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Planning and Implementation of Transmission Projects by Power Grid Corporation of India Limited and Grid Management by Power System Operation Corporation Limited [Based on C&AG, Performance Audit Report No. 18 of 2014]

MINISTRY OF POWER

TWENTIETH REPORT

[Action taken by the Government on the Obserations/Recommendations contained in the Eleventh Report of the Committee on Public Undertakings (16th Lok Sabha) on Planning and Implementation of Transmission Projects by Power Grid Corporation of India Limited and Grid Management by Power System Operation Corporation Limited]
[Based on C&AG, Performance Audit Report No. 18 of 2014]

COMMITTEE ON PUBLIC UNDERTAKINGS (2017 - 2018)

(SIXTEENTH LOK SABHA)

LOK SABHA SECRETARIAT

NEW DELHI

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[Based on C&AG, Performance Audit Report No. 18 of 2014]

Presented to Lok Sabha on 19.12.2017
Laid in Rajya Sabha on 19.12.2017

LOK SABHA SECRETARIAT

NEW DELHI
19 December, 2017/ 28 Agrahayana, 1939 (Saka)

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COMPOSITION OF THE COMMITTEE ON PUBLIC UNDERTAKINGS (2017-2018)

Shri Shanta Kumar -*Chairperson*

MEMBERS

Lok Sabha

2. Shri L.K. Advani
3. Shri Ramesh Bais
4. Shri G. Hari
5. Shri Rabindra Kumar Jena
6. Dr. Hari Babu Kambhampati
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Rajya Sabha

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17. Shri Naresh Gujral
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22. Shri Ram Chandra Prasad Singh

SECRETARIAT

1. Smt. Sudesh Luthra - Additional Secretary
2. Smt. Anita B. Panda - Director
3. Shri G. C. Prasad - Deputy Secretary
4. Shri Shailendra Priyadarshi - Executive Officer

INTRODUCTION

I, the Chairperson, Committee on Public Undertakings having been authorized by the Committee to submit the Report on their behalf, present this Twentieth Report on Action Taken by the Government on the Observations/Recommendations contained in the Eleventh Report of the Committee on Public Undertakings (Sixteenth Lok Sabha) on "Planning and Implementation of Transmission Projects by Power Grid Corporation of India Limited and Grid Management by Power System Operation Corporation Limited" [Based on C&AG, Performance Audit Report No. 18 of 2014].

2. The Eleventh Report of the Committee on Public Undertakings (2015-16) was presented to Lok Sabha and laid on the Table of Rajya Sabha on 25 February, 2016. The Action taken Replies to all the 13 recommendations contained in the Report were received from the Ministry of Power on 16 March, 2017.

3. The Committee considered and adopted the draft Report at their sitting held on 28 August, 2017.

4. An analysis of the action taken by the Government on the Observations/ Recommendations contained in the Twentieth Report of the Committee (2017-2018) is given in Appendix II.

New Delhi
18 December, 2017
27 Agrahayana, 1939(S)

SHANTA KUMAR
Chairperson,
Committee on Public Undertakings.

R E P O R T

CHAPTER I

This Report of the Committee deals with the action taken by the Government on the observations/recommendations contained in the Eleventh Report (Sixteenth Lok Sabha) of the Committee on Public Undertakings on the subject 'Planning and Implementation of transmission projects by Power Grid Corporation of India Limited and Grid Management by Power System Operation Corporation Ltd.' which was presented to Lok Sabha on the 25th February, 2016. It contained thirteen observations/recommendations.

2. Action taken notes have been received from the Government in respect of all the thirteen observations / recommendations contained in the Report. These have been categorized as follows:

(i) Observations/Recommendations which have been accepted by the Government (Chapter II)
Sl. Nos. 2, 4, 5, 6, 7, 8, 10, 11, 12 & 13 (Total 10)

(ii) Observation/Recommendation which the Committee do not desire to pursue in view of the Government's replies (Chapter III)
9 (Total 1)

(iii) Observation/Recommendation in respect of which reply of the Government had not been accepted by the Committee (Chapter IV)
(NIL)

(iv) Observations/Recommendations to which the Government have furnished interim replies (Chapter V)
Sl. No. 1 & 3 (Total 2)

3. The Committee desire that final replies on the observations/recommendations to which interim replies have been furnished should be expedited. They also desire that response to their comments in Chapter I of the Report should be furnished to them expeditiously.

4. The Committee will now deal with the action taken by the Government on some of the observations/recommendations in the succeeding paragraphs.

National Electricity Grid

Recommendation (Sl. No.1)

5. The Committee in their Eleventh Report, had recommended the following with regard to National Electricity Grid :-

> "The Committee note with appreciation that PGCIL has achieved a significant milestone in the process of formation of National Grid through integration of all five regions on 31st December, 2013 thereby reaching the stage of one nation, one grid and one frequency. This has made India the only Country in the world which has developed a single synchronous grid for the entire Country's power systems which, in itself, is amongst the third largest in the world. However, though in technical terms, the integration of all five regions has been done, the development of electricity Grid is an ongoing process and hence capacity augmentation of the grid is being done continuously. To achieve the XIIth Plan target of 72250 MW inter regional capacity by 2016-17, PGCIL is still required to add about 20511 MW more in less than one and half year's period from now. The Committee note from the latest response of the Ministry of Power that they are very confident of achieving the target of 72250 MW by the end of XIIth Plan. While the Committee desire to be apprised of the hitherto progress in capacity augmentation of the National Grid, they feel that the Grid should also be capable of meeting deficit in a particular region like the Southern Region from a surplus region like Western or Eastern Region, as observed by the C&AG in their Performance Audit Report. Only then the actual purpose of having a National Grid could be considered to be accomplished. The Committee, therefore, would like the Ministry of Power to submit a note to them providing the overall capacity as well as the capability and performance of the National Grid on this account in the last three years. Also as the MoP has envisaged 24x7 power supply in the Country by the year 2019, the Committee desire to be apprised of the roadmap, if any, made for achieving the target, which includes expenditure, infrastructure and other requirements at the Central level, State level and private sector level too."

6. The Ministry of Power in their action taken reply stated as follows :-

> **"Status of progress in capacity augmentation of the National Grid**
>
> "The existing inter-regional power transfer capacity mentioned in the report is 53150 MW. Since then, additional 8000 MW inter-regional capacity has already been commissioned and the present inter-regional capacity of the National Grid is 61150 MW. Other planned inter-regional links are also under advance stage of implementation and POWERGRID is confident to achieve the XII plan target of 72250 MW inter-regional capacity by 2016-17.

In regard to power supply from Western/Eastern Region to Southern Region, it may be mentioned that the congestion for such delivery of power has already been reduced to a great extent. Further, various links as given below are already under various stages of implementation which would facilitate additional power transfer from surplus regions like Western and Eastern Region to Southern Region :

1. Angul-Srikakulam-Vemagiri 765kV D/c line- (2016-17)
   along with Vemagiri-C'Peta-Cuddapa 765kV D/c line – (2019)

2. Wardha-Nizamabad-Hyderabad 765kV D/c line (2017-18)
3. Warora – Warrangal 765kV D/c line (2019)

4. Raigarh – Pugalur ±800kV 6000MW HVDC bipole link (2019-20)

Performance of National Grid in last 3 years

The National Grid has made considerable progress in last 3 years. Major achievements include synchronisation of Southern region with rest of the Indian Grid to reach the stage of One Nation, One Grid and One Frequency and commissioning of one pole of (1500MW) 1800 kms. long ± 800 kV, 6000 MW HVDC bipole link from Bishwanath Chariyali (Assam) in NER to Agra in NR.

The total inter-regional transmission capacity has increased significantly in last 3 years as shown below.

Increase in IR Capacity since 2012-13							
Month(↓)/ Corridor(→)	**ER/NER -NR**	**ER-WR**	**WR-NR**	**ER-SR**	**WR-SR**	**ER-NER**	**Total IR**
Mar-13	12130	4390	6220	3630	1520	1260	**29150**
Mar-14	14230	6490	8720	3630	3620	1260	**37950**
Mar-15	14230	10690	8720	3630	720	2860	**45850**
Mar-16	17330	12790	12920	3630	7920	2860	**57450**
Mar-17 (Expected)	23930	12790	16920	7830	7920	2860	**72250**

Similarly the capability (TTC) has also increased considerably as shown in the table below :-

Month(↓)/ Corridor(→)	WR-NR	ER-NR	ER-NER	NEW-SR	NER-NR
Mar-13	**2000**	**2500**	**475**	3600	-
Mar-14	**4200**	**3800**	**720**	3600	-
Mar-15	**4900**	**3200**	**720**	4750	-
Mar-16	**7450**	**3800**	**1470**	6650	1500

Further, the inter-regional exchange has also increased by 78% from 65860 MU in 2012-13 to 117033 MU in 2015-16. Details of major inter-regional exchange figures are given below.

Inter-Regional Exchanges (all figures in MU)

Year	Total IR Exchange	WR-NR	NEW-SR	ER-NR
2012-13	65860	**11668.10**	**27100.04**	**15600.63**
2013-14	78384	**24205.92**	**27914.24**	**14555.89**
2014-15	89225	**29907.59**	**31765.44**	**12909.56**
2015-16	117033	**46623.47**	**37955.7**	**13914.10**

From the above, it may be noted that there has been remarkable progress in the performance of National Grid on account of capacity addition, capability enhancement and inter-regional energy transfer."

7. The office of the C&AG in their comments on the action taken reply of the Government stated as under :-

"COPU has noted that, to achieve XII Plan target of 72250 MW, PGCIL is required to commission 20511 MW inter regional capacity in less than one and half year.

In this regard, details of pending lines was obtained (September 2016) from PGCIL and it was seen that a total of 61150 MW has been commissioned as of now under the XII Plan and 11100 MW is yet to be commissioned during remaining seven months (September 2016 to March 2017). This includes commissioning of 4200 MW in the ER-SR corridor, where the achievement was

less than half the planned addition (3630 MW commissioned against 7830 MW planned).

Audit noticed that going by the pace of addition in earlier years (annual addition was in the range of 7900 MW to 11600 MW during the period from March 2013 to March 2016), a surge is required in the last year to meet the target.

Further, the important issue highlighted in the Audit Report was that physical capacity of lines are added to assess capacity of inter-regional corridor but what was more important was the total transfer capability (TTC) of the corridor, which denotes the ability of the corridor to transfer power from one region to another. Audit noticed that the overall TTC is less than half the physical capacity of lines (Total TTC in March 2016 works out to 21870 MW as against the total physical capacity of 57450 MW). TTC for March 2017 i.e. end of XII Plan has not been mentioned in the ATN.

Also, the Southern Grid which was synchronised with the rest of the grid on 31.12.2013 to form a single grid for the whole nation, got isolated on 14 occasions since then. Even after the inter-connection was strengthened with the commissioning of second circuit of Raichur-Sholapur 765 kV line in June 2014, such isolation of SR occurred on five occasions indicating that the integration of Southern grid with rest of the grid continues to be vulnerable to isolation.

Hence, the position needs to be further monitored

Moreover, MoP has not responded to COPU's desire to be apprised of the roadmap, if any, made for achieving the target of 24 x 7 power supply in the Country by the year 2019."

8. In their response to the Audit observations, the Ministry stated as follows :-

"Existing inter-regional capacity has already reached to 63,650 MW which shall be enhanced to 72250 MW by the end of 12th plan with the commissioning of following links:

Links under implementation	**Additional Capacity**	**Schedule**
LILO of Biswanath Chariali - Agra +/- 800 kV HVDC Bi-pole at Alipurduar	1500 MW	Mar'17
Champa Pool- Kurukshetra +/- 800 kV HVDC Bipole	3000 MW	Mar'17
Angul – Srikakulum 765kV D/c	4200 MW	Dec'16

In regard to difference between Transmission Capacity and Transmission capability, as mentioned in the remarks, physical capacity of lines are added to assess Transmission capacity of inter-regional corridor where as Total Transfer capability(TTC) denotes the ability of the corridor to transfer power from one region to another. Transfer Capability is a complex property influenced by number of factors such as system voltage, loading, availability of parallel system elements and their rating, physical properties, system reactive capability & stability. Transmission capacity is usually far greater than the actual transfer capability between two areas. The same has also been mentioned in the draft report submitted by International Consultant, M/s Powertech Labs, Canada for TTC/ATC & other associated studies.

Further, TTC for Mar'17 shall remain same as that of Jan., 2017, which has already been declared on POWERGRID website. The details are as below:

Month(↓)/ Corridor(→)	**WR-NR**	**ER-NR**	**ER-NER**	**NEW-SR**
Mar-17	9100	4200	1400	7200

Regarding SR isolation, it is submitted that prior to commissioning of Raichur – Solapur 765 kV 2×S/c lines, Southern Region was connected through 3 no. HVDC (asynchronous) interconnections. With the commissioning of Raichur – Solapur 765 kV 2×S/c lines Southern Region got synchronously connected with NEW Grid. During the initial days of operation, there were certain tripping on this synchronous interconnection, however Southern Region remained connected with NEW grid through HVDC inter-connections and as such there was no isolation of the Southern Region Grid with NEW grid under any circumstances. Further, with the commissioning of Narendra-Kolhapur 765 kV D/c line (Initially charged at 400 kV) no such incidents are reported.

Nevertheless, to enhance the inter-connectivity of Southern Region with NEW grid following inter-regional links are already under implementation:

1. Angul-Srikakulam-Vemagiri 765kV D/c line
2. Wardha-Nizamabad-Hyderabad 765kV D/c line
3. Warora – Warrangal 765kV D/c line
4. Raigarh – Pugalur ±800kV 6000MW HVDC bipole link"

9. In their original Report, the Committee had desired to be apprised of the progress of capacity augmentation of the national grid. In this connection, the

Committee note from the Ministry's Action Taken reply that against the target of capacity augmentation of 72250 MW at the end of 12th Five Year Plan, inter-regional grid capacity of 63650 MW only has been achieved so far. However, the Ministry have assured that with commissioning of Biswanath Chariali-Agra, Champa Pool-Kurukshetra and Angul-Srikakulum transmission links, PGCIL will be able to achieve the targets of 72250 MW of capacity augmentation by the end of 12th Five Year Plan. In view of the assurance given by the Ministry, the Committee hope that remaining target of the capacity augmentation would be achieved in the desirable timeframe. As the 12th Five Year Plan has concluded on 31st March, 2017 the Committee would like to be apprised of the grid capacity achieved so far.

