

भारत सरकार
केन्द्रीय विद्युत प्राधिकरण
प्रणाली योजना एवं परियोजना मूल्यांकन प्रभाग
सेवा भवन, रामकृष्णपुरम्, नई दिल्ली 110066

क. सं. : 26/10/2009-प्र. यो. प. मू./ 148-159

दिनांक: 09.08.2010

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|---|---|----|--|
| 1 | सदस्य (विद्युत प्रणाली),
केन्द्रीय विद्युत प्राधिकरण,
सेवा भवन, आर के पुरम्,
नई दिल्ली-110066 | 8 | श्री एम एल जाधव, मुख्य अभियंता (पारेषण),
न्यूक्लीयर पावर कॉरपोरेशन ऑफ इंडिया लि,
9एस30, वीएस भवन, अणुशक्ति नगर,
मुम्बई-400094 फैक्स सं. 022-25993570 |
| 2 | सदस्य सचिव,
पश्चिमी क्षेत्रीय विद्युत समिति, एम. आई. डी. सी क्षेत्र,
मेरोल, अंधेरी पूर्व, मुम्बई-400094
फैक्स सं. 022-28370193 | 9 | कार्यपालक निदेशक (अभियांत्रिकी),
नेशनल थर्मल पावर कॉरपोरेशन लि,
इंजीनियरिंग ऑफिस कॉम्प्लेक्स, ए-8, सैक्टर-24,
नोएडा-201301 फैक्स सं. 0124-2410201 |
| 3 | निदेशक (परियोजना),
पावरग्रिड कॉरपोरेशन ऑफ इंडिया लि.,
सौदामिनी, प्लॉट सं. 2, सैक्टर-29, गुडगाँव-122001
फैक्स सं. 95124-2571760 | 10 | मुख्य अभियंता,
विद्युत विभाग, गोवा सरकार, पणजी
फैक्स सं. 0832-2222354 |
| 4 | अध्यक्ष एवं प्रबन्ध निदेशक,
एम.पी.पी.टी.सी.एल. शक्ति भवन,
रामपुर, जबलपुर-482008
फैक्स सं. 0761-2665593 | 11 | कार्यपालक इंजीनियर (परियोजनाएं),
दादरा एवं नागर हवेली संघ शासित क्षेत्र,
विद्युत विभाग, सिलवासा,
फोन नं. 0260-2642787 |
| 5 | सदस्य (पारेषण एवं वितरण)
छत्तीसगढ़ रा. वि. बोर्ड,
दानगनिया, रायपुर (छत्तीसगढ़) -492013
फैक्स सं. 0771-4066566 | 12 | कार्यपालक इंजीनियर,
विद्युत विभाग, दमन एवं दीव संघशासित क्षेत्र प्रशासन,
मोती दमन, पिन-396220
फोन नं. 0260-2250889, 2254745 |
| 6 | प्रबन्ध निदेशक,
जी.ई.ट्रां.नि.लि, सरदार पटेल विद्युत भवन,
रेस कोर्स, बड़ोदा-390007
फैक्स सं. 0265-2338152 | 13 | कार्यपालक निदेशक, (विशेष आमंत्रित),
डब्लू आर एल डी सी, प्लॉट संख्या-एफ 3,
एम आई डी सी एरिया, मेरोल,
अंधेरी पूर्व, मुम्बई-400093,
फैक्स संख्या-022-28235434 |
| 7 | निदेशक (प्रचालन),
महाद्रांसको, प्रकाशगड, प्लॉट संख्या-जी 9,
बांद्रा-पूर्व, मुम्बई-400051
फैक्स 022-26390383 / 26595258 | 14 | कार्यपालक निदेशक, एनएलसीसी
बी-9, कुतुब इन्स्टीट्यूशनल एरिया,
कटवारिया सराय, नई दिल्ली-110016
फैक्स 011-28052046 |

विषय :- पश्चिमी क्षेत्र की विद्युत प्रणाली योजना पर 8 जुलाई 2010 को नई दिल्ली में आयोजित की गयी की स्थाई समिति की 30वीं बैठक का कार्यवृत्त।

महोदय,

पश्चिमी क्षेत्र की विद्युत प्रणाली योजना पर 8 जुलाई 2010 को नई दिल्ली में आयोजित की गयी की स्थाई समिति की 30वीं बैठक का कार्यवृत्त केन्द्रीय विद्युत प्राधिकरण की वेबसाइट www.cea.nic.in पर लिंक Home page - Power Systems-Standing Committee on Power System Planning-Western Region) पर उपलब्ध है।

संलग्न - उपरोक्त

पी.के. पाहवा
9/8/10
(पी.के. पाहवा)
निदेशक

Govt. of India
Central Electricity Authority
System Planning & Project Appraisal Division
Sewa Bhawan, R.K. Puram, New Delhi – 110066.

No. 26/10/2009-SP&PA/

Date: 09th August, 2010

To


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|----|---|----|--|
| 1 | The Member (PS),
Central Electricity Authority,
Sewa Bhawan, R. K. Puram,
New Delhi-110066 | 8 | Shri M.L Jadhav, Chief Engineer (Trans),
Nuclear Power Corp. of India Ltd.,
9S30, VS Bhavan, Anushakti Nagar, Mumbai-
400094
Fax 022-25993570 |
| 2 | The Member Secretary,
Western Regional Power Committee,
MIDC Area, Marol, Andheri East, Mumbai
Fax 022 28370193 | 9 | The Executive Director (Engg.),
NTPC Ltd., Engg. Office Complex,
A-8, Sector-24, NOIDA 201301
Fax 0120-2410201/2410211 |
| 3 | The Director (Projects),
Power Grid Corp. of India Ltd., "Saudamini",
Plot No. 2, Sector-29, Gurgaon-122001
Fax 0124-2571760/2571932 | 10 | The Chief Engineer,
Electricity Department,
The Government of Goa, Panaji
Fax 0832 2222354 |
| 4 | Chairman and Managing Director,
MPPTCL, Shakti Bhawan,
Rampur, Jabalpur-482008
Fax 0761 2665593 | 11 | Executive Engineer (Projects)
UT of Dadra & Nagar Haveli,
Department of Electricity , Silvassa
Ph. 0260-2642787 |
| 5 | Member (Transmission & Distribution),
Chhatisgarh State Electricity Board,
Dangania, Raipur (CG)-492013
Fax 0771 4066566 | 12 | Executive Engineer
Administration of Daman & Diu (U.T.)
Department of Electricity
Moti Daman-396220
Ph. 0260-2250889, 2254745 |
| 6 | The Managing Director,
GETCO, Sardar Patel Vidyut Bhawan,
Race Course, Baroda-390007
Fax 0265-2338164 | 13 | ED, WRLDC (invitee)
Plot no F-3, MIDC Area, Msarol,
Andheri(East) Mumbai-400093
Fax no 022-28235434 |
| 7. | Director (Operation),
MAHATRANSCO, 'Prakashgad', Plot No.G-9,
Bandra-East, Mumbai-400051
Fax 022-26390383/26595258 | 14 | Executive Director, NLDC (invitee)
B-9, Qutab Institutional Area, Katwaria Sarai
New Delhi-110016
Fax 011-26852747 |

Sub: Minutes of the 30th meeting of the Standing Committee on Power System Planning in Western Region held on 8th July 2010 at New Delhi.

Sir,

The minutes of the 30th meeting of the Standing Committee on Power System Planning of Western Region held on 8th July 2010 at NRPC, Katwaria Sarai, New Delhi are available on CEA website (www.cea.nic.in at the following link: Home page-Power Systems-Standing Committee on Power System Planning-Western Region).

Yours faithfully,


(P. K. Pahwa) 9/8/10
Director, SP&PA

Minutes of the 30th Meeting of Standing Committee on Power System Planning in Western Region held on 8th July 2010 at New Delhi.

The 30th meeting of the Standing Committee on Power System Planning in Western Region was held on Thursday the 8th July, 2010 at NRPC, Katwaria Sarai, and New Delhi. The list of participants is at Annex – I.

Member (Power System), CEA welcomed all the participants to the meeting and stated that private sector was to play a major role in capacity addition program in future. Already a generation capacity of about 58,000 MW by Private Sector was under various stages of construction for commissioning during 12th plan. In view of huge generation capacity addition program, Standing Committee on Power System Planning would need to play a crucial role in creating transmission infrastructure for delivery of the power to the beneficiaries/ buyers. He further stated that Capacity addition under construction by Private Sector was showing good progress and therefore, timely completion of the associated transmission projects was needed to avoid any evacuation constraints. While planning the transmission system for evacuation reliability and grid security issues also need to be given due consideration.

Chief Engineer (SP&PA) endorsed the views of Member (Power System), CEA and stated that during initial period there was a lot of uncertainty in establishment of power projects by private sector but once all the necessary requirements/clearances for setting up the project are tied up, they come up very fast. Therefore, implementation time of the associated transmission schemes needs to be compressed. He further stated that this meeting was taking place in a changed scenario as the present concept of region wise sharing of transmission charges would not be applicable from next year and Central Electricity Regulatory Commission Regulations on Sharing of Inter State Transmission Charges & Losses would come into force from 01.01.2011 which would provide for a national sharing matrix based on Point of Connection tariff. Earlier a lot of deliberations were taking place on the sharing of transmission charges in the Standing Committee meetings. With the new regulation on sharing of transmission charges and losses, the Standing Committee on Power System Planning forum could focus more on the technical aspects, security and reliability issues while planning the transmission system.

Chief Executive Officer (POSOCO) and Executive Director (NLDC), stated that the transmission system in the country had been very well planned and also due consideration was being given to the feedback from the Grid Operators in planning of the transmission system. In present scenario, about 15% of transactions take place under Short Term Open Access and suggested that the future transmission system needs to be planned with higher margins and with stringent contingency in crucial corridors to take care of security and reliability issues.

The agenda items were thereafter taken up.

1.0 Confirmation of the minutes of 29th meeting of the Standing Committee on Power System Planning in Western Region held on 10th September 2009 at Ahmedabad.

1.1 Director (SP&PA), CEA stated that minutes of the 29th meeting of the Standing Committee on Power System Planning in Western Region were issued vide CEA letter no. 26/10/2009-SP&PA/86-98 dated 17th September, 2009. No comments had been received from any constituent. The minutes were thereafter confirmed.

2.0 Review of Progress on Earlier Agreed Transmission Schemes

2.1 Status of under construction / approved schemes

I. The latest status of earlier agreed schemes as obtained from PGCIL is at Annex-II

(a) Availability of land for 400/220 kV GIS at Mumbai New Location:

Director (SP&PA), CEA stated that PGCIL had informed that the identified land in Bhiwandi near Mumbai was not having proper approach/ connectivity and transportation of heavy equipments etc. up to the site would be very difficult. Also it was difficult to get line corridors for laying the transmission lines. Therefore, PGCIL had informed that the 400 kV Navsari- New location near Mumbai 400 kV D/C line covered as a part of Regional System strengthening in WR under Mundra UMPP would now be terminated at existing Boisar 400 kV substation in place of Bhiwandi. Also due to the non – availability of bays at Khargar 400 kV, PGCIL had proposed termination of Aurangabad – Khargar 400 kV D/c (quad) at Boisar. With this change in termination to Boisar, MSETCL needs to plan connectivity from Boisar to their load centres in Mumbai.

Member (PS) stated that load growth of Mumbai was very high. The transmission system for feeding loads in Mumbai needs to be planned for the next 10 years in view of the ROW and land constraints being faced in establishing transmission facilities in cities like Mumbai.

Executive Director, MSETCL informed that at present the load of Mumbai area was about 3000 MW and in the time frame of 2014 – 15 it would be of the order of 4400 MW. For meeting this load, 400 kV sub-station at Vikroli by Tata Power and at Ghodbunder by Reliance had been planned. In addition, 700 MW HVDC from Nagothane to Aaray substation of Reliance had been planned. This would take care of the future load requirements in and around Mumbai area. He suggested that Aurangabad- Khargar 400 kV D/C line may be terminated at Vikroli.

Executive Director, WRTS-I, PGCIL informed that Powergrid along with MSETCL, Tata and Reliance had surveyed to find a suitable land for substation in Mumbai , but it was difficult to get land in Mumbai area. Also at Boisar, there were only 8 bays available at present for future expansion.

After further deliberation, it was decided that the 400 kV D/C Navsari – Mumbai new location agreed earlier would now be terminated at Boisar. Also one 1X500 MVA 400/220 kV transformer would also be provided for drawal of power at Boisar. It was also decided that in view of the space constraint at Boisar for future expansion, the possibility of establishing 400/220 kV GIS substation in the available space would be explored by PGCIL. Regarding Aurangabad – Khargar 400 kV line termination it was decided that matter would be further discussed between CEA, PGCIL and MSETCL.

(b) Interconnection at 220kV level of the State Grid with proposed ISTS stations :

Director (SP&PA), CEA said that a number of 400/220kV substations are being developed by POWERGRID in various States of WR as a part of Regional Transmission schemes, agreed earlier in Standing Committee meetings. The substations are at Bhachau, Pirana, Navsari in Gujarat, Shujalpur in Madhya Pradesh and Navi Mumbai, Wardha, Solapur, Pune, Aurangabad in Maharashtra. For absorption of power from the above substations, underlying 220kV interconnections are to be established by the respective STUs in matching time frame, otherwise non-provision of 220kV interconnection of the State grid would result in under-utilisation of the transmission assets. He requested the constituents to furnish the present status of implementation of 220kV interconnections.

Managing Director (MPPTCL) & Chairman (WRPC) informed that for reviewing the progress of various transmission schemes in Western Region a periodic monitoring system had been evolved by WRPC. The ongoing transmission schemes in Western

Region had been divided in five categories namely, Intra – state transmission schemes, transmission schemes for evacuation of power from state generators, transmission schemes for evacuation of power from IPP generation project, transmission schemes associated with PGCIL sub-stations and transmission schemes being implemented through IPTC route. The latest status of transmission schemes based on the last Transmission Review Meeting held on 8th June 2010 would be forwarded to CEA by Member Secretary, WRPC. He opined that CEA could also be invited to participate in the Transmission Review Meetings of WR.

II. The status of WRSSS-II Set B & C being implemented by RPTL.

Director (SP&PA), CEA said that as per the decision during the 29th SCM of WR a progress review meeting was taken by Member (PS), CEA with RPTL to review the progress of works under WRSSS-II B & WRSSS –II C and subsequently RPTL have started furnishing the status of progress of works of the scheme to CEA. As per the latest status the transmission elements under WRSS – II Set-B and Set-C are scheduled for commission by June 2011.

