms and conditions of tariff.

D . I T E M S F O R N R P C O N L Y

D.1 STATUS OF UI CHARGES:

MS, NRPC informed the members about the status of outstanding UI charges and interest thereon by the constituents as on 28.02.2010 as given below

Rs. In Lakh

Name of utility	Principal UI Charges	Interest on UI charges			Principal + Interest
	Outstanding UI receivable (-) / payable (+) from / to the pool a/c as on 28.02.2010	Cumulative UI interest payable(+)/receivable (-) by the utilities for the period upto 30.09.2009 2 nd quarter	UI interest amount paid(+)/received (-) from the pool (upto 28.02.2010)	Net interest payable(+)/receivable(-) as on 28.02.2010	Net UI receivable(-) / payable(+) from / to the pool a/c as on 28.02.2010
	1	2	3	4=2-3	5=1+4
DELHI	-18397.39548	-15019.04634	-12362.47564	-2656.57070	-21053.96618
J&K	17030.03176	20757.82681	15000.00000	5757.82681	22787.85857
U.P. #	42488.68362	17980.56662	15689.37000	2291.19662	44779.88024
HARYANA	-228.77340	-98.65150	-73.26397	-25.38753	-254.16093
RAJASTHAN	-2239.17262	-1530.65057	-1217.52211	-313.12846	-2552.30108
CHANDIGARH	-173.34508	-690.37164	-596.65846	-93.71318	-267.05826
PUNJAB	8456.83460	-1329.34952	-1260.86531	-68.48421	8388.35039
H.P.	-1237.67420	-4546.04426	-3870.05205	-675.99221	-1913.66641
UTTARAKHAND	10554.57241	-5464.43460	-4956.16229	-508.27231	10046.30010
N.H.P.C.	-2350.27414	-1373.55369	-1083.31576	-290.23793	-2640.51207
N.T.P.C.	-9315.24086	-5077.76241	-4173.40899	-904.35342	-10219.59428

RAILWAYS	-362.93851	-478.42147	-417.69159	-60.72988	-423.66839
S.J.V.N.L.	-773.02583	-551.75003	-432.78862	-118.96141	-891.98724
T.H.D.C.	-366.79420	-318.70634	-245.16521	-73.54113	-440.33533
W.R.	-122.38481	-48.51964	0.00000	-48.51964	-170.90445
E.R.	-6.46146	-445.26142	0.00000	-445.26142	-451.72288
POOL Balance	-42315.95249	0.00000	0.00000	0.00000	-42315.95249

- # i) These figures are based on UI regulations of CERC. However, the differential amount of Rs. 16328.11013 Lakh is there due to different UI ceiling rate as per CERC Regulation on UI Charges and High Court of Allahabad, Lucknow bench order dated 2.5.2008 and CERC order dated 29.5.2008 for implementation of High Court order which is subject to review based on the conclusion of the proceeding in the matter presently pending in High Court. Accordingly the outstanding UI charges of UP is only Rs. 28451.77011 lakh including interest of Rs. 2291.19662 Lakh.
- ii) As per High Court order dated 2.11.2009 and CERC order dated 12.02.2010, UPPCL shall not be compelled to deposit additional 40% UI charges. The additional UI charge liability from the weeks for which weekly UI accounts was issued after the High Court order is Rs. 385.96566 Lakh. Accordingly, the outstanding UI charges of UP is Rs. 28065.80445 Lakh including interest.

MS, NRPC also informed that the above statement was being sent to CERC on monthly basis.

Members noted the status.

D.1.1 UI charges outstanding against UP

UP was requested to give firm time frame for liquidating the outstanding UI charges. Representative of UP stated they would try to liquidate the dues as early as possible.

It was decided that UP should make all endeavour to liquidate the outstanding UI charges immediately.

D.1.2 UI charges outstanding against Uttarakhand:

Representative of Uttarakhand stated that Rs. 75 crore was paid during the March 2010 and balance would be paid shortly.

D.1.3 UI charges outstanding against J&K:

It was decided that J&K should make all endeavour to liquidate the outstanding UI charges immediately.

D.1.4 UI charges outstanding against Punjab:

It was decided that Punjab should make all endeavour to liquidate the outstanding UI charges immediately.

D.2 STATUS OF REACTIVE ENERGY (RE) CHARGES

MS, NRPC informed the members about the status of payment of Reactive Energy charges payable/Receivable by the utilities as on 28.02.2010 of the current financial year as given below:

Rs. In Lakh

Name of utility	Principal RE Charges	Interest on RE charges			Principal + Interest
	Outstanding RE receivable (-) / payable (+) from / to the pool a/c as on 28.02.2010	Cumulative interest payable(+)/receivable (-) by the utilities for the period upto 30.09.2009	Interest amount paid(+)/received (-) from the pool (upto 28.02.2010)	Net interest payable(+)/receivable(-) as on 28.02.2010	Net RE receivable(-) / payable(+) from / to the pool a/c as on 28.02.2010
	1	2	3	4=2-3	5=1+4
CHANDIGARH	-89.26058	-128.73000	0	-128.73000	-217.99
DELHI	-173.53453	-236.91000	0	-236.91000	-410.44
HARYANA	-2296.39806	-1486.52000	0	-1486.52000	-3782.92
H.P.	-162.78516	-116.90000	0	-116.90000	-279.69
J&K	5271.35515	3582.57000	0	3582.57000	8853.93
PUNJAB	-59.47198	-509.13000	0	-509.13000	-568.60
RAJASTHAN	-170.66244	-625.12000	0	-625.12000	-795.78
U.P.	-950.98271	-479.26000	0	-479.26000	-1430.24
UTTARAKHAND	2.09656	0.00000	0	-128.73000	2.097

Members noted the status.

D.2.1 Reactive energy charges outstanding against J&K:

MS, NRPC informed that the outstanding Reactive Energy Charges (principal amount) against J&K were Rs 8853.93 Lakh. Also, an amount of Rs 3583 Lakh was outstanding against J&K as an interest due to late payment of reactive charges upto 30.09.2009. He also informed that NRPC had sanctioned Rs 22 crore from Reactive pool account of NR to J&K for installation of capacitors. However, the progress in installation of capacitor is very poor. He requested PDD, J&K to expedite the installation of capacitors.

D.3 Training of SLDC Operators

MS, NRPC informed that as approved by NRPC, ten Training Programmes on SCADA, Dispatcher, EMS Application and Database & Display Building were conducted and successfully completed at, NRLDC, New Delhi. He further stated that eight Training Programmes on Dispatcher Training covering EMS/ SCADA, Power System Protection and Time Correction in Special Energy Meters were also successfully completed at 8 SLDCs of Northern Region. Total 255 trainees from constituents of Northern Region attended the two programmes. Participants found the course very useful in enhancing their expertise.

MS, NRPC also informed that first training programme on Reactive Power Management through M/s ABB India Ltd for officers of the Northern Region constituents was held from 22.02.2010 to 26.02.2010. 15 nos of participants from various constituents of Northern Region attended the programme. The training programme would be conducted at 8 SLDC locations for officers from STUs and DISCOMs after finalizing the schedule with respective head of SLDC

Representative of HPSEB stated that foreign training for the SLDC officers should also been arranged. Members agreed with the proposal.

D.4 UPGRADATION AND MODERNIZATION (U&M) OF NRPC SECRETARIAT OFFICE/COMPLEX:

MS, NRPC informed that the contribution for U&M works NRPC secretariat office/complex from twenty three regular members had been received. The remaining members as listed below were requested to expedite the contribution.

- i. Power Development Department, J&K
- ii. North Delhi Power Ltd.
- iii. Madhyanchal Vidyut Vitaran Nigam Ltd.
- iv. Haryana Power Generation Co. Ltd.
- v. JSW Power Trading Company Ltd.

He also mentined that as decided in the 15th NRPC meeting held on 24.12.2009 the rotational members as given below had been requested to deposit contribution of Rs. 9 lakh for upgradation & modernization work.

- i) BSES Yamuna Power Limited
- ii) BSES Rajdhani Power Limited
- iii) Jodhpur Vidyut Vitran Nigam Ltd.
- iv) Ajmer Vidyut Vitran Nigam Ltd.
- v) Uttar Haryana Bijli Vitaran Nigam Ltd
- vi) Paschimanchal Vidyut Vitran Nigam Ltd
- vii) Purvanchal Vidyut Vitaran Nigam Ltd.
- viii) Dakshinanchal Vidyut Vitran Nigam Ltd.
- ix) Malana Power Company Ltd.