With respect to the integration of southern grid with rest of the grid, Audit had pointed out that despite the synchronization of southern grid with rest of the grid on 31st December, 2013, the southern grid got isolated on 14 occasions, which exposes the vulnerability of southern grid with the rest of the grid. However, the Ministry in their action reply have stated that with commissioning of Sholapur - Raichur - HVDC and Narendra Kolhapur HVDC interconnections, no such incident of isolation of southern grid with rest of the grid has been reported. They have also expressed hope that with commissioning of four transmission links namely Angul - Srikakulam - Vemagiri; Wardha - Nizamabad - Hyderabad; Warora - Warrangal and Raigarh - Pugalur interconnectivity of southern grid will be strengthened further. While appreciating the efforts being made by the PGCIL to enhance the inter-connectivity of southern grid with the national grid, the Committee desire that PGCIL should ensure that transmission links, which are under implementation, are completed in a time bound manner so that full integration of southern grid with the national grid can be achieved. The Committee accordingly, hope that with commissioning of these projects, no incident of isolation of southern grid with the rest of the grid would occur. In this connection, the Committee also desire the Ministry to clarify upon the Audit's position given in respect of their reply w.r.t recommendation no. 4 of the original

report, which stated that isolation of SR occurred further on 5 occasions even after the commissioning of second circuit of Raichur-Solapur line.

Further, in their original report the Committee had also desired to be apprised of the roadmap prepared by the Ministry for achieving the target of 24X7 power supply in the Country by the year 2019. However, they are constrained to note that the Ministry has chosen to remain silent on its recommendation. The Committee note that the year 2019 is not too far and a specific roadmap is indispensible to assess the progress and make necessary course corrections in order to achieve the target of 24x7 power supply within the projected timeframe. The Committee, therefore, desire to be apprised of the Ministry's position on the same.

Recommendation (Sl. No.3)

10. The Committee in their Eleventh Report, had recommended the following with regard to Transmission Planning and Coordination :-

> "The Committee take note of the provisions made under Section 73 of the Electricity Act, 2003 which confers the responsibility of preparing a perspective plan for development of electricity systems to Central Electricity Authority (CEA) in order to provide reliable and affordable electricity for all consumers. CEA fulfills this responsibility in consultation with other stakeholders, viz. Central Transmission Utility, Members of Standing Power Committee, beneficiary States, etc. Accordingly, a National Electricity Plan is prepared in every five year by CEA, keeping in view the broad requirement of transmission system. However, despite such a comprehensive and participatory process of transmission planning, the objective of affordable and reliable electricity for all consumers is still a distant dream as is evident from transmission congestion, transmission and distribution losses and higher prices being paid by the end user for electricity. The Committee opine that this state of affairs undoubtedly warrants a relook at the present transmission system planning process and framework of coordination among various stakeholders. The Committee, therefore, desire the Ministry of Power to undertake a comprehensive review of the transmission system planning process keeping in view the prevailing anomalies in the Power Sector, constraints being faced by the CPSUs and prospective electricity requirement of the Country. The Committee are of the firm opinion that such an exercise will help the Ministry of Power to plug in the loopholes in the present system and evolve a better roadmap for their future endeavours."

11. The Ministry of Power in their action taken reply stated as follows :-

"As per present planning methodology, inter-state transmission system, including inter-regional links, is developed for the generation projects, who apply for Long Term Access/ whose generation is allocated by Government of India. The inherent margins available in the system in the transmission system so developed can be utilised for catering to contingency situations and commercial market mechanism. For development of such transmission system there is commitment either by generator or by beneficiaries that they shall pay for the transmission facilities for the quantum they have contracted. In the absence of firm beneficiaries, it is the responsibility of generators to commit the payment for the transmission system for the LTA they have applied. This philosophy worked fine when most of the ISGS generation was under Govt/ Central Sector. However with the delicensing of generation and introduction of IPPs, there is a tendency to commit for less quantum of power, meaning thereby that Generators apply for less LTA quantum of power then their installed capacity to minimise their commitment of payment of transmission charges. The balance capacity they want to transfer based on market economics utilising the margins available. As such margins in the system cannot be infinite and can be generally 10-15%. This has led to some congestion as reported only during short term access.

After opening up of generation for private players, lot of private players came forward and planned generation addition. However they could not firm up long term customers for one reason or other. In order to facilitate their evacuation and not to get their power bottled, POWERGRID took the initiative of granting long term access on the basis of target beneficiaries and went ahead planning 11 number of high capacity corridors which are under different phases of implementation and serving as a major backbone in evacuating power from the new generation projects. Thus though the issue of planning major transmission corridors for generation projects applying for LTA without any firm PPA was addressed to a great extent, the generation projects which did not apply for LTA before, and requesting for the same within a short period only after commissioning of the project and finalization of PPA are facing certain constraint. Therefore, it may be appreciated that all along planning of transmission system has been done within prevalent regulatory mechanism i.e building transmission system for the generations who apply for Long Term Access as commitment has to be given for payment of transmission system either by the generator or by beneficiaries. Only the generators / beneficiary who donot make such commitment and wait for last minute opportunity, may face evacuation constraint

as gestation period of transmission system is 3-4 years. To some extent some non committed generation can be accommodated in the margins but not all.

Further considering the evolving market mechanism and to tackle situation of congestion and free flow of power across Country, a new concept in the planning (GNA) is under discussion wherein development of transmission system shall be based on Installed capacity of generators as well as power drawal requirement from consumers and their commitment for payment of transmission charges for the same.

Towards this, CERC published a Staff Paper in 2014 for developing the GNA concept and working out the details. In this regard, in May 2016, CTU has also circulated a Concept Paper to MoP, CERC, CEA and POSOCO on 'Proposed Changes in Transmission Planning, Augmentation and Sharing of Charges under GNA-Regime'. The paper proposes principle changes in transmission planning philosophy wherein instead of planning the transmission systems for the (perceptual) target region load specified by the LTA applicant, the actual load-demand projections based on import/export requirement of States shall be considered."

12. The office of the C&AG in their comments on the action taken reply of the Government stated as under :-

"COPU has desired that Ministry of Power may undertake a comprehensive review of the transmission system planning process keeping in view the prevailing anomalies in the Power Sector, constraints being faced by the CPSUs and prospective electricity requirement of the Country.

It is not clear from the ATN whether such a review has been undertaken by Ministry of Power.

It has been mentioned that PGCIL has prepared a "Concept Paper' in May 2016 on 'Proposed Changes in Transmission Planning, Augmentation and Sharing of Charges under GNA-Regime' and circulated the same.

Further action taken in the matter and details regarding comprehensive review, if any, undertaken by Ministry of Power is awaited.

Hence action is yet to be taken on the recommendation."

13. In their response to the Audit observations, the Ministry stated as follows :-

"Further, in this regard , it is mentioned that CERC vide order dated 08-12-2015, constituted a Committee under the Chairmanship of Sh. Mata Prasad to "Review

Transmission Planning, Connectivity, Long Term Access, Medium Term Open Access and other related issues". The Committee has recently submitted its report to Commission in December 2016 for their consideration."

14. The Committee note from the reply of the Ministry that in pursuance of their recommendation regarding a comprehensive review of the transmission system planning process to address the anomalies in the power sector, PGCIL has prepared a Concept Note on proposed changes in transmission planning augmentation and sharing of charges. Likewise, CERC has also constituted a Committee to review various issues pertaining to transmission planning process which has already submitted their report to CERC in December, 2016. In this connection, the Committee would like to be apprised of the response of various stakeholders with respect to the Concept Note circulated by PGCIL regarding changes in transmission planning, augmentation and sharing of charges and action envisaged on the same. Also in light of the recommendations of the Expert Committee constituted by CERC to review various issues pertaining to transmission planning process, the Committee desire to be apprised of the line of action finally decided to improve the overall transmission system planning process.

Total Transfer Capability (TTC)

Recommendation (Sl. No.4)

15. The Committee in their Eleventh Report, had recommended the following with regard to Total Transfer Capability :-

"During their examination of the issue concerning TTC of the National Grid, the Committee observe that both the Audit and the PGCIL hold completely divergent viewpoints on the matter. The PGCIL does not consider Total Transfer Capability in order to access the capacity augmentation of inter-regional power transfer corridors, while according to Audit, TTC is an important criteria to ensure better appreciation of the ability of transmission network to transfer power and thus in accordance with the 'Procedure for making application for Grant of Medium Term Open Access in Inter State Transmission System' notified by CERC, PGCIL should notify TTC for 4 years i.e. upto March, 2019. Considering TTC as an important yardstick to evaluate the capacity augmentation of grid, the

Audit has also highlighted that during XI plan, against the cumulative transmission capacity of 26050 MW, the total transfer capability was only 11530 MW. However, the PGCIL considers only transmission capacity, which is a fixed parameter, while assessing capacity augmentation in interregional grid. According to PGCIL, it is quite difficult to evaluate the capacity augmentation in the inter-regional power corridors on the basis of TTC as it is a variable parameter which gets impacted by various external factors such as absence of firm schedules, delay of transmission elements, lack of conformity regarding upcoming power generation projects, load as well as non-availability of any published international standard on the same. Thus, despite considering TTC an important parameter, PGCIL admitted before the Committee that it was facing constraints with respect to evaluation of capacity augmentation in inter-regional power corridors in terms of TTC. The Committee also note the Audit's observation that as per CERC regulations, PGCIL is required to declare TTC till March, 2019 in March, 2015, but PGCIL has declared TTC only till March, 2016. Taking note of the differing views of Audit and PGCIL, the Committee feel that a final clear view of the Ministry is warranted on whether PGCIL is required to declare TTC for a period of 4 years as per CERC regulations. The Committee, in agreement with audit's observations, are of the view that ideally PGCIL should declare TTC targets as per CERC regulations since without such long term planning it is not possible to grant long term access and medium term open access to Inter-State transmission systems. However, given the constraints, as explained by PGCIL with respect to declaration of TTC, the Committee feel that these issues need to be addressed with an efficient prospective transmission system planning. The Committee are of the opinion that these constraints, to an extent, are indicative of lacunae in the coordination mechanism related to transmission system planning. The Committee therefore, desire that the Ministry should step in to explore technical as well as administrative solutions to address all the issues in transmission system planning process, in consultation with CEA/CERC, so as to eliminate the scope of uncertainties which may emerge in future. Further, the Committee desire that the progress on TTC issue by the recently constituted National Reliability Council for Electricity (NRCE) may be intimated to them. The Committee feel that without being deterred by the absence of any published international standard on TTC, the Ministry should endeavour to pool in the available technical expertise in the Country and develop TTC parameters for the National Grid. The Committee would also like to be apprised of any augmentation in the current TTC of the National Grid as well as its transmission capacity, particularly after getting assurance from the PGCIL as well as the Ministry of Power during the oral evidences that the constraints faced by the SR in the National Electricity Grid will be addressed shortly."

16. The Ministry of Power in their action taken reply stated as follows :-

"Planning of transmission system is carried out on the basis of generation addition program and load growth projections with number of uncertainties.

Declaration of TTC for longer time horizons is very difficult because of non-availability of firm commissioning schedule of upcoming generation projects and transmission elements for longer horizons. Even if TTC for longer time horizons is declared with number of uncertainties, it may send confusing signals to the market. In fact, due to ever changing grid conditions, even the TTC/ATC declared by operators for a shorter time period is revised regularly. However, TTC/ATC for 2014-15, 2015-16 and 2016-17 time frame has been declared based on certain assumptions and the same is available in POWERGRID Web site. For calculation of ATC/TTC for 2017-18 and 2018-19 time frame, required information has been sought from various state utilities. Upon receipt of the required information the same would be declared on POWERGRID web site.

Besides, MoP has advised POWERGRID and POSOCO to take the services of international consultants for advising on TTC/ATC and related issues holistically, both from long term planning and operational planning perspective. Accordingly, POWERGRID has engaged the services of an International Consultant, M/s Powertech Labs, Canada in Aug., 2015 for advising on the above issues. The final report of the consultant is expected in 2017. Based on the consultant recommendations, the methodology and declaration of ATC/TTC would be suitably revisited.

Regarding progress on TTC issues by the National Reliability Council for Electricity (NRCE), it is mentioned that NRCE has met six (6) times so far from its constitution in Feb 2014. In its fifth meeting in Feb 2015, the NRCE approved the procedure for adoption of seasonal ratings for loading of transmission lines viz. higher loading of the system at lower ambient temperatures and vice-versa instead of adopting a uniform temperature of 45 degree Centigrade.

Regarding the augmentation in the TTC of National Grid specifically w.r.t. SR, it is submitted that based on progressive commissioning of several elements in Western and Southern Regions, the New Grid to Southern Region TTC has gone up from **4750 MW in Aug 2014 to 6650 MW in Dec 2015**. The TTC towards SR shall further be enhanced with the progressive commissioning of following lines (which are in different stages of implementation), as already detailed in reply to Para 1 above :

1. Angul-Srikakulam-Vemagiri (2016-17) along with Vemagiri-C'Peta-Cuddapa 765kV D/c line – (2019)
2. Wardha-Nizamabad-Hyderabad 765kV D/c line (2017-18)
3. Warora – Warrangal 765kV D/c line (2019)

4. Raigarh – Pugalur ±800kV 6000MW HVDC bipole link (2019-20)

Similarly, the TTC on West to North corridor has gone up from **5750 MW in Aug 2015 to 7700 MW in Sep 2015** with the commissioning of 765 kV Gwalior-Jaipur D/C and 765 kV Jaipur-Bhiwani S/C line. This would further be enhanced with the progressive commissioning of following transmission corridors :

1. Champa-Kurukshetra HVDC bipole line with 3000MW terminal capacity
2. Champa-Kurukshetra HVDC augmentation of terminal capacity by 3000MW (total 6000 MW)
3. Jabalpur-Orai 765kV D/c line
4. Vindhyachal-Varanasi 765kV D/c line(New Project)"

17. The office of the C&AG in their comments on the action taken reply of the Government stated as under :-

"Ministry has reiterated that declaration of TTC for longer time horizons is difficult in view of the uncertainties. Ministry has stated that TTC/ATC upto 2016-17 time frame has been declared and for subsequent time frame, information has been sought from state utilities.