3.0 Transmission system associated with New IPP projects in Chattishgarh

- 3.1 Director (SP&PA), CEA stated that during the 29th meeting of the Standing Committee on Power System Planning in WR the transmission system associated with new IPPs coming up in Raigarh and Champa generation complex was finalized along with the phasing of the transmission works, spread over four stages. The Stage-I works included establishment of pooling stations at Raigarh (Kotra), Raigarh (Tamnar) , Raipur and Champa and charging them at 400 kV level, interconnecting them with existing Raigarh and Raipur 400 kV substations. The Raigarh / Champa – Raipur – Wardha -Aurangabad 765 kV link was also initially to be charged at 400 kV level. The Stage-II works included charging of stage-I transmission system at 765 kV level and establishment of Aurangabad-Dhule-Vadodara and Aurangabad – Padge 765 kV link along with its interconnection with existing system. The stage-III and Stage-IV works included establishment of HVDC bipole between Raigarh-Dhule and Champa-Kurushetra respectively along with their interconnection with the existing system. From the finalized transmission system, Dhule (IPTC) 765/400 kV substation along with 400 kV connectivity and interconnection at 765 kV with Aurangabad and Vadodara was identified for implementation through private sector under competitive bidding route.
- 3.2 Subsequently, PGCIL had proposed establishment of a separate Dhule (PG) 400 kV substation along with 2X315 MVA, 400/220 transformers, for termination of the \pm 600 kV 4000 MW HVDC bipole from Raigarh Pooling Station (Near Kotra) along with its interconnection with Dhule (IPTC) 765/400 kV substation through two nos. of 400 kV D/C quad line.
- 3.2.1 Managing Director, GETCO enquired about the need for creating two 400 kV substations at Dhule and their interconnection through a quad line instead of interconnection through a high capacity conductor.
- 3.2.2 Executive Director, SEF (PGCIL) clarified that the quantum of power to be handled at Dhule HVDC station would be of the order of 4000 MW. Therefore, a separate 400 kV substation had been proposed along with 400 kV D/c quad line to Nasik, Malegaon and interconnection with 765/400 kV Dhule (IPTC) substation which was under the scope of Private Sector. Also considering the ease of implementation, it would be desirable to have a separate 400 kV substation of PGCIL at Dhule in addition to the Dhule (IPTC) 765/400 kV substation. He agreed with the suggestion of interconnection between Dhule (IPTC) and Dhule (PGCIL) 400 kV substation through high capacity conductor instead of quad conductor. After discussions the establishment of separate Dhule (PG) 400 kV substation along with interconnection with Dhule (IPTC) through high capacity conductor was agreed.

- 3.3 Director (SP&PA), CEA stated that with the above modification, the scope of works to be implemented by PGCIL and through IPTC route at Dhule would be as following:

Scope of works under PGCIL

- (i) Establishment of 2X315 MVA, 400/220 kV Dhule (PG) 400 kV substation to terminate \pm 600 kV 4000 MW HVDC bipole from Raigarh Pooling Station (Near Kotra).
- (ii) Dhule (PG) – Dhule (IPTC) 400 kV 2X D/c line with high capacity conductors.
- (iii) Dhule (PG) – Nasik (MSETCL) 400 kV D/C (quad).
- (iv) Dhule (PG) – Malegaon (MSETCL) 400 kV D/C (quad)

Scope of works under IPTC route

- (i) Establishment of Dhule (IPTC) 765/400 kV substation
- (ii) Aurangabad- Dhule (IPTC) 765 kV S/C
- (iii) Dhule (IPTC) – Vadodara (PG) 765 kV S/C
- (iv) Dhule (IPTC) – Dhule (MSETCL) 400 kV D/C (quad)

- 3.4 Director (SP&PA), CEA stated that as a part of comprehensive transmission system for HVDC from Raigarh to Dhule and Champa to Kurushetra, PGCIL had proposed provision of metallic return conductor in place of ground return envisaged earlier. At present all the existing bipole HVDC systems had ground return arrangement for power evacuation in case of outage of one pole. PGCIL had informed that the land requirement for setting up earth electrode station is of the order of 500 metre x 500 metre for carrying a current of 2000 Ampere. The land had to be so selected that there are no metallic buried objects i.e metallic gas and oil pipelines, railway lines, telephone lines using metallic wires etc within a radius of 8 to 10 kms. Also the soil resistivity had to be below 250 ohm-metre in hemisphere of radius about 8 to 10 kms. PGCIL had stated that it was difficult to get land which meets these criteria. They have therefore proposed a separate metallic return conductor on the same HVDC line towers. Provision of metallic return in lieu of earth electrode station results in additional cost to the tune of about 250-300 crores for Raigarh-Dhule HVDC bipole line.

- 3.4.1 CSPTCL and MSETCL representatives enquired about the necessity for providing metallic return conductor on the HVDC bipole. Also MD, GETCO opined that cost implications of provision of metallic return was high and requested PGCIL to provide the detailed cost estimates of metallic return conductor on the HVDC bipole from Raigarh to Dhule.

- 3.4.2 Executive Director, SEF (PGCIL) informed that operational difficulties were being experienced in ground return mode in case of Talcher – Kolar HVDC link and also there was element of uncertainty in proper functioning of the earth electrode station. In view of this metallic return conductor was being proposed.

- 3.4.3 After deliberations, constituents agreed for the provision of metallic return conductor in the Raigarh – Dhule HVDC link and Champa – Kurushetra HVDC link. It was also decided that PGCIL will make a technical presentation to the constituents of WR on HVDC, wherein the details of the cost estimates of metallic return conductor would also be indicated.

- 3.5 Director (SP&PA), CEA stated that to ascertain the status of generation projects of IPPs in Chattishgarh, Madhya Pradesh, Andhra Pradesh, Tamil Nadu, Jharkhand, Orissa and Sikkim, a review meeting was held in CEA on 01.02.2010 wherein it emerged that around 10,000 MW capacity out of the total 15,000 MW of generation capacity addition planned in Raigarh and Champa generation complex of Chattishgarh was likely to be commissioned in the time frame of 3 years i.e., by Dec 2013. Subsequent to review meeting, a meeting was held by PGCIL for signing of BPTA and furnishing of Bank Guarantee by the project developers. In the meeting two more IPPs namely Visa Power (1200 MW) in Raigarh complex and GMR (1200 MW) in Raipur had also signed BPTA. These two IPPs had been integrated with the already identified transmission corridor. The dedicated transmission system namely, Visa Power – Raigarh

pooling station (near Kotra) 400 kV D/c (triple) and GMR Chhattisgarh – Raipur pooling Station 400kV D/c (triple) would be developed by the respective developers.

- 3.6 PGCIL had informed that the capacity of GMR had been revised from 1200 MW to 1370 MW and considering the same the dedicated transmission system for GMR Chattishgarh would now be GMR Chhattisgarh – Raipur pooling Station 400kV D/c (quad) line instead of earlier agreed 400 kV line with triple conductor.
- 3.7 Director (SP&PA), CEA said that keeping in view the progress made by the IPPs and their commissioning schedules Powergrid had proposed the Implementation of stage - I and Stage-II of transmission works in the transmission corridor identified for evacuation of power from IPPs in Raigarh / Champa generation complex simultaneously instead of initial charging at 400 kV (Stage-I) and subsequently charging the system at 765 kV (Stage-II) as agreed earlier.
 - 3.7.1 CSPTCL representatives stated that they had no objection for combining the implementation of phase-I and phase-II but the commissioning schedule of the various transmission elements should be the same as intimated in earlier meetings because any delay in commissioning schedule would result in transmission constraints for evacuation of power from IPPs in Chattishgarh.
 - 3.7.2 Executive Director (SEF), PGCIL stated that for implementing the transmission system associated with Chhattisgarh IPP they had taken regulatory approval from CERC which took considerable amount of time. CERC while giving approval for implementing the ISTS system associated with the IPPs had mentioned that the Central Transmission Utility shall implement the transmission elements out of the approved ISTS Scheme in a coordinated manner considering the progress of the generation project(s). Therefore, the transmission elements would now be commissioned progressively in the time frame of 2013 – 14 depending on the progress of generation capacity addition. He further informed that for ease of implementation, the transmission system associated with Chhattisgarh IPP was now sub-divided into nine numbers of transmission schemes.
- 3.8 Director (SP&PA), CEA stated that Powergrid had requested to proceed ahead with implementation of 2XS/C 765 kV lines configuration against 1XD/C line configuration agreed in the earlier meetings to avoid delays as the tower design / testing of 765 kV D/C lines was not yet completed.
 - 3.8.1 Executive Director (SEF), PGCIL informed that tower design / testing of 765 kV D/c lines had been completed recently and they would now be implementing the 1XD/c tower configuration as agreed in previous Standing Committee meetings.
- 3.9 Director (SP&PA), CEA stated that in the review meeting with IPPs held on 01.02.2010 it was noted that in addition to Balco TPS, RKM Power Gen and Vandana Vidhyut TPS, whose interim arrangement had already been agreed, KSK Mahanadi (erstwhile Wardha Power Ltd. 3600 MW) was also likely to be commissioned before the availability of the planned evacuation system. PGCIL as an interim arrangement for providing connectivity had proposed LILO 400kV Raigarh – Raipur D/C line at KSK Mahanadi generation switchyard.
- 3.10 Director SP&PA) further informed that CSPTCL had proposed energisation of Champa pooling station through LILO of one ckt of Raigarh – Raipur 400 kV D/C line instead of its energisation from Raipur through Raipur – Champa 765 kV D/C line charged at 400 kV level (approx. 250 km line) . They had further stated that with energisation of Champa pooling station through LILO of Raigarh –Raipur line and energisation of Raigarh(near Kotra) pooling station by interconnecting with the existing Raigarh 400 kV substation, the need for temporary arrangement for providing connectivity to BALCO TPS (1200 MW), Vandana Vidhyut TPS (540 MW) and RKM Powergen (1440 MW) generation projects would not arise. This arrangement would provide the start up power to the developers through their dedicated line. And after the

availability of planned evacuation system, the LILO of the line could be restored to its original status.

- 3.10.1 Director (SP&PA), CEA stated that the proposal of PGCIL regarding interim connectivity to KSK Mahanadi (3600 MW) through LILO of both ckts of 400 kV Raigarh-Raipur D/C line at KSK switchyard would be at the cost of the project developer. After establishment of Champa pooling station KSK Mahanadi could be terminated at Champa and LILO be restored to its original position. Regarding CSPTCL proposal of LILO of Raigarh - Raipur 400 kV D/C line at Champa pooling station for providing start up power and interim evacuation of power from BALCO, RKM, Vandana Vidhut and KSK Mahanadi, he stated that this may result in evacuation constraints if all the generators are terminated at Champa during interim stage without availability of planned network. Therefore the earlier interim arrangement agreed in the 29th SCM for BALCO, RKM, Vandana Vidhyut need not be modified.
- 3.10.2 Regarding provision of interim arrangements for evacuation of power from IPPs, GM (NTPC) suggested that before agreeing for LILO, short circuit (fault level), and contingency should be checked and there should be provision of Special Protection Schemes and also the date of removal of the LILO arrangement should be fixed.
- 3.10.3 Executive Director (SEF), PGCIL stated that LILO arrangement is allowed only as interim arrangement in case of non-availability of the planned evacuation system in time frame of the commissioning of generation project after giving due consideration to fault level issues. Also while giving the open access it is specifically mentioned that in case of transmission constraints, the generator for whom interim arrangement has been provided has to back down.
- 3.10.4 Executive Director, NLDC informed that many of the IPPs who had been allowed to evacuate their power through an interim arrangement were not backing down their generation in situation of transmission constraints and neither were they agreeing for provision of any special protection scheme so that generation could be backed down automatically. Therefore, at planning stage itself the need for providing Special Protection Scheme (SPS) for backing down of generation by IPPs needs to be specified.
- 3.10.5 The issue was deliberated and the proposal of PGCIL regarding interim connectivity to KSK Mahanadi (3600 MW) through LILO of both ckts of 400 kV Raigarh-Raipur at KSK switchyard was agreed. This LILO and its restoration would be at the cost of the project developer. It was also decided that while agreeing for interim arrangement for an IPP generation project for evacuation of power till the planned evacuation system is commissioned, Special Protection Schemes to bring down the generation level in case of transmission constraints has to be put into place by the IPP. The SPS details would be worked out by RLDC concerned in consultation with RPC.
- 3.10.6 Managing Director, GETCO raised the issue of the capacity of the IPP generation projects to be assumed while sharing of the transmission charges in view of the fact that PGCIL had taken the Bank Guarantee for the capacity for which Long Term Open Access had been sought by the IPP.
- 3.10.7 It was clarified that presently sharing of pooled regional charges was on basis of gross generation capacity and the IPPs would also share the transmission charges according to gross generation capacity for injection through ISTS. The capacity applied for LTA is relevant for the purpose of Bank Guarantee to be paid to the CTU by the IPP.
- 3.11 Director (SP&PA), CEA stated that in the 29th SCM it was decided that KSK Mahanadi (erstwhile Wardha Power) generation project (6x600 MW) and Jindal Power Ltd (4x600 MW) generating units shall be connected at separate 400kV bus at Champa and Raigarh (Tamnar) pooling station respectively and they would be stepped-up at 765kV level through 400/765kV

transformers as a part of their dedicated transmission system. The dedicated transmission system agreed earlier for M/s KSK and M/s JPL was as under:

Dedicated tr. system for KSK Mahanadi Power Co. Ltd. (3600MW)

- a) 400KV KSK Mahanadi (Wardha Power)- Champa Pooling Station 2x D/c (Quad) line.
- b) 765/400kV, 3x1500 MVA transformer at Champa Pooling station

Dedicated tr. system for Jindal Power Ltd. (2400+400 MW)

- a) 400kV JPL – Raigarh Pooling station (Near Tamnar) 2x D/c (Quad) line.
- b) 765/400kV, 3x1500 MVA transformer at Raigarh Pooling station (Near Tamnar)

PGCIL had now proposed that dedicated 765/400kV 3x1500MVA transformers each at Champa & Raigarh (Tamnar) Pooling Station be implemented by POWERGRID as a part of transmission system of IPP projects in Chhattisgarh.

- 3.11.1 CSPTCL representative stated that while giving the connectivity based on the quantum of generation, the step up voltage should be clearly specified. MD, GETCO also opined that these generators should have stepped up to 765 kV level.
- 3.11.2 Director (SP&PA), CEA informed that initially these generators were asked to step up their generation at 765 kV level but since they had gone ahead with their generation step up voltage of 400 kV they were allowed to come up to the pooling stations at 400 kV level and then step up to 765 kV level through 765/400 kV transformers as a part of their dedicated system.
- 3.11.3 Executive Director (SEF), PGCIL stated that at 765/400kV Champa Pooling station, generation projects of relatively smaller installed capacity (upto 1320MW) other than KSK project are being pooled at 400kV level which is to be further interconnected at 765kV level through 400/765kV transformer, as a part of common transmission system of IPP generation projects coming up in Champa complex. Similarly, at 765/400kV Raigarh (near Tamnar) pooling station, other future smaller capacity IPPs are envisaged to be interconnected at 400kV level with step-up at 765kV level through common 765/400kV transformers. Considering the fact that 765/400kV Pooling stations at Champa and Raigarh (near Tamnar) along with 765/400kV transformers at Champa Pooling station (for other IPPs) is being implemented by POWERGRID as part of common transmission system of IPP projects in Chhattisgarh, the dedicated 765/400kV 3x1500MVA transformers each at Champa & Raigarh (Tamnar) Pooling Station may also be implemented by POWERGRID as a part of transmission system of IPP projects in Chhattisgarh.
- 3.11.4 The issue was deliberated at length and it was agreed that the dedicated 765/400kV, 3x1500MVA transformers each at Champa & Raigarh(near Tamnar) Pooling Station for KSK and Jindal project may be implemented by Powergrid as a part of transmission system of IPP projects in Chhattisgarh .
- 3.12 Considering the above agreed modifications, the modified transmission system associated with new IPPs in Chattishgarh was as under:

A. Pooling Stations along with their interconnections for New IPP projects in Chattishgarh

- (i) Raigarh Pooling Station (near Kotra)- Raipur Pooling station 765 kV D/C line
- (ii) Raigarh Pooling Station (near Kotra) - Champa Pooling station 765 kV S/C line.
- (iii) Champa Pooling station- Raipur Pooling station 765 kV D/C line.
- (iv) Raigarh Pooling station (near Kotra) - Raigarh Pooling station (near Tamnar) 765 kV D/C line.
- (v) Champa Pooling station – Dharamjaygarh / Korba 765 kV S/C line.