MS, NRPC informed that the U&M work was to be implemented through NTPC on deposit work basis. He requested representative of NTPC to inform about the latest status in the matter.

Representative of NTPC informed that the tender for the work was to be opened on 16.4.2010. He assured that the work would be started in the first week of May 2010.

MS, NRPC stated that as reported by NTPC, the work would be started in the first week of May 2010. He, therefore, requested remaining regular members and rotational members to expedite the contribution.

NRPC decided that the members should expedite the contribution for U&M work.

D.5 MEMBERSHIP IN NRPC FOR ROTATIONAL MEMBERS

MS, NRPC informed that Jammu and Kashmir State Power Development Corporation Ltd. (JKPDC) owned by J&K, Govt. have requested for membership in NRPC. As per the Resolution of MoP, JKPDC had been included as regular member of NRPC. He also stated that as per the List of traders nominated for the membership of the various RPCs for the year 2010-11 by CEA, M/S Lanco Electric Utility Ltd had been included as member in NRPC for the year 2010-11.

MS, NRPC further stated that as per the Resolution of MoP, generating companies having power plants in the region and not covered in any of the category mentioned for membership of RPC in the resolution had to be nominated by rotation in alphabetical order for one year. Such generating companies presently operating in the Northern Region were J.P. Hydro Power Ltd. (Baspa-II HEP), JSW Energy Ltd. (Jalpa Kapurdi TPS in Rajasthan) and Malana Power Company Ltd. (Malana HEP). During the year 2009-10, membership of NRPC was given to J.P. Hydro Power Ltd. As per alphabetical order, it was the turn of JSW Energy Ltd. for the year 2010-11. JSW Energy Ltd had also requested for membership of NRPC for the year 2010-11. Accordingly, JSW Energy Ltd had been included as member of NRPC for the year 2010-11.

The membership for DISCOMs as given below for the year 2010-11 had been considered based on the rotation followed for membership in the previous years.

- i) BSES Rajdhani Power Ltd. (Delhi)
- ii) Dakshinanchal Vidyut Vitran Nigam Ltd. (UP)
- iii) Ajmer Vidyut Vitran Nigam Ltd. (Rajasthan)
- iv) Uttar Haryana Bijli Vitaran Nigam. (Haryana)

Members noted the above.

D.6 Agenda pertaining to transmission system agreed in 28th Standing Committee Meeting of Power System Planning in NR for Concurrence of NRPC

MS, NRPC requested POWERGRID to briefly explain and apprise Members of RPC about the new transmission schemes discussed and agreed during the 28th Standing Committee Meeting of NR constituents. POWERGRID explained that following schemes were discussed and agreed in the Standing Committee Meeting and are being put up for NRPC approval.

- i) **LILO of 400 kV Dehar-Bhiwani line at Rajpura S/s (PSEB)** : It was informed to the Members that PSEB had agreed to carry out the work of LILO of 400 kV Dehar-Bhiwani line at Rajpura S/s.

Members noted the information.

- ii) **Dehradun-Abdullapur 400 kV D/c line:** It was explained that the Dehradun-Abdullapur 400 kV D/c (quad) line would provide an additional transmission corridor from eastern part of Northern Regional Grid towards western part of the Grid and has been agreed for system strengthening of NR grid.
- iii) **Augmentation of transformation of Raibareilly:** POWERGRID informed that under ATS of Unchahar-III, 220/132kV, 2x100 MVA Raibareilly S/s was established. Transformers at Raibareilly are heavily loaded. Accordingly additional 100 MVA transformer was agreed in 28th SCM to meet the contingency. Further, looking into the urgent requirement POWERGRID proposed to take up this augmentation scheme as a separate scheme.
- iv) **Dulhasti-Samba 400 kV D/C:** It was informed that the issue of reliable power evacuation from Dulhasti HEP was discussed during the 14th NRPC meeting held on 19/09/2009 wherein it was agreed to provide a 400 kV D/c quad conductor line from Dulhasti to Samba. This was again discussed during the 28th Standing Committee Meeting wherein it was opined that Kishenpur is better for dispersal of power as compared to Samba as well the length of the line would reduce. It was also expressed that due to initial low loading there would be over voltages and excessive MVAR. Accordingly it was proposed to provide Single ckt (quad) stringing on D/c towers (suitable for quad D/c) and same was agreed. It was also agreed that Stringing of 2nd circuit would be taken up with additional generation in the area.

It was further informed that two nos. of 63 MVAR line reactors on Barh – Balia 400 kV D/c line were also agreed during the 28th Standing Committee Meeting.

Summarizing the above it was informed that following transmission schemes would be taken up by POWERGRID as regional scheme:

- 1) **Northern Regional System Strengthening Scheme – XXIV**
- **Dehradun-Abdullapur 400 kV D/c (Quad)**
 - **Dulhasti – Kishenpur 400 kV D/c (Quad) – Initially only one ckt to be strung. Stringing of 2nd ckt to be taken up later with additional generation**
 - **2 nos. of 63 MVAR line reactors on Barh – Balia 400 kV D/c line at Balia end**

2) Augmentation of 220/132 kV Transformation Capacity at Raibareilly (POWERGRID) by 1x100 MVA Transformer

Above schemes (at 1 & 2) were concurred by NRPC and it was also agreed to include these schemes as part of the main BPTA.

v) Tr. System associated with Tilaiya UMPP (4000 MW) in Jharkhand:

It was informed that earlier Tillaiya – Balia 765 kV 2XS/c & Tilaiya UMPP – Gaya, 765kV S/C lines were agreed, however to conserve the RoW it was agreed to change the Tillaiya – Balia 765 kV line as D/c line instead of 2xS/c lines.

Members concurred the above proposal.

vi). Evacuation of Bagliar-II (3x150 MW) & Ratle (690 MW) HEPs in J&K:-

It was informed that J&K has proposed following power evacuation system for Bagliar HEP & Ratle HEP which has been agreed in the 28th Standing Committee Meeting:

Bagliar-II HEP (3x150 MW)

- Step up of generation at 400 kV
- LILO of one circuit of existing 400 kV Kishenpur-Wagoora D/c line or 400 kV Kishenpur-New Wanpoh line (whichever is nearer to Bagliar HEP) at Bagliar-II HEP.
- Interconnection of Bagliar-I & II HEPs through 400 kV cables

Members noted the above.

Ratle HEP (690 MW)

- Step up of generation at 400 kV
- LILO of new Dulhasti-Kishenpur ckt at Ratle HEP
- Stringing of second ckt from Ratle to Kishenpur

The proposal of J&K was accepted and J&K was advised to apply for Connectivity and Long Term Access to the CTU, after which, stringing of 2nd ckt of 400 kV Kishenpur-Dulhasti D/C quad line would be planned.

Members noted the above.

vii) Transmission system associated with IPPs located in Chhatisgarh, Orissa, Jharkhand, West Bengal, Madhya Pradesh, and Southern Region:

POWERGRID explained that subsequent to Long Term Open access regulations of CERC, POWERGRID received applications for a capacity addition of more than 200,000 MW from various generation developers. Out of the above capacity about 55,000 MW has been targeted to be sold in Northern region. While processing these applications readiness of generation projects applied for LTOA were assessed. Considering the power transfer from these

IPPs and other power transfer from DVC projects, UMPPs & ISGS projects the total envisaged power flow to Northern region is estimated to be about about 29,000 MW. Out of this 29,000 MW, transmission system for transfer of about 16500 MW is already planned and under various stages of implementation and transmission system for additional power transfer and to facilitate open access to various IPPs has been evolved.