However as per CERC 'Procedure for making application for Grant of Medium Term Open Access in Inter State Transmission System' PGCIL should notify TTC for 4 years i.e. TTC for March 2020 should be declared in March 2016.

COPU has observed that PGCIL should declare TTC targets as per CERC regulations since without such long term planning it is not possible to grant long term access and medium term open access to Inter-State transmission systems.

Ministry has stated that PGCIL has engaged an International Consultant for advising on TTC and related issues and the final report of the consultant is expected in 2017.

Regarding constraints faced by SR, Ministry has stated that New Grid to Southern Region TTC has gone up from 4750 MW in Aug 2014 to 6650 MW in Dec 2015.

Audit noticed that though TTC has increased, SR-NEW grid links continue to be vulnerable. SR got isolated on 14 occasions since it was first integrated with the rest of the grid on 31.12.2013. Even after the inter-connection was strengthened

with the commissioning of second circuit of Raichur-Sholapur 765 kV line in June 2014, such isolation of SR occurred on five occasions indicating that the integration of Southern grid with rest of the grid continues to be susceptible to isolation.

Hence the action taken on the recommendation may be further monitored."

18. In their response to the Audit observations, the Ministry stated as follows :-

"TTC for 2014-15, 2015-16 and 2016-17 time frames had already been declared on POWERGRID website. For calculation of TTC for 2018-19 time-frame & beyond, required information had been sought from various state utilities, which are yet to be furnished by many STUs. Nevertheless, based on the data available, TTC for 2017-18 and 2018-19 time frames (till July'18) has been calculated and uploaded on POWERGRID website and the same is reproduced below :

Month(↓)/ Corridor(→)	**WR-NR**	**ER-NR**	**ER-NER**	**NEW-SR**
Apr-17	11100	4200	1400	8200
Apr-18	14600	7300	1750	10450
Jul-18	18000	7300	1750	10450

Regarding isolation of SR Grid from the new grid it is once again submitted that prior to commissioning of Raichur – Solapur 765 kV 2×S/c lines, Southern Region was connected through 3 no. HVDC (asynchronous) interconnections. With the commissioning of Raichur – Solapur 765 kV 2×S/c lines Southern Region got synchronously connected with NEW Grid. During the initial days of operation, there were certain trippings on this synchronous interconnection, however Southern Region remained connected with NEW grid through HVDC inter-connections and as such there was no isolation of the Southern Region Grid with NEW grid under any circumstances. Further, with the commissioning of Narendra-Kolhapur 765 kV D/c line (Initially charged at 400 kV) no such incidents are reported .

Nevertheless, to enhance the inter-connectivity of Southern Region with NEW grid following inter-regional links are already under implementation:

1. Angul-Srikakulam-Vemagiri 765kV D/c line
2. Wardha-Nizamabad-Hyderabad 765kV D/c line
3. Warora – Warrangal 765kV D/c line

4. Raigarh – Pugalur ±800kV 6000MW HVDC bipole link"

19. In view of the differing interpretation of Audit and PGCIL over the declaration of TTC for longer time horizons, the Committee in their original Report had opined that this issue needs to be addressed with an efficient prospective transmission system planning and desired that the Ministry should step in to explore technical as well as administrative solutions to address all the issues in transmission system planning process, in consultation with CEA/CERC, so as to eliminate the scope of uncertainties which may emerge in future. In this connection, the Ministry have stated in their action taken reply that in view of the uncertainties pertaining to transmission system planning particularly with respect to additional power generation and load growth projections, declaration of TTC for longer period is not feasible. Further, due to rapidly changing grid conditions, even the TTC declared by for a shorter time period, is revised regularly. However, as per the action taken reply furnished by the Ministry, the PGCIL has declared TTC till July, 2018. Further, in view of the Committee's recommendations in their original report, PGCIL have also appointed a Consultant namely M/s Powertech Labs Canada, for advising on TTC and related issues and the Ministry have assured that based on the recommendations of the consultant which is expected in the current year, methodology declaration of TTC would be suitably revisited. Though the Ministry do not find merit in declaration of TTC for longer time period, CERC regulations require the declaration of TTC by PGCIL for four years in advance as pointed out by Audit. In this connection, the Committee note that PGCIL has appointed a consultant to advise the Company with respect to revision of TTC declaration methodology and other related issues. The Committee hope that with steps taken to review TTC matters the issue regarding declaration of TTC for a longer time horizon would be settled.

Nonetheless, keeping in view the provision for notifying TTC for four years, as per CERC regulations, procedure for making application for Grant of Medium Term Open Access in Inter-State Transmission System, the Committee note that the onus of implementation of CERC provisions lies with PGCIL. Hence, PGCIL needs to take up the matter with CERC so as to avoid the violation of extant

CERC regulations *vis a vis* declaration of TTC. The Committee hope that PGCIL would take due care and precaution in this regard.

Regional inequalities in Power Prices

Recommendation (Sl. No.5)

20. The Committee, in their Eleventh Report, had recommended the following with regard to regional inequalities in power prices :-

> "With integrated development and operationalisation of Regional Grids, a state has been reached where generation capacity available anywhere in the Country could be transmitted to deficit regions which has facilitated bringing down price of energy in market from Rs.8-9 per unit to 3-4 per unit. However, the Committee observe that regional inequalities in the prices of power still persist. There are States such as Tamil Nadu, Kerala, Karnataka and Andhra Pradesh which are paying Rs.5.1 to Rs.7.3 per unit as against Market Clearing Price of Rs.3.5 per unit for power procurement whereas State of Chhattisgarh, Odisha, West Bengal and Sikkim are receiving lower prices (Rs.2.8-2.9 per unit against Market Clearing Price of Rs.3.5 per unit). The Committee observe that first of all, these prices hardly seem real as the price paid by the general public for power is much higher than the Market Clearing Price of Rs.3.5 per unit. As regards the wide gap in prices of power in different States, they feel that this problem is partly attributed to the congestion in transmission system. The Committee are of the view that development of more transmission corridors may have impact on reduction of regional inequalities of power prices in short run. However, in view of the fact that there are many factors which contribute to regional inequalities in power prices for instance, the Power Purchase Agreements signed by Discoms, efficiency of utilities, cost of supply of power etc., the Committee are of the considered view that it is primarily the domain and responsibility of the Ministry of Power and as such they need to take a holistic view on the issue and work out a solution to ensure economic exchange of power across various regions connected with the Grid so as to bring down the price of power."

21. The Ministry, in their action taken reply, have stated as follows :-

> **1) "Regional inequalities in power prices**
>
> With the commissioning of various transmission links the congestion has been reduced to a large extent. It is incidentally mentioned here that in recent past, on many occasions, single price band has been witnessed for the entire Country, in the Power Exchange.
>
> Regarding, zero congestion, it is submitted that a balance has to be arrived between transmission capacity implementation (which is directly related to capital expenditure) and the utilization of the corridors.

Keeping in view the nature of power consumption pattern, which varies sharply over different time of the day, over different seasons and over various geographical locations/region, built-up transmission capacity may lead to idle capacity at different time and expected to increase the cost of transmission of power. On the other hand, some congestion is viewed as a positive indication towards optimum capacity utilization."

22. The office of the C&AG in their comments on the action taken reply of the Government stated as under :-

"Ministry has stated that congestion has been reduced to a large extent and a single price for the whole Country has been achieved, in the Power Exchange on many occasions.

In this connection, Audit noticed that annual average prices in the power exchange were as follows:

Year	MCP (Rs. Per KWhr)	ACP S1	ACP S2
2010-11	3.6	4.4	4.5
2011-12	3.5	5.1	5.3
2012-13	3.5	6.9	7.3
2013-14	2.8	4.73	5.57
2014-15	3.51	5.10	5.93
2015-16	2.73	3.79	4.28
2016-17 Upto 25th Nov.2016, based on IEX website	2.39	2.76	2.76

Hence there has been a reduction in Market Clearing Price (MACP) of electricity traded through power exchanges but the Area Clearing Prices (ACP) at Southern Region continued to be higher than the MCP, on an average, annually.

In this connection COPU has noted that the Market Clearing Price of Rs.3.5 per unit (2012-13) hardly seem real as the price paid by the general public for power is much higher.

COPU has recommended that it is primarily the domain and responsibility of the Ministry of Power and as such they need to take a holistic view on the issue and work out a solution to ensure economic exchange of power across various regions connected with the Grid so as to bring down the price of power.

Ministry of Power has not furnished details of solution found, if any, to ensure economic exchange of power across various regions, so as to bring down the price of power.

Hence action taken on the recommendation may be monitored further."

23. In their response to the Audit observations, the Ministry stated as follows :-

"It may be seen from the table mentioned in Audit comments above, the price differential has further reduced in 2016-17 between the Southern Region and the Unconstrained Market Clearing price (UMCP).

Infact, transmission system is an enabler for bringing market efficiency. With the commissioning of number of transmission elements at ISIS level through continuous monitoring by MOP/CEA and POWERGRID as well as effective project management by POWERGRID facilitated enhancement of corridor capacity progressively. This has led to single price across the Country on number of occasions in bulk power market."

24. The Committee note that the Ministry has expressed the hope that with commissioning of number of transmission elements at ISIS level and effective project management by PowerGrid, corridor capacity will increase progressively which in turn will pave the way for single price of power across the Country. Price difference between MCP and ACP, though reducing gradually, as observed in the original recommendations, MCP/ACP hardly seem real in the price paid by the general public for power as it is still much higher as observed by Audit. The Committee still feel that the objective of a national grid will not be achieved in a real sense until price paid by the general public for power remain considerably high than the market clearing price of power. The Committee also notice that the Ministry has not furnished any concrete action plan to achieve the target of single power price across the Country in a projected time frame. Hence, the Committee desire to be furnished with the statistics showing the reduction in price differential, if any, resulting from the commissioning of various new lines in the last 5 years, and future prospects.

<u>Grid Disturbance of July 2012: Fixing Accountability</u>

Recommendation (Sl. No.7)

25. With regard to Gird Disturbance of July 2012, the Committee in their Eleventh Report, had recommended as follows :-

"The Committee note from the Audit report that the proximate cause for the severe Grid disturbance on 30 & 31 July 2012 involving NR, ER and NER, that resulted in non-serving of 757 Million Units of energy to consumers, was ill-planned shut down of the 400 kv BinaGwalior-Agra Trunk Line. Later on the basis of Audit observations as well as the evidences of the representatives of PGCIL and the Ministry of Power, the Committee gather that multiple factors were found to be responsible for this major Grid disturbance, such as over drawl/underdrawl by power utilities, inadequate response by the State level Dispatch Centres to Regional Load Dispatch Centres as well as the specific reason of over-loading of Bina-Gwalior-Agra trunk line. The Committee are constrained to note that even though three years have passed, investigations to fix accountability of the responsible units/authority/individual remain inconclusive. Even during the evidence of the Ministry of Power, the Committee was not given a satisfactory reply with respect to the issue of fixing accountability of entities/authorities/individuals for not following the relevant regulation/Electricity Act provisions leading to the said Grid failure, despite availability of the High Level Enquiry Committee report on the incident. The Committee strongly feel that to prevent the occurrence of such incidents in future, it is necessary to fix the responsibility of the violators and take action accordingly, It is essential to discourage any further non compliance on the part of various stakeholders. They desire to be apprised of the specific action taken on this particular point. "

26. The Ministry, in their action taken reply, have stated as follows :-

"Regarding Grid Disturbance of July 2012, Central Electricity Regulatory Commission (CERC) vide order dated 14th Dec 2015 has observed as below:

'As per analysis in preceding paras and report of task force, the combined inaction/ non-serious approach created a situation which caused grid disturbance.'

CERC has imposed penalty on SLDC of Haryana, UP, Punjab, Maharashtra, Gujarat, Madhya Pradesh and Chhattisgarh. CERC has also imposed penalty on other entities including WRLDC, NRLDC and PGCIL."

27. The office of the C&AG in their comments on the action taken reply of the Government stated as under :-

"CERC has passed Orders levying penalty on the following institutions:

Sl. No.	Institution	Penalty Imposed (In Rs.)
1.	PGCIL	1,00,000
2.	Western Regional Load Dispatch Centre	50,000
3.	Northern Regional Load Dispatch Centre	50,000

4.	State Load Dispatch Centre (SLDC),-Haryana	1,00,000
5.	SLDC - Uttar Pradesh	1,00,000
6.	SLDC - Punjab	1,00,000
7.	SLDC - Gujarat	1,00,000
8.	SLDC - Maharashtra	1,00,000
9.	SLDC - Madhya Pradesh	1,00,000
10.	SLDC - Chhattisgarh	1,00,000
11.	NTPC, Sipat	Nil-Warning issued

It has been verified from PGCIL/POSOCO records that PGCIL, WRLDC and NRLDC have paid the penalty amount.

No further remarks."

28. Noting that combined inaction/non-serious approach of entities/ authorities/personnel had created a situation which caused the grid disturbance of July, 2012, the Committee in their original Report had recommended that the Ministry of Power should take action against the violators so that such incident is not repeated in future. The Ministry in their action taken reply have stated that in case of grid disturbance of 30 and 31 July 2012, CERC has imposed penalties on SLDC of Haryana, Uttar Pradesh, Punjab, Maharashtra, Madhya Pradesh, Chandigarh including PGCIL, WRLDC and MRLDC. In their further reminder Audit has also submitted that payment of penalties by PGCIL, WRLDC and MRLDC has been verified. While taking note of CERC's decision the Committee find that penalty imposed by CERC are too ostensible to be considered as an effective deterrent so as to prevent such incidents in future. Not only the investigation has focused on the organization as a serious incident of grid-disturbance. The reasons at micro level appears not to be taken into account. While reemphasizing their recommendation with regard to fixing accountability of entities/authorities/individuals for not following the relevant regulation/Electricity Act provisions leading to the said Grid failure, the Committee therefore, would like to be apprised of the specific action taken in this regard.

