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Date:
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To
The Secretary,
KERC, Mahalakshmi Chambers,
M.G. road, Bangalore- 560 006

Dear Sir,

I, on behalf of the Expert Committee thank the Commission for giving the Members of the Committee an opportunity to review the capital budget proposal of KPTCL for the year 2006-07 amounting to Rs. 2700 crores and furnish its recommendations.

The Committee had to examine the proposal in greater detail than normally required, considering the fact that amount programmed to be spent by KPTCL during the next financial year is nearly five times the average capital outlay incurred by KPTCL over the previous four years. The physical targets are also very ambitious in as much as it is nearly ten times the average achievement during the four years of the 9th Five Year Plan. The achievement for 2005-06 also is not likely to be very different. Though the Perspective Plan "Version 3" prepared and approved by KPTCL during July 05 envisaged commissioning of 98 stations, it is understood that KPTCL is expected to commission 35 stations only by the end of FY 06

The historical performance necessitated the Committee to go into micro details because of discrepancies observed with the data furnished by KPTCL, to arrive at realistic targets. KPTCL was very cooperative in providing the requisite details

and its officers were present at all the ten sittings that were held and furnished whatever clarifications that were required.

As mentioned earlier, the Committee discerned quite a few discrepancies not only in terms of physical targets, but also with regard to outlay incurred and the funds proposed for the year under consideration.

The Committee noted that the backlog of works taken up during the last five years was rather heavy and the attempt of KPTCL to expedite completion of all the on-going schemes and its anxiety in this regard, needs to be appreciated.

The Committee also noted from the data furnished by KPTCL during the meetings that about 400 out of 542 stations in service registered a peak demand in excess of 70% of installed capacity and urgently required reinforcement either through augmentation of capacity or by establishing a new station at an appropriate location nearby.

The Committee is of the view, based on the discussions with KPTCL, that some stations targeted for commissioning during 2006-07 particularly in the 220 KV class could be taken up and completed during the following year without serious impact on the reliability. However, preliminary works could be taken up but keeping the expenditure to the minimum. It also observed that there is scope to keep the value of works in progress at a much lower level than Rs. 1693 Crs. which has been indicated in the ERC filing.

The Committee has stressed in the Report that all the on-going works of yesteryears are to be completed and serviced during 2006-07 and has even recommended a larger amount that has been indicated in the revised statement furnished to the Committee (copy enclosed with the Report). The Committee is of the view that some of the new schemes proposed to be taken up during 2006-07 and a few schemes which were contemplated in the earlier years, could be taken up during the first year of the 11th Plan viz., 2007-08.

The Committee also reviewed other aspects which could affect the ambitious targets of KPTCL such as (a) availability of funds, (b) capacity to prepare specifications in large numbers, processing of bids, placing of orders etc, (c) monitoring effectively a larger number of schemes, (d) timely flow of funds and (e) even the availability of competent contractors to complete the works on schedule.

After considering all aspects, the Committee has recommended that an amount of Rs.. 1755 Crs. be approved as the Capital Budget of KPTCL for the year 2006-07.

I wish to thank the Members of the Committee for their proactive role and valuable suggestions given during the discussions and also the convener and the staff of the Commission for extending all the cooperation and rendering assistance to carry out the delicate task of the Committee for the preparation of the Report and conducting the meetings.

Sri Chandregowda, Technical Director, KPTCL has given a separate note, which has been enclosed with the Report.

Yours faithfully
For Expert Committee

(B.G. Rudrappa)
Chairman

REPORT OF THE EXPERT COMMITTEE CONSTITUTED BY KERC TO EXAMINE THE INVESTMENT PROPOSAL OF KPTCL FOR FY 07

- 1 KPTCL submitted the ERC application to KERC vide its letter dated 30th Nov. 2005 which inter-alia, envisaged a capital investment of Rs. 2700 Cr. for the financial year 2006-07 with a target of commissioning of 365 new sub stations, augmentation of capacity in 194 sub-stations and erection of several transmission lines besides seeking upward revision of transmission tariff. KERC observed that the financial and physical targets indicated by KPTCL were several times higher than what KPTCL had achieved historically over the last four years in terms of financial out-lay and physical achievements. The Commission took a decision to have the proposals of KPTCL examined by a committee of experts.

Accordingly an Expert Committee comprising the following Members was constituted by the KERC by OM No.B/07/5/1916, Dt. 21.12.2005.

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| 1. Sri B. G. Rudrappa, Former Chairman, KEB | - | Chairman |
| 2. Sri H.R. Gopal, Former Member, KERC | - | Member |
| 3. Sri P.S. Jagannatha Gupta, Retd. CE, KPTCL | - | Member |
| 4. Technical Director, KPTCL | - | Member |
| Technical Director, KERC | - | Convener |

The terms of reference were:

The Committee may look into the following aspects while examining the budget proposals:

- Budget provision required in FY07 for works in progress keeping in view time and cost over-run.
- Examine the list of new works proposed to be taken up by KPTCL and to recommend the programme and the budget provision required to

be approved by the Commission in the ERC for FY07, keeping in view the perspective plan.

- Any other suggestions regarding the capital works programme.
- 2 The Committee met for the first time on 27th Dec. 2005 in which the officers of KPTCL were present to furnish whatever clarifications that might be required by the Committee. Thereafter, the Committee met ten times and interacted in depth with the officers of KPTCL to obtain the required clarifications and also on the discrepancies that were discovered while perusing the data furnished in the several statements submitted by KPTCL.
 - 3 The Committee after going through the documents made available to it viz., (a) The gist of the proposal of KPTCL, (b) Observations by KERC, (c) Response of KPTCL to KERC's comments, (d) The list of 365 Sub-Stations programmed to be commissioned at the rate of "one a day" (hereinafter called ERC list) and (e) the list of schemes taken up prior to 2005-06 and included for implementation during 2005-06 on hand and proposed to be taken up during 2006-07 (hereinafter called "Comprehensive List"), requested KPTCL to furnish clarifications on the following points:
 - (a) The justification for investing a large sum of Rs 2700 Crores in one year, which is more than five times the normal annual Capital outlay of KPTCL and commissioning nearly ten times the average number of stations serviced in a year over the previous four years of the 10th Plan period.
 - (b) Whether this programme for 2006-07 was based on the Perspective Plan prepared by PRDC during December 2001 for the 10th Plan period or any later version of it. If so a copy of the same was requested to be furnished to enable the Committee to review if the programme for 2006-07 conformed to the Perspective Plan covered in PRDC Report or a later version of the same.