It was further informed that based on the information furnished by the IPPs, group of generation projects who have made progress on ground were prioritized. These projects are likely to add generation capacity of about 49,000 MW. For meeting the evacuation requirement of above generation projects, nine nos. of high capacity transmission corridors have been proposed, at an estimated cost of Rs. 58,000 Crores. The proposed transmission corridors will focus on wheeling power from the generation projects located in the coal belt of Chhattisgarh, Jharkhand, Orissa and imported coal based generation projects in coastal Tamil Nadu & Andhra Pradesh. All the above applications have no firm beneficiaries and accordingly the transmission system requirement has been worked out on the basis of target beneficiaries/regions. **It was also informed that POWERGRID has already gone ahead for the regulatory approval for the above transmission corridors. It was informed that initially the transmission charges for the identified scheme would be borne by the IPPs, however after signing of the long term PPA by the beneficiaries the proportionate transmission charges would have to be borne by the beneficiary. In addition to above transmission charges, regional transmission charges for ER, WR, NR and associated inter regional transmission charges would be borne by the respective open access applicant, as applicable (as per CERC norms).**

Subsequently, the transmission system for evacuation & transfer of power from various IPPs in Northern Region as agreed in the Standing Committee Meetings was informed to the Members, which is enclosed at **Annexure-V**

In addition to above, POWERGRID informed that there are some applicants, located within Northern region, who have been granted Connectivity / Long Term Open Access / Long Term Access after deliberations during 28th Standing Committee Meeting. The details of such projects were informed to the Members of NRPC and list of the same is given below:

Project	Location	Capacity	LTOA/LTA /Connectivity	Brief Details
Hanol Tiuni HEP	Uttarakhand	60 MW	LTOA	LTOA Granted for 52.8 MW for 30 years from 30/06/2013 for NR beyond Dehradun
Rupin HEP	HP	45MW	LTOA	LTOA Granted for 45

				MW for 40 years from June 2014 for Punjab / Rajasthan (22.5 MW) & Maharashtra (22.5 MW) beyond Nalagarh
Barmer Wind Power Plant	Rajasthan	300MW	LTOA	LTOA granted for 250 MW for Punjab (150 MW) & Haryana (100 MW) for 25 years from March 2012 beyond Bhinmal. Injection of power at Bhinmal at 220 kV level by applicant
Lanco Anpara Power Pvt Ltd	Uttar Pradesh	100MW	LTA	LTA granted for 100MW for 25 years from 26/03/2011 for NR beyond Singrauli
Shree Cements Ltd.	Rajasthan	300 MW	Connectivity	Connectivity granted by LILO of one ckt of Kota – Merta 400 kV D/c line

Members noted the above.

D.7 Posting of officers from Constituent Members in NRPC Secretariat

MS, NRPC stated that, as per the resolution of MoP, the Member Secretary as well as other staff for the secretariat is to be provided by the Central Electricity Authority. Around 60% of the posts at the level of EEs, AEES and AEs were vacant in NRPC Secretariat. It had become extremely difficult to perform the normal functions of NRPC as defined in the resolution of GoI. There had also been increase in the activities of Commercial & Operation circles due to recent amendments made in the Regulations by CERC. The matter regarding filing up the post was being taken up regularly with CEA. CEA vide its letter dated 8th August 2008 had advised to consider utilization of the services of the employees of State Govt. on loan basis subject to the condition that the State Govt. employees may be repatriated to the parent cadres on completion of their tenures or filling up of the their respective post by regular incumbents from CEA which ever is earlier.

MS, NRPC further stated that during the emergency meeting of NREB (now NRPC) held on 3.9.2001 at New Delhi, the matter regarding posting of Personnel

from SEBs /STUs /PSUs in NRPC Secretariat was discussed. It was decided that each constituent State might deploy a maximum of three personnel preferably two technical and one non-technical staff in NREB in consultation with Member Secretary, NREB subject to the condition that at any given time maximum number of the personnel deployed in NREB should not be more than eight technical officers and six non technical staff.

He requested the constituent members to depute the officers to NRPC Secretariat He further stated that in case of non availability of personnel for posting in NRPC secretariat, MS, NRPC might be empowered to recruit the personnel from the outsourcing agency or the retired personnel with the approval of Chairman, NRPC.

NRPC agreed with the proposal of MS, NRPC for posting of personnel to NRPC secretariat.

D.8 STUDY VISIT TO NORWAY

MS, NRPC stated that as per IEGC effective from 1st April, 2006, the money remaining in the regional reactive account upto 31st March of every year shall be utilized for training of the SLDC operators, and other similar purposes which would help in improving /streamlining the operation of the respective regional grids, as decided by the respective RPC from time to time. Accordingly, ten Training Programmes on SCADA, Dispatcher, EMS Application and Database & Display Building, eight Training Programmes on Dispatcher Training covering EMS/ SCADA, Power System Protection and Time Correction in Special Energy Meters and one programme on Grid Security and Related Issues were conducted and successfully completed. The training programme on Reactive Power Management through M/s ABB India Ltd was in progress.

He also stated that in the series of above training programme, it was proposed to arrange study tour to Norway on power market, system operation and regulation for officers of NRPC, NRLDC and NRPC Secretariat. North Eastern Regional Power Committee had already completed the study tour to Norway through PTC. The proposal of such study tour for ERPC delegates through PTC had already been approved by ERPC He stated that the above programme had been proposed through PTC as there was MOU between PTC and Ministry of Power for such training programme.

MS, NRPC further stated that the matter was taken up with PTC for submitting the proposal for study tour. The salient features of the study tour as proposed by PTC are as under:

The objective of the study tour is to get acquaintance to power market, system operation and regulation with special focus to following:

- i) Overview of Nord Pool power market with emphasis on latest development in power sector and system operation and state of the art facilities in the power sector.
- ii) Open access in the integrated grid operation of Scandinavian countries, agreements that were entered for cooperation and some salient features.
- iii) Transmission pricing/ tariff design based on point of connection concept
- iv) Settlement procedures and processes.
- v) Regulatory over view and the broader role of regulator including market monitoring in the emerging scenario.
- vi) Energy efficiency and climate change efforts.

Group Size : The study visit will comprise of three groups of at most 16 delegates each, out of which one delegate-cum-coordinator shall be from PTC.

Duration : About nine days including journey time.

Cost : All expenses will be borne from the Reactive Energy Pool Account and shall include the expenses of one executive of PTC who will accompany with each group of delegates. PTC will not charge any fees for arranging and coordinating the study tour.

Tentative cost for the training would be Rs. 187 Lakh in case the amount is paid directly by NRPC to SWECO. In case payments are routed through PTC then Service Charge @ 10.30% and TDS shall be applicable extra and total cost would be Rs. 225 Lakh. (Rs. 4.7 lakh per person)

Representative of HPSEB stated that the officers from the Constituents members those were participating in Reactive Energy Pool should be included. He also stated the officers dealing with the subject should be considered.

After further discussion the proposal of study tour to Norway for the officers of the Constituents members those were participating in Reactive Energy Pool, NRLDC and NRPC Secretariat as detailed above was approved by NRPC. MS, NRPC was empowered to take up the proposal for further necessary action in the matter with the approval of Chairman, NRPC.

D.9 Participation of officers at the meetings Sub-committees of NRPC

MS, NRPC stated that in order to assist NRPC in discharging its functions, a number of sub-committees viz. Technical Coordination Sub-committee (TCC),

Operation Coordination Sub-committee (OCC), Commercial Sub-committee (CC) and Protection Sub-Committee (PCC) System Studies Sub-committee (SSC) have been constituted, which meet on monthly / quarterly basis to discuss the issues related to them and recommend solutions. As per Conduct of Business Rules of NRPC, the officers nominated to OCC and PCC shall be of the level of Chief Engineer / GM; and for CC, he should be Commercial Head of the organization (generally Chief Engineer / GM).

He further stated that the meetings of various sub-committees were being attended by junior officers from a number of constituents. The participation of officers of the right level at various meetings helps in having fruitful discussions and taking quick decisions on various issues. He requested the NRPC members to advise nominated members of Sub-committees of NRPC to represent in the meeting themselves or depute senior officers to represent him under exigencies.

NRPC agreed with the proposal of MS, NRPC.

D.10 REIMBURSEMENT OF EXPENDITURE OF NRPC SECTT. FOR THE YEAR 2010-11 BY THE MEMBERS OF NRPC

MS, NRPC stated that the estimated annual expenditure of NRPC secretariat for the financial year 2010-11 would likely to be Rs.316 Lakh. After meeting expenditure for meetings at Secretariat and reimbursing NRPC expenditure to Gol for the year 2009-10 and committed expenditure on computerization of NRPC Secretariat and for software development work, the balance amount in the account stands at Rs 99.10 Lakh. Therefore, the contribution for the year 2010-11 works out to Rs 8 Lakh per member.

Members approved the estimated annual expenditure of Rs.316 Lakh for NRPC secretariat for the year 2010-11 and also agreed to contribute the amount of Rs.8 Lakh per member for the year 2010-11.

D.11 VERIFICATION OF NRPC FUND ACCOUNT:

MS, NRPC stated that as per the Bye-laws for NRPC Fund, the “NRPC –Fund” account was required to be audited annually for each financial year. Accordingly, the auditing of expenditure of NRPC fund account for the year 2009-10 was carried out by the officers nominated by Chairman, NRPC and statement was placed in the agenda.

Members approved the statement of audited accounts of “NRPC – Fund” for the Financial Year 2009-10.