Role of Personnel manning NLDC & RLDCs

Recommendation (Sl. No.8)

29. With regard to role of personnel manning NLDC & RLDCs, the Committee in their Eleventh Report, had recommended as follows :-

> "The Committee note from the transcript of phone conversations between the NLDC, ERLDC and WRLDC personnel on 29 July, 2012 i.e. a day before the major GD, as given in the audit report that though the impending crisis was being felt yet the situation was handled in an utterly unprofessional manner. It showed that the personnel manning the dispatch centres were either untrained, lacked requisite competence or had no powers to take appropriate decisions or prevail upon the region violating the grid code to follow the procedure. The Committee feel that the role of personnel in NLDC/RLDCs is like a signaller-cum-train controller who is not only responsible for smooth traffic regulation but also has safety-critical responsibility to manage any contingency, which may affect smooth operation of the area network. Hence, the Committee recommend that all personnel managing NLDCs and RLDCs must be appropriately trained to handle the on-line/computerized systems and adequately empowered to handle any violation of grid codes by any constituent region of the National Grid to prevent any major GD. The Committee hope that the High Level Enquiry Committee which had analysed the GD of July, 2012 has delved on the matter. The Committee would like to be apprised of the steps taken in this direction by the competent authorities."

30. The Ministry, in their action taken reply, have stated as follows :-

> "After the grid disturbances of July 2012, several steps have been taken by POSOCO in ensuring that the control rooms of RLDCs/NLDC are manned by experienced personnel. Training in different areas is being continuously provided through the National Power Training Institute (NPTI) as well as other institutes. A process of certification of operators is in place. The control centres at RLDCs have also been upgraded during 2012-2015 and that at NLDC will be upgraded by 2018-19. Phasor Measurement Units (PMUs) have been installed for Wide Area Monitoring so as to alert the operators in real time and preventive actions are taken promptly in case of any contingency in the system."

31. The office of the C&AG in their comments on the action taken reply of the Government stated as under :-

"Ministry has stated that POSOCO has taken steps to ensure that the control rooms of RLDCs/NLDC are manned by experienced personnel.

In this connection Audit noticed (September 2016) that out of 24 personnel deployed for control room duty, 19 were certified for basic level qualification and out of these 19 only one official was certified for specialist level qualification (Regulatory). None of the 24 personnel were certified for specialist level qualification (Reliability).

No further comments."

32. In their response to the Audit observations, the Ministry stated as follows :-

Regarding Training of operators it is submitted that training and certification is a continuous process . Daily review on various aspects of dispatch, Congestion management, Grid Control, Reliability, Renewables etc., with all the operators in the control room by senior management is also a part of the continuous learning and development program of the operators. Besides, periodic training program are conducted at NPTI, PSTI & CBIP, while certification exams are conducted on an annual basis."

33. The Committee appreciate that in accordance with their recommendations in the original Report, the Ministry, in their action taken reply, have stated that after the grid disturbance of July, 2012, several steps have been taken by POSOCO to ensure that control rooms of RLDC/NLDC are manned by experienced personnel. They have also stated that adequate training is being imparted to these personnel through national power training institute. However, Audit in their remarks has observed that in September 2016, out of 24 people deployed for control room duty, only one official was certified for specialist level qualification. The Committee feel that unless specialized and trained people are deployed, the upgradation of control centres at RLDCs and installing of Phasor Measurement units would be of little use. While reiterating their recommendation, the Committee would like to reemphasize for training and certification of personnel in their specific areas of control so as to enable them to effectively man the control room duties.

Loop In Loop Out (LILO) Short Term Arrangements

Recommendation (Sl. No.10)

34. The Committee in their Eleventh Report, had recommended the following with regard to Loop in Loop Out Short Term Arrangement :-

> "The Committee note from the Audit Report that some developers such as M/s Sterlite and GMR have been postponing their obligations under Long-term Access Agreements with PGCIL in Odisha. These obligations inter-alia involve the completion of a dedicated line from generation plant to nearest pooling stations so as to ensure transfer of power under LTA Agreements. However, despite postponing their commitments under LTAs, these developers remained connected to the Grid under Short-term Access Agreements (STOA) through Loop in Loop out (LILO) arrangement which work on margins available in the Grid. As per Audit, such a LILO agreement has caused revenue losses to PGCIL on account of differences between LTA charges and STOA charges, as well as congestion in some places such as Chhattisgarh due to inadequacy of transmission system. PGCIL, however, was not in agreement with the Audit Observation. According to the PGCIL, interim loop in loop out arrangements has benefitted the Indian Grid as considerable quantum of power under short term, which would have otherwise remained stranded, could be transferred and facilitated. The Committee were informed by PGCIL that postponing of obligation by developers has not caused any revenue loss to them.
>
> Notwithstanding the arguments and counter arguments of Audit and PGCIL, the Committee are of the considered view that even though LILO has benefitted PGCIL and has not caused any revenue loss on account of postponing of obligations under the LTA, yet PGCIL should not overlook the violation of Long Term Agreement by private developers. Meanwhile the Committee are surprised to know that even today the developer of sterlite Generation Power station has not completed a dedicated line upto Jharsuguda Pooling station. They, therefore, desire to be apprised about the measures taken to ensure that such delays do not become a regular feature in case of private developers. The Committee recommend that the MoP and PGCIL should take up the issue with CERC and take legal action so as to ensure that private developers do not manipulate the LILO arrangements at their advantage and must fulfill their obligation under LT Agreement earnestly."

35. The Ministry of Power in their action taken reply stated as follows :-

> **"LILO Short Term Arrangements / LTA Agreement** -
>
> Generations projects connected through LILO arrangements are regularly being advised to construct their dedicated transmission line at the earliest and the

progress of dedicated transmission line is being monitored. In this regard, Hon'ble CERC has directed that the issue be discussed in the Standing Committee Meeting on Transmission and the timeline for replacement of the LILOs of generation developer by dedicated transmission lines should be finalised. Accordingly, specific agenda for finalising timeline for discontinuation of LILO is being taken up for discussion in Standing Committee Meetings of various regions. POWERGRID is therefore, taking actions under the legal framework to address the issue of manipulation of LILO arrangement by private developers to their advantage.

In regard to LILO through interim arrangement granted for 4 number of generation projects in Odisha corridor, it may be mentioned that LILO of two projects (GMR and JITPL) has already been removed upon commissioning of their dedicated lines in 2014. The LILO of remaining two projects i.e. Ind-Bharat and Sterlite was discussed in the Standing Committee Meeting of Eastern Region on 13-June-2016, wherein the generation projects were given the timeline of July, 2016 and Nov., 2016 respectively for completion of their dedicated lines and removal of LILOs.

Regarding, LTA agreements, it may be mentioned that LTA agreements are being complied strictly. LTA is provided to the applicant with certain transmission system. As soon as the transmission system is commissioned, corresponding LTA applicants are required to open the Letter of Credit (LC) so that billing of transmission charges can be started. In cases where the applicant has not opened the LC even after persistent follow up, thus not fulfilling the CERC regulations, POWERGRID has approached CERC to direct the applicant to open the LC. The matter is presently under consideration in CERC."

36. The office of the C&AG in their comments on the action taken reply of the Government stated as under :-

"Ministry of Power has stated that the issue of manipulation of LILO arrangement by private developers to their advantage is being addressed through specific agenda in Standing Committee meetings of various regions, as per directions of CERC.

Ministry has also stated that Sterlite and Ind-Bharat have not yet commissioned their dedicated lines and are evacuating power through the LILO. Two other private developers viz. GMR and JITPC have commissioned their dedicated lines to the pooling station and the LILOs have been removed in 2014.

Regarding the Ministry's statement that they have been given permission by the Standing Committee for completion of dedicated lines, Audit noticed that while permission was given to Ind-Bharat (till July 2016), in the case of Sterlite (now Vedanta), members of the Standing Committee ER were of the opinion that the interim arrangement (LILO) granted to Sterlite should be disconnected, in view of non-compliance of decisions and its insincere efforts towards completion of dedicated transmission line. As per the minutes of meeting of the Standing Committee, the Committee finally agreed that decision in this regard shall be taken in the forthcoming ERPC meeting.

PGCIL has also taken up with CERC the matter regarding non-opening of Letter of Credit by Long Term Access applicants, required for billing of transmission charges from them.

The action taken on the recommendation may be further monitored in view of the continuing LILO arrangement in the case of Sterlite and Ind-Bharat."

37. In their response to the Audit observations, the Ministry stated as follows :-

"The LILO arrangement of M/s Vedanta (previously M/s Sterlite) and M/s Ind Bharat (IBEUL) is being monitored continuously and the issue has been regularly raised in the RPC meetings. During the latest ERPC meeting held on 18th and 19th November, 2016 (34th meeting), ERPC has directed M/s Vedanta that the physical completion of the project should be done by the end of February 2017. The pending statutory clearances may be obtained post completion of the physical activities and the status may be reviewed in next TCC meeting/March 2017.

Regarding Ind-Bharat, it was informed in the said meeting by M/s IBEUL that the construction of the line has been completed but CEA clearance was awaited."

38. Taking note of measures being taken up by the PGCIL to address the issue of manipulation of Loop In Loop Out (LILO) agreements by private developers to their advantage, the Committee note that PGCIL has taken suitable legal action in accordance with directions of CERC to ensure that private developers do not manipulate the facility of LILO arrangement for their advantage and comply with their obligations under the long term agreements. Further, the Committee appreciate that due to persistent efforts of PGCIL two developers namely GMR and JITPC have commissioned their dedicated lines to the pooling stations and

their corresponding LILO have been removed from 2014 accordingly. The Committee also note that PGCIL has been regularly monitoring the issue of LILO arrangement with M/s Vedanta and M/s Ind Bharat through ERPC meetings. As per information furnished by PGCIL, M/s Ind Bharat has completed the line and requisite CEA clearances are awaited and M/s Vedanta were directed to complete the project by February 2017. The Committee desire that they be apprised whether the project has been completed before February 2017 by M/s Vedanta as directed by ERPC and also whether the status has been reviewed in the proposed meeting of TCC in March, 2017.

Chapter II

Observations/Recommendations which have been accepted by the Government

(Recommendation Sl. No. 2)

Renewable-based Capacity of National Grid

In order to meet the huge energy demand in the country, the Committee are of the opinion that the electricity production in the country will have to be increased manifold. This requires greater capacity expansion of the National Electricity Grid in order to swiftly evacuate the electricity generated through a diverse set of sources, apart from fossil fuels. Also with the pressing need for a low carbon footprint of economic growth to tackle climate change, it is expected that in future energy mix of India would witness greater diversification in the form of growing share of renewables based energy. Keeping it in view, the Committee feel that PGCIL must give due importance to the inclusion of renewable energy based electricity generation projects into the National Electricity Grid. However, it is a matter of concern that at present, the renewable based capacity of the Grid is only 36 GW against the total 279 GW of installed capacity. Also out of the 36 GW renewable capacity, a major share i.e. 23 GW is wind-based and solar component is just 4 GW. The Committee feel that since India has a vast eco-friendly solar energy potential and the Government is already running the National Solar Mission to achieve grid parity by 2022 as well as parity with coal-based thermal power by 2030, CPSUs in the energy sector like PGCIL should participate more in the same, particularly when the CPSUs have already been asked by the Government to set up Grid-connected Solar PV power projects under the said Mission. The Committee desire to be apprised if PGCIL has participated in the same. They expect that with growing share of renewable electricity in the energy mix of the country, PGCIL will correspondingly endeavour to meet the optimum level of renewable based inter regional Grid capacity. The Committee also hope that the Ministry of Power will extend the necessary policy support to facilitate the initiatives of PGCIL in this regard. They would desire to be furnished with the future plans of PGCIL in the direction of enhancing renewable-based capacity of the National Grid.

Reply of the Government (Ministry of Power)

POWERGRID, being the CTU, cannot engage in any type of generation as well as trading of electricity. However, in its important role, POWERGRID is facilitating integration of renewable energy sources with the national grid. In this regard, POWERGRID has evolved a comprehensive plan for integration of RE generation capacity envisaged in XII plan in eight renewable resources rich States as Green Energy Corridors . It involves development of Inter State and Intra State transmission System Strengthening, Control infrastructure, establishment of renewable energy management centers etc.

POWERGRID is implementing inter-state transmission scheme as part of Green Energy Corridor at an estimated cost of about Rs.11,500 crore.

Further, POWERGRID is also performing a vital role in evacuation of Solar Power and has evolved comprehensive plans to evacuate power from various ultra mega solar parks envisaged in different States through Inter-State transmission network. In this direction POWERGRID is implementing transmission schemes worth Rs.4300 crore for eight Ultra Mega Solar Parks, capacity 7200 MW envisaged in different States.

It may be seen that as CTU POWERGRID is effectively involved in discharging its responsibilities.

Audit Remarks on the Reply of the Government (Ministry of Power)

PGCIL has stated that it is implementing a 'Green Energy Corridor' at a cost of about Rs.11,500 crore and transmission schemes worth Rs.4300 crore for eight Ultra Mega Solar Parks of 7200 MW capacity. These are inter-State transmission schemes.

No further remarks.