- (vi) Establishment of 765/400 kV pooling stations at Raigarh (4X1500 MVA) near Kotra, at Raigarh (3X1500 MVA) near Tamnar, at Champa (6X1500 MVA), and at Raipur (1X1500 MVA).
- (vii) Raigarh Pooling Station (near Kotra) - Raigarh (existing) 400 kV D/C (to be kept open at a later date).
- (viii) Raipur Pooling Station – Raipur (existing) 400 kV D/C (to be kept open at a later date)

B. Transmission System within WR associated with New IPP projects in Chattishgarh

- (i) Raipur Pooling station- Wardha 765 kV 2XD/C line.
- (ii) Wardha- Aurangabad (PG) 765 kV 2XD/C line.
- (iii) Aurangabad- Padghe(PG) 765 kV 1XD/C line.
- (iv) Establishment of 765/400 kV 2x1500 MVA substations at Aurangabad and Padghe (GIS Substation).
- (v) Aurangabad(PG)-Boisar / Kharghar 400 kV D/C (quad) line.
- (vi) Padghe(PG)- Padghe 400 kV D/C (quad) line.
- (vii) Vadodra-Asoj (GETCO) 400 kV D/C (quad) line.
- (viii) Establishment of 2X315 MVA, 400/220 kV substation at Dhule (PG).
- (ix) Dhule (PG) – Dhule (IPTC) 400 kV 2X D/C with high capacity conductors.
- (x) Dhule (PG) – Nasik (MSETCL) 400 kV D/C (quad) line.
- (xi) Dhule (PG) – Malegaon (MSETCL) 400 kV D/C (quad) line.
- (xii) \pm 600 kV 4000 MW HVDC bipole between Raigarh pooling station (near Kotra) – Dhule (PG) along with metallic return conductor.
- (xiii) Establishment of 4000 MW, \pm 600 kV HVDC bipole terminal each at Raigarh pooling station (near Kotra) and Dhule (PG).
- (xiv) Aurangabad- Dhule (IPTC) 765 kV S/C (*Implementation by private sector through tariff based competitive bidding route*)
- (xv) Dhule (IPTC) – Vadodara (PG) 765 kV S/C (*Implementation by private sector through tariff based competitive bidding route*)
- (xvi) Establishment of 765/400 kV 2x1500 MVA substations at Dhule (IPTC) (*Implementation by private sector through tariff based competitive bidding route*)
- (xvii) Dhule (IPTC) – Dhule (MSETCL) 400 kV D/C (quad) (*Implementation by private sector through tariff based competitive bidding route*)

C. Transmission System in NR associated with New IPP projects in Chattishgarh

- (i) \pm 800 kV 6000 MW HVDC bipole between Champa Pooling Station – near Kurushetra (NR) in Haryana with metallic return (initially to be operated at 3000 MW).
- (ii) Establishment of 3000 MW, \pm 800 kV HVDC bipole terminal each at Champa pooling station and near Kurushetra in Haryana with provision to upgrade the terminals to 6000 MW.
- (iii) Kurushetra- Jallandhar 400 kV D/C (Quad) line (one ckt via Nakodar S/S)
- (iv) LILO of Abdullapur- Sonapat 400 kV D/C (triple) at Kurushetra
- (v) Establishment of 400/220 kV , 2x500 MVA substation at Kurushetra

D. Interim arrangement for connectivity to projects coming prior to availability of the planned transmission system

BALCO TPS (1200 MW), Vandana Vidhyut TPS (540 MW), RKM Powergen (1440 MW) and KSK Mahanadi (erstwhile Wardha Power Ltd.) generation projects are getting commissioned before the availability of the planned evacuation system. The following are the Interim arrangement for connectivity of these projects:

Balco Ltd. (1200 MW)	(i) LILO of both circuits of Korba – Birsinghpur 400kV D/c at Balco
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RKM Powergen Ltd.(1440 MW)	(i) LILO of Rourkela- Raigarh 400kV D/c at RKM Powergen
Vandana Vidyut Ltd(540 MW)	(i) LILO of one ckt of Korba – Birsingpur 400kV D/c at Vandana Vidyut
KSK Mahanadi (3600 MW)	(i) LILO of both ckts of Raigarh – Raipur 400kV D/c at KSK Mahanadi.

It may be noted that above is purely interim arrangement. LILO and restoration to original configuration would have to be carried out by the project developer. Till the availability of planned network, in case of any transmission constraints the above generators would have to be backed down and priority shall be given for evacuation of power from those generation stations who are having their identified transmission system along with their long term beneficiaries. Special Protection Schemes to bring down the generation level in case of transmission constraints has to be put into place by the IPP along with the implementation of LILO arrangement.

Subdivision of the above transmission system in to nine sub-schemes for purpose of implementation, as furnished by Powergrid was as under:

A. Establishment of Pooling Stations at Raigarh (Near Kotra) and Raipur for IPP Generation Projects in Chhattisgarh

- (i) Raigarh Pooling Station (near Kotra) - Raipur Pooling station 765 kV D/C line.
- (ii) Raigarh Pooling Station (near Kotra) - Raigarh (existing) 400 kV D/C (to be kept open at a later date).
- (iii) Raipur Pooling Station – Raipur (existing) 400 kV D/C line (to be kept open at a later date).
- (iv) Establishment of 765/400kV 4x1500MVA Raigarh Pooling Station (near Kotra).
- (v) Establishment of 765/400kV 1x1500MVA Raipur Pooling Station.

B. Establishment of Pooling Stations at Champa and Raigarh (Near Tamnar) for IPP Generation Projects in Chhattisgarh

- (i) Champa Pooling station- Raipur Pooling station 765 kV D/C line.
- (ii) Raigarh Pooling station (near Kotra) - Raigarh Pooling station (near Tamnar) 765 kV D/C line.
- (iii) Champa Pooling Station – Dharamjaygarh/Korba 765kV S/c line.
- (iv) Raigarh Pooling Station (near Kotra) – Champa Pooling Station 765kV S/c line.
- (v) Establishment of 765/400kV 6x1500MVA Champa Pooling Station
- (vi) Establishment of 765/400kV 3x1500MVA Raigarh Pooling Station(near Tamnar)

C. Integration of Pooling Stations in Chhattisgarh with Central part of WR for IPP Generation Projects in Chhattisgarh

- (i) Raipur Pooling Station – Wardha 765kV D/c line.

D. Transmission System strengthening in Western part of WR for IPP Generation Projects in Chhattisgarh

- (i) Wardha – Aurangabad (PG) 765kV D/c line.
- (ii) Aurangabad(PG) – Boisar / Kharghar 400kV D/c (Quad) line.
- (iii) Augmentation of transformation capacity by 400/220kV, 1x500 MVA transformer at Boisar
- (iv) Establishment of 765/400kV 2x1500MVA Aurangabad (PG) S/s.

E. System strengthening in North/West part of WR for IPP Projects in Chhattisgarh

- (i) Aurangabad (PG) – Padghe(PG) 765kV D/c line

- (ii) Padghe (PG) – Padghe(MSETCL) 400kV D/c (Quad) line.
- (iii) Vadodara – Asoj 400kV D/c(Quad) line.
- (iv) Establishment of 765/400kV, 2x1500MVA Padghe(PG) S/s [GIS Substation]

F. System strengthening in Raipur-Wardha corridor for IPP Projects in Chhattisgarh

- (i) Raipur Pooling Station – Wardha 765kV 2nd D/c line

G. System strengthening in Wardha-Aurangabad corridor for IPP Projects in Chhattisgarh

- (i) Wardha – Aurangabad (PG) 765kV 2nd D/c line.

H. Raigarh(Kotra) – Dhule HVDC System for IPP Projects in Chhattisgarh

- (i) A \pm 600kV, 4000MW HVDC bipole between Raigarh Pooling Station(near Kotra) and Dhule(PG) along with metallic return
- (ii) Dhule(PG) – Dhule(IPTC)* 400kV 2xD/c high capacity conductor.
- (iii) Dhule(PG) – Nasik 400kV D/c(Quad)
- (iv) Dhule(PG) – Malegaon 400kV D/c(Quad)
- (v) Establishment of 4000MW \pm 600KV HVDC bipole terminal each at Raigarh Pooling station(near Kotra) and Dhule(PG) along with 400kV AC Station
- (vi) Installation of 400/220kV, 2x315MVA transformer at Dhule(PG)

** Dhule(IPTC) S/s to be implemented under private sector through competitive tariff based bidding*

I. WR-NR HVDC interconnector for IPP Projects in Chhattisgarh

- (i) A \pm 800kV, 6000 MW HVDC bipole between Champa Pooling Station (WR) – near Kurushetra (NR) in Haryana with metallic return (initially to be operated at 3000 MW).
- (ii) Establishment of 3000 MW, \pm 800 kV HVDC bipole terminal each at Champa pooling station and near Kurushetra in Haryana with provision to upgrade the terminals to 6000 MW.
- (iii) Kurukshetra(NR) - Jallandhar 400kV D/c(Quad) line (one ckt. via 400/220kV Nakodar S/s).
- (iv) LILO of Abdullapur – Sonapat 400kV D/c(triple) at Kurukshetra
- (v) Establishment of 400/220kV, 2x500 MVA S/s at Kurukshetra

4.0 Transmission system associated with 1320 MW (2X660 MW) Solapur STPP and 1320 MW (2X660 MW) Mauda STPP-II.

4.1 Director (SP&PA), CEA stated that NTPC had planned to take up four projects through Bulk Tendering of 660 MW units to be implemented during XII plan period. These projects were Solapur STPP (1320 MW), Mauda STPP-II (1320 MW), Meja- JV UPRUVNL (1320 MW) and Nabinagar STPP- JV BSEB (1980 MW). Out of the above, Solapur and Mauda STPP located in Maharashtra would be implemented as regional projects for the benefit of Western Region. These projects are scheduled for commissioning in the year 2014-15. The tentative allocation to WR constituents from these projects, intimated by NTPC was as under:

S.No.	State	Mauda STPP-II	Solapur STPP
1.	Unallocated (15%)	198 MW	198 MW
2.	Home State (10%)	132 MW	132 MW
3.	Retained by NTPC (15%)	198 MW	NIL
4.	Madhya Pradesh	165 MW	305 MW

5.	Chattishgarh	66 MW	122 MW
6.	Maharashtra	286 MW	524 MW
7.	Gujarat	253 MW	NIL
8.	Goa	12 MW	21 MW
9.	DNH	6 MW	11 MW
10.	DD	4 MW	7 MW
11.	Total	1320 MW	1320 MW

- 4.2 Director (SP&PA) further stated that Load Flow studies had been carried out by PGCIL to evolve the evacuation arrangement of both the above generation projects. Load generation scenario and network configuration of Western Region corresponding to 2014-15 time frame had been considered taking into account various Central/State/Private Sector generation projects proposed to be set up by the time frame. Peak demand in WR was considered as 76,000 MW which was about 25% higher than the projected demand growth of about 59,000 MW as projected by the 17th EPS. Load flow studies show normal loading on major 400 kV lines except for lines towards Kalwa/Mumbai. Based on studies, for Solapur STPP transmission system PGCIL had proposed a 400 kV D/C quad line to Pune (PG) and a 400 kV D/C line between Solapur and Solapur (PG) along with augmentation of 400/220 kV transformer capacity at Solapur (PG) by 1x315 MVA.
- 4.3 Director (SP&PA) informed that Mauda Stage-II transmission system needs to be integrated with Mauda-I. Under Mauda-I two D/C quad lines one to Wardha and other to Khaparkheda had been agreed in the 29th meeting. MSETCL had informed that for terminating the Mauda – Khaperkheda 400 kV D/C line at Khaperkheda, space for only one bay was available at Khaperkheda. To overcome the problem it was decided that MSETCL should procure additional land for providing one more bay at Khaperkheda and in case of difficulty the line would need to be terminated at some other nearby 400 kV substations. Subsequently, MSETCL has informed that it was not possible to acquire land adjacent to the Khaperkheda S/s site for accommodating the bay for terminating 400 kV D/c lines from Mauda and they had suggested to terminate the Mauda – Khaperkheda (MSETCL) 400kV D/C (Quad) at the proposed Koradi-III (MSETCL) (765/400 kV) D/C in view of space constraints at Khaperkheda.
- 4.4 For Mauda-II, PGCIL had proposed a 400 kV D/c quad line (2nd ckt) to Wardha as a part of its evacuation system. With large number of interconnections planned at Wardha the short circuit level at Wardha was expected to exceed the permissible limit. For overcoming the same PGCIL had proposed bus splitting at Wardha 400 kV substation.
- 4.5 To a query from ED, MSETCL for assuming 25 % higher demand , Executive Director (SEF), PGCIL stated that 25% higher demand had been considered in view of the availability of additional power from various IPP generation projects located in Chhattisgarh, Madhya Pradesh, Orissa, Jharkhand, Andhra Pradesh and Tamil Nadu which were scheduled for commissioning progressively by the above time frame. Presently the Solapur STPP and Mouda St-I and St-II generation project, would be connected to the Regional Grid and in future a separate system strengthening would be taken up for absorption of power by the beneficiaries and overcoming any higher loading in transmission corridors.
- 4.6 Executive Director (SEF), PGCIL stated that due to non-availability of space at Khaparkheda, MSETCL had proposed to terminate the Mouda St-I – Khaparkheda 400 kV D/c at Koradi-III. He opined that against the proposed three number of quad circuit outlets from Mauda Stage-I and II, only two number 400 kV quad lines would be adequate for evacuating power from Mauda Stage-I and II.
- 4.7 NTPC representative informed that Mouda Stage-I and Stage -II were in the same complex and Stage-I & Stage-II could be connected through bus extension. In case of only one evacuation outlet from Mouda Stage – I in the form of Mouda stage-I – Wardha 400 kV D/C quad line, two nos. of 400 kV spare bays would be available at Mouda stage-I. He suggested that Mouda – Wardha 400 kV D/c (quad) could be agreed with Mouda Stage-I (2X500 MW)

and Mouda – Koradi- III 400 kV D/c (quad) could be agreed with Mouda Stage-II (2X660 MW). He opined that this configuration would also help in addressing the high short circuit level observed at Wardha 400 kV bus.

4.8 After discussion the following transmission system was agreed for Solapur STPP (1320 MW).

A. Solapur (1320MW)

- (i) Solapur NTPC- Solapur (PG) 400kV D/c
- (ii) Solapur NTPC - Pune (PG) 400kV (Quad) D/c
- (iii) Augmentation of 400/220kV ICT by 1x315 MVA transformer at Solapur (PG)

The estimated cost of the above transmission system is about Rs. 600 crores.

4.8.1 The step up voltage for Mouda Stage- II switchyard would be 400 kV with 2 no 400 kV line bays. The evacuation system would be further studied and would be taken up in the next Standing Committee meeting.

4.8.2 The transmission system for Mouda Stage-I (1000 MW) was agreed to be modified as under. NTPC may retain spare bays for any future line.

A. Modified transmission for Mouda Stage-I (1000MW)

- (i) Mouda – Wardha 400 kV D/c (quad) line

4.8.3 The **Bus splitting at Wardha 400 kV substation** to contain the short circuit level at Wardha was required in the Mouda Stage-I time frame itself. Therefore, it was agreed that Bus splitting at Wardha 400 kV substation would be taken up as a separate system strengthening scheme and would be implemented in the Mouda stage-I timeframe.