D.12 VERIFICATION OF REGIONAL BOARD FUND:

As per Bye-laws for Regional Board Fund (RBF), the account for each financial year was required to be audited annually by the officers nominated by Chairman, NREB (now NRPC). The auditing of expenditure of RBF account for the year 2009-10 was carried out by the officers nominated by Chairman, NRPC and statement was placed in the agenda.

Members approved the statement of audited accounts of RBF for the Financial Year 2009-10.

HOSTING OF NEXT MEETINGS OF NRPC / TCC

Taking into account the agreed roster for hosting of meetings, the next meetings of TCC (16th) & NRPC (17th), which would become due in June, 2010 would be hosted by Himachal Pradesh. Exact dates & venue for the meetings would be intimated later.

List of Participants of 16th TCC Meeting held on 15.04.2010 at Nainital, Uttarakhand

S. No	Name of Officer	Designation	Organisation/ Company
	S/Shri		
1	<u>DELHI</u>		
	A.K. Kaul	Director (O) & Chairman, TCC	DTL
	Roop Kumar	GM (SLDC)	DTL
	S.M.Verma	GM	IPGCL/PPCL
	Ajay Kumar	ADDL.Vice President	BSES, Rajdhani
2	<u>J & K</u>		
	I.A. Kakroo	D.G.M	JKSPDC
	A.R.Tak	Consultant	JKSPDC
4	<u>HARYANA.</u>	-	
	Niraj Gulati	Director (Tech.)	HVPNL
	H. R. Satija	Chief Engineer (SO & C)	HVPNL
	O.P. Singh	Chief Engineer	HPGCL,Panchkula
	A.K.Virdi	S.E.	HPGCL,Panchkula
5	<u>RAJASTHAN</u>		
	B.N. Saini	Chief Engineer (PPM)	RRVNL
	R. P. Katara	S.E. (SLDC)	RRVNL
	L.N. Nimawat	S.E. (PLP)	RRVNL
	H.C. Agrawal	S. E.	RRVUNL
6	<u>HIMACHAL PRADESH</u>		
	R.K.Dhiman	Member (Tech.)	HPSEB
	S.D. Rattan	Chief Engineer (SO)	HPSEB
	Suneel Grover	Director (PR & CERC)	HPSEB
7	<u>UTTAR PRADESH</u>		
	A.K. Singh	Chief Engineer (System)	UPPTCL
	V.P. Trivedi	Chief Engineer (Trans.)	UPPTCL
	Praveen Malhotra	SE	UPPTCL
	Y.P.Singh	E.E.	UPPTCL
	S.P.Gupta	Sr. A. E.	UPPTCL

9	<u>UTTARAKHAND</u>		
	R.M.Agarwal	Chief GM (OM)	UPCL
	S.C.Tewari	GM (D)	UPCL
	S.K.Tamta	G.M.(Comml.)	UPCL
	Rakesh Jain	DGM (S.O.)	PTCUL
10	<u>NTPC</u>		
	S. N. Banerjee	R.E.D. (NC)	NTPC Ltd.
	K. K. Agarwal	E.D. (COMML)	NTPC Ltd.
	R. P. Sharama	Manager	NTPC Ltd.
11	<u>NHPC</u>		
	S. Kalgaonkar	G. M.	NHPC
	Prashant Kaul	Chief Engr. (Comml)	NHPC LTD
	Manoj Kumar Jha	Dy. Manager (Comml.)	NHPC LTD
12	<u>BBMB</u>		
	S. K. Gupta	S.E./ HQ	BBMB
	S. Dilbagi	Dy. Director	BBMB
13	<u>NPCIL</u>		
	M. L. Jadhav	Chief Engineer (Tr.)	NPCIL
14	<u>THDC</u>		
	Ajay Kumar Mathur	Addl. GM (Comml)	THDC Ltd.
	Manoj Kuamr Tyagi	Sr. Manager (Comml)	THDC Ltd.
15	<u>SJVNL</u>		
	R. K. Agarwal	G.M.	SJVN Ltd.
16	<u>POWER GRID</u>		
	Arun Kumar	ED (Comml.)	POWERGRID
	Mahender Singh	GM (Comml.)	POWERGRID
	B. Sharma	GM	POWERGRID
	Pankaj Kumar	GM (ENGG.)	POWERGRID
	U. K. Tyagi	GM (Comml.)	POWERGRID
	H. H. Sharan	AGM (LD&C)	POWERGRID
	Anoop Singh	DGM	POWERGRID
	Mukesh Khanna	DGM (ENGG)	POWERGRID
17	<u>NRLDC</u>		
	V.K. Agarwal	GM	NRLDC
	P.K.Agrawal	DGM	NRLDC

	Rajiv Porwal	Chief Manager	NRLDC
20	<u>NRPC</u>		
	A.K. Aggarwal	MS	NRPC
	P.S. Mhaske	SE	NRPC
	Rishika Sharan	EE	NRPC
	Vikram Singh	EE	NRPC
	B.S. Bairwa	EE	NRPC
	Uma Maheswara Rao	AEE	NRPC

List of Participants of 16th NRPC Meeting held on 16.04.2010 at Nainital, Uttarakhand

S. No	Name of Officer	Designation	Organisation/ Company
	S/Shri		
1	<u>DELHI</u>	-	
	Rajendra kumar, IAS	CMD & Chairman, NRPC	DTL
	R.K.Gaur	MD	IPGCL
	A.K. Kaul	Director (O)	DTL
	Roop Kumar	GM (SLDC)	DTL
	S.M.Verma	General Mnager	IPGCL/PPCL
	Ajay Kumar	ADDL.Vice President	BSES, Rajdhani
2	<u>J & K</u>		
	I.A. Kakroo	D.G.M	JKSPDC
	A.R.Tak	Consultant	JKSPDC
4	<u>HARYANA.</u>	-	
	Niraj Gulati	Director (Tech.)	HVPNL
	H. R. Satija	Chief Engineer (SO & C)	HVPNL
	O.P. Singh	Chief Engineer	HPGCL,Panchkula
	A.K.Virdi	S.E.	HPGCL,Panchkula
5	<u>RAJASTHAN</u>		
	B.N. Saini	Chief Engineer (PPM)	RRVPNL
	R. P. Katara	S.E. (SLDC)	RRVPNL
	L.N. Nimawat	S.E. (PLP)	RRVPNL
	H.C. Agrawal	S. E.	RRVUNL
6	<u>HIMACHAL PRADESH</u>		
	R.K.Dhiman	Member (Tech.)	HPSEB
	<u>S.D. Rattan</u>	Chief Engineer (SO)	HPSEB
	Suneel Grover	Director (PR & CERC)	HPSEB
7	<u>UTTAR PRADESH</u>		
	A.K. Singh	Chief Engineer (System)	UPPTCL
	V. P. Trivedi	Chief Engineer (Trans.)	UPPTCL
	Y. P. Singh	E.E.	UPPTCL
	S. P. Gupta	Sr. A. E.	UPPTCL

9	<u>UTTARAKHAND</u>		
	Jagmohan Lal	MD	UPCL
	R.M.Agarwal	Chief GM (OM)	UPCL
	S.C.Tewari	GM (D)	UPCL
	S.K.Tamta	G.M.(Comml.)	UPCL
	Rakesh Jain	DGM (S.O.)	PTCUL
10	<u>NTPC</u>		
	S. N. Banerjee	R.E.D. (NC)	NTPC Ltd.
	K. K. Agarwal	E.D. (COMML)	NTPC Ltd.
	R. P. Sharama	Manager	NTPC Ltd.
11	<u>NHPC</u>		
	S. Kalgaonkar	G. M.	NHPC
	Prashant Kaul	Chief Engr. (Comml)	NHPC LTD
	Manoj Kumar Jha	Dy. Manager (Comml.)	NHPC LTD
12	<u>BBMB</u>		
	S. K. Gupta	S.E./ HQ	BBMB
	S. Dilbagi	Dy. Director	BBMB
13	<u>NPCIL</u>		
	K.M. Joshi	Station Director	NPCIL
	M. L. Jadhav	Chief Engineer (Tr.)	NPCIL
14	<u>THDC</u>		
	Ajay Kumar Mathur	Addl. GM (Comml)	THDC Ltd.
	Manoj Kuamr Tyagi	Sr. Manager (Comml)	THDC Ltd.
15	<u>SJVNL</u>		
	R. P. Singh	Director (E)	SJVN Ltd.
	R. K. Agarwal	G.M.	SJVN Ltd.
16	<u>POWER GRID</u>		
	R. N. Nayak	Director (O)	POWERGRID
	Arun Kumar	ED (Comml.)	POWERGRID
	S. C. Singh	GM (I/C), NR-II	POWERGRID
	Mahender Singh	GM (Comml.)	POWERGRID
	B.Sharma	GM	POWERGRID
	Pankaj Kumar	GM (ENGG.)	POWERGRID
	U. K. Tyagi	GM (Comml.)	POWERGRID
	H. H. Sharan	AGM (LD&C)	POWERGRID