[Ministry of Power (OM No. 9/6/2014-PG dated 16.03.2017)]

(Recommendation Sl. No. 4)

Total Transfer Capability (TTC)

During their examination of the issue concerning TTC of the National Grid, the Committee observe that both the Audit and the PGCIL hold completely divergent viewpoints on the matter. The PGCIL does not consider Total Transfer Capability in order to access the capacity augmentation of inter-regional power transfer corridors, while according to Audit, TTC is an important criteria to ensure better appreciation of the ability of transmission network to transfer power and thus in accordance with the 'Procedure for making application for Grant of Medium Term Open Access in Inter State Transmission System' notified by CERC, PGCIL should notify TTC for 4 years i.e. upto March, 2019. Considering TTC as an important yardstick to evaluate the capacity augmentation of grid, the Audit has also highlighted that during XI plan, against the cumulative transmission capacity of 26050 MW, the total transfer capability was only 11530 MW. However, the PGCIL considers only transmission capacity, which is a fixed parameter, while assessing capacity augmentation in inter-regional grid. According to PGCIL, it is quite difficult to evaluate the capacity augmentation in the inter-regional power corridors on the basis of TTC as it is a variable parameter which gets impacted by various external factors such as absence of firm schedules, delay of transmission elements, lack of conformity regarding upcoming power generation projects, load as well as non-availability of any published international standard on the same. Thus,

despite considering TTC an important parameter, PGCIL admitted before the Committee that it was facing constraints with respect to evaluation of capacity augmentation in inter-regional power corridors in terms of TTC. The Committee also note the Audit's observation that as per CERC regulations, PGCIL is required to declare TTC till March, 2019 in March, 2015, but PGCIL has declared TTC only till March, 2016. Taking note of the differing views of Audit and PGCIL, the Committee feel that a final clear view of the Ministry is warranted on whether PGCIL is required to declare TTC for a period of 4 years as per CERC regulations. The Committee, in agreement with audit's observations, are of the view that ideally PGCIL should declare TTC targets as per CERC regulations since without such long term planning it is not possible to grant long term access and medium term open access to Inter-State transmission systems. However, given the constraints, as explained by PGCIL with respect to declaration of TTC, the Committee feel that these issues need to be addressed with an efficient prospective transmission system planning. The Committee are of the opinion that these constraints, to an extent, are indicative of lacunae in the coordination mechanism related to transmission system planning. The Committee therefore, desire that the Ministry should step in to explore technical as well as administrative solutions to address all the issues in transmission system planning process, in consultation with CEA/CERC, so as to eliminate the scope of uncertainties which may emerge in future. Further, the Committee desire that the progress on TTC issue by the recently constituted National Reliability Council for Electricity (NRCE) may be intimated to them. The Committee feel that without being deterred by the absence of any published international standard on TTC, the Ministry should endeavour to pool in the available technical expertise in the Country and develop TTC parameters for the National Grid. The Committee would also like to be apprised of any augmentation in the current TTC of the National Grid as well as its transmission capacity, particularly after getting assurance from the PGCIL as well as the Ministry of Power during the oral evidences that the constraints faced by the SR in the National Electricity Grid will be addressed shortly.

Reply of the Government (Ministry of Power)

Planning of transmission system is carried out on the basis of generation addition program and load growth projections with number of uncertainties. Declaration of TTC for longer time horizons is very difficult because of non-availability of firm commissioning schedule of upcoming generation projects and transmission elements for longer horizons. Even if TTC for longer time horizons is declared with number of uncertainties, it may send confusing signals to the market. In fact, due to ever changing grid conditions, even the TTC/ATC declared by operators for a shorter time period is revised regularly. However, TTC/ATC for 2014-15, 2015-16 and 2016-17 time frame has been declared based on certain assumptions and the same is available in POWERGRID Web site. For calculation of ATC/TTC for 2017-18 and 2018-19 time frame, required information has been sought from various state utilities. Upon receipt of the required information the same would be declared on POWERGRID web site.

Besides, MoP has advised POWERGRID and POSOCO to take the services of international consultants for advising on TTC/ATC and related issues holistically, both from long term planning and operational planning perspective. Accordingly, POWERGRID has engaged the services of an International Consultant, M/s Powertech Labs, Canada in Aug., 2015 for advising on the above issues. The final report of the consultant is expected in 2017. Based on the consultant recommendations, the methodology and declaration of ATC/TTC would be suitably revisited.

Regarding progress on TTC issues by the National Reliability Council for Electricity (NRCE), it is mentioned that NRCE has met six (6) times so far from its constitution in Feb 2014. In its fifth meeting in Feb 2015, the NRCE approved the procedure for adoption of seasonal ratings for loading of transmission lines viz. higher loading of the system at lower ambient temperatures and vice-versa instead of adopting a uniform temperature of 45 degree Centigrade.

Regarding the augmentation in the TTC of National Grid specifically w.r.t. SR, it is submitted that based on progressive commissioning of several elements in Western and Southern Regions, the New Grid to Southern Region TTC has gone up from **4750 MW in Aug 2014 to 6650 MW in Dec 2015**. The TTC towards SR shall further be enhanced with the progressive commissioning of following lines (which are in different stages of implementation), as already detailed in reply to Para 1 above :

4. Angul-Srikakulam-Vemagiri (2016-17) along with Vemagiri-C'Peta- Cuddapa 765kV D/c line – (2019)
5. Wardha-Nezamabad-Hyderabad 765kV D/c line (2017-18)
6. Warora – Warrangal 765kV D/c line (2019)
4. Raigarh – Pugulur ±800kV 6000MW HVDC bipole link (2019-20)

Similarly, the TTC on West to North corridor has gone up from **5750 MW in Aug 2015 to 7700 MW in Sep 2015** with the commissioning of 765 kV Gwalior-Jaipur D/C and 765 kV Jaipur-Bhiwani S/C line. This would further be enhanced with the progressive commissioning of following transmission corridors :

1. Champa-Kurukshetra HVDC bipole line with 3000MW terminal capacity
2. Champa-Kurukshetra HVDC augmentation of terminal capacity by 3000MW (total 6000 MW)
3. Jabalpur-Orai 765kV D/c line
4. Vindhyachal-Varanasi 765kV D/c line(New Project)

Audit Remarks on the Reply of the Government (Ministry of Power)

Ministry has reiterated that declaration of TTC for longer time horizons is difficult in view of the uncertainties. Ministry has stated that TTC/ATC upto 2016-17 time frame has been declared and for subsequent time frame, information has been sought from state utilities.

However as per CERC 'Procedure for making application for Grant of Medium Term Open Access in Inter State Transmission System' PGCIL should notify TTC for 4 years i.e. TTC for March 2020 should be declared in March 2016.

COPU has observed that PGCIL should declare TTC targets as per CERC regulations since without such long term planning it is not possible to grant long term access and medium term open access to Inter-State transmission systems.

Ministry has stated that PGCIL has engaged an International Consultant for advising on TTC and related issues and the final report of the consultant is expected in 2017.

Regarding constraints faced by SR, Ministry has stated that New Grid to Southern Region TTC has gone up from 4750 MW in Aug 2014 to 6650 MW in Dec 2015.

Audit noticed that though TTC has increased, SR-NEW grid links continue to be vulnerable. SR got isolated on 14 occasions since it was first integrated with the rest of the grid on 31.12.2013. Even after the inter-connection was strengthened with the commissioning of second circuit of Raichur-Sholapur 765 kV line in June 2014, such isolation of SR occurred on five occasions indicating that the integration of Southern grid with rest of the grid continues to be susceptible to isolation.

Hence the action taken on the recommendation may be further monitored.

Further ATN/reply/clarification of the Government (Ministry of Power)

TTC for 2014-15, 2015-16 and 2016-17 time frames had already been declared on POWERGRID website. For calculation of TTC for 2018-19 time-frame & beyond, required information had been sought from various state utilities, which are yet to be furnished by many STUs. Nevertheless, based on the data available, TTC for 2017-18 and 2018-19 time frames (till July'18) has been calculated and uploaded on POWERGRID website and the same is reproduced below :

Month(↓)/ Corridor(→)	**WR-NR**	**ER-NR**	**ER-NER**	**NEW-SR**

Apr-17	12900	4200	1400	8400
Apr-18	14600	7300	1750	10450
Jul-18	18000	7300	1750	10450

Regarding isolation of SR Grid from the new grid it is once again submitted that prior to commissioning of Raichur – Solapur 765 kV 2×S/c lines, Southern Region was connected through 3 no. HVDC (asynchronous) interconnections. With the commissioning of Raichur – Solapur 765 kV 2×S/c lines Southern Region got synchronously connected with NEW Grid. During the initial days of operation, there were certain trippings on this synchronous interconnection, however Southern Region remained connected with NEW grid through HVDC inter-connections and as such there was no isolation of the Southern Region Grid with NEW grid under any circumstances. Further, with the commissioning of Narendra-Kolhapur 765 kV D/c line (Initially charged at 400 kV) no such incidents are reported .

Nevertheless, to enhance the inter-connectivity of Southern Region with NEW grid following inter-regional links are already under implementation:

5. Angul-Srikakulam-Vemagiri 765kV D/c line
6. Wardha-Nizamabad-Hyderabad 765kV D/c line
7. Warora – Warrangal 765kV D/c line
8. Raigarh – Pugalur ±800kV 6000MW HVDC bipole link

[Ministry of Power (OM No. 9/6/2014-PG dated 16.03.2017)]

(Recommendation Sl. No. 5)

Regional inequalities in Power Prices

With integrated development and operationalisation of Regional Grids, a state has been reached where generation capacity available anywhere in the Country could be transmitted to deficit regions which has facilitated bringing down price of energy in market from Rs.8-9 per unit to 3-4 per unit. However, the Committee observe that regional inequalities in the prices of power still persist. There are States such as Tamil Nadu, Kerala, Karnataka and Andhra Pradesh which are paying Rs.5.1 to Rs.7.3 per unit as against Market Clearing Price of Rs.3.5 per unit for power procurement whereas State of Chhatisgarh, Odisha, West Bengal and Sikkim are receiving lower prices (Rs.2.8-2.9 per unit against Market Clearing Price of Rs.3.5 per unit). The Committee observe that first of all, these prices hardly seem real as the price paid by the general public for power is much higher than the Market Clearing Price of Rs.3.5 per unit. As

regards the wide gap in prices of power in different States, they feel that this problem is partly attributed to the congestion in transmission system. The Committee are of the view that development of more transmission corridors may have impact on reduction of regional inequalities of power prices in short run. However, in view of the fact that there are many factors which contribute to regional inequalities in power prices for instance, the Power Purchase Agreements signed by Discoms, efficiency of utilities, cost of supply of power etc., the Committee are of the considered view that it is primarily the domain and responsibility of the Ministry of Power and as such they need to take a holistic view on the issue and work out a solution to ensure economic exchange of power across various regions connected with the Grid so as to bring down the price of power.

Reply of the Government (Ministry of Power)

2) Regional inequalities in power prices

With the commissioning of various transmission links the congestion has been reduced to a large extent. It is incidentally mentioned here that in recent past, on many occasions, single price band has been witnessed for the entire country, in the Power Exchange.

Regarding, zero congestion, it is submitted that a balance has to be arrived between transmission capacity implementation (which is directly related to capital expenditure) and the utilization of the corridors.

Keeping in view the nature of power consumption pattern, which varies sharply over different time of the day, over different seasons and over various geographical locations/region, built-up transmission capacity may lead to idle capacity at different time and expected to increase the cost of transmission of power. On the other hand, some congestion is viewed as a positive indication towards optimum capacity utilization.

Audit Remarks on the Reply of the Government (Ministry of Power)

Ministry has stated that congestion has been reduced to a large extent and a single price for the whole country has been achieved, in the Power Exchange on many occasions.

In this connection, Audit noticed that annual average prices in the power exchange were as follows:

Year	MCP (Rs. Per KWhr	ACP S1	ACP S2
2010-11	3.6	4.4	4.5
2011-12	3.5	5.1	5.3

2012-13	3.5	6.9	7.3
2013-14	2.8	4.73	5.57
2014-15	3.51	5.10	5.93
2015-16	2.73	3.79	4.28
2016-17 Upto 25th Nov.2016, based on IEX website	2.39	2.76	2.76

Hence there has been a reduction in Market Clearing Price of electricity traded through power exchanges but the Area Clearing Prices at Southern Region continued to be higher than the MCP, on an average, annually.

In this connection COPU has noted that the Market Clearing Price of Rs.3.5 per unit (2012-13) hardly seem real as the price paid by the general public for power is much higher.

COPU has recommended that it is primarily the domain and responsibility of the Ministry of Power and as such they need to take a holistic view on the issue and work out a solution to ensure economic exchange of power across various regions connected with the Grid so as to bring down the price of power.

Ministry of Power has not furnished details of solution found, if any, to ensure economic exchange of power across various regions, so as to bring down the price of power.

Hence action taken on the recommendation may be monitored further.

Further ATN/reply/clarification of the Government (Ministry of Power)

It may be seen from the table mentioned in Audit comments above, the price differential has further reduced in 2016-17 between the Southern Region and the Unconstrained Market Clearing price (UMCP).

Infact, transmission system is an enabler for bringing market efficiency. With the commissioning of number of transmission elements at ISIS level through continuous monitoring by MOP/CEA and POWERGRID as well as effective project management by POWERGRID facilitated enhancement of corridor capacity progressively. This has led to single price across the country on number of occasions in bulk power market.

[Ministry of Power (OM No. 9/6/2014-PG dated 16.03.2017)]

(Recommendation Sl. No. 6)

Apart from ensuring electricity transfer at cheaper prices across the grid, it is also important to ensure that benefits of the formation of integrated National Electricity Grid, particularity the downfall in prices, is trickled down to the end user of the power, which, in view of the Committee, is not happening presently. Owing to various anomalies in the power sector such as speculation practices at power exchanges, growing losses of Discoms because of difference between average cost of power supplying and average revenue realization, as admitted by the Secretary(Power) during the oral evidence, the benefits of the formation of National Electricity Grid are not reaching to the end-users and regional inequalities in power prices persist. At the same time, the Committee would like to refer to the issue of cross-subsidies aptly brought out in the National Electricity Policy wherein it is stated that cross-subsidies have increased to unsustainable levels and they hide inefficiencies and losses in operations. The policy further suggests that the existing cross-subsidies for consumers apart from those below poverty line, would need to be reduced progressively and gradually. The Committee, therefore, urge the Ministry of Power to explore the ways to resolve various policy-level issues as well as technical, managerial and coordination related issues which are presently hampering the growth of a robust and dynamic yet affordable power sector.

Reply of the Government (Ministry of Power)

With the commissioning of various transmission links the congestion has been reduced to a large extent. It is incidentally mentioned here that in recent past, on many occasions, single price band has been witnessed for the entire country, in the Power Exchange.

Regarding, zero congestion, it is submitted that a balance has to be arrived between transmission capacity implementation (which is directly related to capital expenditure) and the utilization of the corridors.

Keeping in view the nature of power consumption pattern, which varies sharply over different time of the day, over different seasons and over various geographical locations/region, built-up transmission capacity may lead to idle capacity at different time and expected to increase the cost of transmission of power. On the other hand, some congestion is viewed as a positive indication towards optimum capacity utilization.

Audit Remarks on the Reply of the Government (Ministry of Power)

Ministry has given the same reply given under the previous recommendation to this recommendation also.