(c) Apart from techno-economic considerations, whether the following issues have been examined:

- i. Extent of funding from loans or equity and change in the debt-equity ratio which is to be maintained in accordance with extant guidelines.
- ii. Availability of competent contractors to handle the steep increase in the quantum of works numbering 779 which are included in the Comprehensive list and are proposed to be taken up and completed, fully or partially.
- iii. Timely availability of equipment like transformers, breakers, switchgear, control panels etc.
- iv. Difficulties likely to be encountered in the acquisition of land, obtaining right of way etc. to ensure completion of schemes on schedule.

(d) Whether DPRs for the schemes have been prepared and benefit cost analysis were conducted for each scheme and clearance by TAC/TCCM as the case may be, has been obtained and inter-se priority has been fixed to take up more essential schemes in the eventuality of shortage of funds.

(e) The quantum of additional power that is estimated to be handled under the "Open Access" facility, which has been approved recently by the Commission.

(f) Whether the location of the proposed stations have been selected with the concurrence of ESCOMs

(g) Whether capital programme for the year 2006-07 fits into long term programme envisaged for the 11th Five Year Plan

4 KPTCL was prompt enough to furnish clarifications and information on the various points raised by the Committee, which enabled it to have further

fruitful discussions with KPTCL. The gist of replies given by KPTCL is indicated below:

- (a) Action plan has been prepared after taking into consideration the load forecast studies, which are approved by KPTCL. These studies are based on suppressed demand as a result of restricted power supply as well as system constraints that are prevailing in more than 150 stations. Therefore the load flow study on which the Perspective Plan is based, can be considered as conservative.
- (b) The debt: equity ratio works out to 75:25 as on 31.03.2005, which is close to the desired level of 70:30. The ratio would go up further once the proposed loan of Rs.2700 Crs is utilized during 2006-07. The Commission could relax this norm for the benefit of the sector. In some States like Tamil Nadu and Gujarat, the ratio is quite high viz., 95:5 and 100:0 respectively. Higher loan content would be beneficial to consumers as the cost of debt fund is lower than that of equity.
- (c) All the schemes cleared by TAC are to be executed on priority only. Meetings of TAC are arranged frequently to get the required clearances so that the schemes are executed on schedule. TAC does not clear projects, which are not techno-economically feasible.
- (d) The proposals for setting up of 66 KV & 110 kV stations at various locations have been formulated in consultation with ESCOMs. After commissioning of these stations losses on distribution lines will come down and the actual loss reduction can be assessed after the commissioning of these stations.
- (e) A peak load of 6495 MW is anticipated during 2006-07, with additional availability from new power stations like BTPS (500 MW) and Kudankulam Nuclear Power Plant in Tamilnadu (1000 MW). The estimated energy consumption during 2006-07 would be 38057 mus corresponding to a load factor of 0.6689. The computer studies indicate the following loss levels for 2006-07:

Voltage Level	Loss-mus	% loss over the total
400 KV	302	0.79
220 KV	670	1.76
110 KV	97	0.26
66 KV	226	0.66
Total	1545*	4.06

***Note: The figures furnished by KPTCL in its reply appear to be wrong and the total comes to 1295 and the percentage loss would be 3.40%. This needs to be verified.**

Besides reduction in energy losses likely to be achieved on the 11 KV lines under the control of ESCOMs is indicated below:

List	No. of new sub-stations	Reduction in energy loss- mus
List 1	50	147
List II (a)	11	55
List II (b)	66	301
List II (c)	312	644
Total	439	1067*

*** In this case also, the total worked out by KPTCL is incorrect and the saving would be 1147 mus.**

Note: The Comprehensive list includes the following:

List-1 refers to spill over schemes taken up before 31.3.2005. (128 nos.)

List- II (a) refers to schemes taken up during 2005-06, each costing more than Rs. 5 Crs. (35 nos.)

List- II (b) refers to schemes taken up during 2005-06, each costing less than Rs. 5 Crs. (188 nos.)

List- II(c) refers to new schemes to be taken up during 2006-07(428 nos.)

Total number of schemes- 779 nos.

The above lists are part of the comprehensive list of schemes (which are proposed to be executed during 2006-07) enclosed with ERC filing

The number of new sub-stations viz., 439 under the above four lists is at variance with the 365 stations (actually 363 stations which will be explained later) which are programmed to be commissioned during 2006-07 at the rate of one a day as per ERC list. It is presumed that the remaining stations will be commissioned during 2007-08 or later.

(f) Spare capacity required for reliability is not available in many sub stations and requires to be provided.

- (g) It is not possible to furnish details of customers who may seek open access facility at this stage.
- (h) Sufficient number of contractors are available and they would come forward to execute the works awarded to them(a list of 35 contractors enclosed).
- (i) Land acquisition procedure has been standardized and non-availability of land will not be a problem.
- (j) Procedure for tendering and release of work order has been standardized to avoid any delay in this area.
- (k) Procurement of transformers has been taken up by KPTCL itself as it will take more time for individual contractors to procure transformers. Besides timely availability of these equipment, price advantage can also be expected because of bulk purchase.
- (l) Interest of Rs. 202.50 Crs on the loan of Rs. 2700 crores is proposed to be recovered at a rate of 5.32 paise per unit on 38057 mus estimated to flow through the network during 2006-07. The loan repayment would be arranged through depreciation. The interest burden will not be immediate as there will be a 2-year moratorium on interest payment.
- (m) KPTCL has not made substantial investment during 9th & 10th Plan periods. Hence there is an urgent need to clear the backlog and strengthen the system to conform to the stringent norms prescribed by the Commission.
- (n) At present all works included in the list will be executed, as these are required to ensure reliability and reduce loss. Non-availability of funds will not be an issue.
- (o) KPTCL is not contemplating any short-term loans. (In a clarification furnished during subsequent discussions, KPTCL has indicated that it proposes to mobilize Rs. 1000 crores through IPO).