	Anoop Singh	DGM	POWERGRID
	A. K. Arora	DGM	POWERGRID
	Mukesh Khanna	DGM (ENGG)	POWERGRID
17	<u>NRLDC</u>		
	V. K. Agarwal	GM	NRLDC
	P. K. Agrawal	DGM	NRLDC
	Rajiv Porwal	Chief Manager	NRLDC
21	OTHERS		
	N .Murugesan	Director	C.P.R.I.
	A.Sudhindra	Addl. Director	C.P.R.I.
20	<u>NRPC</u>		
	A.K. Aggarwal	MS	NRPC
	P.S. Mhaske	SE	NRPC
	Rishika Sharan	EE	NRPC
	Vikram Singh	EE	NRPC
	B.S. Bairwa	EE	NRPC
	Uma Maheswara Rao	AEE	NRPC

Annexure-III

Status of Commissioning of New Generating Units in 2010-11&2011-12

Name of the Plant/Unit	Agency	Capacity (MW)	Expected Date of Commissioning
<u>Rajasthan</u>			
Barsingsar Lignite	NLC	2x125	U#1 -Syn. on 27.10.09 and U#2 -April, 2010.
Chhabra TPS	RRVUNL	2x250	Unit -1 commissioned on 30.10. 2009. DoS Jan, 2010 CoD 1.4.2010 Unit -2 Synchronized in March, 2010, Expected CoD April, 2010.
Kota TPS (Unit-7)	RRVUNL	195	CoD 31.12.09
Suratgarh TPS (Unit - 6)	RRVUNL	250	Synchronized on 31 st March, 2009, . COD 1 st July, 2010
RAPP-5 and 6	NPCIL	2x220	Unit-5, 22 nd Dec, 2009.COD 4 th Feb.2010 Unit -6, CoD 31 st March, 2010.
Jallipa Kapurdi TPP (8x135 MW)	Raj West Power Ltd (JSW)		Unit 1 commissioned on 16.10.09 COD from -26 th Nov, 09, Unit- 2 - May, 2010 and Unit 3 and 4 in July 2010 to March 2011 Unit 5 & 6 Syn Nov 2010, CoD Dec 2010 Unit 7 Synchronized Feb 2011 and CoD March, 2011 U 8 Syn Mar 2011, CoD April 2011
Bihar (NR States have Share)			
Kahalgaon Stage-II, U-3	NTPC	500	Synchronised on 28.6.2009. CoD in March,2010
Uttar Pradesh			
NCP Project St-II U-5 &6	NTPC	2X490	U#1- Syn. –25 th December, 2009 CoD-31 st Jan,2010 U#2 -June, 2010 COD July2010
Rosa (Stage-1)	Reliance	2X300	U#1, Synchronised on 28.12.2009COD 31.03.2010 U#2, CoD 30 th June, 2010
Parichha	UPRVUNL	2x250	Unit-5, July, 2010- 2010. Unit-6, Dec, 2010
Harduaganj	UPRVUNL	2x250	Unit-8, Dec-2010. Unit-9, Dec, 2010
Haryana			
Rajiv Gandhi Thermal Power Plant (Khedar)	HPGCL	2X600	U#1, Synchronised on 28.12.2009COD March end U#2, Likely to be synchronized, April 2010
Indira Gandhi Super Thermal Power Project-Jhajjar	NTPC (JV)	3x500	Unit-1, NOV, 2010. Unit-2, March, 2011. Unit-3, August, 2011
Jammu & Kashmir			

Sewa-II	NHPC	3x40	Unit # 1 and 2--end of May, 2010 unit#3 in June 2010.
URI-II	NHPC	4x60	Unit-1, Nov, 2010. Unit-2, Dec, 2010. Unit-3, Jan, 2011. Unit-4, Feb-2011
Nimmo Bazgo	NHPC	3x15	December, 2010
Chutak	NHPC	4x11	Feb, 2011
Himachal Pradesh			
Alian Duhangan	AD Hydro Power Ltd.	2x96	Unit -1: 15 th May,2010 Unit -2:15 th June, 2010
Chamera-III	NHPC	3x77	Dec, 2010
Budhil	LANCO	2x35	Unit-1, June-2010. Unit-2, July, 2010
Ganvi-II	HPSEB/ HPPCL	1x10	December, 2010
Bhaba Aug.	HPSEB/ HPPCL	4.5	December, 2010.
Malana-II	Everest Power Pvt. Ltd.	100	September,2010
Delhi			
Rithala CCPP	NDPL	108	Jun, 2010
Pragati III (Bawana)	PPCL	Two Modules each of (2x250GT + 1x250 ST)	1 st GT – July 2010 2 nd GT – Nov 2010 3 rd GT – Nov 2010 4 th GT – Jan 2011 1 st ST- Nov 2010 2 nd ST -
Uttrakhand			
Koteshwar	THDC	4x100	Unit-1, October, 2010. Unit-2, December, 2010. Unit-3, February, 2011. Unit-4, March, 2011

2011-12

Name of the Plant/unit	Agency	Capacity (MW)	Expected Date of Commissioning/ synchronization
Himachal Pradesh			
Parbati St. II 4x200= 800 MW	NHPC	4X200	March 2013
Parabati-III 4x130=520 MW	NHPC	4x130	June 2011
Kol Dam	NTPC	4x200	March 2012

4x200=800 MW			
Rampur 6x68.67=412 MW	SJVNL	6x68.67	12 th Plan
State sector			
Uhl-III 3x33.33= 100 MW U-1 to U-3 Himachal Pradesh/	Beas Valley Power Corp. Ltd. (BVPC)	3x33.33= 100 MW	July 2011 onwards
Swara Kuddu 3x36.6= 110 MW	Beas Valley Power Corp. Ltd. (BVPC)	3x36.6= 110 MW	March 2012
Private sector			
Sorang 2x50= 100 MW	Himachal Sorang Power Corporation Ltd.	2x50= 100 MW	2011-12
Uttar Pradesh			
Anpara –C	UPRVUNL	2X600 MW	5/11 and 7/2011
Anpara –D	UPRVUNL	2X500 MW	4/11 and 7/2011
Rosa TPP (phase-II)	Reliance	2X300 MW	2/12 and 6/2012
Uttarakhand			
Loharinagpala 4x150=600 MW	NTPC	4x150=600 MW	12th Plan
Tapovan Vishnugad 4x130=520 MW	NTPC	4x130=520 MW	12th Plan
Private sector			
Shrinagar 4x82.5= 330 MW	M/s GVK Industries	4x82.5= 330 MW	2011-12
Rajasthan			
KalisindTPP	RUVNL	2X600 MW	4/12 and 7/2012
Chhabra TPP Extn	RUVNL	2X250MW	5/12 and 8/2012
Punjab			
Govindwal Sahib	GVK power	2x 270 MW	2012

Annexure-IV

The status on other major decisions as taken during TCC & NRPC meetings

S.No.	Major decisions and its status
1.	12th NRPC meeting held on 22nd April, 2009 in Chandigarh
1.1	<p>Phasor measurement Unit (PMU) Pilot Project</p> <p>NRLDC intimated that 4 PMUS are being installed, one each at Dadri, Kanpur, Vindianchal and at Moga. NRLDC would start getting data by 30th April 2010.</p>
1.2	<p>Replacement of obsolete protection relays with State of numerical relays</p> <p>Haryana intimated that they have retrofitted around 110 relays in their system they have all numerical relays in their system.</p> <p>HP stated that they have 02 relays installed in their system. They are studying the replacement requirement in their system.</p> <p>Rajasthan stated that they have numerical relays at 220 KV system and about 50 % of 132 KV system</p> <p>It was decided that all constituents would submit the information on prescribed format to NRPC sect. by email.</p>
2.	13th NRPC meeting held on 24th June, 2009 at Lucknow
2.1	<p>Automatic Meter Reading(AMR) for SEMs</p> <p>POWERGRID stated that specifications have been finalized and submitted to NRLDC for updating..</p>
3.	14th meeting held on 9th September 2009 at Surajkund
3.1	Procurement of 315 MVA, 400/220 kV ICTs as spare, one for Delhi NCR