COPU has urged Ministry of Power to explore the ways to resolve various policy-level issues as well as technical, managerial and coordination related issues which are presently hampering the growth of a robust and dynamic yet affordable power sector.

Specific action taken, if any, by Ministry of Power has not been elaborated.

Further ATN/reply/clarification of the Government (Ministry of Power)

The tariff Policy has been amended vide resolution dated 28.1.2016. These amendments will ensure availability of electricity to consumers at reasonable and competitive rates, ensure financial viability of the sector and attract investments, promote transparency, consistency and predictability in regulatory approaches across jurisdictions. It will further facilitate competition, efficiency in operations and improvement in quality of supply of electricity.

Regarding, cross subsidy it is submitted that the National Electricity Policy notified on 12th February, 2005 emphasis the need for ensuring recovery of cost of service from consumers to make the power sector sustainable and simultaneously , it also provides that a minimum level of support may be required to make the electricity affordable for the consumers of very poor category, however, the existing cross subsidies for other categories of consumers would need to be reduced progressively and gradually. Further, for achieving the objective that the tariff progressively reflects the cost of supply of electricity, the revised Tariff Policy, 2016 mandates SERCs to notify roadmap for reduction of cross subsidy such that tariffs are brought within +/- 20% of the average cost of supply.

[Ministry of Power (OM No. 9/6/2014-PG dated 16.03.2017)]

(Recommendation Sl. No. 7)

Grid Disturbance of July 2012: Fixing Accountability

The Committee note from the Audit report that the proximate cause for the severe Grid disturbance on 30 & 31 July 2012 involving NR, ER and NER, that resulted in non-serving of 757 Million Units of energy to consumers, was ill-planned shut down of the 400 kv Bina-Gwalior-Agra Trunk Line. Later on the basis of Audit observations as well as the evidences of the representatives of PGCIL and the Ministry of Power, the Committee gather that multiple factors were found to be responsible for this major Grid

disturbance, such as over drawl/underdrawl by power utilities, inadequate response by the State level Dispatch Centres to Regional Load Dispatch Centres as well as the specific reason of over-loading of Bina-Gwalior-Agra trunk line. The Committee are constrained to note that even though three years have passed, investigations to fix accountability of the responsible units/authority/individual remain inconclusive. Even during the evidence of the Ministry of Power, the Committee was not given a satisfactory reply with respect to the issue of fixing accountability of entities/authorities/individuals for not following the relevant regulation/Electricity Act provisions leading to the said Grid failure, despite availability of the High Level Enquiry Committee report on the incident. The Committee strongly feel that to prevent the occurrence of such incidents in future, it is necessary to fix the responsibility of the violators and take action accordingly, It is essential to discourage any further non compliance on the part of various stakeholders. They desire to be apprised of the specific action taken on this particular point.

Reply of the Government (Ministry of Power)

Grid Disturbance of July 2012: Fixing accountability

Regarding Grid Disturbance of July 2012, Central Electricity Regulatory Commission (CERC) vide order dated 14th Dec 2015 has observed as below:

'As per analysis in preceding paras and report of task force, the combined inaction/ non-serious approach created a situation which caused grid disturbance.'

CERC has imposed penalty on SLDC of Haryana, UP, Punjab, Maharashtra, Gujarat, Madhya Pradesh and Chhattisgarh. CERC has also imposed penalty on other entities including WRLDC, NRLDC and PGCIL.

Audit Remarks on the Reply of the Government (Ministry of Power)

CERC has passed Orders levying penalty on the following institutions:

Sl. No.	Institution	Penalty Imposed (In Rs.)
1.	PGCIL	1,00,000
2.	Western Regional Load Dispatch Centre	50,000
3.	Northern Regional Load Dispatch Centre	50,000
4.	State Load Dispatch Centre (SLDC),- Haryana	1,00,000
5.	SLDC - Uttar Pradesh	1,00,000
6.	SLDC - Punjab	1,00,000
7.	SLDC - Gujarat	1,00,000
8.	SLDC - Maharashtra	1,00,000
9.	SLDC - Madhya Pradesh	1,00,000
10.	SLDC - Chhattisgarh	1,00,000
11.	NTPC, Sipat	Nil-Warning

		issued

It has been verified from PGCIL/POSOCO records that PGCIL, WRLDC and NRLDC have paid the penalty amount.

No further remarks.

[Ministry of Power (OM No. 9/6/2014-PG dated 16.03.2017)]

(Recommendation Sl. No. 8)

Role of Personnel manning NLDC & RLDCs

The Committee note from the transcript of phone conversations between the NLDC, ERLDC and WRLDC personnel on 29 July, 2012 i.e. a day before the major GD, as given in the audit report that though the impending crisis was being felt yet the situation was handled in an utterly unprofessional manner. It showed that the personnel manning the dispatch centres were either untrained, lacked requisite competence or had no powers to take appropriate decisions or prevail upon the region violating the grid code to follow the procedure. The Committee feel that the role of personnel in NLDC/RLDCs is like a signaller-cum-train controller who is not only responsible for smooth traffic regulation but also has safety-critical responsibility to manage any contingency, which may affect smooth operation of the area network. Hence, the Committee recommend that all personnel managing NLDCs and RLDCs must be appropriately trained to handle the on-line/computerized systems and adequately empowered to handle any violation of grid codes by any constituent region of the National Grid to prevent any major GD. The Committee hope that the High Level Enquiry Committee which had analysed the GD of July, 2012 has delved on the matter. The Committee would like to be apprised of the steps taken in this direction by the competent authorities.

Reply of the Government (Ministry of Power)

Role of personnel manning NLDC and RLDCs

After the grid disturbances of July 2012, several steps have been taken by POSOCO in ensuring that the control rooms of RLDCs/NLDC are manned by experienced personnel. Training in different areas is being continuously provided through the National Power Training Institute (NPTI) as well as other institutes. A process of certification of operators is in place. The control centres at RLDCs have also been upgraded during 2012-2015 and that at NLDC will be upgraded by 2018-19. Phasor Measurement Units (PMUs) have been installed for Wide Area Monitoring so as

to alert the operators in real time and preventive actions are taken promptly in case of any contingency in the system.

Audit Remarks on the Reply of the Government (Ministry of Power)

Ministry has stated that POSOCO has taken steps to ensure that the control rooms of RLDCs/NLDC are manned by experienced personnel.

In this connection Audit noticed (September 2016) that out of 24 personnel deployed for control room duty, 19 were certified for basic level qualification and out of these 19 only one official was certified for specialist level qualification (Regulatory). None of the 24 personnel were certified for specialist level qualification (Reliability).

No further comments.

Further ATN/reply/clarification of the Government (Ministry of Power)

Regarding Training of operators it is submitted that training and certification is a continuous process . Daily review on various aspects of dispatch, Congestion management, Grid Control, Reliability, Renewables etc., with all the operators in the control room by senior management is also a part of the continuous learning and development program of the operators. Besides, periodic training program are conducted at NPTI, PSTI & CBIP, while certification exams are conducted on an annual basis.

[Ministry of Power (OM No. 9/6/2014-PG dated 16.03.2017)]

(Recommendation Sl. No. 10)

Loop In Loop Out (LILO) Short Term Arrangements

The Committee note from the Audit Report that some developers such as M/s Sterlite and GMR have been postponing their obligations under Long-term Access Agreements with PGCIL in Odisha. These obligations inter-alia involve the completion of a dedicated line from generation plant to nearest pooling stations so as to ensure transfer of power under LTA Agreements. However, despite postponing their commitments under LTAs, these developers remained connected to the Grid under Short-term Access Agreements (STOA) through Loop in Loop out (LILO) arrangement which work on margins available in the Grid. As per Audit, such a LILO agreement has caused revenue losses to PGCIL on account of differences between LTA charges and STOA charges, as well as congestion in some places such as Chhattisgarh due to inadequacy of transmission system. PGCIL, however, was not in agreement with the Audit Observation. According to the PGCIL, interim loop in loop out arrangements has benefitted the Indian Grid as considerable quantum of power under short term, which

would have otherwise remained stranded, could be transferred and facilitated. The Committee were informed by PGCIL that postponing of obligation by developers has not caused any revenue loss to them.

Notwithstanding the arguments and counter arguments of Audit and PGCIL, the Committee are of the considered view that even though LILO has benefitted PGCIL and has not caused any revenue loss on account of postponing of obligations under the LTA, yet PGCIL should not overlook the violation of Long Term Agreement by private developers. Meanwhile the Committee are surprised to know that even today the developer of sterlite Generation Power station has not completed a dedicated line upto Jharsuguda Pooling station. They, therefore, desire to be apprised about the measures taken to ensure that such delays do not become a regular feature in case of private developers. The Committee recommend that the MoP and PGCIL should take up the issue with CERC and take legal action so as to ensure that private developers do not manipulate the LILO arrangements at their advantage and must fulfill their obligation under LT Agreement earnestly.

Reply of the Government (Ministry of Power)

LILO Short Term Arrangements / LTA Agreement -

Generations projects connected through LILO arrangements are regularly being advised to construct their dedicated transmission line at the earliest and the progress of dedicated transmission line is being monitored. In this regard, Hon'ble CERC has directed that the issue be discussed in the Standing Committee Meeting on Transmission and the timeline for replacement of the LILOs of generation developer by dedicated transmission lines should be finalised. Accordingly, specific agenda for finalising timeline for discontinuation of LILO is being taken up for discussion in Standing Committee Meetings of various regions. POWERGRID is therefore, taking actions under the legal framework to address the issue of manipulation of LILO arrangement by private developers to their advantage.

In regard to LILO through interim arrangement granted for 4 number of generation projects in Odisha corridor, it may be mentioned that LILO of two projects (GMR and JITPL) has already been removed upon commissioning of their dedicated lines in 2014. The LILO of remaining two projects i.e. Ind-Bharat and Sterlite was discussed in the Standing Committee Meeting of Eastern Region on 13-June-2016, wherein the generation projects were given the timeline of July, 2016 and Nov., 2016 respectively for completion of their dedicated lines and removal of LILOs.

Regarding, LTA agreements, it may be mentioned that LTA agreements are being complied strictly. LTA is provided to the applicant with certain transmission system. As soon as the transmission system is commissioned, corresponding LTA applicants are required to open the Letter of Credit (LC) so that billing of transmission

charges can be started. In cases where the applicant has not opened the LC even after persistent follow up, thus not fulfilling the CERC regulations, POWERGRID has approached CERC to direct the applicant to open the LC. The matter is presently under consideration in CERC.

Audit Remarks on the Reply of the Government (Ministry of Power)

Ministry of Power has stated that the issue of manipulation of LILO arrangement by private developers to their advantage is being addressed through specific agenda in Standing Committee meetings of various regions, as per directions of CERC.

Ministry has also stated that Sterlite and Ind-Bharat have not yet commissioned their dedicated lines and are evacuating power through the LILO. Two other private developers viz. GMR and JITPC have commissioned their dedicated lines to the pooling station and the LILOs have been removed in 2014.

Regarding the Ministry's statement that they have been given permission by the Standing Committee for completion of dedicated lines, Audit noticed that while permission was given to Ind-Bharat (till July 2016), in the case of Sterlite (now Vedanta), members of the Standing Committee ER were of the opinion that the interim arrangement (LILO) granted to Sterlite should be disconnected, in view of non-compliance of decisions and its insincere efforts towards completion of dedicated transmission line. As per the minutes of meeting of the Standing Committee, the Committee finally agreed that decision in this regard shall be taken in the forthcoming ERPC meeting.

PGCIL has also taken up with CERC the matter regarding non-opening of Letter of Credit by Long Term Access applicants, required for billing of transmission charges from them.

The action taken on the recommendation may be further monitored in view of the continuing LILO arrangement in the case of Sterlite and Ind-Bharat.

Further ATN/reply/clarification of the Government (Ministry of Power)

The LILO arrangement of M/s Vedanta (previously M/s Sterlite) and M/s Ind Bharat (IBEUL) is being monitored continuously and the issue has been regularly raised in the RPC meetings. During the latest ERPC meeting held on 18th and 19th November, 2016 (34th meeting), ERPC has directed M/s Vedanta that the physical completion of the project should be done by the end of February 2017. The pending statutory clearances may be obtained post completion of the physical activities and the status may be reviewed in next TCC meeting/March 2017.

Regarding Ind-Bharat, it was informed in the said meeting by M/s IBEUL that the construction of the line has been completed but CEA clearance was awaited.

[Ministry of Power (OM No. 9/6/2014-PG dated 16.03.2017)]

(Recommendation Sl. No. 11)

Transmission & Distribution Losses

High electric losses cripple a utility's ability to properly invest in its system and provide stable service. The Committee note that the transmission and distribution losses have, in the last five years, remained between 20-24% on an average. In this connection, they have been informed that transmission losses are technical losses in the process of supplying electricity and as per PGCIL, 3-4% of such losses are at par with the international standard. The Committee note that the average Inter-State Transmission System loss is around 3.37% out of 20.83% total loss in 2014-15. This trend is visible in previous year too which implies that while technical losses are not a cause of concern, the Distribution losses are constantly on a very high side. The Committee have been informed that such losses, suffered mainly by the Discoms, are due to non-metering, defective metres, non-billing, non-realisation, electricity theft etc. As the Country suffers huge revenue loss due to such a high percentage of distribution losses, the Committee urge the Ministry of Power to press upon the Discoms to utilize various technical and managerial solutions to tackle issues like non-metering, non-billing etc. efficiently in consultation with State Governments, so as to contain the losses.

Reply of the Government (Ministry of Power)

The Ministry of Power has undertaken several measures to help States / DISCOMS contain their Distribution losses, which can be further classified into Technical losses (live losses) and commercial losses (non billing, non collection, theft and pilferage, etc.)

For strengthening the Distribution and sub transmission infrastructure of DISCOMs, the Government has introduced schemes such as IPDS (for urban areas) and DDUGJY (for Rural areas) at an overall outlay of Rs. 32,612 cr and 43,033 crore respectively. IPDS and DDUGJY will improve the Distribution Network to reduce the Technical losses. IPDS also includes the IT interventions in the urban Distribution Infrastructure that would occur the DISCOMs / States with tools to detect loss pockets, theft prone areas as well as enable them to conduct energy audits.