5.0 Evacuation of Power from LANCO Amarkantak TPS 2X300 MW, Pathadi generation project in Chattishgarh.

5.1 Director (SP&PA), CEA informed that 2nd unit of 300 MW of LANCO Amarkantak TPS (2X300 MW) at Pathandi had been synchronized recently. Long term Open Access for Unit-1 was granted in 2006 with power evacuation through LILO of Korba-Sipat 400 kV S/C line at Pathadi. Long term Open Access was granted for Unit-II in 2008 with Lanco Amarkantak (Pathadi) - Bilaspur pooling station 400 kV D/C (quad) line as the dedicated transmission system for both Unit 1&2 and removal of LILO of 400 kV Korba - Sipat at Pathadi. While granting LTOA for Unit-II, it was decided that till the WR pooling station (Bilaspur) was available, power from Unit-II may be evacuated over the LILO arrangement on short term basis.

5.2 He further informed that with both the units in operation transmission constraints under certain operating conditions were experienced in transfer of power from Pathadi generating station and Pathadi – Sipat 400 kV S/C line was getting overloaded. To overcome the constraints, based on the studies carried by PGCIL and interaction between CEA, PGCIL and NTPC it was decided to bypass LILO at Sipat of Korba-Pathadi-Sipat-Raipur 400 kV S/C line and making it Korba-Pathadi- Raipur line, as an interim arrangement. Also for addressing the high voltage problems at Sipat, voltage control measures such as transformer tap adjustment at Sipat and possibility of use of line reactors at Sipat end of already opened Ranchi – Sipat 400 kV line could be adopted. With this arrangement, in case of any transmission constraints in evacuation of power from NTPC/ State generating stations due to contingency or otherwise, Lanco Amarkantak TPS 2X300 MW will have to back down first and NTPC and other state generating units will have higher priority.

5.3 Executive Director, WRLDC informed that the agreed interim arrangement has already been implemented.

Members noted the same.

6.0 Provision of 400/220 kV substation to Union territory of DNH (Dadar and Nagar Haveli) and Daman & Diu.

6.1 Director (SP&PA), CEA stated that in the 29th SCM establishment of 400/220 kV, 2X315 MVA substation at Kala in DNH (Dadar and Nagar Haveli) by LILO of Navsari-Mumbai new location 400 kV D/C line and establishment of a 400/220 kV, 2X315 MVA GIS substation in Daman & Diu by LILO of Vapi – Navi Mumbai 400 kV D/C line was agreed. Subsequently PGCIL had intimated that they had identified land near Magarwada in Daman & Diu for establishment of GIS substation and DPR was under preparation. PGCIL had intimated that LILO off take point of above line is on multi-circuit tower comprising both Vapi – Navi Mumbai 400 kV D/C line and Navsari – New locations near Mumbai/Boisar 400 kV D/C line. Further, Vapi – Navi Mumbai 400kV D/c line is being strung on top portion of the multi circuit tower and Navsari – Boisar 400kV D/c line is being strung on bottom portion of the tower. To take care of tower/conductor balancing, PGCIL had proposed that one ckt. of Vapi – Navi Mumbai and one ckt. of Navsari – Boisar line may be made LILO at 400/220kV Magarwada S/S in place of LILO of both ckts. of Vapi – Navi Mumbai 400kV D/c line.

6.2 Executive Director (WRTS), PGCIL informed that land for Magarwada 400 kV substation had not yet been made available.

6.3 Executive Director (SEF) stated that creation of two LILOs on the Navsari – Boisar 400 kV D/c line had been resolved and the lines would now be strung in vertical configuration on the multi-circuit towers instead of one 400 kV D/c at top layer and other 400 kV D/c at bottom layer as planned earlier. Therefore the LILO at Magarwada would be as per the agreed configuration during the 29th SCM.

6.4 Director (SP&PA), CEA informed that for interconnectivity from Kala 400 kV substation Electricity Department, DNH, had proposed two no. of 220 kV D/C lines from 400/220 kV Kala substation, one to existing 220 kV Kharadpada and other to existing 220 kV Khadoli substation. Similarly for 220 kV interconnectivity from proposed 400/220 kV Magarwada substation in Daman & Diu, Electricity Department, had proposed two no. of 220 kV D/C lines from Magarwada 400/220 kV substation i.e., one to existing 220/66/11 kV Magarwada substation and other to the proposed 220/66/11 kV Ringanwada substation. He suggested that considering ROW constraints it would be desirable that the 220 kV transmission corridors should be developed keeping in mind the future requirements of power transfers and instead of zebra conductors, moose conductor could be adopted.

6.5 DNH and DD representatives agreed to consider the above suggestions.

7.0 Proposal of MPPTCL for LILO of 400 KV Birsinghpur - Damoh (PGCIL) – Bhopal 400 KV line at Sagar.

7.1 Director (SP&PA), CEA stated that MPPTCL had proposed establishment of a 400 kV substation at Sagar by LILO of Birsinghpur – Damoh - Bhopal 400 kV line as this line was passing close to Sagar. Birsinghpur – Damoh - Bhopal 400 kV line was a regional line being implemented by PGCIL under Western Region System Strengthening Scheme – II Set D (Regional Strengthening in Northern Madhya Pradesh), therefore establishment of 400 kV substations at Sagar by LILO of Bhopal – Damoh 400 kV line involved connectivity with the Regional Grid. He informed that MPPTCL had earlier proposed establishment of 400 kV Sagar substations by LILO of one ckt of Birsinghpur-Damoh 400 kV (MPPTCL) line. The proposal was examined in CEA and since it was resulting into a long length line (of about 300 km Birsinghpur-Sagar 400 kV S/C line), it was suggested that instead of LILO arrangement 400 kV, Sagar sub-station could be established through a 400 kV D/C line between Damoh(PG)-Sagar .

- 7.2 Chairman, WRPC and Managing Director, MPPTCL stated that Sagar 400 kV substation had been planned to feed the increasing loads in that area. These loads were presently being fed through 220 kV network. Earlier, 400 kV connectivity to Sagar was planned from Damoh substation which involved a lot of forest area. He informed that Bhopal – Damoh line was passing near to the proposed Sagar 400 kV substation and only 35 km of LILO line would need to be constructed.
- 7.3 Members agreed to the MPPTCL proposal of LILO of one circuit of Bhopal – Damoh 400 kV D/c line (to be implemented by MPPTCL) at Sagar 400 kV substation.
- 8.0 Proposal of MSETCL for Koradi-II – Wardha (PG) 400 kV D/C line with quad conductor.**
- 8.1 Director (SP&PA), CEA stated that MSETCL had sought the approval of Standing Committee for Koradi-II – Wardha (PG) 400 kV D/C line as regional connectivity with the regional grid was involved. MSETCL had intimated that they had already completed the tendering process for Koradi-II – Wardha (PG) 400 kV D/C line.
- 8.2 Executive Director (SEF), PGCIL stated that MSETCL had requested for 2 nos. 400kV line bays at Wardha S/s to terminate 400 kV D/C quad line from Koradi-II generation project. This is in addition to 2 nos. of bays already provided to MSETCL at Wardha (PG) 400 kV substation for termination of line from Warora – Wardha 400 kV D/C line carrying power from intra state generation projects at Tiroda and Chandrapur-II. Further to contain the short circuit level at Wardha, split-bus arrangement had also been proposed. With split-bus arrangement, the major concern was to ensure that each of the split-bus section should be reliable for all operating conditions from input-output power flow point of view. He opined that due to high short circuit level at Wardha it would not be desirable to connect Koradi-II to Wardha and the line may be terminated at Koradi-III or at any other suitable location.
- 8.3 Executive Director, MSETCL informed that additional land at Wardha had been acquired and the 400 kV bus from existing Wardha station may be extended to accommodate the Koradi-II – Wardha 400 kV D/c quad line.
- 8.4 After further deliberation, it was decided that issues of termination of Koradi-II – Wardha line of MSETCL at Koradi-III or at any other suitable location may be further discussed in a working level meeting between CEA, PGCIL and MSETCL.
- 9.0 Establishment of 765/400kV GIS substations at Pune and Vadodra.**
- 9.1 Director (SP&PA), CEA stated that establishment of 765/400kV substation at Pune was agreed as a part of Evacuation System of Krishnapatnam (4000MW) UMPP, in the 27th meeting of Standing Committee on Power System Planning in Western Region held on 30.07.2007 at Indore, PGCIL had informed that while identifying the land for Pune substation, it was difficult to find fairly leveled land of about 100 acres suitable for establishing the substation. To overcome the problem PGCIL had now proposed to establish the 765/400kV substation at Pune with GIS technology instead of AIS. He stated that only Maharashtra was beneficiary of Krishnapatnam UMPP and the proposal also needs to be put up to the other beneficiaries of the Krishnapatnam UMPP in Southern Region.
- 9.2 Director (SP&PA) further informed that CEA had also received a proposal from PGCIL for having a 765/400 kV GIS substation at Vadodara agreed as a part of WR System Strengthening for IPP projects in Madhya Pradesh and Chhattisgarh (being pooled at Bilaspur Polling station).

- 9.3 Executive Director, WRTS-II stated that they were facing problem in getting land for Vadodara 765/400 kV substation. Therefore, they had proposed GIS substation instead of AIS substation.
- 9.4 Managing Director, GETCO stated that land availability in and around Vadodara should not be an issue and with some efforts one could get the required land for Vadodara 765/400 kV substation.
- 9.5 The proposal of 765/400 kV GIS substation at Pune was agreed. Regarding 765/400 kV substation at Vadodra it was decided that PGCIL and GETCO would jointly survey and sort out the issue of acquisition of suitable land for setting up 765/400 kV AIS substation.
- 10.0 MSETCL proposal of connectivity of 400 kV Sholapur (MSETCL) with South Solapur (PG) under Central sector.**
- 10.1 Director (SP&PA), CEA stated that during the 29th SCM MSETCL had proposed a direct connectivity of 400 kV Sholapur with South Solapur (PG) under Central sector through Solapur (PG) – Solapur 400 kV D/c line. The connectivity from South Sholapur (PG) through LILO of Karad (MSETCL) - Sholapur (MSETCL) 400 kV S/C at Sholapur (PG) was already agreed as a part of Western Region System Strengthening scheme and was under implementation by IPTC. During the last meeting it was decided that this would be discussed with IPTC.
- 10.2 The issue was discussed by CEA with Reliance Power Transmission Ltd. wherein RPTL informed that significant progress had been made and it was not feasible to re-route the transmission line for establishing a direct connectivity between Sholapur (MSETCL) and Sholapur (PG).
- 11.0 GETCO proposal of sparing additional 2 nos. of 220 kV line bays at 400/220 kV Bhachau (Bhimsar, PGCIL) substation for full evacuation of power from 1st unit of 800 MW at Mundra UMPP.**
- 11.1 Director (SP&PA), CEA stated that Mundra UMPP (5X800 MW) located in Gujarat being implemented by M/s Coastal Gujarat Private Ltd.(CGPL) was scheduled for commissioning during the period Sep 2011 to March 2013 (Unit 1: Sep 2011, Unit 2: March 2012, Unit 3: July 2012, Unit 4: November 2012 and Unit 5: March 2013). The power from 1st 800 MW unit would be evacuated through Mundra - Bhachau 400 kV D/c line to GETCO system. The underlying 220 kV network planned by GETCO from 2X315 MVA 400/220 kV Bhachau substation of PGCIL was LILO of Halvad – Morbi 220 kV D/c line at Bhachau substation. For evacuating full power of 800 MW from unit-1 GETCO had proposed 2 nos. of 220 kV line bays and provision of one more ICT of 315 MVA at 400/220 kV Bhachau (Bhimsar, PGCIL) substation. The two no. addition bays would be utilized for connecting Bhachau (PGCIL) 400/220 kV substation and Versana (GETCO) 400/220 kV substation through 220 kV D/c line They had also proposed Bhimsar (Bachau) - Varsana 400 kV D/C line as system strengthening scheme for facilitating Gujarat in drawing their share of power (1800 MW) from Mundra UMPP.
- 11.2 Director (SP&PA), CEA opined that, in case the proposal of 400 kV interconnection between Bhachau (PGCIL) - Versana (GETCO) 400 kV substation was agreed the need for 220 kV interlinking along with additional 400/220 kV transformer at Bachau was not needed.
- 11.3 Executive Director, WRTS informed that Mundra (UMPP) – Bhimsar (Bachau) – Ranchhodpura 400 kV D/c line was under implementation and was expected to be commissioned by February, 2011.
- 11.4 Managing Director, GETCO stated that Bhimsar (Bachau) – Versana 400 kV D/c line as system strengthening was agreeable to GETCO. Also commissioning of Bachau – Ranchhodpura 400 kV D/c line by February, 2011 would facilitate them in absorption of power from 1st unit of Mundra UMPP.

11.5 After deliberation Bhimsar (Bhachau) – Versana 400 kV D/c line as System strengthening scheme was agreed.

12.0 **Setting up of On Line High Power Short Circuit Test Facility in India.**

12.1 CEO, NHPTL informed that National High Power Test Laboratory (Pvt.) Ltd., a Joint Venture Company of NTPC, NHPC, POWERGRID and DVC was incorporated on 22nd May 2009 with the objective of establishing a fully independent, stand alone, state of the art, professionally managed, international class On Line High Power Short Circuit Test Facility in India to provide a full range of Short Circuit testing for the electrical equipment manufacturing industry and power utilities in conformance to Indian and International Standards. The Test facilities are to be established in phased manner as under;

STAGE-I: Facilities to test large power transformers up to 400 kV for short-circuits withstand capabilities as National (BIS) and International (IEC) standards.

STAGE-II: Facilities to test large power transformers up to 765 kV class for short-circuits withstand capabilities.

STAGE-III: Facilities to test switchgears (CBs) up to 550kV, 63 kA for short-circuits duties with synthetic methods (HPS) as per National (BIS) and International (IEC) standards.

STAGE-IV: Facilities to test the high current with stand capability of electrical equipment (HCLV) like LV Bus Bar, LV Contactor, LV breakers, LV Disconnectors, LV switchgear, Bushings, CT, up to 400 kA rms with 1100 kA peak (stage IV);

12.2 CEO, NHPTL further informed that Bina substation for establishing Online High Power Test Laboratory had been selected due to proximity of the transformer manufacturing factories such as BHEL (Jhansi & Bhopal), CGL Mandideep (Bhopal) as well as connectivity by Rail & Road. The connectivity to the laboratory would be provided by extending line bays at 400 kV and 765 kV level from 765/400 kV Bina substation of Powergrid. He stated that CESI Italy had been engaged as technical consultant for the Online High Voltage Test Laboratory project and CPRI Bangalore was the management consultant. The feasibility report had been approved by NHPTL Board on 5th May, 2010. The execution of project was in two phases with each phase comprising of two stages. Under Phase-1, Stage-I and Stage-II would be taken up for implementation and under Phase-2, Stage-III and Stage-IV would be implemented. The estimated cost of Phase-1 was Rs. 298.64 crores. The completion schedule of Phase-I of the project was May, 2012. The implementation of Phase-II would be taken up after completion of Phase-I of the project. He informed that the project cost would to be funded through the mix of debt and equity in the ratio of 60:40. Initial equity would be infused by JV partners to fund the capital expenditure followed by the debt taken for the project from financial institution.

12.3 CE (SP&PA) enquired about the protection features adopted for isolation of the test facility from the grid in case of faults while transformer testing and emphasized that the impact of the drawal of short circuit power on grid stability needs to be studied.

12.4 CEO, NHPTL clarified that in case of any fault during transformer testing the test facility would be isolated from the grid in 80 milliseconds. Chief Engineer (SP&PA) desired that NHPTL should furnish written confirmation on the protection system provided for isolation of the test facility from the grid in case of fault during transformer testing .

12.5 Members took a note of the above and agreed that CEA may issue approval, after ensuring that it would not have adverse effect on grid stability, for the connection of the test facility to the Western Region Grid at Bina 765/400 kV substation.