	<p>and one for other Northern States of the Region</p> <p>POWERGRID stated that the tendering process is being done for the work. TCC requested POWERGRID to arrange one ICT for Delhi system in view of CWG.</p>
4	<p>15th NRPC meeting held on 24th Dec 2009 at Chandigarh</p>
4.1	<p>Provision of Bus Reactors in Northern Region to Control Over Voltages</p> <p>NHPC stated that the proposal of installation at generating stations were principally approved. However the scope was not decided in during the last NRPC meeting. It was clarified that matter was discussed during standing committee meeting of NR and generating station would fund the installation of reactor at their end.</p> <p>SJVNL stated that as per recommendation of this subcommittee various recommendations are being implemented. Regarding availability 125 MVAR reactor POWERGRID was requested to intimate whether they can provide a spare reactor to them on recoupment basis.</p>

Annexure-V

The transmission system for evacuation & transfer of power from various IPPs

1. Transmission system associated with IPP projects in Chattisgarh

S.No	Applicant	Capacity (MW)	Time frame (unit wise)	LTOA (MW)	LTOA Granted(MW)			
					WR	NR	SR	TOTAL
RAIGARH COMPLEX								
1	RKM Powergen Ltd.(4x360)	1440	Jun'11,Sep'11, Dec'11, Mar'12	819	419	200	200	819
2	Athena Chhattisgarh Power Ltd.(2x600)	1200	Jun'13, Nov'13	683	342	341		683
3	Jindal Power Ltd.(4x600)	2400	Mar'12,Jul'12, Nov'12,Mar'13	1400	700	700		1400
4	Jindal Power Ltd.(225+175)	400	Jul'10,existing	400	400	0		400
5	SKS Ispat & Power (4x300)	1200	Dec'12,Sep'13, Nov'13,Dec'13	683	319	364		683
6	Korba West Power (1x600)	600	Nov'12	240	140	100		240
7	DB Power Ltd.(2x600)	1200	Oct'13,Feb'14	705	530	175		705
	Sub-total	8440		4930	2850	1880	200	4930
JANJGIR-CHAMPA COMPLEX								
8	KSK Mahanadi Power Co. Ltd (6x600)	3600	Feb'12, Jun'12, Oct'12,Feb'13, Jun'13,Oct'13	2340	2340	0		2340
9	BALCO(4x300)	1200	Oct'10, Jan'11, May'11, Aug'11	200	100	100		200
10	Vandana Vidyut(2x135+1x270)	540	Jan'12,Mar'12,Mar'14	265	165	100		265
11	Lanco Amarkantak Power (2x660)	1320	Jan'12,Mar'12	858	858	0		858
12	Chhattisgarh Steel & Power Ltd.(1x35+1x250)	285	Jun'13	167	120	47		185

	Sub-total	6945		3830	3583	247	0	3830
13	Chhattisgarh State Power Trading Co.			4871	2925	1946		4871
	Total	15385		13631	9358	4073	200	13631

- \pm 800 kV 6000 MW HVDC bipole between Champa Pooling Station – Around Kurushetra (NR)(initially to be operated at 3000 MW)
- 3000 MW, + 800 kV HVDC bipole terminal at Champa pooling station and Around Kurushetra (with a provision to upgrade to 6000MW level based on the progress of generation addition in the complex)
- Kurushetra- Jalandhar 400 kV D/C (Quad) (one ckt via 400/220kV Nakodar S/S)
- LILO of Abdullapur- Sonapat 400 kV D/C (triple) at Kurushetra
- Establishment of 400/220 kV , 2x500 MVA substation at Kurushetra
- Raigarh Pooling Station (Kotra)- Raipur Pooling station 765 kV D/C (initially to be operated at 400 kV)
- Raigarh Pooling Station (Kotra)- Champa Pooling station 765 kV S/C
- Champa Pooling station- Raipur Pooling station 765 kV D/C (initially to be operated at 400 kV)
- Raigarh Pooling station (Kotra)- Raigarh Pooling station (Tamnar) 765 kV D/C (initially to be operated at 400 kV)
- Champa Pooling station – Dharamjaygarh 765 kV S/C
- Raigarh Pooling Station (Kotra) - Raigarh existing 400 kV D/C (to be kept open at a later date).
- Raipur Pooling Stn.–Raipur existing 400kV D/C(to be kept open at a later date)
- Establishment of 765/400kV 4x1500MVA Raigarh Pooling Station(near Kotra) (the Pooling station shall be initially at 400kV and later upgraded to 765kV with indicated transformation capacity)
- Establishment of 765/400kV, 3x1500 MVA Raigarh Pooling Station(near Tamnar) (the Pooling station shall be initially at 400kV and later upgraded to 765kV level)
- Establishment of 765/400kV 3x1500MVA Champa Pooling Station(the Pooling station shall be initially at 400kV and later upgraded to 765kV with indicated transformation capacity)
- Establishment of 765/400kV 1x1500MVA Raipur Pooling Station(the Pooling station shall be initially at 400kV and later upgraded to 765kV with indicated transformation capacity)
- Raipur Pooling station- Wardha 765 kV 2x D/C (initially 1st D/c line to be operated at 400 kV)
- Wardha- Aurangabad(PG) 765 kV 2xD/C (initially 1st D/c to be operated at 400 kV)
- Aurangabad(PG)- Padge(PG) 765 kV D/C
- Aurangabad(PG)- Dhule (New) 765 kV S/C (private sector)
- Dhule (New) – Vadodara 765 kV S/C (private sector)
- Dhule (New) – Dhule (MSETCL) 400 kV D/C (quad) (private sector)

- Establishment of 765/400kV 2x1500MVA substations at Dhule (New) (private sector)
- Establishment of 765/400 kV 2x1500 MVA substations at Aurangabad and Padghe (GIS)
- Aurangabad(PG)-Khargar(MSETCL)400 kV D/C (quad)
- Padghe(PG)- Padghe 400 kV D/C (Quad)
- Vadodra-Asoj (GETCO) 400 kV D/C (Quad)
- Dhule(PG) – Dhule(new) 400kV D/c(Quad)
- Dhule(PG) – Nashik 400kV D/c (Quad)
- Dhule(PG) – Malegaon 400kV D/c (Quad)
- ±600 kV 4000 MW HVDC bipole between Raigarh pooling station (Kotra) – Dhule
- 4000 MW , 600 kV HVDC bipole terminal each at Raigarh pooling station (Kotra) and Dhule
- Establishment of 400/220 kV 2x315 MVA substations at Dhule (PG)

Dedicated transmission system along with IPP's is being taken up by Project Developer. Stagewise development would be taken up. Transmission scheme indicated above is the complete scheme however this would be implemented in phases.

Dedicated transmission System up to pooling point under the scope of Project Developer for generation projects in Raigarh Complex

Projects	Transmission Line
RKM Powergen Ltd.(4x360MW)	RKM Powergen – Raigarh Pooling Station (near Kotra) 400kV D/c (Quad)
Athena Chhattisgarh Power Ltd.(2x600MW)	Athena Chhattisgarh – Raigarh Pooling Station (near Kotra) 400kV D/c (Triple/Quad)
Jindal Power Ltd. (4x600MW + 400MW))	Jindal Power – Raigarh Pooling Station(near Tamnar) 400kV 2xD/c(Quad) along with 765/400kV 3x1500MVA transformers at Raigarh Pooling Station(Near Tamnar)
SKS Ispat & Power Ltd.(4x300MW)	SKS Ispat - Raigarh Pooling Station (near Kotra) 400kV D/c(Triple/Quad)
Korba (West) Power Ltd.(1x600MW)	Korba(W) – Raigarh Pooling Station 400kV D/c (Near. Kotra)
DB Power Ltd. (2x600MW)	DB Power – Raigarh Pooling Station (near Kotra) 400kV D/c (Quad/Triple)

Dedicated transmission System up to pooling point under the scope of Project Developer for generation projects in Champa Complex

Projects	Transmission Line
KSK Mahanadi Power Ltd. (6x600 MW)	Wardha Power-Champa Pool 400kV 2xD/c line (Quad) along with 765/400kV 3x1500 MVA transformers at Champa Pooling Stations
BALCO Ltd (4x300 MW)	BALCO–Champa Pooling Station 400kV D/c (Quad/Triple)
Vandana Vidyut Ltd (2x135+1x270 MW)	Vandana Vidyut – Champa Pooling Station 400kV D/c
Lanco Amarkantak Power (2x660 MW)	Lanco - Champa Pooling Station 400kV D/c (Quad)
Chhattisgarh steel & Power (1x35+1x250 MW)	LILO of Vandana Vidyut – Champa Pooling Station 400kV D/c at CSPL