The Ministry is also actively engaged in enabling online Feeder Monitoring in both rural and urban areas, which would help identifying loss-prone feeders. There

would enable States / DISCOMs to fix accountability through the concept of assigning Feeder Managers responsible for every Feeder.

Apart from the above, the Ujwal DISCOM Assurance Yojana (UDAY) launched by the Government provides a framework of several energy efficiency and conservation measures which would enable AT&C loss reduction to levels of 15% in three years.

Audit Remarks on the Reply of the Government (Ministry of Power)

Ministry of Power has furnished details of schemes and technical and managerial solutions adopted by the Ministry to tackle issues like non-metering, non-billing etc.

No further remarks.

[Ministry of Power (OM No. 9/6/2014-PG dated 16.03.2017)]

(Recommendation Sl. No. 12)

Compensation to affected Farmers/Land Owners

The Committee take note of the fact that PGCIL does not acquire land for towers and it s only granted user rights with respect of laying and maintenance of electric lines for the purpose of transmission of electricity and pay compensation under the relevant provisions of the Electricity Act, 2003 and Indian Telegraph Act, 1885. The Committee further note that earlier PGCIL used to pay compensation for the damages caused to crops/trees and structures, however, following the landowners demands to pay cost of land for tower base as well as cost of land value diminution in the corridor area due to laying of transmission lines, New Guidelines have been issued by the Ministry of Power on the 15th October, 2015 for payment of enhanced compensation towards damages in regard to Right of Way for transmission lines to all stakeholders including PGCIL, POSOCO, CERC, all States/UTs and State Power Utilities. PGCIL has assured the Committee that the New Guidelines would be soon adopted by them. The Committee appreciate the same and hope that the guidelines will be adopted by all the States/UTs too and implemented in their true spirit so that grievances of the affected persons are addressed in a satisfactory manner. Besides, the Committee desire that the PGCIL should study best practices all around the world to explore and implement technical solutions to establish transmission networks which may involve minimum of right of way permission, for instance, laying of underground transmission lines at par with the best of the practices followed in developed countries.

Reply of the Government (Ministry of Power)

POWERGRID is always exploring the best practices adopted around the world and trying to implement the same while planning the new transmission system. In order to address the Right of Way issues, POWERGRID is deploying various technologies

such as adoption of higher voltages, High Temperature Low Sag (HTLS) Conductors, Multi Circuit Towers, Compact & Tall Towers, Underground Cables etc.

Higher Voltage Level Lines

POWERGRID has been planning and constructing higher voltages level lines like 765 kV Double Circuit transmission lines, ±800 kV UHVDC and 1200 kV UHVAC transmission lines in the Country which require much reduced RoW per MW of power transferred. Many 765 kV Double Circuit transmission lines are under various stages of construction. One ±800 kV, 6000MW HVDC line from Biswanath Chariyali (Assam) to Agra (Uttar Pradesh) (about 1750 km long) has already been commissioned to facilitate transfer of bulk power from North Eastern Region to Northern Region through the constricted chicken neck area and is one of the longest HVDC lines in the world. Second ±800 kV HVDC line between Champa (Western Region) and Kurukshetra (Northern Region) having length of approx. 1400 km is under construction while implementation activities for ~~another~~ ±800 kV HVDC line between Raigarh (Western Region) and Pugular (Southern Region) is ~~being taken up~~ underway.

POWERGRID has also developed indigenously **1200kV Ultra High Voltage (UHC) AC technology**, the highest transmission voltage level in the world and successfully established the 1200 kV test station at Bina including test-charge of 1200 kV single and double circuit transmission lines as pilot project. Construction of 1200 kV upgradable transmission line from Wardha to Aurangabad (approx. 350 km length, to be initially charges at 400kV level) is also underway and shall be charged after field trials.

High Performance Conductors

POWERGRID is also adopting High performance conductors which have the capacity to transfer more power using the same towers and line corridor. It avoids the need of creating new parallel corridors, thereby conserving the RoW.

- **Special Towers**

In order to address the Right of Way constraints, POWERGRID has been designing and using various types of towers depending upon land Topography and conditions:

- **Compact towers:** In certain areas, compact towers like delta configuration, narrow based towers etc. which reduce the space occupied by the tower base are being used. In this direction, 765kV tower with delta configuration has been designed and implemented, which reduces the RoW requirement of 765kV lines from 85m to 64m (appox. 33% less).

- **Pole type towers:** 400kV Pole structure is also being used especially in areas of high population density. Pole type structures with about 2 m base width as against 12-15 m base width of a conventional tower are used to address Right-of-way problem.
- **Multi-circuit towers:** The multi-circuit towers accommodating 4 circuits on one tower are implemented in many transmission systems to address RoW problems. This has effectively reduced the RoW to half.

Underground Cables

In some of the transmission lines passing through cities and other inhabited areas having severe ROW issues, portion of the lines have been planned as underground cables instead of overhead lines viz. Transmission line in UT of Chandigarh, Lines of Delhi Transco as consultant, Line in New Mumbai etc.

Audit Remarks on the Reply of the Government (Ministry of Power)

Ministry of Power has furnished details of technical solutions adopted by PGCIL to reduce right of way permission.

No further remarks.

[Ministry of Power (OM No. 9/6/2014-PG dated 16.03.2017)]

(Recommendation Sl. No. 13)

Awareness regarding Health Hazards of Transmission Infrastructure:

The Committee note that the PGCIL is following the Indian Electricity Rules and CEA's regulations on safety requirements regarding the minimum electrical clearances to be maintained with respect to ground and building etc. The Committee also note that PGCIL is following the requisite guidelines regarding limiting exposure to Electric & Magnetic Fields(EMF) as specified by International Commission on Non-Ionizing Radiation Protection. This includes installation of protecting devices, anti-climbing devices, provision of earthing in all high tension wires as well as a very fast-acting protection system to clear any faults. Also, during the site surveys, PGCIL engineers interact with people and try to allay their fears. While the Committee believe that PGCIL is taking all requisite protective measures, they feel that owing to a lack of mass awareness, people still harbour misconceptions about the high tension towers and transmission lines. Such apprehension in an aggravated form may cause public resistance towards transmission system infrastructure development activities of PGCIL. Thus the Committee feel that there is an urgent need to create substantial awareness among people in order to allay such misconceptions. The Committee,

therefore, desire that the MoP should chalk out a definite strategy to inform people about safety standards followed by PGCIL during the setting up of transmission lines/towers etc. through the use of social media, SMS in local language, local bodies etc. which will have a wider coverage and appeal and generate adequate awareness among people to allay their misconceptions regarding the transmission lines and towers.

Reply of the Government (Ministry of Power)

MOP has advised POWERGRID to take actions for safety concerns and awareness amongst people regarding the safety aspects.

POWERGRID has taken following actions to promote Safety Awareness among general public.

- Consultative meetings are held with the general public and villagers before construction of new Transmission Projects and all the issues raised by the public, including safety concerns, are addressed in such meetings

- Video films on “Safety” and “Health & Hygiene” have been made in English and Hindi, and circulated to all sites for promoting general awareness of the workers and public.

- During construction of Transmission Lines, appropriate Caution Boards / Red flags are placed at vulnerable public places / road crossings to caution the public.

- Strict instructions have been given to Construction Agencies to ensure safety of the public working / moving in the vicinity of construction sites by suitably warning them.

- Safety Posters / Banners and Caution Boards are displayed near construction sites to promote awareness

- Safety concerns, if any, raised by the villagers and general public living near POWERGRID sub-stations, are promptly addressed by the concerned Site Officials through informal gatherings / meetings

- Before commissioning of Transmission Lines, wide publicity is given through local news papers and public address systems, cautioning them not to climb the towers or approach the live conductors.

- RTI queries on safety concerns are promptly replied, and wherever required, safety compliances are checked and demonstrated at the concerned spot / road crossing.

Audit Remarks on the Reply of the Government (Ministry of Power)

Ministry of Power has furnished details of action taken by PGCIL to ensure safety awareness among general public regarding transmission lines.

No further remarks.

[Ministry of Power (OM No. 9/6/2014-PG dated 16.03.2017)]

Chapter III

Observation/Recommendation which the Committee do not desire to pursue in view of the Government's replies

(Recommendation Sl. No. 9)

Independent Analysis of GDs

The Committee note that in line with Central Electricity Authority Grid Standards and Indian Electricity Grid Code provisions, first investigation Reports are filed by Regional Load Dispatch Centers with Regional Power Committee. Regional Power Committees after detailed analysis prepare detailed Report after taking into account the views of Members of utilities/experts etc. The Committee however feel that this arrangement is similar to an in house mechanism which provide for a post grid disturbance analysis and the way forward in view of the lessons learnt from the incidents of Grid Disturbances. The Committee suggest that for a better Post Grid disturbance analysis, the inputs from the RLDCs/RPCs may be utilized by an independent institutional arrangement which may analyze the causes of and suggest remedies for Grid disturbances without any bias. The Committee, therefore, recommend that the Ministry of Power should explore the possibilities of engaging an independent institutional mechanism having technical experts from the power utilities for post grid disturbance analysis. They would also like to be apprised about the status of notification of CERC's draft Ancillary Services Framework, which would statedly provide NLDC and RLDCs an opportunity to suo motu reduce generation immediately without disturbing any State's net drawl schedules, in case of a network contingency.

Reply of the Government (Ministry of Power)

Independent analysis of GDs and Ancillary Services Framework.

The Regional Power Committees (RPCs) are already in existence. These RPCs operate through various sub-Committees and these need to be strengthened rather than creating a separate institutional mechanism for analysis of Grid Disturbances (GDs). Utilities should be mandated to depute their experts to RPC for analysis of any GDs beyond category GD-1.

The Ancillary Services framework has already been implemented by POSOCO wef 12th April 2016 based on the orders by CERC and procedure approved by CERC.

Audit Remarks on the Reply of the Government (Ministry of Power)

Ministry of Power has stated that existing mechanism such as RPCs need to be strengthened rather than creating a separate institutional mechanism, as suggested by COPU.

Hence this recommendation has not been accepted by the Ministry and as such no action has been taken.

The Ancillary Services framework has, however, been implemented in April 2016.

Hence the ATN may be kept pending.

Further ATN/reply/clarification of the Government (Ministry of Power)

Further to our submissions made above it is submitted that the RPCs have different stakeholders as its members and the sub-committee are well represented by all these stakeholders.

There are many ways in which the RPCs can ensure independent analysis of events, such as, ensuring that for different events, they constitute different sub-groups which don't have members from the affected utility; a time bound manner of investigations by such sub-groups and follow up of recommendations. There has been a continuous emphasis on protection system audits at the RPC level, as well as capacity building program in this area, including taking services of consultants of international repute.

In the long run , standards for timely completion of investigations at the RPC level and remedial measures must be in place with a high level of compliance monitoring at the regulatory level. This would bring further seriousness in the matter.

[Ministry of Power (OM No. 9/6/2014-PG dated 16.03.2017)]

Chapter IV

Observation/Recommendation in respect of which reply of the Government had not been accepted by the Committee

-- NIL --

Chapter V

Observations/Recommendations to which the Government have furnished interim replies

(Recommendation Sl. No. 1)

National Electricity Grid

The Committee note with appreciation that PGCIL has achieved a significant milestone in the process of formation of National Grid through integration of all five regions on 31st December, 2013 thereby reaching the stage of one nation, one grid and one frequency. This has made India the only country in the world which has developed a single synchronous grid for the entire country's power systems which, in itself, is amongst the third largest in the world. However, though in technical terms, the integration of all five regions has been done, the development of electricity Grid is an ongoing process and hence capacity augmentation of the grid is being done continuously. To achieve the XIIth Plan target of 72250 MW inter regional capacity by 2016-17, PGCIL is still required to add about 20511 MW more in less than one and half year's period from now. The Committee note from the latest response of the Ministry of Power that they are very confident of achieving the target of 72250 MW by the end of XIIth Plan. While the Committee desire to be apprised of the hitherto progress in capacity augmentation of the National Grid, they feel that the Grid should also be capable of meeting deficit in a particular region like the Southern Region from a surplus region like Western or Eastern Region, as observed by the C&AG in their Performance Audit Report. Only then the actual purpose of having a National Grid could be considered to be accomplished. The Committee, therefore, would like the Ministry of Power to submit a note to them providing the overall capacity as well as the capability and performance of the National Grid on this account in the last three years. Also as the MoP has envisaged 24x7 power supply in the country by the year 2019, the Committee desire to be apprised of the roadmap, if any, made for achieving the target, which includes expenditure, infrastructure and other requirements at the Central level, State level and private sector level too.

Reply of the Government (Ministry of Power)

Status of progress in capacity augmentation of the National Grid

The existing inter-regional power transfer capacity mentioned in the report is 53150 MW. Since then, additional 8000 MW inter-regional capacity has already been commissioned and the present inter-regional capacity of the National Grid is 61150 MW. Other planned inter-regional links are also under advance stage of implementation and

POWERGRID is confident to achieve the XII plan target of 72250 MW inter-regional capacity by 2016-17.

In regard to power supply from Western/Eastern Region to Southern Region, it may be mentioned that the congestion for such delivery of power has already been reduced toa great extent. Further, various links as given below are already under various stages of implementation which would facilitate additional power transfer from surplus regions like Western and Eastern Region to Southern Region :

4. Angul-Srikakulam-Vemagiri 765kV D/c line- (2016-17)
   along with Vemagiri-C'Peta-Cuddapa 765kV D/c line – (2019)
5. Wardha-Nezamabad-Hyderabad 765kV D/c line (2017-18)
6. Warora – Warrangal 765kV D/c line (2019)
4. Raigarh – Pugulur ±800kV 6000MW HVDC bipole link (2019-20)

Performance of National Grid in last 3 years

The National Grid has made considerable progress in last 3 years. Major achievements include synchronisation of Southern region with rest of the Indian Grid to reach the stage of One Nation, One Grid and One Frequency and commissioning of one pole of (1500MW) 1800 kms. long ± 800 kV, 6000 MW HVDC bipole link from Bishwanath Chariyali (Assam) in NER to Agra in NR.

The total inter-regional transmission capacity has increased significantly in last 3 years as shown below.