13.0 Proposal of MPPTCL for construction of 220 kV D/c line between Shujalpur (400/220 kV) substation of Powergrid and Badod 220 substation of MPPTCL under Western Region System Strengthening Scheme.

13.1 Director (SP&PA), CEA stated that MPPTCL had intimated that the interconnection of WR-NR system through Ujjain/ Badod – Kota 220 kV link was resulting in overloading of lines and interconnecting transformers in Indore, Nagda and Ujjain area. To overcome overloading MPPTCL had proposed a 220 kV D/C line between Shujalpur 400 kV substation of PGCIL and Badod 220 kV substation of MPPTCL under Regional scheme. This was also discussed during the 28th meeting of Standing Committee on Power System Planning in Western Region wherein it was felt that in case MPPTCL wished they could construct this line on their own.

13.2 Managing Director, MPPTCL stated that with the commissioning of Gwalior – Agra 765 kV 2nd circuit (charged at 400 kV level) the problem of overloading of lines and interconnecting transformers in Indore, Nagda, and Ujjain area had been partly solved and for further addressing the problem of overloading 220 kV D/c line between Shujalpur and Badod could be agreed as System Strengthening Scheme.

13.3 Director (SP&PA) stated that 220 kV D/c line between Shujalpur and Badod may not address the overloading problem being suffered in totality, instead a 400 kV link between like Nagda – RAPP between WR – NR would be an appropriate as this would reduce the flow on the underlying 220 kV network of MPPTCL. The 220 kV D/c line between Shujalpur and Badod could be implemented by MPPTCL to strengthen the 220 kV network of MPPTCL.

13.4 MPPTCL suggested that a 400 kV link between WR and NR between Shujalpur-RAPP 400 kV.

13.5 Executive Director (SEF), PGCIL suggested that 400 kV link between WR and NR through Shujalpur - RAPP along with strengthening in the RAPP to Jaipur corridor could be considered in future.

14.0 MSETCL proposal of connecting Intra- state 400 kV substations with the Regional Grid 400 kV substation.

14.1 Director (SP&PA), CEA informed that MSETCL had intimated that two nos. of 400 kV substation i.e., Vikroli substation by Tata Power and Ghodbunder substation by R-Infra had been planned as a part of 5 year STU plan of Maharashtra. These substations were linked with following 400 kV lines:

Vikroli 400 kV substation:

- Vikroli – Panvel (PG) 400 kV S/c line – 35 km
- Vikroli – Bhiwandi (PG) 400 kV S/c line- 37 km
- Vikroli – Kharghar (MSETCL) 400 kV S/c line- 22 km

Ghodbunder 400 kV substation:

- Ghodbunder – Boisar (PG) 400 kV D/c line- 76 km
- Ghodbunder – Bhiwandi (PG) 400 kV D/c line – 17 km

14.2 The above two 400 kV station were getting connected to the Powergrid substations at Boisar and Bhiwandi. Since Bhiwandi (PG) 400 KV substation was not materialising due to RoW constraints being faced by Powergrid in terminating the 400 kV D/c line from Navsari at Bhiwandi, the same would now be terminated at existing Boisar 400 kV substation. Therefore, the above connectivity planned by MSETCL for 400 kV substations at Vikroli and Ghodbunder needs to be reviewed.

It was decided that issue would be discussed in the working group level meeting proposed between Powergrid, MSETCL and CEA.

15.0 Preliminary information on evacuation arrangements of 4000 MW (6X660) Chhattisgarh UMPP.

15.1 Chhattisgarh UMPP was proposed to come up near Village Salka and Khamaria in Surguja Distt. Chhattisgarh. The tentative unit wise commissioning schedule was: Unit-I – Dec 2016, Unit-II – May 2017, Unit-III – Dec 2017, Unit-IV – May 2018, Unit-V – Dec 2018, Unit-VI – May 2019. The tentative allocation to WR constituent state was as under:

Sl.No.	Beneficiary	Allocation(MW)
Western Region		
1	Chhattisgarh	2000
2	Maharashtra	1000
3	Madhya Pradesh	425
4	Gujarat	275
5	Goa	200
6	UT DD	50
7	UT DNH	50
	Total	4000

15.2 For evacuating power to the beneficiaries in the Western Region, the power from Chattisgarh UMPP would need to be evacuated at 765 kV level. In view of the development of 765/400kV Jabalapur Pooling as a part of transmission system for IPPs in Orissa and Champa Pooling Station as a part of transmission system for IPPs in Chhattisgarh, connectivity of Chhattisgarh UMPP with Jabalpur Pooling Station as well as Champa Pooling station at 765kV level was envisaged. The evacuation system as well as system strengthening required in Western Region in the time frame of 2016-17, for absorption of power by the beneficiaries would be evolved subsequently.

Members took note of the above.

16.0 Proposal of UT of DNH for Installation of 3rd 315 MVA, 400/220 kV transformer at Vapi (PGCIL) substation.

16.1 Director (SP&PA), CEA stated that Electricity Department, DNH had proposed the Installation of 3rd 1X315 MVA, 400/220 kV transformer at Vapi (PGCIL) substation. DNH had informed that Vapi 400 kV substation was fully loaded and outage of any one of the ICT overloads the other ICT. They had further intimated that during period of failure (19.09.2009 to 16.10.2010) of one of the ICT at Vapi 400/220 kV substation load shedding was carried out to avoid overloading of the other ICT. Further with commissioning of 220/66 kV Khadoli sub-station the long pending loads of around 200 MW would be released. This increased load would be further reflected on Vapi 400 kV substation.

16.2 Director (SP&PA) further stated that Electricity Department, DNH vide their letter dated 28.06.2010 had also requested for LILO in one circuit of 220 kV Vapi-Khadoli D/c line at proposed 220 kV Sayali substation to be established by DNH for feeding their loads in that area.

16.3 The above proposal of DNH was agreed. The 3rd 1X315 MVA ICT at Vapi 400/220 kV substation would be implemented by PGCIL and LILO of one circuit of 220 kV Vapi - Khadoli 220 kV D/c at proposed Sayali substation would be under purview of Electricity Department of DNH.

16.4 Executive Director (SEF), PGCIL stated that at present there was only one 400 kV line S/C incoming line to Vapi from Sugan whereas there were three nos. of 400 kV outgoing lines namely Vapi – Navi Mumbai 400 kV D/c and Vapi – Boisar 400 kV S/c line. There were also a large number of 220 kV outlets from Vapi to facilitate power drawl by UT of DNH and D&D as well as Gujarat. Further, with connectivity of Khadoli at 220kV level and Navi Mumbai at 400kV, the loading of 400kV SUGEN- Vapi S/c line may change substantially. Therefore in order to increase reliability of power supply at 400kV Vapi Substation, which is becoming a major power hub in Southern part of Gujarat, as well as relieve loading on 400kV Sugan-Vapi S/c line, he proposed LILO of 400kV Navsari- Boisar D/c line (being implemented as a part of transmission system of Mundra UMPP) at Vapi.

16.5 It was decided that proposal of PGCIL would be studied further.

17.0 **Transmission System Associated with Cheyyur UMPP in Tamil Nadu 4000 MW.**

17.1 Cheyyur UMPP (TNUMPP) at Cheyyur Taluk, Kanchipuram District, Tamil Nadu was being taken up by Coastal Tamil Nadu Power Ltd, an SPV company of PFC. As per the allocation of power from this UMPP, 3100 MW had been allocated for Southern Region and rest 900 MW for Western and Northern Regions:

Southern Region (3100 MW):

- Tamil Nadu - 1600 MW
- Karnataka - 800 MW
- Andhra Pradesh - 400 MW
- Kerala - 300 MW

Western Region (400 MW):

- Maharashtra - 400 MW

Northern Region (500 MW):

- Uttar Pradesh - 300 MW
- Punjab - 200 MW

The project was presently expected to be commissioned in the time frame of 2015-17. A comprehensive transmission requirement had been assessed for evacuation of power from the new IPP projects, including TNUMPP, coming in Andhra Pradesh and Tamil Nadu who had applied for LTOA. The following transmission system had been agreed by the SR constituents in their 28th Standing Committee meeting:

- (i) TNUMPP – Tiruvalam 765kV 2xS/C or D/C line \$
- (ii) Tiruvalam – Kurnool 765kV S/C line
- (iii) Kurnool – Raichur 765kV 2xS/C or D/C line \$
- (iv) TNUMPP – Salem 765kV S/C line.
- (v) Salem – Madhugiri 765kV S/C line (line no.# 2)*

\$ - PGCIL would assess technical feasibility of constructing and maintaining 765kV D/C lines and submit the same to CEA. Decision regarding building the TNUMPP Tiruvalam and Kurnool-Raichur links as 2xS/C or D/C lines would be taken up after examining the feasibility report submitted by PGCIL.

* - Another Salem-Madhugiri 765kV line (line no.# 1) alongwith Salem and Madhugiri 765kV pooling stations is being planned to be implemented by PGCIL as part of evacuation system from IPP generation projects in Tuticorin area of Tamil Nadu, which would be initially charged at 400kV. These two S/Ss and the Salem-Madhugiri line would be charged at 765kV matching commissioning of TNUMPP or IPP generating stations coming in Cuddalore area, which ever would be earlier. The Cuddalore and Tiruvalam 765kV pooling Sub-stations are planned to be implemented by PGCIL as part of transmission system for evacuation of power from IPP

generation projects coming in Tamil Nadu and Andhra Pradesh. A final decision in this regard would be taken after reviewing the progress on IPP generation projects.

- 17.2 The generation switchyard at TNUMPP would have five number of 765kV line bays. Out of these five line bays, three would be for the transmission lines mentioned above and two line bays would be for LILO of Cuddalore- Tiruvalam 765kV S/C line at TNUMPP. The Cuddalore-Tiruvalam 765kV S/C line was being planned for evacuation of power from IPP projects in Tamil Nadu. In addition to above, provision for two more 765kV bays would have to be kept in the generation switchyard for two number of bus reactors.

Member took note of the above.

18.0 **Transmission System for Tillaiyya (4000 MW) UMPP**

- 18.1 Director(SP&PA), CEA stated that in the Tilaiya UMPP Eastern Region, Northern Region and Western Region had share of 1500 MW, 1700 MW and 800 MW respectively. The generation specific transmission system associated with Tilaiya UMPP, was informed in the 28th standing Committee meeting of Power System Planning in Western Region as under:

- Tilaiya UMPP – Sasaram, 765kV S/C line
- Tilaiya UMPP – Gaya, 765kV S/C line.
- Tilaiya UMPP – Balia 765kV S/C line

In view of the space constraints at Sasaram, the generation specific transmission system of Tilaiya UMPP was further deliberated in the Northern Region and Eastern Region. The revised system was as under:

- Tilaiya UMPP – Balia 765kV D/C line
- Tilaiya UMPP – Gaya 765kV S/C line

The charges for the above transmission system are to be shared by the constituents in proportion to allocation.

Further, LILO of one ckt. of Tilaiyya UMPP – Balia 765 kV D/C line at Varanasi as a part of System Strengthening in NR has been agreed by the NR constituents.

Members took note of the above.

19.0 **Proposal of Goa for Installation of 3rd 315 MVA, 400/220 kV transformer at Mapusa (PGCIL) substation.**

- 19.1 Director (SP&PA), CEA stated that Goa vide their letter 15/2/CEE/Tech/467 dated 25th June 2010 had requested for provision for 3rd ICT at Mapusa 400/220 kV substation of Powergrid for meeting their increased loads and reliability purpose. They had indicated that their present demand was of the order of 480 MW which would increase with procurement of more power from IPP generation projects. Hence, they have proposed for 3rd ICT at Mapusa.

- 19.2 Executive Director (NLDC) stated that Mapusa 400 kV substation was being fed radially from the grid and addition of 3rd ICT would result in increased drawl of power at Mapusa and may cause low voltage problems in that area. He suggested that WRPC may examine the low voltage issues and take up reactive power compensation studies to address the same.

After discussions the augmentation of Mapusa substation by 1x315 MVA (3rd transformer) was agreed.

20.0 **Termination of Akola(MSETCL) – Aurangabad (MSETCL) 400 kV D/C line under System Strengthening in WR for Mundra UMPP.**

20.1 Director (SP&PA), CEA stated that during the special meeting of Standing Committee held on 18.04.2010, to facilitate interconnection between Aurangabad (PG) and Aurangabad (MSETCL), following arrangement was agreed:

- Termination of Akola – Aurangabad (MSETCL) 400 kV D/C line at Aurangabad (PG) instead of at Aurangabad (MSETCL). This would result in availability of two bays at Aurangabad (MSETCL) for construction of Aurangabad(PG) –Aurangabad (MSETCL) 400 kV D/C (quad) line
- MSETCL would need to make necessary arrangement of busbar capacity corresponding to quad line capacity.

20.2 Director (SP&PA), CEA stated that now Powergrid has proposed LILO of 400 kV Akola-Aurangabad (MSETCL) at Aurangabad (PG). The proposed LILO arrangement would result into a weak link (through 400 kV D/C twin moose line instead of quad line) between Aurangabad (MSETCL) and Aurangabad (PG).

20.3 Executive Director (SEF), PGCIL stated that for implementation of the above agreed interconnection i.e., shifting of Akola – Aurangabad (MSETCL) 400 kV D/C line from Aurangabad(MSETCL) to Aurangabad (PG) involves huge dismantling/ de-stringing works as well as long duration shut downs would be required at MSETCL substation. Therefore LILO of 400 kV Akola-Aurangabad (MSETCL) at Aurangabad (PG) has now been proposed. Further, MSETCL needs to confirm the suitability of bus capacity for termination of quad line at Aurangabad (MSETCL)

20.4 Executive Director, MSETCL said that they would confirm about the bus capacity at Aurangabad (MSETCL).

20.5 Based on the feedback of MSETCL the matter could be further deliberated in the next Standing Committee meeting.

21.0 Transmission System for IPPs located in Orissa

21.1 The transmission system for evacuating power from IPPs in Orissa to their targeted beneficiaries in WR and SR was agreed during the 29th meeting of SCM of WR. The agreed transmission system was as under:

➤ System Strengthening common for WR and NR associated with Orissa IPPs.

- (i) Establishment of 765kV switching substation at Dharamjaygarh
- (ii) Establishment of 2x1500 MVA, 765/400kV Jabalpur Pooling Station
- (iii) Jharsuguda Pooling Station – Dharamjaygarh (WR) 765kV D/c
- (iv) LILO of Ranchi – Sipat (Bilaspur) PS 765kV S/c line at Dharamjaygarh
- (v) Dharamjaygarh – Jabalpur Pool 765kV D/c line
- (vi) Jabalpur Pooling station – Jabalpur 400 kV D/c (high capacity)
- (vii) Jabalpur Pooling station – Bina 765kV D/c line
- (viii) Bina – Gwalior 765kV S/c (3rd circuit)

➤ System Strengthening in WR associated with Orissa IPPs.

- (i) Establishment of 2x1500MVA, 765/400kV Bhopal Pooling Station. (*Implementation by private sector through tariff based competitive bidding route*)
- (ii) Jabalpur Pooling station – Bhopal 765kV S/c (*Implementation by private sector through tariff based competitive bidding route*)

- (iii) Bhopal – Indore 765kV S/c (*Implementation by private sector through tariff based competitive bidding route*)
- (iv) Bhopal New substation – Bhopal (M.P.) 400kV D/c (high capacity) (*Implementation by private sector through tariff based competitive bidding route*)

➤ **System Strengthening in NR associated with Orissa IPP.**

- (i) Gwalior - Jaipur 765kV S/c line
- (ii) Jaipur - Bhiwani 765kV S/c line

➤ **Pooling Stations along with their interconnections for IPPs in Orissa**

- (i) Establishment of 765/400kV Pooling Station at Jharsuguda
- (ii) Establishment of 765/400kV Pooling Station at Angul
- (iii) Angul Pooling Station – Jharsuguda Pooling Station 765kV 2xS/c
- (iv) LILO of Rourkela – Raigarh 400kV 1xD/c at Jharsuguda Pooling station
- (v) *LILO of Meramundali – Jeypore 400kV S/c line at Angul pooling station
- (vi) *LILO of one ckt of Talcher - Meramundali 400kV D/c line at Angul pooling station.