Interim arrangement for connectivity of projects coming prior to availability of transmission

Projects	Transmission Line
BALCO Ltd (4x300 MW)	<ol style="list-style-type: none"> 1) LILO of both circuits of Korba - Birsinghpur 400kV D/c at Balco 2) Restoration of 400kV Korba - Birsinghpur D/c by removing LILO after commissioning of 400kV Balco- Champa Pooling station D/c
RKM Powergen [4x360 MW]	<ol style="list-style-type: none"> 1) LILO of Rourkela- Raigarh 400kV D/c at RKM Powergen 2) Restoration of 400kV Rourkela – Raigarh D/c by removing LILO after commissioning of 400kV RKM- Raigarh Pooling station(Kotra) D/c (Quad)
Vandana Vidyut Ltd (2x135+1x270 MW)	<ol style="list-style-type: none"> 1) LILO of one ckt of Korba – Birsinghpur 400kV D/c at Vandana Vidyut 2) Restoration of 400kV Korba – Birsinghpur D/c by removing LILO after commissioning of 400kV Vandana Vidyut- Champa Pooling station D/c.

The cost of implementation, operation and maintenance of dedicated transmission system shall remain with respective IPP's. .

2. Transmission system associated with IPP projects in MP, Chattisgarh (Bilaspur), Gujarat

	Applicant	Capacity	Time Frame	LTOA (MW)	Allocation (MW)		
					WR	NR	TOTAL
	IPP in Chhattisgarh(Bilaspur)						
1	Maruti Clean Coal(1X300 MW)	300	Dec'12	171	126	45	171
2	Dheeru Power Gen (3x350 MW)	1050	Sep'13, Dec'13, Mar'14	450	367.5	82.5	450
3	Chhattisgarh State Power Trading			432	260	172	432
	Sub-total	1350		1053	753.5	299.5	1053
	IPP in Madhya Pradesh						
1	Jaiprakash Power Ventures Ltd.(2x660 MW)	1320	May'13, Nov'13	1240.8	853.5	387.3	1240.8
2	Aryan MP Power generation Pvt. Ltd(2x600 MW)	1200	Mar'14, Sep'14	1122	841.5	280.5	1122
3	Bina Power Supply Company Ltd.(2x250 MW)	500	Sep'11, Dec'11	265.35	132.68	132.67	265.35
4	Moser Baer (2x600MW)	1200	Dec'12 Jun13	392	200	192	392
	Sub total	4220		3020.15	2027.68	992.47	3020.15
	IPP in Gujarat						
1	Pipavav Energy (2x600MW)	1200	Mar'13 & Sep'13	1110	555	555	1110

Total	5420	4130.15	2582.68	1547.47	4130.15
--------------	-------------	----------------	----------------	----------------	----------------

Immediate Evacuation system - under the scope of Project Developer for generation projects

Projects	Transmission Line
Maruti Clean Coal (300 MW)	<ul style="list-style-type: none"> ➤ Maruti – WR Pooling Station(Bilaspur) 400 kV D/C ➤ Two nos of 400kV bays at WR Pooling Station (Bilaspur)
Dheeru Power (1050MW)	<ul style="list-style-type: none"> ➤ Dheeru Power–WR Pooling Stn. (Bilaspur) 400 kV D/C (high capacity) ➤ Two nos of 400kV bays each at WR Pooling (Bilaspur)
Jaiprakash Power(1320MW)	<ul style="list-style-type: none"> ➤ Jaiprakash – Satna 400kV D/C (high capacity) ➤ Two nos of 400kV bays at Satna(POWERGRID)
Aryan Coal Beneficiary(1200MW)	<ul style="list-style-type: none"> ➤ Aryan Coal – Vindhyachal Pooling Stn. 400kV D/c (high capacity) ➤ Two nos of 400kV bays at Vindhyachal Pooling Station ➤ 1X1500 MVA, 765/400KV trf. at Vindhyachal Pooling Stn.(to be reviewed in light of 400 kV D/C interconnection between Vindhyachal pool and Sasan)
Bina Power Supply(500MW)	<ul style="list-style-type: none"> ➤ Bina TPS-Suitable location(along BIna (PG to Bina (MP 400kV) 400kV D/c ➤ Terminate one circuit out of above D/c from suitable loaction to BIna(PG) and other to BIna(MP)
Moser Baer(1200 MW)	<ul style="list-style-type: none"> ➤ Moser Baer TPS – Jabalpur Pooling Station 400kv D/c (triple) ➤ 2 nos. 400kv line bays at Jabalpur Pooling station

Pipavav Energy Ltd. (1200MW)	➤ Pipavav TPS- Amreli(GETCO) 400kv D/c Quad
---------------------------------	---

Above IPP shall share the transmission charges towards following transmission common transmission corridors

Common Transmission Corridors

(I) Common Transmission system to shared by Maruti Clean Coal & Power Ltd.(300MW), PTC India(600MW), Dheeru Powergen(450MW), Jaiprakash Power Ventures Ltd(1320MW), Aryan M.P Power Generation Pvt. Ltd(1200MW), Bina Power(500MW), M B Power[MP] (1200 MW) to be shared along with IPPs in Orissa in proportion to allocation to NR

- Bina – Gwalior 765 kV S/c (3rd)
- Gwalior – Jaipur 765kV S/c (2nd)
- Jaipur – Bhiwani 765kV S/c

(II) Common Transmission system to shared by M B Power(MP) [1200MW] along with IPPs in Orissa in proportion to allocation to WR

- Jabalpur Pooling Station – Bhopal – Indore 765kV S/c (*Implementation through private sector*)
- 765/400kV 2x1500MVA Jabalpur Pooling Station

(III) Common Transmission system to shared by Maruti Clean Coal & Power Ltd. (300MW), PTC India(600MW), Dheeru Powergen(450MW), Jaiprakash Power Ventures Ltd, (1320MW) and Aryan M.P Power Generation Pvt. Ltd. (1200MW), Bina Power(500MW), M B Power(MP) [1200MMW] in proportion to allocation to WR

- Indore - Vadodara 765 kV S/c
- Vadodara – Pirana 400kV D/c(Quad)
- Establishment of 765/400kV 2x1500MVA Pooling station at Vadodara

Further, M/s Pipavav Energy Ltd shall share the transmission charges towards following transmission system strengthening scheme for WR-NR corridor along with other already identified IPPs in SR (in Krishnapatnam, Tuticorin and Srikakulam area).

- 1) Jabalpur Pooling Station – Orai 765kV S/c
- 2) Orai – Bulandshahar 765kV S/c
- 3) Bulandshahar – Sonipat 765kV S/c

- 4) Establishment of 765/400kV 2x1000MVA S/s at Orai by LILO of one ckt. of Satna – Gwalior 765kV line
- 5) Establishment of 765/400kV 2x1500MVA S/s at Bulandshahar by LILO of Agra – Meerut 765kV line
- 6) Establishment of 765/400kV 2x1500MVA S/s at Sonapat by LILO of Bhiwani – Meerut 765kV line

3. Transmission system for IPP's in Orissa

Phase-I – 7 IPP's

Sl. No	Projects	IC (MW)	LTOA (MW)	Time frame	NR	WR	ER	SR
1	Sterlite	2400	400	Jun-09	200	200	-	-
2	GMR	1050	800	Sept -11	600	-	-	200
3	Navbharat	1050	720	Jul - 11	465	255	-	-
4	Monnet	1050	900	June-12	300	225	225	150
5	Jindal	1200	1044	Mar-11	834	210	-	-
6	Lanco Babandh	2640	1600	Dec-13	650	950	-	-
7	Ind Barath	700	616	Sept-11	266	350	-	-
	Subtotal	10090	6080		3315	2190	225	350

Transmission System for Phase-I Generation Projects in Orissa - Part-A

- o Angul Pooling Station – Jharsuguda Pooling Station 765 kV 2xS/c line
- o LILO of Rourkela – Raigarh 400 kV D/c at Jharsuguda Pooling station
- o LILO of Meramundali – Jeypore 400 kV S/c line at Angul pooling station
- o LILO of one ckt of Talcher – Meramundali 400 kV D/c line at Angul pooling station
- o Establishment of 2x1500MVA, 765/400 kV Pooling Station at Jharsuguda
- o Establishment of 4x1500MVA, 765/400 kV Pooling Station at Angul