5. The Committee in the meanwhile reviewed in greater detail the various documents enclosed along with ERC filing and also the reply given by

KPTCL to KERC's preliminary observations on the ERC filing by KPTCL and these included:

(a) Comprehensive list comprising:

(i) List-I, which contains a list of 128 works, which were, commenced prior to 2005-06

(ii) List-II (a) which contains a list of 35 works each costing more than Rs.5 crores and taken up during 2005-06

(iii) List-II (b) which contains a list of 188 works each costing less than Rs.5 crores, and taken up during 2005-06.

(iv) List-II(c) which contains a list of 428 works, which are proposed to be taken up during 2006-07.

The lists include not only construction of new substations and associated lines, but also augmentation of capacity in several existing stations and erection of new lines besides some miscellaneous works such as modernization of load dispatch center, replacement of old switchgear, improvement in the protection system etc.

(b) The ERC list which contains the names of 365 stations which are programmed to be commissioned at the rate of one a day during 2006-07 (the number is actually 363 which is explained later).

(c) Perspective Plan Report prepared by PRDC on behalf of KPTCL indicating the stations to be commissioned during the 10th Plan period (hereinafter called PRDC Report).

6. The Committee also took note of the fact that KPTCL has sought a revision of tariff of ps.6.52/unit and that the value of works in progress which is expected to be Rs.800 crores at the end of 2005-06 would go up to Rs.1690 crores by the end 2006-07. It also took note of the replies furnished by KPTCL and decided initially to focus on the extent of works proposed to be taken up during 2006-07 and also on the extent of slippages that have occurred in the completion of works taken up during the previous years

and examine whether it was necessary to take up all the schemes included in the list II (c) during 2006-07 itself.

7. At the instance of the Committee, KPTCL prepared two maps one indicating the locations of existing and proposed 66 KV stations and the other of 110 KV stations. This information was useful not only for discussions but also to KPTCL to get a clearer picture of the locations of the hundreds of stations proposed to be commissioned during 2006-07.

The performance of KPTCL vis-à-vis the targets indicated in the PRDC Report was reviewed and the slippages were considerable as can be seen from the Table below:

Voltage Class	PRDC Recommendation for establishing new sub-stations year-wise						KPTCL's Actual year wise achievement/programme of commissioning new sub-stations						Backlog as on 31.03.2006
	01-02 (Base year)	02-03	03-04	04-05	05-06	Total	01-02 (Base year)	02-03	03-04	04-05	05-06	Total	
220	49	9	12	6	6	82	47	1	5	1	2	56	26
110	160	57	35	6	6	264	139	10	17	16	14	196	68
66	301	41	39	31	30	442	253	16	13	14	19	315	127
Total	510	107	86	43	42	788	439	27	35	31	35*	567	221

* estimated number to be serviced by March 06

Note: Even at the beginning of the 10th Plan period, there was slippage. Instead of 510 stations considered by PRDC, there existed only 439 stations.

8. In case KPTCL desires to clear the entire backlog accumulated over the years including the possible slippage during 2005-06, the number of stations to be commissioned during 2006-07 are indicated in the following Table:

At the end of 2005-06			
Voltage in KV	Total no. of sub-stations to be in service as recommended by PRDC	Actual achievement by KPTCL	No. of Sub-Stations to be commissioned during 2006-07
220	82	56	26
110	264	196	68

66	442	315	127
Total	788	567	221

9. It is understood that the PRDC Report was revised and a new Perspective Plan 'Version 3' was prepared by KPTCL in July 05. This report is quite comprehensive and revision in targets has been based on district-wise load forecast. A comparison of targets indicated in this Report and those indicated in PRDC Report has been made in the Table below:

Voltage Class in KV	2002-03		2003-04		2004-05		2005-06		2006-07		Total for 10 th Plan		No. of stations to be commissioned as per ERC
	PRDC	Version 3 *	PRDC	Version 3 *	PRDC	Version 3 *	PRDC	Version 3	PRDC	Version 3	PRDC	Version 3	
220	9	1	12	5	6	1	6	7	6	10	39	24	34
110	57	10	35	17	6	16	6	39	5	65	109	147	108
66	41	16	39	13	31	14	30	52	33	79	174	174	221
Total	107	27	86	35	43	31	42@	98	44	154	322	345	363 \$

Note 1: * The figures indicate actual achievement.

Note 2: @ 35 stations are anticipated to be commissioned

Note 3: \$ Though the ERC list mentions 365 stations, it is seen that item 346 mentions several stations and cannot be considered. Items 363 and 365 represent one sub-station of 110/11 KV and one of 110/33 KV at the same location viz., Kabbur. Therefore the actual target can be deemed as 363.

It can be seen from the above table that the number of stations to be commissioned during 10th Plan period has been increased from 322 to 345 under 'Version 3'. However the number of 220 KV stations to be serviced has been reduced from 39 to 24.

10. It is also to be pointed out that in accordance with PRDC Report, the total number of stations to be serviced during the 10th Plan period was 322. During the first four years of the Plan period, only 128 stations could be commissioned by KPTCL, which corresponds to a slippage of 194 stations for that period. It is also observed that at the time of the preparation of the report, PRDC assumed 510 stations to be in service. However, the number actually in service was only 439 representing a shortfall of 71 numbers. If KPTCL has to wipe off the entire backlog, the number of stations to be commissioned during 2006-07 would be (including the

target of 44 stations for the year) 265 stations. However, KPTCL is contemplating a more ambitious programme of commissioning 363 stations, which is in excess of the backlog by 98 stations. It is also relevant to note in this context that PRDC report envisaged handling of about 44725 mus during the year 2006-07 whereas, the quantum likely to be handled as projected by KPTCL is only 38057 mus.

11. 'Version 3' of the Perspective Plan prepared only 7 months ago has proposed commissioning 345 stations as compared to 322 stations recommended by PRDC Report. Even compared to this higher target, the number of stations planned to be commissioned by KPTCL during 2006-07 would be 75 numbers in excess. No specific reasons were furnished by KPTCL for adding 75 more stations over 'Version 3' or 98 stations over PRDC Report.