* Interim arrangement. LILO to be removed after establishment of 765 kV pooling station at Angul

➤ **Dedicated transmission System up to pooling point under the scope of Project Developer for Orissa IPPs**

Sterlite (2400 MW)	(i) Sterlite- Jharsuguda Pooling station 400 kV D/C line with associated bays
Ind- Barath(700 MW)	(i) Ind-Barath- Jharsuguda Pooling station 400 kV D/C line with associated bays
Jindal Thermal (1200 MW)	(i) Jindal Thermal- Angul Pooling station 400 kV D/C line with associated bays
Monnet (1050 MW)	(i) Monnet- Angul Pooling station 400 kV D/C line with associated bays
GMR (1050 MW)	(i) GMR- Angul Pooling station 400 kV D/C line with associated bays
Lanco Babandh (2640 MW)	(i) Lanco Babandh- Angul Pooling station 400 kV 2XD/C line with associated bays (ii) 3X1500 MVA, 765/400 kV transformers at Angul along with associated bays
Navbharat Phase-I (1050 MW)	(i) Navbharat - Angul Pooling station 400 kV D/C line with associated bays

21.2 The elements of the above transmission system to be implemented through private sector were in the process of bidding through PFC Consulting Engineers. For the other elements to be implemented by PGCIL, for ease of implementation PGCIL had divided them into three parts - Part A, Part B and Part C as given below:

Transmission System for Phase-I generation projects in Orissa

Part-A

Pooling stations along with their interconnections

- (i) Establishment of 2x1500 MVA, 765/400kV Pooling Station at Jharsuguda
- (ii) Establishment of 4x1500MVA, 765/400kV Pooling Station at Angul
- (iii) Angul Pooling Station – Jharsuguda Pooling Station 765kV 2xS/c
- (iv) LILO of Rourkela – Raigarh 400kV D/c at Jharsuguda Pooling station
- (v) LILO of Meramundali – Jeypore 400kV S/c line at Angul pooling station

(vi) LILO of one ckt of Talcher - Meramundali 400kV D/c line at Angul pooling station

- * As the pooling stations/ transmission system identified for evacuation of power would not be available for some of the generation projects which are likely to come prior to available of evacuation system, interim arrangement for connectivity at the cost of project developers for the following generation projects had been planned as under:

Sterlite	• LILO of one ckt of Rourkela-Raigarh 400kV D/c line
Ind Bharat	• LILO of other ckt of Rourkela-Raigarh 400kV D/c line
GMR	• LILO of one ckt of Talcher-Meramundali 400kV D/c line
Jindal	• LILO of Meramundali-Jeypore 400kV S/c line

Part-B

System Strengthening Common for WR and NR associated with Orissa IPPs

- (i) Establishment of 765kV substation at Dharamjaygarh
- (ii) Establishment of 2x1500 MVA, 765/400kV Jabalpur Pooling Station
- (iii) Jharsuguda Pooling Station – Dharamjaygarh (WR) 765kV D/c
- (iv) LILO of Ranchi – WR Pooling near Sipat 765kV S/c line at Dharamjaygarh
- (v) Dharamjaygarh – Jabalpur Pool 765kV D/c line
- (vi) Jabalpur Pool – Jabalpur 400 kV D/c (high capacity)

Part-C

System Strengthening Common for WR and NR associated with Orissa IPPs

- (i) Jabalpur Pool – Bina 765kV D/c line
- (ii) Bina – Gwalior 765kV S/c (3rd circuit)

System Strengthening in NR associated with Orissa IPPs

- (iii) Gwalior - Jaipur 765kV S/c line
- (iv) Jaipur - Bhiwani 765kV S/c line

Part-D

(Under scope of Private Sector)

System strengthening in WR associated with Orissa IPPs.

- (i) Establishment of 2x1500MVA, 765/400kV Bhopal Pooling Station. (Implementation by private sector through tariff based competitive bidding route)
- (ii) Jabalpur Pooling station – Bhopal 765kV S/c (Implementation by private sector through tariff based competitive bidding route)
- (iii) Bhopal – Indore 765kV S/c (Implementation by private sector through tariff based competitive bidding route)
- (iv) Bhopal New substation – Bhopal (M.P.) 400kV D/c (high capacity) (Implementation by private sector through tariff based competitive bidding route)

Members took note of the above.

22.0 Agenda proposed by GETCO: Utilization of GETCO network Zerda (Kansari) – Kankroli Inter-Regional link between WR and NR.

22.1 Director (SP&PA), CEA stated that GUVNL had intimated that since commissioning of Zerda (Kansari) –Kankroli link GETCO network was being utilized for inter-regional transfer of power to NR as Zerda substation was presently not connected to the CTU network. GUVNL had

requested for applicability of GETCO transmission charges and losses for utilization of GETCO network for any transfer of power to NR on Zerda-Kankroli inter-regional link.

22.2 With regard to the above it was noted that Ranchodpura-Zerda 400 kV D/C line planned as a part of WRSS-II was under implementation through RPTL and once this line gets commissioned Zerda would get connected to the CTU network.

22.3 The issue was deliberated and it emerged that issues raised by GETCO were commercial in nature and Standing Committee on Power System Planning was not the appropriate forum for discussing such issues.

23.0 Agenda proposed by CSPTCL for alternative supply to Jagdalpur (South Chattisgarh) area.

23.1 CSPTCL representative informed that at present the whole of South Chattisgarh comprising of Jagdalpur, Kanker, Dantewada, Bijapur & Narayanpur Districts was getting supply through a 220 kV double circuit line, which was a radial line emanating from Bhilai 220 kV substation to Barasur (Bodghat). The break down of the double circuit line results in failure of power to all the districts. There were dense forest with lot of naxal activities and in case of outage of this line there was no alternative supply even for feeding essential loads like waterworks, hospitals etc. CSPTCL had proposed a 220 kV line from Jeypore (Orissa) in Eastern Region to Jagdalpur as an alternative dependable supply to South Chhattisgarh and had suggested that this line may be constructed by PGCIL.

23.2 The proposal of CSPTCL was discussed and it was felt that since the 220 kV line would be for the benefit of Chhattisgarh for feeding loads in and around Jagdalpur, they could construct the line on their own. However, since the proposal involved supply of power to Chhattisgarh from ER the proposal would need to be discussed in the SCM of ER for their approval. PGCIL confirmed availability of space for 2 no 220 kV bays at Jeypore 400/220 kV substation.

24.0 Open Access Applications pertaining to New Generation Projects in Southern Region with target beneficiaries in Western/Northern/Southern Region.

24.1 The following transmission system for system strengthening within WR/NR and between WR and NR for transfer of power from the New Generation Projects in Southern Region to their target beneficiaries in WR and NR was informed in the 29th Standing Committee of WR:

- (i) Sholapur – Pune 765 kV 2nd S/c.
- (ii) Jabalpur Pooling station – Orai 765 kV S/c line.
- (iii) Orai – Bulandshahar 765 kV S/c line.
- (iv) Bulandshahar – Sonapat 765 kV S/c line
- (v) Establishment of 765/400 kV 2X1000 MVA substation at Orai by LILO of one circuit of Satna – Gwalior 765 kV line
- (vi) Establishment of 765/400 kV 2X1500 MVA substation at Bulandshahar by LILO of Agra – Meerut 765 kV line.
- (vii) Establishment of 765/400 kV 2X1500 MVA substation station at Sonapat by LILO of Bhiwani – Meerut 765 kV line.

24.2 The above transmission system was subsequently discussed and agreed by the NR constituents in their 28th Standing Committee meeting of NR held on 23.02.2010. The agreed transmission system was as given below:

- (i) Sholapur – Pune 765 kV 2nd S/c.
- (ii) Jabalpur Pooling station – Orai 765 kV S/c line.
- (iii) Orai – Bulandshahar 765 kV S/c line.
- (iv) Bulandshahar – Sonipat 765 kV S/c line
- (v) Establishment of 765/400 kV 2X1000 MVA substation at Orai by LILO of one circuit of Satna – Gwalior 765 kV line
- (vi) Establishment of 765/400 kV 2X1500 MVA substation at Bulandshahar by LILO of Agra – Meerut 765 kV line.
- (vii) Establishment of 765/400 kV 2X1500 MVA substation station at Sonepat by LILO of Bhiwani – Meerut 765 kV line.
- (viii) Orai-Orai (UPPCL) 400kV D/c (Quad)
- (ix) Sonipat-Kurushetra 400 kV D/c (Quad)
- (x) Sonipat (new) – Sonipat (Under Construction) 400 kV D/c (Quad)
- (xi) Bulandshahr – Hapur (UPPCL) 400kV D/c (Quad)

Transmission charges of item (i) would be shared by IPPs in SR in Tuticorin, Krishnapatnam & Srikakulam area for exporting to WR & NR and remaining items shall be shared by IPPs exporting to NR. Charges would be transferred to beneficiaries as and when confirmed

Members took note of the above.

25.0 Transmission system of Vindhyachal-IV & Rihand-III gen. projects.

25.1 Director (SP&PA), CEA stated that the transmission system associated with Vindhyachal –IV (1000 MW) and Rihand – III (1000 MW) generation projects of NTPC was deliberated in the 28th and 29th meeting of Standing committee on power system planning in WR. The final agreed system comprised of Generation specific transmission system, Common System Strengthening for WR & NR and System Strengthening in NR. With the commissioning of 1st unit of Vindhaychal-IV (2x500MW) and Rihand-III(2x500 MW) generation, Vindhyachal Pooling Station-Satna 765kV link was to be charged at 400kV level and with the commissioning of 2nd unit of Vindhyachal-IV & Rihand-III, Vindhyachal Pooling Station-Satna was to be charged at 765kV along with suitable reactive compensation. PGCIL had now proposed direct charging at 765 kV of Vindhyachal Pooling Station-Satna line.

25.2 POWERGRID informed that charging of above line initially at 400kV level involved about 7(Seven) nos. line crossings at Satna. Further, there would be acute ROW problem due to inhabitation around Satna S/s. Keeping this in view, POWERGRID had proposed that 765kV Vindhyachal Pooling Station- Satna 2xS/c line may be charged at 765kV from the beginning itself.

25.3 Members agreed for operating the Vindhyachal Pooling Station – Satna 2xS/c line at 765kV level from the beginning itself instead of initially charging it at 400 kV level.

26.0 Evacuation arrangement for M/s Ideal Energy (2x135 MW+2x135 MW), M/s Power Maharashtra Ltd (3x660 MW + 2x660 MW).

26.1 Director (SP&PA), CEA said that MSETCL has proposed interconnection of M/s Ideal Energy (2x135 MW+270 MW) and M/s Power Maharashtra Ltd (3x660 MW + 2x660 MW) with Wardha(PG) and Aurangabad(PG) substation respectively. The evacuation arrangement proposed by MSETCL was as under:

- A. Evacuation Arrangement for M/s Ideal Energy Project Ltd. (2x135 MW+270 MW)

(i) LILO on one ckt. of 400 kV Koradi –II – Wardha (PG) at M/s Ideal Energy

B. Evacuation Arrangement for M/s Power Maharashtra Ltd. ((3X660 MW (Phase -I) + 2X660 MW (Phase –II))

(i) Tiroda (Gondia) – Warora 400 kV D/c line (quad), 195 km.

(ii) Tiroda (Gondia) – Koradi III 765 kV 2X S/C line, 120 km

(iii) 2X1000 MVA, 765/400 kV ICT at Tiroda (Gondia)

(iv) Koradi III – Akola-II 765 kV 2X S/C line, 282 km

(v) Akola-II – Aurangabad (PG) 765 kV 2X S/C line, 210 km

26.2 At present, the transmission corridor from Wardha towards Aurangabad(PG) and beyond viz. Wardha-Aurangabad 765 kV 2XD/c transmission line, Aurangabad- Phadge/ Dhule 765 kV line was planned as a part of the transmission scheme for IPP generation projects coming up in Chhattisgarh who had signed BPTA/ furnished Bank Guarantee and transmission margins would not be available for evacuating power from M/s Ideal Energy Project Ltd. and M/s Power Maharashtra Ltd beyond Wardha / Aurangabad.

26.3 In the meeting it was noted that STU network was not adequately planned beyond Aurangabad for evacuating power from generation projects at Tiroda, Koradi II, Nandgaonpet and Khaperkheda to load centers and for absorbing the power from Intra State generation projects in Maharashtra, MSETCL needs to adequately plan the intra –state network beyond Aurangabad to their load centers.

26.4 It was decided that a joint study shall be conducted by CEA, MSETCL & POWERGRID to identify intra-state transmission network, considering above generation projects as well as other projects of Maharashtra coming up in that area.

27.0 Open Access Meeting

The summary of the Connectivity, Open Access (Medium term and Long term) cases discussed in the 12th meeting of WR constituents regarding Long Term Open Access (LTOA) applications in Western Region is enclosed as **Summary - OA**. The detailed minutes of the meeting would be issued by PGCIL.

Summary of Applications for Grant of Connectivity / Long Term Access / Medium Term Open Access

A. Applications for Grant of Connectivity

1. Hindustan Electricity Generation Co. Pvt. Ltd.

- | | | |
|-------|----------------------------|--|
| (i) | Generation Project Details | 1x350MW+3x700MW (2450 MW)
Village/Town-Navlaka-Umbre, District-Pune,
State- Maharashtra |
| (ii) | Commissioning schedule | U-1: May'12, U-2: Apr'13,
U-3: Apr'14, U-4: Apr'14 |
| (iii) | Connectivity sought for | 2450 MW |
| (iv) | Connectivity sought from | April12 |
| (v) | Step up voltage | 350 MW unit at 400 kV and 700 MW unit at 765 kV |
| (vi) | Connectivity not granted | ➤ Applicant has already obtained the connectivity with the MSETCL network, additional connectivity at ISTS is not required as purpose of getting connected is fulfilled. |

2. Lanco Vidarbha Thermal Power Pvt Ltd.

- | | | |
|-------|----------------------------|---|
| (i) | Generation Project Details | 2x660 MW(1320MW)
Village – Near Mandav, Taluk-Wardha, District Wardha,
State- Maharashtra |
| (ii) | Commissioning schedule | U-1 & 2: Mar'12 |
| (iii) | Connectivity sought for | 1320 MW |
| (iv) | Connectivity sought from | January 2012 |
| (v) | Step up voltage | 765 kV |
| (vi) | Connectivity granted | ➤ LILO of Seoni – Wardha 765 kV S/C line at Lanco Vidarbha TPS along with 1x125MVAR bus reactor at generation switchyard. |

3. Raigarh Energy Limited.(REL)

- | | | |
|-------|----------------------------|--|
| (i) | Generation Project Details | 2x300MW (600MW)
Village-Hamirpur and Jobra, District- Raigarh,
State- Chhattisgarh |
| (ii) | Commissioning schedule | U-1: Dec'13, U-2: Jul'15 |
| (iii) | Connectivity sought for | 600 MW |
| (iv) | Connectivity sought from | Dec'13 |

- (v) Step up voltage 400 kV
- (vi) Connectivity granted ➤ Raigarh Energy Ltd TPS – Raigarh Pooling Station (near Tamnar) 400kV D/c line along with 1x80MVAR bus reactor at generation switchyard.