Transmission System for Phase-I Generation Projects in Orissa - Part-B

- o Jharsuguda Pooling Station – Dharamjaygarh / near Korba (WR) 765 kV D/c line
- o LILO of Ranchi – Sipat Pooling station (Bilaspur) 765 kV S/c line at Dharamjaygarh / near Korba
- o Dharamjaygarh / near Korba – Jabalpur Pool 765 kV D/c line

- Jabalpur Pooling Station – Jabalpur 400 kV D/c (high capacity) line
- Establishment of 765 kV sub-station at suitable location near Dharamjaygarh / Korba
- Establishment of 2x1500MVA 765/400 kV Pooling Station at Jabalpur

Transmission System for Phase-I Generation Projects in Orissa - Part-C

- Jabalpur Pooling Station – Bina 765 kV D/c line
- Bina – Gwalior 765 kV S/c (3rd circuit) line
- Gwalior – Jaipur 765 kV S/c line (2nd circuit)
- Jaipur – Bhiwani 765 kV S/c line

System strengthening in WR

- Establishment of 2x1500MVA, 765/400kV Bhopal Pooling Stn. (private sector)
- Jabalpur Pooling station – Bhopal 765kV S/C (private sector)
- Bhopal – Indore 765kV S/C (private sector)
- Bhopal New S/s– Bhopal (M.P.) 400kV D/C (high capacity) (private sector)

Dedicated transmission system upto pooling point under the scope of Project developers of Orissa IPPs

Projects	Transmission Line
Sterlite (2400 MW)	<ul style="list-style-type: none"> • Sterlite-Jharsuguda Pooling station 400kV DC line
IND-Barath (700 MW)	<ul style="list-style-type: none"> • IND-Barath- Jharsuguda Pooling station 400 kV D/C line
Jindal Thermal (1200MW)	<ul style="list-style-type: none"> • Jindal Thermal- Angul Pooling station 400 kV D/C line
Monnet(1050 MW)	<ul style="list-style-type: none"> • Monnet- Angul Pooling stn. 400kV D/C line
GMR (1050 MW)	<ul style="list-style-type: none"> • GMR- Angul Pooling station 400 kV D/C line
Lanco Babandh (2640MW)	<ul style="list-style-type: none"> • Lanco Babandh- Angul Pooling station 400 kV 2xD/Cline • 3x1500 MVA, 765/400 kV transformers at Angul
Navbharat Phase-I (1050 MW)	<ul style="list-style-type: none"> • Navbharat - Angul Pooling station 400 kV D/C line

4. Transmission system for evacuation of power from IPP projects in Jharkhand & West Bengal:

Phase-I : 3 IPPs + WB projects

Sl. No	Projects	IC (MW)	LTOA (MW)	Commn.	Allocation (MW)		
					NR	WR	ER
1	Adhunik	540	450	Jan,12	200	50	200
2	Corporate	540	480	Sept 13	240	240	-
3	Essar	1200	1100	Mar 13	400	400	300
4	West Bengal Phase-I	1000	1000	2011-12	600	400	0
	Total	3280	2820		1470	850	500

System strengthening in NR

- New 2x1500MVA 765/400 kV substation at Varanasi and Kanpur
- Gaya – Varanasi 765 kV S/c
- LILO of one ckt of Tillaiya – Balia 765 kV D/c at Varanasi
- Varanasi – Kanpur 765 kV D/c
- Kanpur – Jhatikra 765 kV S/c
- 400kV connectivity for new 765/400kV S/s at Varanasi & Kanpur
 - Varanasi-Sarnath(UPPCL) 400kV D/c (Quad)
 - LILO of Sasaram-Allahabad 400kV line at Varanasi
 - Kanpur (765/400kV) – Kanpur Existing 400kV D/c (Quad)

System strengthening in WR

- Ranchi - Dharamjayagarh 765kV S/c (instead of Ranchi-Sipat 765kV 2nd S/C line)
- Dharamjayagarh – Jabalpur 765kV D/c (2nd line) –proposed to be under Pvt. Sector

Pooling Stations along with their interconnections

- Establishment of 400kV Pooling Station (Jharkhand Pool) near Essar and Corporate generation projects.
- Ranchi – Jharkhand Pool – Gaya 400 kV D/c line (Quad Moose)

Dedicated transmission system to pooling point: under the scope of Project Developer

For Jharkhand Projects

Projects	Transmission Line
CorporateTPS (540MW)	<ul style="list-style-type: none"> • CorporateTPS– Jharkhand Pooling Station (NewS/s) 400kV D/c

Essar TPS (1200MW)	<ul style="list-style-type: none"> EssarTPS–Jharkhand Pooling Station 400kV D/c (quad moose)
Adhunik TPS (540 MW)	<ul style="list-style-type: none"> Adhunik – Jamshedpur 400kV D/c line (on availability of land at Jamshedpur S/s)- Or LILO of Maithon-Jamshedpur 400kV D/c line at Adhunik

Strengthening System (Under the scope of WBSEDCL/WBSETCL)

- Chanditala– Subhashgram 400kV D/c line
- Kolaghat – Kharagpur 400kV D/c line
- Chanditala -Guptamani 400kV D/c line
- Chanditala -Gokarna 400kV D/c line
- LILO of Baripada – Kolaghat 400kV S/c at Kharagpur

Inter-State Lines in ER

- Guptamani – Jamshedpur 400kV D/c line
- Purulia PSS – Ranchi 400kV D/c line

5. Transmission system for IPPs in Southern region:

Sl. No	Projects	IC (MW)	LTOA (MW)	Commn.	NR	WR	SR
1	Meenakshi Energy Pvt.	600	546	Apr'11	183	177	186
2	Ind – Barath Power	1320	900	Mar'12	405	270	225
	Subtotal	2286	1796		588	447	411

Transmission System for transfer of power from SR to NR & WR

- Sholapur – Pune 765 kV 2nd S/c (1st circuit already covered under transmission associated with Krishnapatnam UMPP).
- Jabalpur Pooling station – Orai 765 kV S/c line.
- Establishment of 2x1000MVA 765/400kV sub-station at Orai by LILO of one circuit of Satna–Gwalior 765kV line.
- Establishment of 2x1500MVA 765/400kV sub-station at Bulandshahar by LILO of Agra – Meerut 765 kV line
- Establishment of 2x1500MVA 765/400kV kV sub-station at Sonipat by LILO of Bhiwani – Meerut 765 kV line
- Orai – Bulandshahar – Sonipat 765 kV S/c line.
- Orai-Orai (UPPCL) 400kV D/c (Quad)
- Sonipat-Kurushetra 400 kV D/c (Quad)

- Sonipat (new) – Sonipat (Under Construction) 400 kV D/c (Quad)
- Bulandshahr – Hapur (UPPCL) 400kV D/c (Quad)

Transmission System within SR- Krishnapattinam area

Dedicated transmission system -under the scope of Project Developer

- Simhapuri switchyard – Meenakshi switchyard 400 kV D/c line or bus extension which ever is feasible

Note** – Power from Meenakshi generation project shall be evacuated through Simhapuri – Nellore 400kV D/c quad line therefore its transmission charges shall be shared equally by the Meenakshi and Simhapuri generation developer

Common Transmission system to shared by IPP developer in Krishnapattinam area , incl. Meenakshi.

- Establishment of 765/400kV , 2x1500 MVA Pooling station at Nellore by LILO of Simhapuri – Nellore 400kV D/c Quad line
- Nellore Pooling station – Kurnool 765 kV 2x S/c
- Kurnool – Raichur 2nd 765 kV S/c line
- Associated 765kV & 400kV bays at Nellore Pooling station, Kurnool and Raichur substations

Transmission System within SR- Tuticorin

Dedicated transmission system -under the scope of Project Developer

- Ind-Barath gen.- Tuticorin pooling station 400 kV D/c quad/high capacity line
- Coastal Energen gen.- Tuticorin pooling station 400 kV D/c quad/high capacity line

Common transmission system for Coastal Energen and Ind-Barath

- Establishment of 765 kV pooling station in Tuticorin and Salem (initially charged at 400 kV)
- LILO of both circuit of Tuticorin JV- Madurai 400kV D/c (Quad) at Tuticorin Pooling station
- Tuticorin Pooling station–Salem Pooling station 765 kV D/c line initially charged at 400 kV.
- Interconnection of Salem pooling station with existing Salem 400/230kV S/s through 400kV D/c (Quad) line
- Salem pooling station – Madhugiri pooling station 765 kV S/c initially charged at 400 kV