12. 'Version 3' of the Perspective Plan also includes the programme for commissioning of stations during the 11th Five Year Plan Period and the schedule is as indicated in the table below:

Sl. no	Voltage Class In KV	2007-08	2008-09	2009-10	2010-11	2011-12	Total
1	220	6	3	6	4	9	28
2	110	13	15	9	8	5	50
3	66	29	19	19	15	16	98
	Total	48	37	34	27	30	176

It can be seen that the target for commissioning of stations over a period of five years beyond 2006-07 is 176 numbers as compared to 363 numbers proposed to be commissioned in one year i.e., 2006-07.

13. KPTCL submitted 'Version 4' of the Perspective Plan during the course of the discussions, which was stated to have been prepared in January 06. Apparently, this document was prepared to justify the programme of commissioning 365 stations indicated by KPTCL. It is interesting to

compare the targets in this document with those of 'Version 3'. The targets for the 11th Plan period under 'Version 4' are no different from those indicated in 'Version 3'.

Voltage KV	2002-03		2003-04		04-05		05-06		06-07		Total		07-08		08-09		09-10		10-11		11-12		Total	
	V3	V4	V3	V4	V3	V4	V3	V4	V3	V4	V3	V4	V3	V4	V3	V4	V3	V4	V3	V4	V3	V4	V3	V4
220	1	1	5	5	1	1	7	2	10	22	24	31	6	6	3	3	6	6	4	4	9	9	28	28
110	10	10	17	17	16	16	39	14	65	153	147	210	13	13	15	15	9	9	8	8	5	5	50	50
66	16	16	13	13	14	14	52	19	79	150	174	190	29	29	19	19	19	19	15	15	16	16	98	98
Total	27	27	35	35	31	31	98	35	155	365	345	493	48	48	37	37	34	34	27	27	30	30	176	176

It can be seen from the above that, the target for 2005-06 has been scaled down from 98 to 35 after taking into consideration the slippage that is likely to occur during this year. However, for 2006-07, the target has been steeply raised from 155 to 365 (or 363 as explained earlier). As mentioned earlier, the basis for enhancing the targets to 363 was not furnished. However, the targets for each year of the 11th Plan period have not been altered. The Committee had its reservations about the possibility of commissioning 363 stations in one year compared to an average of less than 35 stations over the last four years and sought details of strategy from KPTCL. KPTCL officers reiterated the clarifications furnished earlier. No specific reasons were furnished for enhancing the target indicated in the Perspective Plan 'Version 3' by 75 stations.

14. The Committee discerned some more inconsistencies during discussions with KPTCL officers. Initially KPTCL had indicated that about 64 stations were overloaded and required immediate augmentation. In the clarification furnished subsequently the number of overloaded stations was increased to 150. However, from the list of augmentation schemes included in the four sections of the comprehensive list, the number came to 194. It was clarified by KPTCL that in the case of 64 stations referred to initially, the situation was so bad that it was not possible even to adhere to schedule load shedding.

15. It was difficult for the Committee to take any view on the discrepancies in the data furnished by KPTCL and it therefore sought a latest statement of peak loads of all the stations in service to get a clearer picture of overload conditions prevailing in various stations and identifying those which needed immediate relief. KPTCL was able to provide the Committee with a statement, which indicated peak loads of 542 stations as on 30.11.05. An analysis of the peak load data revealed a rather disconcerting picture. According to the established practice, action has to be taken to enhance the capacity of a station immediately after the peak load reached 70% or establish a new station close by to provide relief. By this yardstick, the number of stations that needed immediate attention by way of augmentation or by establishing a new station close by came to 390. In the opinion of the Committee, this number would further go up because maximum peak load is normally encountered during the months of February and March, when requirement of electricity from the irrigation pump sets reaches the maximum.

16. The Committee wishes to make it clear and this was mentioned during discussions also, that reliability of power supply during the failure of a transformer in any sub-station is as important as reduction of losses. The Committee stressed that it is very necessary that whatever action is required to provide relief to the fully loaded and overloaded stations should be taken up without delay. It was not possible to know whether the 390 stations, which have peak loads in excess of 70% of installed capacity, would be getting relief by adding capacity or by shifting load to the new stations. The Committee suggested that such an exercise may be carried out. This was done and such a statement was handed over at the concluding meeting.

17. As mentioned earlier, the comprehensive list contains four sections: (a) works taken up prior to 31.3.05 and not yet completed. (b) works taken up during 2005-06 and each scheme costing more than Rs. 5 crores (c) works

taken up during 2005-06 and each work costing less than Rs. 5 crores and (d) new schemes to be taken up during 2006-07. The works include new substations with associated lines, augmentation for existing stations, new transmission lines and strengthening of existing stations. Lump sum provisions are also made for miscellaneous works such as replacement of failed equipment like transformers, circuit breakers, switchgear, CTS, PTS, relays, modernization of load dispatch center etc.

18. It is normal that in the case of continuing works to indicate in the budget, the costs of the estimate (revised if necessary), outlay till the end of previous financial year, likely outlay during the current year and the balance required for the ensuing year. The Committee observed that the information furnished was not accurate and was also incomplete in many cases. Under such circumstances, it was not possible to arrive at the quantum of fund requirements in respect of several schemes to be completed during the year 2006-07.

19. It was also found during a review of the various statements that the substations, which are not included in the Comprehensive list, had found a place in the ERC list. This is a discrepancy of serious nature. In other words, there was no budget provision at all for those stations, which are planned to be serviced during 2006-07. With a view to have a cross check on the status of various projects, the Committee sought a copy of progress monitoring report for capital works and it was observed that this report which was prepared as late as in December 2005, comprised a review of only 153 works, as compared to about 351 ongoing works included in list I, list II (a) and list II (b).