4. SJK Powergen Ltd

- (i) Generation Project Details 2x660MW (1320 MW)
Village-Lalpur, District- Shadol, State - MP
- (ii) Commissioning schedule U-1: Dec'14, U-2: Jun'15
- (iii) Connectivity sought for 1320 MW
- (iv) Connectivity sought from Jun'14
- (v) Step up voltage 400 kV
- (vi) Connectivity granted ➤ SJK TPS – Jabalpur Pooling Station 400kV D/c (Triple) along with 1x125MVAR bus reactor at generation switchyard

5. Cosmos Sponge & Power Ltd. (CSPL)

- (i) Generation Project Details 1x350MW (350 MW)
Village -Bhainsamuhan, Tehsil – Dabara,
District- Janjgir-Champa, State- Chhattisgarh
- (ii) Commissioning schedule U-1: Jun'13
- (iii) Connectivity sought for 320 MW
- (iv) Connectivity sought from Jun'13
- (v) Step up voltage 400 kV
- (vi) Connectivity granted ➤ CSPL TPS - Raigarh Pooling Station (Near Kotra) 400kV D/c along with 1x80MVAR bus reactor at generation switchyard

6. Essar Power MP Ltd. (Mahan Phase II)

- (i) Generation Project Details 1x600MW (600 MW)
Village- Bandhora Nagwa, Khairahi and Karsualal,
Tehsil- Singrauli District Sidhi ,State-Madhya Pradesh
- (ii) Commissioning schedule U-1: Mar'13
- (iii) Connectivity sought for 540MW
- (iv) Connectivity sought from Mar'13

- (v) Step up voltage 400 kV
- (vi) Connectivity granted ➤ Bus extension of Mahan TPS phase-1 generation project to proposed generation project switchyard along with 1x125MVAR bus reactor

7. Visa Steel Ltd.

- (i) Generation Project Details 450 MW(3x150MW)
Village- Kotmar & Patrapalli, District - Raigarh,
State- Chhattisgarh
- (ii) Commissioning schedule U-1 & U-2:Oct'13, U-3:Oct'15
- (iii) Connectivity sought for 450 MW
- (iv) Connectivity sought from Aug'13
- (v) Step up voltage 400 kV
- (vi) Connectivity granted ➤ Visa Steel TPS - Raigarh Pooling Station (near Kotra) 400kV D/c line along with 1x80MVAR bus reactor at generation switchyard

8. Chitrangi Power Private Limited

- (i) Generation Project Details Ph-I: 6x660MW+ Ph-II:3x660MW (5940MW)
Village-Khokhwa, Tehsil - Chitrangi,
District- Singrauli, State- Madhya Pradesh
- (ii) Commissioning schedule Phase –I (6x660MW)
U-1: Sep'13, U-2: Dec'13, U-3: Mar'14, U-4: Jun'14
U-5: Sep'14, U-6: Dec'14

Phase –II (3x660MW)
U-7:Mar'15, U-8: Jun'15, U-9: Sep'15
- (iii) Connectivity sought for 3960 MW [6x660 MW] (Phase-I)
- (iv) Connectivity sought from Mar'13
- (v) Step up voltage 765 kV
- (vi) Connectivity granted ➤ Chitrangi TPS – Vindhyachal Pooling Station 765kV D/c along with 765kV, 1x240MVAR bus reactor at generation switchyard

9. Gupta Energy Pvt. Ltd

- (i) Generation Project Details Ph-I:2x60+ Ph-II: 2x270 (Total 660 MW)
Village-Usegaon & Ghuggus ,
District- Chandrapur, State- Maharashtra
- (ii) Commissioning schedule Phase –I (2x60MW) U-1: Dec'10, U-2: Jan'11

Phase –II (2x270MW) U-3: Dec'11, U-4: Jan'12

- (iii) Connectivity sought for 540 MW (Ph-II)
- (iv) Connectivity sought from Nov'11
- (v) Step up voltage 400 kV
- (vi) Connectivity granted ➤ LILO of Bhadravati –Parli 400kV one ckt at Gupta Energy TPS along with 1x80MVAR bus reactor at generation switchyard

10. JSW Energy (Ratnagiri) Ltd.

- (i) Generation Project Details 4x800 MW (3200 MW)
Village - Chaferi District- Ratnagiri,
State- Maharashtra
- (ii) Commissioning schedule U-1: Apr'15, U-2: Aug'15
U-3: Dec'15, U-4: Apr'16
- (iii) Connectivity sought for 3200 MW
- (iv) Connectivity sought from Apr'15
- (v) Step up voltage 765 kV
- (vi) Connectivity ➤ Connectivity to the STU network can be established through Installation of 765/400kV, 1x1000MVA transformer at gen. switchyard and 400kV Interconnection between JSW-II(3200MW) and JSW-I(1200MW) through D/c line along with 765kV,1x240 MVAR bus reactor at generation switchyard.
➤ Project developer should apply to STU for connectivity.
➤ In case applicant applies for LTA to CTU, system strengthening for evacuation of power will be identified.

11. TRN Energy Pvt Ltd.

- (i) Generation Project Details 2x300MW (600 MW)
Village -Nawapara, Tehsil – Gharghoda
District- Raigarh, State- Chhattisgarh
- (ii) Commissioning schedule U-1: Jul'12, U-2: Oct'12
- (iii) Connectivity sought for 600 MW
- (iv) Connectivity sought from Mar'12
- (v) Step up voltage 400 kV

- (vi) Connectivity Application withdrawn by the project developer

12. Ideal Energy Projects Ltd and Dhariwal Infrastructure Ltd.

Applications for grant of connectivity of M/s Ideal Energy Projects Ltd (540 MW) and M/s Dhariwal Infrastructure Ltd (600 MW) have been withdrawn.

13. MB Power (Madhya Pradesh) Ltd.

- | | | |
|-------|----------------------------|---|
| (i) | Generation Project Details | 2X600 MW (1200 MW)
District-Anuppur, State- Madhya Pradesh |
| (ii) | Commissioning schedule | U-1 : Aug'13, U-2 : Dec'13 |
| (iii) | Connectivity sought for | 1122 MW |
| (iv) | Connectivity sought from | Feb'13 |
| (v) | Step up voltage | 400 kV |
| (vi) | Connectivity granted | <ul style="list-style-type: none">➤ Moser Baer TPS – Jabalpur Pooling Station 400kV D/c (triple) along with 1x125 MVAR bus reactor at generation switchyard.➤ Till availability of above proposed transmission system, connectivity may be provided by following interim arrangement : Moser Baer TPS – Jabalpur (Existing) 400kV D/c (triple) |

14. Pipavav Energy Pvt. Ltd

- | | | |
|-------|----------------------------|---|
| (i) | Generation Project Details | 1200MW (2x600MW)
Village- Bherai, Tehsil- Rajula
District-Amreli, State- Gujarat |
| (ii) | Commissioning schedule | U-1 : Jun'13, U-2 : Oct'13 |
| (iii) | Connectivity sought for | 1110 MW |
| (iv) | Connectivity sought from | Jan'13 |
| (v) | Step up voltage | 400 kV |
| (vi) | Connectivity granted | <ul style="list-style-type: none">➤ Pipavav TPS – Pirana 400kV D/c line (Triple) along with 1x125MVAR bus reactor at generation switchyard➤ Till availability of above proposed tr. system, connectivity may be provided by following interim arrangement LILO of 400kV Amreli – Jetpur S/c line |

15. Essar Power Gujarat Ltd

(i)	Generation Project Details	4x150MW+4x660MW (3240 MW) District- Jamnagar, State- Gujarat
(ii)	Commissioning schedule	U-1:Jun'12, U-2: Sep'12, U-3: Dec'12, U-4: Mar'13,U-5: Mar'13, U-6: Jul'13 U-7: Nov'13, U-8: Mar'14
(iii)	Connectivity sought for	3040 MW
(iv)	Connectivity sought from	Jun'12
(v)	Step up voltage	400 kV
(vi)	Connectivity granted	<ul style="list-style-type: none">➤ EPGL TPS – Bachau 400kV D/C (Triple) along with 1x125MVAR bus reactor at generation switchyard➤ Till availability of above proposed transmission system, connectivity may be provided by following interim arrangement : LILO of one circuit of 400kV Mundra UMPP – Jetpur D/c line (Triple)

B. Applications for Grant of Long Term Access:

1.0 MB Power (Madhya Pradesh) Ltd

(i)	Generation Project Details	2X600 MW (1200 MW) District-Anuppur, State- Madhya Pradesh
(ii)	Commissioning schedule	U-1 : Aug'13, U-2 : Dec'13
(iii)	LTA sought for	392 MW
(iv)	Target Beneficiary	WR – 200 MW, NR - 192MW
(v)	LTA sought from	Aug'13
(vi)	Connectivity granted	<ul style="list-style-type: none">➤ Moser Baer TPS – Jabalpur Pooling Station 400kV D/c (triple) along with 1x125 MVAR bus reactor at generation switchyard.➤ Till availability of above proposed transmission system, connectivity may be provided by following interim arrangement : Moser Baer TPS – Jabalpur (Existing) 400kV D/c (triple)
(vii)	LTOA granted	<ul style="list-style-type: none">➤ Transmission System Strengthening in WR: Jabalpur Pooling Station – Bina 765kV S/c (3rd) (Implementation through Pvt. Sector)➤ Common Transmission System Strengthening already identified with IPPs. in Madhya Pradesh, Chattishgarh (getting pooled at Bilaspur) and Orissa

2.0 Pipavav Energy Pvt. Ltd

- | | | |
|-------|----------------------------|--|
| (i) | Generation Project Details | 1200MW (2x600MW)
District-Amreli, State- Gujarat |
| (ii) | Commissioning schedule | U-1 : Jun'13, U-2 : Oct'13 |
| (iii) | LTA sought for | 1110 MW |
| (iv) | Target Beneficiary | WR - 510MW , NR - 270MW & ER - 330MW |
| (v) | LTA sought from | Aug'13 |
| (vi) | Connectivity granted | <ul style="list-style-type: none">➤ Pipavav TPS – Pirana 400kV D/c line (Triple) along with 1x125MVAR bus reactor at generation switchyard➤ Till availability of above proposed tr. system, connectivity may be provided by following interim arrangement LILO of 400kV Amreli – Jetpur S/c line |
| (vii) | LTOA granted | <ul style="list-style-type: none">➤ Transmission System Strengthening in WR<ul style="list-style-type: none">– Pirana – Dehgam 400kV D/c (2nd)– Installation of 1x315 MVA,400/220kV ICT (3rd) at Pirana➤ Transmission system strengthening identified in WR-NR Corridor for IPPs in SR |

3.0 Essar Power Gujarat Ltd

- | | | |
|-------|----------------------------|---|
| (i) | Generation Project Details | 4x150MW+4x660MW (3240 MW)
District- Jamnagar, State- Gujarat |
| (ii) | Commissioning schedule | U-1:Jun'12, U-2: Sep'12, U-3: Dec'12,
U-4: Mar'13,U-5: Mar'13, U-6: Jul'13
U-7: Nov'13, U-8: Mar'14 |
| (iii) | LTA sought for | 3040 MW |
| (iv) | Target Beneficiary | WR – 1600 MW , NR – 1440 MW |
| (v) | LTA sought from | Jun'12 |
| (vi) | LTOA not granted | <ul style="list-style-type: none">➤ In the meeting it was informed that Gujarat has a share of 800 MW. In view of material change in quantum of power LTA M/s EGPL to submit new LTA application. |

4.0 Bina Power Supply Company Ltd.

- | | | |
|-----|----------------------------|---|
| (i) | Generation Project Details | 500 MW (2x250MW)
Village –Sirchopi, Tehsil- Bina, District – Sagar
State- MP. |
|-----|----------------------------|---|

- | | | |
|-------|------------------------|--|
| (ii) | Commissioning schedule | U-1 Sep'11, U-2 Dec'11 |
| (iii) | LTA sought for | 265.35 MW |
| (iv) | Target Beneficiary | WR – 132.68 MW , NR – 132.67 MW |
| (v) | LTA sought from | Sep'11 |
| (vi) | LTOA granted | <ul style="list-style-type: none"> ➤ Dedicated transmission system to be developed by the project developer : <ul style="list-style-type: none"> • Bina TPS – Suitable location (along Bina (PG)-Bina(MPPTCL) 400kV line) 400kV D/c (high capacity conductor) • Terminate one ckt. out of above D/c from the suitable location to Bina(PG) and other to Bina(MPPTCL) ➤ Common Transmission System Strengthening already identified with IPPs. in Madhya Pradesh, Chattishgarh (getting pooled at Bilaspur) and Orissa |

5.0 Adani Power Ltd

- | | | |
|-------|----------------------------|---|
| (i) | Generation Project Details | 4x330MW+5x660MW (4620 MW),
Mundra, Gujarat |
| (ii) | LTA sought for | 400 MW |
| (iii) | Target Beneficiary | 400MW(UPPCL/NR) |
| (iv) | LTA sought from | June'11 |
| (v) | LTOA granted | <ul style="list-style-type: none"> ➤ Dedicated transmission system to be developed by the project developer : Mundra – Sami - Bhinmal 400kV D/c line <p>The line to be routed through Sami for provision of reactive compensation. There shall be no interconnection between this Sami bus and the existing Sami bus connected with Dehgam S/s.</p> <ul style="list-style-type: none"> ➤ For transfer of power beyond Bhinmal, following transmission system is agreed as common system strengthening in NR for M/s Adani & other IPP project viz. Essar Power Gujarat Ltd (EPGL) etc.: <ul style="list-style-type: none"> – LILO of Kankroli-Zerda 400kV D/c (2nd) line at Bhinmal – Jaipur-Bhiwani 765 kV 2nd S/c – Bhiwani- Hissar 400kV D/c |

6.0 TRN Energy Pvt. Ltd.

M/s TRN had applied for connectivity under CERC Regulation 2009 but in the meeting they had requested that their application may be processed under CERC regulation 2004 and present connectivity application under regulation 2009 shall stand withdrawn.

LTOA granted to TRN Energy Pvt. Ltd for 600 MW. The generation project shall be shall be integrated with already agreed transmission corridors/pooling stations as a part of IPP projects in Chhattisgarh through dedicated 400kV TRN TPP – Raigarh(near Tamnar) Pooling Station D/c line.

(i)	Generation Project Details	2x300MW (600 MW) Village -Nawapara, Tehsil – Gharghoda District- Raigarh, State- Chhattisgarh
(iv)	Commissioning schedule	U-1 Jul'12, U-2 Oct'12
(ii)	LTOA sought for	600 MW
(iii)	LTOA sought from	Mar'12
(iv)	Step up voltage	400 kV
(v)	LTOA granted	<ul style="list-style-type: none"> ➤ Dedicated line to be developed by the Project developer: TRN TPP – Raigarh(near Tamnar) Pooling Station 400 kV D/c line ➤ To sign BPTA and furnish necessary BG to POWERGRID for transmission corridor identified for IPP projects in Chhattisgarh

7.0 LTOA applications of various IPPs, as per CERC regulation 2004:

It was decided that a separate meeting may be convened by POWERGRID to review the progress of generation projects before providing LTOA.

C. Applications for Medium Term Open Access (MTOA)

MTOA Applications of Electricity Department, Silvassa (UT DNH) (32 MW) and Electricity Department, Daman (UT DD) (22 MW) were discussed. In the meeting it was informed that applicants have not obtained concurrence of Chhattisgarh SLDC (injection point SLDC) which is a pre-requisite condition for processing the MTOA application. In view of the above, it was decided that applications shall be processed after furnishing of Chattishgarh SLDC concurrence by the applicants.