Increase in IR Capacity since 2012-13							
Month(↓)/ Corridor(→)	**ER/NER-NR**	**ER-WR**	**WR-NR**	**ER-SR**	**WR-SR**	**ER-NER**	**Total IR**
Mar-13	12130	4390	6220	3630	1520	1260	**29150**
Mar-14	14230	6490	8720	3630	3620	1260	**37950**
Mar-15	14230	10690	8720	3630	720	2860	**45850**
Mar-16	17330	12790	12920	3630	7920	2860	**57450**
Mar-17 (Expected)	23930	12790	16920	7830	7920	2860	**72250**

Similarly the capability (TTC) has also increased considerably as shown in the table below.

Month(↓)/ Corridor(→)	WR-NR	ER-NR	ER-NER	NEW-SR	NER-NR
Mar-13	**2000**	**2500**	**475**	3600	-
Mar-14	**4200**	**3800**	**72**	3600	-
Mar-15	**4900**	**3200**	**720**	4750	-
Mar-16	**7450**	**4800**	**1470**	6650	1500

Further, the inter-regional exchange has also increased by 78% from 65860 MU in 2012-13 to 117033 MU in 2015-16. Details of major inter-regional exchange figures are given below.

Inter-Regional Exchanges (all figures in MU)

Year	Total IR Exchange	WR-NR	NEW-SR	ER-NR
2012-13	65860	**11668.10**	**27100.04**	**15600.63**
2013-14	78384	**24205.92**	**27914.24**	**14555.89**
2014-15	89225	**29907.59**	**31765.44**	**12909.56**
2015-16	117033	**46623.47**	**37955.7**	**13914.10**

From the above, it may be noted that there has been remarkable progress in the performance of National Grid on account of capacity addition, capability enhancement and inter-regional energy transfer.

Audit Remarks on the Reply of the Government (Ministry of Power)

COPU has noted that, to achieve XII Plan target of 72250 MW, PGCIL is required to commission 20511 MW inter regional capacity in less than one and half year.

In this regard, details of pending lines was obtained (September 2016) from PGCIL and it was seen that a total of 61150 MW has been commissioned as of now under the XII Plan and 11100 MW is yet to be commissioned during remaining seven months (September 2016 to March 2017). This includes commissioning of 4200 MW in the ER-SR corridor, where the achievement was less than half the planned addition (3630 MW commissioned against 7830 MW planned).

Audit noticed that going by the pace of addition in earlier years (annual addition was in the range of 7900 MW to 11600 MW during the period from March 2013 to March 2016), a surge is required in the last year to meet the target.

Further, the important issue highlighted in the Audit Report was that physical capacity of lines are added to assess capacity of inter-regional corridor but what was more important was the total transfer capability (TTC) of the corridor, which denotes the ability of the corridor to transfer power from one region to another. Audit noticed that the overall TTC is less than half the physical capacity of lines (Total TTC in March 2016 works out to 21870 MW as against the total physical capacity of 57450 MW). TTC for March 2017 i.e. end of XII Plan has not been mentioned in the ATN.

Also, the Southern Grid which was synchronised with the rest of the grid on 31.12.2013 to form a single grid for the whole nation, got isolated on 14 occasions since then. Even after the inter-connection was strengthened with the commissioning of second circuit of Raichur-Sholapur 765 kV line in June 2014, such isolation of SR occurred on five occasions indicating that the integration of Southern grid with rest of the grid continues to be vulnerable to isolation.

Hence, the position needs to be further monitored

Moreover, MoP has not responded to COPU's desire to be apprised of the roadmap, if any, made for achieving the target of 24 x 7 power supply in the country by the year 2019.

Further ATN/reply/clarification of the Government (Ministry of Power)

Existing inter-regional capacity has already reached to 63,650 MW which shall be enhanced to 72250 MW by the end of 12th plan with the commissioning of following links:

Links under implementation	**Additional Capacity**	**Schedule**
LILO of Biswanath Chariali - Agra +/- 800 kV HVDC Bi-pole at Alipurduar	1500 MW	Mar'17
Champa Pool- Kurukshetra +/- 800 kV HVDC Bipole	3000 MW	Mar'17
Angul – Srikakulum 765kV D/c	4200 MW	Dec'16

In regard to difference between Transmission Capacity and Transmission capability, as mentioned in the remarks, physical capacity of lines are added to assess Transmission capacity of inter-regional corridor where as Total Transfer capability(TTC) denotes the ability of the corridor to transfer power from one region to another. Transfer Capability is a complex property influenced by number of factors such as system

voltage, loading, availability of parallel system elements and their rating, physical properties, system reactive capability & stability. Transmission capacity is usually far greater than the actual transfer capability between two areas. The same has also been mentioned in the draft report submitted by International Consultant, M/s Powertech Labs, Canada for TTC/ATC & other associated studies.

Further, TTC for Mar'17 shall remain same as that of Jan., 2017, which has already been declared on POWERGRID website. The details are as below:

Month(↓)/ Corridor(→)	**WR-NR**	**ER-NR**	**ER-NER**	**NEW-SR**
Mar-17	9100	4200	1400	6800

Regarding SR isolation, it is submitted that prior to commissioning of Raichur – Solapur 765 kV 2×S/c lines, Southern Region was connected through 3 no. HVDC (asynchronous) interconnections. With the commissioning of Raichur – Solapur 765 kV 2×S/c lines Southern Region got synchronously connected with NEW Grid. During the initial days of operation, there were certain tripping on this synchronous interconnection, however Southern Region remained connected with NEW grid through HVDC inter-connections and as such there was no isolation of the Southern Region Grid with NEW grid under any circumstances. Further, with the commissioning of Narendra-Kolhapur 765 kV D/c line (Initially charged at 400 kV) no such incidents are reported.

Nevertheless, to enhance the inter-connectivity of Southern Region with NEW grid following inter-regional links are already under implementation:

5. Angul-Srikakulam-Vemagiri 765kV D/c line
6. Wardha-Nizamabad-Hyderabad 765kV D/c line
7. Warora – Warrangal 765kV D/c line
8. Raigarh – Pugalur ±800kV 6000MW HVDC bipole link

[Ministry of Power (OM No. 9/6/2014-PG dated 16.03.2017)]

(Recommendation Sl. No. 3)

Transmission Planning and Coordination

The Committee take note of the provisions made under Section 73 of the Electricity Act, 2003 which confers the responsibility of preparing a perspective plan for development of electricity systems to Central Electricity Authority (CEA) in order to provide reliable and affordable electricity for all consumers. CEA fulfills this responsibility in consultation with other stakeholders, viz. Central Transmission Utility,

Members of Standing Power Committee, beneficiary States, etc. Accordingly, a National Electricity Plan is prepared in every five year by CEA, keeping in view the broad requirement of transmission system. However, despite such a comprehensive and participatory process of transmission planning, the objective of affordable and reliable electricity for all consumers is still a distant dream as is evident from transmission congestion, transmission and distribution losses and higher prices being paid by the end user for electricity. The Committee opine that this state of affairs undoubtedly warrants a relook at the present transmission system planning process and framework of coordination among various stakeholders. The Committee, therefore, desire the Ministry of Power to undertake a comprehensive review of the transmission system planning process keeping in view the prevailing anomalies in the Power Sector, constraints being faced by the CPSUs and prospective electricity requirement of the Country. The Committee are of the firm opinion that such an exercise will help the Ministry of Power to plug in the loopholes in the present system and evolve a better roadmap for their future endeavours.

Reply of the Government (Ministry of Power)

As per present planning methodology, inter-state transmission system, including inter-regional links, is developed for the generation projects, who apply for Long Term Access/ whose generation is allocated by Govt of India. The inherent margins available in the system in the transmission system so developed can be utilised for catering to contingency situations and commercial market mechanism. For development of such transmission system there is commitment either by generator or by beneficiaries that they shall pay for the transmission facilities for the quantum they have contracted. In the absence of firm beneficiaries, it is the responsibility of generators to commit the payment for the transmission system for the LTA they have applied. This philosophy worked fine when most of the ISGS generation was under Government/ Central Sector. However with the delicensing of generation and introduction of IPPs, there is a tendency to commit for less quantum of power, meaning thereby that Generators apply for less LTA quantum of power then their installed capacity to minimise their commitment of payment of transmission charges. The balance capacity they want to transfer based on market economics utilising the margins available. As such margins in the system cannot be infinite and can be generally 10-15%. This has led to some congestion as reported only during short term access.

After opening up of generation for private players, lot of private players came forward and planned generation addition. However they could not firm up long term customers for one reason or other. In order to facilitate their evacuation and not to get their power bottled, POWERGRID took the initiative of granting long term access on the basis of target beneficiaries and went ahead planning 11 number of high capacity corridors which are under different phases of implementation and serving as a major

backbone in evacuating power from the new generation projects. Thus though the issue of planning major transmission corridors for generation projects applying for LTA without any firm PPA was addressed to a great extent, the generation projects which did not apply for LTA before, and requesting for the same within a short period only after commissioning of the project and finalization of PPA are facing certain constraint. Therefore, it may be appreciated that all along planning of transmission system has been done within prevalent regulatory mechanism i.e building transmission system for the generations who apply for Long Term Access as commitment has to be given for payment of transmission system either by the generator or by beneficiaries. Only the generators / beneficiary who do not make such commitment and wait for last minute opportunity, may face evacuation constraint as gestation period of transmission system is 3-4 years. To some extent some non committed generation can be accommodated in the margins but not all.

Further considering the evolving market mechanism and to tackle situation of congestion and free flow of power across country, a new concept in the planning (GNA) is under discussion wherein development of transmission system shall be based on Installed capacity of generators as well as power drawal requirement from consumers and their commitment for payment of transmission charges for the same.

Towards this, CERC published a Staff Paper in 2014 for developing the GNA concept and working out the details. In this regard, in May 2016, CTU has also circulated a Concept Paper to MoP, CERC, CEA and POSOCO on 'Proposed Changes in Transmission Planning, Augmentation and Sharing of Charges under GNA-Regime'. The paper proposes principle changes in transmission planning philosophy wherein instead of planning the transmission systems for the (perceptual) target region load specified by the LTA applicant, the actual load-demand projections based on import/export requirement of States shall be considered.

Audit Remarks on the Reply of the Government (Ministry of Power)

COPU has desired that Ministry of Power may undertake a comprehensive review of the transmission system planning process keeping in view the prevailing anomalies in the Power Sector, constraints being faced by the CPSUs and prospective electricity requirement of the Country.

It is not clear from the ATN whether such a review has been undertaken by Ministry of Power.

It has been mentioned that PGCIL has prepared a "Concept Paper' in May 2016 on 'Proposed Changes in Transmission Planning, Augmentation and Sharing of Charges under GNA-Regime' and circulated the same.

Further action taken in the matter and details regarding comprehensive review, if any, undertaken by Ministry of Power is awaited.

Hence action is yet to be taken on the recommendation.

Further ATN/reply/clarification of the Government (Ministry of Power)

Further, in this regard , it is mentioned that CERC vide order dated 08-12-2015, constituted a Committee under the Chairmanship of Sh. Mata Prasad to "Review Transmission Planning, Connectivity, Long Term Access, Medium Term Open Access and other related issues". The Committee has recently submitted its report to Commission in December 2016 for their consideration.

[Ministry of Power (OM No. 9/6/2014-PG dated 16.03.2017)]

New Delhi
18 December, 2017
27 Agrahayana, 1939(S)

SHANTA KUMAR
Chairperson,
Committee on Public Undertakings.

APPENDIX - I

MINUTES OF THE SIXTH SITTING OF THE COMMITTEE ON PUBLIC UNDERTAKINGS (2017-18)

The Committee sat on Monday, the 28 August 2017 from 1100 hrs to 1240 hrs in Committee Room 'B', Ground Floor, Parliament House Annexe, New Delhi.

PRESENT

Shri Shanta Kumar - Chairperson

MEMBERS

Lok Sabha

2. Shri Lal Krishna Advani
3. Shri G. Hari
4. Shri Rabindra Kumar Jena
5. Shri Kristappa Nimmala
6. Shri B. Vinod Kumar
7. Shri Ravneet Singh
8. Shri Rameshwar Teli

Rajya Sabha

9. Shri Narendra Budania
10. Shri Tapan Kumar Sen
11. Shri Ram Chandra Prasad Singh

SECRETARIAT

1.	Smt. Sudesh Luthra	Additional Secretary
2.	Shri G.C. Prasad	Deputy Secretary
3.	Smt. Mriganka Achal	Under Secretary

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2. At the outset, the Chairperson welcomed the members to the sitting of the Committee and briefed about the agenda of the sitting. The Committee then took up for consideration of the draft Action Taken Report on the observations / recommendation contained in the Eleventh Report of the Committee (2016-17) on "Planning and Implementation of Transmission Projects by Power Grid Corporation of India Limited and Grid Management by Power System Operation Corporation limited" [Based on C&AG, Performance Audit Report No. 18 of 2014]. The Committee made suggestions to strengthen the recommendations mentioned at Sl. No. 9 and 24. With these suggestions, the Committee adopted the report. The modifications in these recommendations in this regard have been given at Annexure. The Committee then authorised the chairperson to finalise the aforesaid draft Action Taken Report on the basis of factual verification by Ministry / Department concerned and present the same to Parliament.

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A verbatim record of the proceedings has been kept separately.

The Committee then adjourned.

APPENDIX II

(Vide para 4 of the Introduction)

Analysis of the Action Taken by Government on the Observations/ Recommendations contained in the Eleventh Report of the Committee on Public Undertakings on Planning and Implementation of Transmission Projects by Power Grid Corporation of India Limited and Grid Management by Power System Operation Corporation Limited] [Based on C&AG, Performance Audit Report No. 18 of 2014]

I	Total number of recommendations		13
II	Observations/Recommendations that have been accepted by the Government [Para Nos. 2, 4, 5, 6, 7, 8, 10, 11, 12 and 13]	Total - Percentage -	10 76.9
III	Observations/Recommendation which the Committee do not desire to pursue in view of Government's replies [Para Nos. 9]	Total - Percentage -	1 7.70
IV	Observation/Recommendation in respect of which replies of the Government had not been accepted by the Committee	Nil	
V	Observations/Recommendations in respect of which Government have furnished interim replies [Para Nos. 1 and 3]	Total - Percentage -	02 15.40