20. The Committee had therefore no option but to go into greater details. A criticism has been made in one of the letters from KPTCL that the Committee was going into micro details, thus delaying the execution of projects. The Committee wishes to point out that it has the responsibility to

present a correct status of the schemes proposed to be taken up during 2006-07 and also a correct picture of the fund requirement for implementing them to the Commission particularly in view of the fact that a hefty investment of Rs. 2700 crores has been proposed. Besides, it has a direct impact on the tariff, which affects the consumers at large. KERC on its part, is required under the Statute to safeguard the interests of consumers, consistent with quality of supply and at the same time ensure that the utility does not sustain loss, except on account of its own lapses. The task of reviewing the schemes has been assigned to the Committee and it had no option but to go into greater details particularly in the face of inconsistencies and discrepancies discerned in the information made available to the Committee.

21. Though obvious, the Committee would stress that the preparation of capital budget is a delicate exercise particularly in respect of the power sector, which is capital intensive. Provision in excess of the requirement is as undesirable as under provision, though to a lesser extent. When an investment of this order is contemplated, risk factors have to be taken into account to avoid any investment becoming redundant or not contributing to reduction of loss. Reliability is relatively an abstract factor and an element of subjectivity could creep in resulting in a higher expenditure. It is therefore necessary to optimize the investment to minimize burden on the consumers. Though KPTCL has stated that all works are urgent and prioritization is not essential, pragmatism necessitates preparation of a priority list so that works, which are more essential, are taken up in the eventuality of fund shortage or due to other unforeseen factors.

22. At the instance of the Committee, KPTCL prepared a set of revised statements which include:

- (a) The estimated cost of the scheme
- (b) Outlay till the end of 2004-05

(c) Expected outlay during 2005-06

(d) Likely fund requirements for all the ongoing works included in List I, II (a) & II (b).

It was found that the revised fund requirement was at variance with figures furnished initially as shown in the following Table:

Amounts in Rs. crores							
Sl. No	List	Details furnished along with ERC		Revised details furnished by KPTCL at the instance of the Committee			
		Estimated cost	Provision sought for 2006-07	Estimated cost	Expenditure incurred up to the end of 31.03.2005	Provisional outlay till end of 2005-06	Provision for 2006-07
1	1	Not furnished	559.02	1146.22*	261.29	364.39	496.48 247.45@
2	2(a)	492.26	262.82	531.73	5.47	69.32	441.75
3	2(b)	376.31	254.16	425.67	1.72	151.15	267.25
4	2(c)	2424.71	1624.00	2424.71			1624.00

*The provisions sought for miscellaneous schemes which inter-alia include replacement of old switchgear, circuit breakers, failed power transformers, providing intermediate towers, modernization of load dispatch center etc. to an extent of Rs. 247.45@ crores is not included in this amount.

23. The Committee observed that the estimates have been revised upwards and the fund requirement for the year 2006-07 have been increased significantly. The requirement of funds for the on-going works in list 1 was indicated as Rs. 311.57 crores (559.02-247.45) and this has been increased to Rs. 496.48 crores for the year 2006-07 even after enhancing the provision for the year 2005-06 to a large extent. Similarly, in the case of works in list II (a) (taken up during 2005-06, and each scheme costing more than Rs. 5 crores), the requirement of funds has been enhanced from 262.82 crores to Rs. 441.75 crores. In the case of list II(b) works taken up during 2005-06 and each scheme costing less than Rs. 5 crores, the fund requirement sought now is Rs. 267.25 crores as against Rs. 254.16 crores requested earlier.

24. In regard to 428 new schemes proposed to be taken up during 2006-07, KPTCL has retained the same figures viz., 2424.71 crores and Rs. 1624 crores as the estimated cost and fund requirement respectively. KPTCL has also submitted a list of transmission line works to be carried out during 2006-07. This list contains 35 works estimated to cost Rs. 294 crores and a provision of Rs. 91 crores has been indicated for the year 2006-07. Adequate transmission system is very crucial to the health of the network. While 66 KV and 110 KV stations help reduce the losses on the 11 KV feeders and additional transmission lines contribute to reduction of losses in the KPTCL network. Therefore, priority has to be given to ensure that the load on any particular transmission line is limited to rated capacity so that the loss on the line is within permissible limits.

25. It can therefore be summarised that with the amount of works in progress at Rs. 800 Crs., quite a few schemes will spill over to the year 2007-08 and beyond. It is relevant in this context to point out the value amounting to Rs. 800 crores is rather high. Yet another serious discrepancy came to the notice of the Committee. 17 stations, which are included in the ERC list, and programmed to be commissioned during 2006-07 do not find a place at all in the Comprehensive list of works. This implies that there is no provision in the budget even though these are programmed to be commissioned during 2006-07 and the names of these stations are:

1. Ilwala (7)
2. Devalapura (91)
3. Hulki Cross (116)
4. Handiganur (186)
5. Biselahalli (209)
6. Giryapura (211)
7. Nelamangala (247)
8. Bagalkot New (341)
9. Sulkunte (348)
10. Manchanakuppe (349)

11. Kultagalu (350)
12. Hujjanahalli (351)
13. Nagawara (352)
14. Manyaltha (353)
15. Kabbur 110/11KV(357)
16. Kabbur 110/33 KV (354)
17. Mannahalli (363)

Note: Figures in bracket indicate the sl.no. of the station in the list of 365 schemes provided by KPTCL which are proposed to be commissioned during 2006-07 at the rate of one each day of the year

KPTCL tried to clarify that the scheme for Nelamangala, is included in the comprehensive list as Dobbaspeta etc. Still the discrepancy prevails and it is necessary that even the revised budget provisions have to be revised further, or the implementation dates of these stations reviewed.

26. The Committee also desired to carry out a sample review of the schemes proposed (augmentation as well as new stations) on district wise basis and requested that the proposed schemes may be marked on a topo map and impressed on KPTCL that such maps would be very useful to KPTCL itself. After reviewing the proposed projects for Kolar and Bijapur districts, it was observed that a capacity addition of 800 MVA for Kolar was on the higher side. However on going through in greater detail, it was found that the schemes proposed were more or less in order, though there was scope for a few stations to be commissioned during 2007-08. At the same time it was noted that a few existing stations still needed support during 2006-07, but no proposal was included in the budget. A similar exercise was carried out for Bijapur District and it was found that the proposals were generally in order and commissioning of one or two stations could be postponed to the following year.