List of Participants during the 30th Meeting of Standing Committee of Power System Planning in WR held on 08.07.2010 at NRPC, Katwaria Sarai, New Delhi.

S.No.	Name (S/Sh)	Designation	Contact No	E-mail
CEA				
1	S. M. Dhiman	Member (PS)	09868281520	memgod.cea@nic.in
2	Ravinder	Chief Engineer (SP&PA)	09971568444	Ravinders.only@gmail.com
3	P. K. Pahwa	Director (SP &PA)		
4	A. K. Yadav	Dy. Director (SP&PA)	011-26732308	awd@rediffmail.com
5	O. K. Shukla	Asst. Director (SP&PA)	011-26732319	omkants@yahoo.com
POWERGRID				
6	Y. K. Sehgal	ED(SEF&CE)		yksehal@powergridindia.com
7	D. K. Valecha	ED (WR-I)	09422811647	dkvalecha@powergridindia.com
8	S. K. Gupta	GM (Projects), WR-II	09428504051	skgupta.59@gmail.com
9	Pankaj Kumar	GM (Engg.)	09873549049	pankaj@powergridindia.com
10	Subir Sen	DGM		subir@powergridindia.com
11	Manju Gupta	DGM (SEF)	09910378111	manju@powergridindia.com
12	K. K. Gupta	CM (Engg)	09422811686	kkgupta@powergridindia.com
13	Kashish Bhambhani	Dy. Mgr. (SEF)	09971399117	kashish@powergridindia.com
WRPC				
14	Manjit Singh	Member Secretary	09820878384	hora2512@rediffmail.com
15	S. G. Tenpe	S E (Comml)	09987513281	sgtenpe@yahoo.com
MPPTCL				
16	R. K. Verma	CMD MPPTCL & Chairman WRPC	09425324301	cmd_mpptcl@hotmail.com
17	O. P. Jaiswal	CE (P.S.)	09425804949	ceps321@yahoo.com
18	M. M. Dhoke	EE (PS)	09425805237	mmdhoke@gmail.com
GETCO				
19	S. K. Negi	MD	09879200622	md.getco@gebmail.com
20	S. G. Prasad	EE (System)	09925208598	eesystem.getco@gebmail.com
21	P. J. Jani	E.E.(Com.), GUVNL	09879618754	
MSETCL				
22	S. D. Shrouty	E.D. (STU)	09920456251	edstu@mahatransco.in
23	S. G. Kelkar	C.E.	09619892000	celd@rediffmail.com
24	N. R. Sonkavday	SE (STU)	09987783924	n.sonkavday@rediffmail.com
CSPTCL				
25	Vijay Singh	Chief Engr. (Trans.)	09406249987	vijaysingh.cseb@gmail.com
26	A. K. Garg	Chief Engineer(CSP Trading Co. Ltd)	09893276323	ce.techcell@gmail.com
27	Shiv Raj Singh	Advisor	09827216858	
UT of DD & DNH				
28	H. M. Patel	Exe.Engg., DNH	09924127039	hmpatel39@gmail.com
GOA				
29	Jose E. Demelo	Asst. Engr.	09271427040	nbraganza04@yahoo.co.in
NTPC				
30	A. K. Gupta	GM (PE-Elect & C&I)	09650992233	akgupta@ntpceoc.co.in
31	S. S. Mishra	DGM (PE-Elect)	09650991145	ssmishra@ntpceoc.co.in

NPCIL				
32	Sandeep Sarwate	Dy.C.E.(T)	09869441211	ssarwate@npcil.co.in
POSOCO				
33	S. K. Soonee	CEO	09899091115	sksoonee@gmail.com
34	S. R. Narasimhan	Dy. Gen. Mgr. (OS)	09869080665	smarasimhan@gmail.com
WRLDC				
35	M. G. Raoot	ED, WRLDC	09869455582	mraoot@gmail.com
36	Pushpa Seshadri	Manager (OS)	09869404982	pushpa_seshadri@hotmail.com
NHPTL				
37	Dr. L. Hari	CEO	09818778025 / 011-24369147(Fax)	lakshman.hari@nhptl.com

1	2	3	4	5	6	7	8
S. No.	Description of Scheme	Estimated Cost (Rs. Cr.)	Date of firming up in WR standing committee	Date of FR	Date of investment approval	Target date as of now	Remarks
	<p>Sub-Stations (POWERGRID)</p> <p>a) Establishment of 400/220kV 2x315MVA substation at Pune and South Solapur</p> <p>b) Establishment of 400kV switching station at Parli(PG)</p> <p>c) 25% Fixed Series Compensation at Rajgarh & Wardha</p> <p>d) Bay extension of existing substations to terminate lines under : Set-A Set-B Set-C Set-D</p>	830					
3.	<p>Western Region System Strengthening - V</p> <p>a) 400 kV Vapi- Navi Mumbai D/c</p> <p>b) LILO of 400 kV Lonikhand/Pune - Kalwa line at Navi Mumbai</p> <p>c) Establishment of 400/220 kV, 2 x 315 MVA new S/s (GIS) at Navi Mumbai</p> <p>d) 220 kV Vapi- Khadoli D/c</p>	471	25 th (30.09.06)	Jan '07	Nov'07	Mar'11	Under implementation

1	2	3	4	5	6	7	8
S. No.	Description of Scheme	Estimated Cost (Rs. Cr.)	Date of firming up in WR standing committee	Date of FR	Date of investment approval	Target date as of now	Remarks
4	Western Region System Strengthening -VI a) Pirana – Dehgam 400 kV D/c b) Establishment of 400/132 kV, 2 x 315 MVA S/s at Pirana c) Installation of additional 400/220 kV, 1x315 MVA transformers along with associated 220 kV line bays at Wardha, Pune, Gwalior, Raipur and Bina(PG)	311	25 th (30.09.06)	Jan '07	Jan'08	Nov'10	Under implementation
5.	Western Region System Strengthening -VII a) Provision of 420 kV, 1x125 MVAR Bus reactor at Khandwa b) Provision of 420 kV, 1x125 MVAR Bus reactor at Dehgam	37	26 th (23.02.07)	May' 07	Jan'08	Sept'10	Under implementation
6.	Western Region System Strengthening -IX a) LILO of 400kV Bina-Nagda D/c line at Shujalpur b) Establishment of 400/220kV 2x315MVA substation at Shujalpur c)	231	26 th (23.02.07)	Jun'07	Apr'08	Jan'11	Under implementation

1	2	3	4	5	6	7	8
S. No.	Description of Scheme	Estimated Cost (Rs. Cr.)	Date of firming up in WR standing committee	Date of FR	Date of investment approval	Target date as of now	Remarks
7.	Tr. System of Sasan Ultra Mega Power Project (4000 MW) Transmission Lines a) Sasan – Satna 765 kV 2xS/c b) Satna - Bina(PG) 765 kV 2xS/c c) Bina(PG)-Indore(PG) 765 kV S/c d) LILO of Vindhyachal-Jabalpur 400 kV D/c at Sasan e) Indore (MP)– Indore(PG) 400kV D/c (Quad) f) Bina(PG)-Bina(MP) 400 kV D/c Substations a) Establishment of new 765/400 kV, 2x1500MVA substation at Gwalior and 765/400 kV, 2x1000 MVA at Bina(PG) for charging of Bina-Gwalior and Agra-Gwalior 2xS/c lines at 765 kV level b) Provision of 765 kV Bays for charging of Seoni- Bina S/c line at 765 kV level c) Establishment of new 765/400 kV, 2x1000 MVA substation at Satna d) Establishment of new 765/400 kV, 2x1500 MVA substation at Indore(PG)	5323	26th (23.02.07)	Jun' 07	Dec'08	Dec'12	Under implementation

1	2	3	4	5	6	7	8
S. No.	Description of Scheme	Estimated Cost (Rs. Cr.)	Date of firming up in WR standing committee	Date of FR	Date of investment approval	Target date as of now	Remarks
8.	Tr. System of Mundra Ultra Mega Power Project (4000 MW) Transmission Lines a) Mundra – Bachchau-Ranchodpura 400 kV (Triple) D/c b) Mundra – Jetpur 400 kV (Triple) D/c c) Mundra – Limbdi 400 kV (Triple) D/c d) Gandhar-Navsari 400 kV D/c e) Navsari-New Location near Mumbai 400 kV D/c f) LILO of both circuits of Kawas-Navsari 220 kV D/c at Navsari (PG) g) Wardha-Aurangabad 400 kV(Quad) D/c (with provision to upgrade at 1200 kV at later date) Substations a) 40% Fixed Series Compensation each on Wardha - Aurangabad 400 kV D/c at Wardha end b) Establishment of new 400/220 kV, 2x315 MVA substation at Navsari, Bachchau & a 400 kV switching station at New Location near Mumbai (GIS) c) Establishment of new	4546	26th (23.02.07)	Jun'07	Oct'08	Oct'12	Under implementation

1	2	3	4	5	6	7	8
S. No.	Description of Scheme	Estimated Cost (Rs. Cr.)	Date of firming up in WR standing committee	Date of FR	Date of investment approval	Target date as of now	Remarks
	765/400 kV, 3x1500 MVA, substation at Wardha for charging of Seoni - Wardha 2xS/c lines at 765 kV level						
9.	Transmission system of Korba-III (500 MW) Gen. Project <ul style="list-style-type: none"> ▪ Korba STPS switchyard – Raipur. 400kV D/c 	347	27 th (30.07.07)	Dec'07	Feb'09	Jun'11	Under implementation
10.	Western Region strengthening scheme-X <ul style="list-style-type: none"> ▪ Establishment of 400/765kV 2x1500MVA WR Pooling Station near Sipat ▪ LILO of Sipat-Seoni 765kV S/c at WR Pooling Station 	446	27 th (30.07.07)	Sep'07	Feb'09	Feb'12	Under implementation
11.	Western Region strengthening scheme-XI <ul style="list-style-type: none"> ▪ LILO of Sipat-Seoni 765kV 2nd S/c at WR Pooling Station ▪ Installation of 765/400kV, 1x1500MVA 3rd transformer at WR Pooling Station 	425.28	27 th (30.07.07)	Nov'08	Feb'09	Feb'12	Under implementation
12.	Western Region strengthening scheme-XII <ul style="list-style-type: none"> ▪ Pune-Navi Mumbai 400kV D/c 	193	27 th (30.07.07)	May'08		30 months from Inv. approval	System to be executed matching with the commissioning of Krishapatnam project.
13.	Tr. System associated with DVC, Maithon in ER (Part system) <ul style="list-style-type: none"> ▪ Ranchi-WR Pooling 	1100	27 th (30.07.07)	Sept'07	Jul'08	Mar'12	Under implementation

1	2	3	4	5	6	7	8
S. No.	Description of Scheme	Estimated Cost (Rs. Cr.)	Date of firming up in WR standing committee	Date of FR	Date of investment approval	Target date as of now	Remarks
14.	<p>Station 765kV S/c</p> <p>Transmission system associated with Krishnapatnam (5x800 MW) (WR Portion)</p> <ul style="list-style-type: none"> ▪ Raichur – Sholapur 765 kV S/c ▪ Sholapur – Pune 765 kV S/c ▪ Pune (New) – Pune 400 kV Quad D/c ▪ Establishment of new 765/400 kV substations at Sholapur & Pune with 2x1500 MVA transformation capacity 	2100	27 th (30.07.07)	Jan'08		48 months from Inv. approval	Investment approval awaited
15.	<p>Tr. System associated with South – West interconnection</p> <ul style="list-style-type: none"> ▪ Establishment of 1000MW HVDC back-to-back station at Kolhapur ▪ Narendra – Kolhapur 400 kV D/c line with Lapwing conductor ▪ LILO of both circuits of existing Kolhapur – Mapusa 400 kV D/c line at Kolhapur HVDC back-to-back station 	1234	27 th (30.07.07)	Jan'08		42 months from Inv. approval	Investment approval awaited
16.	Split Bus arrangement and reconfiguration/shifting of terminating lines at Raipur 400kV S/s	16	28 th (06.12.08)	Apr'09		15 months from Inv. approval	Investment approval awaited

1	2	3	4	5	6	7	8
S. No.	Description of Scheme	Estimated Cost (Rs. Cr.)	Date of firming up in WR standing committee	Date of FR	Date of investment approval	Target date as of now	Remarks
	<ul style="list-style-type: none"> ▪ Splitting 400kV Raipur bus into two sections between existing line bays of Chandrapur-1 & Chandrapur-2 through bus sectionaliser. ▪ Bypass 400kV Bhatapara-Raipur-Bhilai line at Raipur and restore the line as 400kV Bhatapara-Bhilai S/c ▪ Shifting of Chandrapur-2 and Chandrapur-3 line bays from Section Raipur-B* to Raipur-A*. 						
17.	Installation of 125 MVAR Bus reactor at 400kV Rajgarh S/s	10	Special SCM (18.04.09)	Jun'09	July'10	May'12	Under implementation
18.	<p>Associated transmission system of VSTPP-IV and Rihand-III</p> <ul style="list-style-type: none"> ▪ Rihand-III- Vindhyachal Pool 765 kV 2xS/c (initially to be op. at 400kV) ▪ Vindhyachal-IV Vindhyachal Pool 400kV D/c(Quad) ▪ Vindhyachal Pool-Satna 765 kV 2xS/c ▪ Satna -Gwalior 765 kV 	4334	29 th (10.09.09)	Sep'09	Mar'10	Nov'12	Under implementation

1	2	3	4	5	6	7	8
S. No.	Description of Scheme	Estimated Cost (Rs. Cr.)	Date of firming up in WR standing committee	Date of FR	Date of investment approval	Target date as of now	Remarks
	2xS/c <ul style="list-style-type: none"> ▪ Gwalior – Jaipur(South) 765 kV S/c ▪ Vindhyaachal Pool-Sasan 765 kV S/c ▪ Vindhyaachal Pool-Sasan 400 kV D/c ▪ Establishment of 765/400kV, 2x1500 MVA substation at Vindhyaachal Pool 						
19.	Associated transmission system of Mauda Transmission System <ul style="list-style-type: none"> ▪ Mauda–Khaperkheda (MSETCL) 400kV D/c (Quad)-60 km ▪ Mauda – Wardha 400kV D/c (Quad) -125 km 	469	29th (10.09.09)	Oct'09	Feb'10	Oct'12	Under implementation
20.	Establishment of 400/220kV substation in UT DNH <ul style="list-style-type: none"> ▪ LILO of Navsari- New location near Mumbai/Boisar 400kV D/c at proposed Kala S/s in UT DNH-9 km ▪ Establishment of 400/220kV, 2x315 MVA substation at proposed Kala S/s in UT 	183	28 th (06.12.08)	Jan'10		28 months from Inv. approval	Investment approval awaited

1	2	3	4	5	6	7	8
S. No.	Description of Scheme	Estimated Cost (Rs. Cr.)	Date of firming up in WR standing committee	Date of FR	Date of investment approval	Target date as of now	Remarks
21.	DNH (GIS) Establishment of 400/220kV substation in UT Daman <ul style="list-style-type: none"> ▪ LILO of Vapi- Navi Mumbai 400kV D/c/ LILO of Navsari-Boisar 400kVD/c line at Magrwada S/s-30 km ▪ Establishment of 400/220kV, 2x315 MVA substation at Magarwada S/s (GIS) 	245	29 th (10.09.09)	Mar'10		28 months from Inv. approval	Investment approval awaited