27. It is suggested that KPTCL carry out similar exercises for all the districts and these are reviewed by TAC or another sub-committee which could add or defer some schemes for implementation to a later date depending on

the urgency or otherwise. It is also necessary to verify if every station, which has reached a peak load corresponding to 70% of the installed capacity, is provided with relief either in the form of augmentation of capacity or from a new sub-station. The Committee considers it necessary to provide requisite funds sought for augmentation under lists I, II (a), II (b) as per the revised statements the total requirement of which comes to Rs. 1205.48 crores. The provisions sought for in the ERC application was however Rs. 829 crores. Additional requirements may have to be met by reallocation of the required amount from the provision of Rs. 1624 crores made for works in list II (c).

28. KPTCL has included 58 augmentation works in List II (c), the original cost of which is indicated as 134.14 crores. But the fund requirement is shown as Rs. 151.35 crores. On a review of the list, it is observed that the same amount have been provided for each type of scheme depending on the extent of capacity addition. Apparently, detailed estimates are yet to be prepared. Nevertheless, it is necessary that these works are taken up on priority and the funds recommended for new works to be taken up during 2006-07 are earmarked primarily for these schemes and balance to other works.

29. In list I, a sum of Rs. 247.25 crores had been provided for miscellaneous works referred to earlier. The Committee recommends a provision of Rs. 60 crores, for these works, a portion of which can be utilized for taking initial steps for modernization of Load Dispatch Centre such as engaging consultants for defining the scope and preparing specifications.

30. The action taken by KPTCL to procure about 700 transformers of various capacities and voltages, which have the longest lead time, to ensure timely completion of works is a step in the right direction. However care has to be exercised to schedule the supply of transformers in such a way that the transformers received are not kept idle. It is possible in the view of

the Committee to have some of the transformers supplied during 2007-08 without impairing the programme for 2006-07.

31. In the course of furnishing clarification, KPTCL has indicated the loss levels at various voltages that are likely to take place during 2006-07 (see para 4 e). The Committee observed that the total quantum of losses at 220 KV is 670 mus and that in the 110 and 66 KV levels is 97 mus and 226 mus respectively. All the power received at 220 KV has to flow through 110 and 66 KV networks, barring a very small quantity on account of 220 KV consumers. The combined loss of 66 and 110 KV systems works out to 0.92%, which is far lower than the loss level on 220 KV System. Further studies may be conducted to verify the figures, as this will have an impact on the tariff.

32. KPTCL has mentioned that while the loss levels in its network would remain more or less at the same level at around 4% in spite of the massive investment because of the increased flow of power during 2006-07, substantial energy loss reduction is expected on 11 KV side as the insertion of a 66 or 110 KV station at right locations reduces not only the length of the 11 KV feeders, but also the quantum of power transmitted. According to KPTCL, 1147 mus would be the saving. Naturally, the benefits will have to be passed on to the consumers. According to a rough calculation, the ultimate increase in tariff would be minimal, because additional expenses towards interest, depreciation, O&M costs are offset by reduction in the cost of purchase because of reduced requirement of electricity. This aspect has to be taken into account during tariff revision.

33. According to ERC list, 34 numbers of 220 KV stations are proposed to be commissioned during 2006-07. This compares with 1 to 5 stations serviced over the past four years. Besides, 'Version 3' envisages only 24 numbers of 220 KV stations, out of which 13 stations have been commissioned. Discussions with KPTCL officers revealed that there is scope to postpone

commissioning of several stations to the following year/s and thus bring down the capital expenditure during 2006-07.

34. In the ERC filing, KPTCL has indicated that the value of works in progress at the end of 2006-07 would be Rs. 1693 crores and this is a steep increase over the Rs. 800 crores estimated value of WIP at the end of 2005-06. It is true that WIP will be in some proportion to the capital expenditure during the year. Still the norm is around 20% of the capital budget. With concerted efforts and careful scheduling of procurement and works, it is possible to achieve the target and reduce the financial burden.
35. Finally, KPTCL is very keen to clear up the backlog of various schemes, some of which were started several years ago and not yet completed. It is equally particular to enhance reliability and reduce losses both at the transmission and distribution levels. To achieve these objectives, it intends to incur a capital expenditure of Rs. 2700 Crs. during 2006-07, which is five times the average capital outlay incurred over the last four years. The physical targets are even more stringent. 365 new stations are programmed to be serviced which is about ten times the average annual achievement over the previous four to five years. It has set upon itself a tremendous task. This needs to be appreciated. However it is to be recognized that there are many unforeseen obstacles, one of the most important amongst them being the fund availability. Initially it had mentioned that there will be no difficulty in mobilizing the funds and that PFC & REC have assured whatever assistance is required would be forthcoming. Nevertheless, in the statement submitted to the Commission, it had been mentioned that about Rs. 220 crores would be mobilized in the form of short-term loans during 2005-06. When clarifications were sought, KPTCL has replied that the short-term loan was in the nature of bridge finance. It also clarified that it is attempting to mobilize about Rs. 1000 crores through IPO. It was revealed that this issue is pending with the Government. The Committee still has reservations about KPTCL

- succeeding to collect Rs. 1000 Crs. through IPO because of the several formalities involved. The Committee anticipates difficulties in mobilising even Rs. 1755 crores, which is being recommended as the capital budget for the year 2006-07.
36. Funding is only one of the problems in the execution of schemes on such a massive scale. The in-house capability to attend to various activities such as drawing specifications, processing of tenders, placing of orders, monitoring the progress of works will have to be strengthened. Mere creation of posts will not suffice. Persons with adequate capability are required and they may be in short supply.
37. Acquisition of land and getting the right of way for transmission lines is not going to be an easy task either, in spite of streamlining the procedure. The limitations of contractors and delay in the execution of works due to disputes cannot be ignored. No doubt, KPTCL has furnished a list of 35 contractors. Once having accepted the contract, there are possibilities of at least some of them raising disputes and delaying the works.
38. Lastly, monitoring of 779 works is not an easy task. The Committee observed open endedness in respect of several schemes in the Progress Review Report prepared as late as in December 2005. Nevertheless, the Committee has recommended a budget of Rs. 1755 crores, for the year 2006-07, considering the anxiety of KPTCL to clear the backlog and the measures it proposes to streamline the procedures and expedite the works. Capital Budget has to be deemed as a sacred document. While it is true that deviations are inevitable, these should be kept within reasonable limits say less than 10%, be it financial or physical targets.
39. The fund requirement for various works which can be deemed as essential based on the revised statements submitted by KPTCL is summarised as follows:

Sl.No.	List	Particulars	Amount in Rs. Crs.
1	List 1	Sub-stations and lines(on-going)	496.48
2	List 1	Miscellaneous works	60.00
3	List II (a)	Works taken up during 2005-06 (each scheme costing more than Rs. 5 Crs.)	441.75
4	List II (b)	Works taken up during 2005-06 (each scheme costing less than Rs. 5 Crs.)	267.25
5	List II (c)	Works proposed to be taken up during 2006-07- Augmentation of station capacities	151.35
6	List II (c)	Works proposed to be taken up during 2006-07- Transmission lines	91.00
	Total		1507.83

If the total allocation is limited to Rs. 1755 Crs. the allocation for new works to be taken up during 2006-07 will be Rs. 253.17 Crs.

The Committee noted that the revised fund requirement statements have not been submitted formally, though these can be considered as more realistic than the original ones. Therefore, amounts indicated above are at variance with the final recommendations made in the Report, which are based on the amounts indicated in the ERC filing and can only be considered by the Commission.

Under the circumstances, Rs. 1755 Crs. recommended to be invested can be utilized in the following order of priority:

1. (a) All schemes which are included in List 1 (excepting item 1-10) so that all ongoing schemes are completed. KPTCL may defer some schemes, if it considers them as not being urgent
(b) Miscellaneous works included in list 1 (items 1-10)
2. Most of the schemes included in List II (a) and II (b)
3. Augmentation of station capacities included in List II (c)
4. Transmission line works included in List II (c)
5. Stations included in list II (c) to the extent of funds available after meeting the requirements of items 1 to 4 above.

Conclusions & Recommendations of the Expert Committee on Investment Proposal of KPTCL for FY 07

1. After detailed examination of the proposals submitted by KPTCL and taking into account clarifications furnished during several discussions, the Committee recommends that all the 118 schemes (excluding items 1 to 10) included in Annex 1 of the Comprehensive list which had been taken up for implementation prior to 31.03.2005 are commissioned during 2006-07 and the budget sought for in the ERC filing to an extent of Rs. 312 (559.00-247.00)crores by KPTCL can be accepted.
2. Annex II (a) contains 35 schemes (each costing more than Rs.5 crores), which were proposed to be implemented during 2005-06. It is necessary that most of the works included in the list are put to service during 2006-07. The provision sought for these schemes in the ERC filing is Rs. 263 crores which may be accepted.
3. Annex II (b) contains 188 schemes (each costing less than Rs.5 crores) which were also proposed to be implemented during 2005-06. It is necessary that all these schemes are commissioned by 2006-07. The fund sought for is Rs. 254 crores, which may be accepted.
4. Hence, the total budget sought for the backlog works in Annex I, Annex II (a) and II (b) is Rs. 829 crores. However, the Committee came to know during discussions that the requirement would be more than the amount indicated above, on account of (a) cost escalation, (b) change of scope, and (c) understatement of provision for the year 2006-07. The Committee is of the view that an additional provision of around Rs. 200 cores would be required over and above the provision sought for, which makes for a total provision for these works to Rs. 1029 crores.
5. Annex II(c) includes 428 schemes, which are proposed to be taken up during 2006-07. Out of these, 58 schemes envisage augmentation of

capacity to the existing stations, which are necessary. The proposal to incur an expenditure of Rs. 151 crores for these works during 2006-07 may be accepted. As regards the other schemes, the works may be prioritized and adequate funds provided for works to be completed during the year and minimum funds provided for schemes which are programmed to be commissioned during 2007-08, for the purpose of land acquisition, survey, soil testing etc.

6. In Annex I, out of the 128 schemes, 10 schemes are of general nature such as replacement of failed equipment, modernization of stations, Load Dispatch center, civil engineering works for which a provision of Rs. 248 crores has been made. The Committee deliberated on the extent of funds that are earmarked for this purpose. It was revealed that only Rs. 16.41 crores had been spent during the first six months of the year 2005-06. The Committee understood that there is urgent need to replace several old equipment and recommends a sum of Rs. 60 crores for the year 2006-07. The modernization work of LDC and communication could be initiated in 2006-07 and completed in 2007-08.

7. The total cost of the schemes included in Annex II (c) is indicated as Rs. 2424 crores (including Rs. 151 crores for augmentation of stations and the outlay proposed to be incurred is Rs. 1624 crores. This implies that the amount of works completed would be Rs. 800 crores. The committee has already recommended that Rs. 151 crores be provided for augmentation schemes included in this list. The expenditure for the balance works may be limited to Rs. 515 crores. The Committee is more or less convinced that most of the schemes in list II (c) need to be taken up and as many station and lines should be commissioned during 2006-07 and this can be achieved by minimizing the investment during 2006-07 on schemes to be commissioned during 2007-08, thus reducing the amount of work in progress to the barest minimum. **Thus, the total allocation recommended for 2006-07 would come to Rs. 1755.00 crores (including outlay in respect**

- of schemes of general nature) and this is still more than 3 times the average fund utilized during the previous year.** The Committee is of the view that a considerable amount of planning, programming and monitoring would be necessary to achieve an outlay of this magnitude.
8. During the course of the deliberations it was revealed that most stations have recorded peak loads in excess of 70% of capacity and there are still some stations, which need relief by KPTCL. Priority needs to be given for such works.
 9. It is understood that advance action has been taken for procurement of a large number of transformers of different sizes and voltages to expedite commissioning of stations. It is necessary that the procurement schedule is so adjusted that the transformers are not kept idle for long periods. The possibility of rescheduling the supply of transformers to the following year (2007-08) may have to be examined considering the fact that 127 transformers are being released in the augmentation programme.
 10. KPTCL has stated that 1112 MU is the savings in energy due to implementation of these works. It is also stated that most of the benefits accrue to ESCOMs due to shortening of 11 KV lines. The benefit of energy savings due to this investment has to be taken into consideration in the ERCs of ESCOMs and KPTCL.
 11. In the power sector, it is not appropriate to prepare a program of capital works in isolation for one particular year. Such a programme should fit into a plan conceived over a period of five years. The proposal to the Commission may have to include schemes envisaged over a time horizon of five years.
 12. The statements and information furnished by KPTCL to the Commission and to the Committee were found to be lacking in consistency and

contained many errors. Most of the statements were revised by KPTCL during the course of the meetings. Greater attention is required in the preparation of statements and furnishing of information.

Sd/-
V.M. Chandregowda
Member

Sd/-
P.S. Jagannatha Gupta
Member

Sd/-
H.R. Gopal
Member

Sd/-
B.G. Rudrappa
Chairman

A separate note has been enclosed on behalf of KPTCL, which may please be considered as part of this report

Sd/-
V.M. Chandregowda
DT KPTCL

KARNATAKA POWER TRANSMISSION CORPORATION LIMITED

Dated: 10.02.2006

NOTE

Sub: Capital Investment programme for 2006-07

At the outset, I thank KERC for the Honour of making me the member of expert committee. Also, I thank Honorable Chairman and other members of the expert committee for the brain storming sessions.

It has been noticed that due to lack of far sighted planning, lack of proper methodology in carrying out the works in bygone years has resulted in inadequate infrastructure, that we are witnessing these days. Electrical utilities in Karnataka are not geared up to meet the load growth, 24 hours (single phase) power supply in rural areas, which call for strengthening of the infrastructure facilities in Electricity, in a big way. In the previous years, the progress achieved year by year is so small that instead of improving the facilities, big gap is created between achievement and to be achieved. A case in point is that Electrical utilities fell short of around 300 sub-stations (66 KV class, 110 kV class, 220 KV class).

Hence KPTCL has embarked upon the ambitious programme of planning capital investment plan of Rs. 2700 Crores and commissioning 365 Sub-Stations during the financial year 2006-07.

The perspective plan for the 10th and 11th five year plan projected (version - 4) indicated a backlog of more than 300 Sub-Stations at the end of 10th plan period. Implementing the backlog works is essential to meet the load growth and cater quality power supply to consumers, in accordance with KERC guidelines.

The ERC filing consists of Augmentation of 189 Sub-Stations, most of them are overloaded. Overloading results in load shedding in the Rural areas. Further there will be no cushion for load growth in these Sub-Stations.

Another important factor to be reckoned, is the load growth and spreading of Industries to various parts of Karnataka. The load growth ranges from 4.67 to 14% in Bangalore Metropolitan area. However, in reality load growth in certain parts of Bangalore Metropolitan area, is much more than 14% due to growth of IT/BT sectors and other loads. Hence Government of Karnataka is diversifying the IT/BT and connected industries to other cities of Karnataka, viz Mysore, Mangalore, Hubli etc..

Also, the following points are to be reckoned in this context.

I). The standard prescribed by CEA for capital investment in generation, Transmission & Distribution is in the ratio of 2:1:1 to have fairly good reliability and to maintain T&D losses within 15%.

II). The ratio of investment made on Generation and T&D in Karnataka during the 9th Plan is 52.92:28.60, against the national average of 38.13:44.97.

III). The investment during the other period is also low on T&D in Karnataka

IV). The ratio of Sub-Station per unit area between Karnataka & Andhra Pradesh is as follows:

(As per FY-05)

Sl. No.	State	Area in Sq. KM	No. of Sub-Stations in including 33 KV Sub-Stations	Average area covered by each Sub-Stations (Sq. KM)
1	Karnataka	1,92,0000	805	239
2	Andhra Pradesh	2,75,000	2915	94

Above figures indicate that the area covered by each Sub-Station in Andhra Pradesh is much less compared to that in Karnataka. This effectively reduces the length of 11 KV lines and results in loss reduction.

V). The no of Sub-Station that were existing as on March 205 in Karnataka and Andhra Pradesh is as follows:

Sub-Stations

Voltage Class	Karnataka	Andhra Pradesh	
400 KV	4	6	
220 KV	54	79	
110 KV	182	239	
66 KV	301		
33 KV	264	2591	
Total	805	2915	

Transmission Lines

Voltage Class	Karnataka	Andhra Pradesh	
400 KV	1977.844	2645	
220 KV	8351.115	11519	
110 KV	7182.89	13772	
66 KV	7348.69	-	
33 KV	7176.00	34582	
Total	32036.54	62518	

VI) The capital investment proportion of generation to Transmission is 2.61:2.0 against Karnataka ratio 3.25:1.0.

From the above, it can be surmised that development of infrastructure in all parts of Karnataka is of paramount importance.

In the foregoing circumstances, that a comprehensive & a huge programme like this one is very much necessary to create infrastructure.

Further in Annexure II (c) of ERC, a number of new works included, which will be commenced during 2006-07 and some of them will be spilled over to 2007-08. This includes 47 nos of new Sub-Station in Bangalore City. 34 nos Bangalore Rural District, 32 nos in Kolar District etc. Unless these works not commenced, once

again the backlog will continue, which will be very difficult at a later stage to bring it to even terms.

Another aspect is, modernization of various systems ie Automation, SCADA, Retrofitting etc., If these are not done, the technology in our system will become obsolete in course of time.

Further the following measures have been adopted for speeding up of works.

- I) The land acquisition process have been simplified.
- II) Immediate action is being taken to tender the proposals which are cleared by TAC.
- III) Tenderers lists are also finalized.
- IV) Procurement of Transformers for the Turnkey works is assured by KPTCL, as it will take much time for the contractors to procure power transformers individually. With these arrangements, the gestation period for 220 KV & 110/66 KV Sub-Stations is reduced to 12 months & 7 months respectively.

Hence it is once again requested that the programme in complete form may be approved.

There has been repeated reference to ability of KPTCL to raise to the occasion. With all humility, I wish to reiterate that with modern Techniques in the method of Tendering i.e. E-tendering, ordering power transformers separately etc., KPTCL is going to achieve the targets set.

Sd/
Member, Expert Committee, KERC
&
Director (Transmission)
KPTCL