

**Before the Karnataka Electricity Regulatory Commission  
Bangalore**

**Dated the 10<sup>th</sup> Day of October 2003**

**Present**

- 1. Shri Philipose Matthai      Chairman**
- 2. Shri H.S.Subramanya      Member – I**
- 3. Shri S.D.Ukkali              Member - II**

**Subject:              In the matter of the draft PPA of  
                                 Yelahanka Diesel Generating Station**

**Between**

**Karnataka Power Transmission Corporation Ltd.,**

**&**

**M/s Visvesvaraya Vidyuth Nigama Limited (VVNL)**

**Which PPA has been submitted to this Commission seeking approval  
contemplated under the KER Act 1999.**

- Parties to the cause:**
- 1) Managing Director  
Karnataka Power Transmission Corporation Ltd.,  
Cauvery Bhavan, K.G.Road  
Bangalore –560 009.**
  - 2) Managing Director  
Visvesvaraya Vidyuth Nigama Limited  
Yelahanka  
Bangalore-560 064.**



## Yelahanka Diesel Generating Station

### Preamble:

1. The following Power stations are presently owned and operated by Visvesvaraya Vidyuth Nigama Limited (VVNL):

Sl. No.	Name of Power station	Year of Commissioning	Installed capacity
1	K. Seshadri Iyer Hydro Electric Generating Station, Sivasamudram	1902	42 MW
2	Shimsha Hydro Electric Generating Station	1940	17.2 MW
3	Mahatma Gandhi Hydro Electric Generating Station, Jog	1947 – 52	120 MW
4	Munirabad Hydro Electric Generating Station	1962 – 65	28 MW
5	Yelahanka Diesel Generating Station	1993-94	127.92 MW

2. The above generating stations, as can be seen, were set up long ago and some of them even prior to the formation of the erstwhile KEB. These stations were transferred from the erstwhile KEB to VVNL under the terms of the Statutory first transfer scheme. When the stations were part of the KEB, the question of separate power purchase agreements for purchase of power from these stations did not arise. The operating expenses of these stations were part of the overall KEB budget. Now that the stations have come under the ownership and operation of VVNL under the provisions of the statutory transfer scheme, a formal power purchase agreement between KPTCL and VVNL is required under the provision of the KER Act.

3. The Commission stated in its Tariff Order 2003 that it does not view this as a case of a new supplier company entering into an agreement with the licensee without taking the prior approval of the Commission, but as a case of formally covering by a PPA, an arrangement that has been in force for a number of years. The Commission further stated in the Order that it did not desire to permit VVNL to continue indefinitely without a formal PPA and accordingly directed KPTCL to furnish the PPA to cover the purchases from VVNL within three months from the date of the Tariff Order 2003 issued on 10<sup>th</sup> March 2003.

### **Filing of the Draft PPA by KPTCL**

4. In accordance with the directive issued in the Tariff Order 2003, KPTCL filed a draft PPA initialed with VVNL in respect of the DG plant at Yelahanka vide its letter No.KPTCL/B-36/5703/T-1/10/74-76 dated 19.4.2003 for approval of the Commission under Section 25 (3), read with Section 17 (1) of the KER Act.

5. The draft PPAs in respect of the Hydro stations under the control of VVNL are yet to be filed with the Commission for approval.

6. Subsequent to furnishing of the above draft PPA of DG Plant, the Electricity Act 2003 has come into force with effect from 10<sup>th</sup> June 2003.

Section 61 (a) of the Electricity Act 2003 provides that, the Appropriate Commission shall, subject to the provisions of this Act specify the terms and conditions for the determination of Tariff and in doing so shall be guided by the principles and methodologies specified by the Central Commission for determination of the Tariff applicable to generating companies and transmission licensees. Further, Section 62 (1) of the Act provides among other things, that the Appropriate Commission shall determine the Tariff in accordance with the provisions of the Act for supply of electricity by a generating company to a distribution licensee. Sub-section (b) of Section 86 of the Act dealing with the functions of the State Commission further provides that, the State Commission shall regulate electricity purchase and procurement process of distribution licensees including the price at which electricity shall be procured from the generating companies or licensees or from other sources through agreements for purchase of power for distribution and supply within the State.

7. Presently, all the power purchase agreements have been entered into by the State Transmission Utility (KPTCL) for purchase of power from various sources. However, as per the provisions in the Electricity Act 2003, the State Transmission Utility /Transmission licensee shall not engage itself in the business of trading. The distribution licensees will therefore be required to enter into

power purchase agreements with generating companies or trading licensees after the STU/ Transmission Licensee is divested of the trading activity. The proviso under Section 61 of the Electricity Act 2003 provides that the terms and conditions for determination of Tariff under the Electricity (Supply) Act, 1948, the Electricity Regulatory Commission's Act 1998 and the Enactments specified in the Schedule (which also includes KER Act 1999) as they stood immediately before the enactment of the Electricity Act 2003 shall continue to apply for a period of one year or until the terms and conditions for tariff are specified under this section whichever is earlier. Section 61 also provides that the Appropriate Commission shall, subject to the provisions of the Act, specify the terms and conditions for the determination of tariff and in doing so, shall be guided by the principles and methodologies specified by the Central Commission for the determination of tariff applicable to generating companies and transmission licensees. In this connection the Central Commission is yet to prescribe the principles and methodologies for determination of tariff for generating companies. Similarly, the Commission is also yet to prescribe the terms and conditions under the provisions of Section 61.

8. From the accounts of VVNL for the years 2000-01, 2001-02 and 2002-03 (provisional) the Commission notes that the accounts have been drawn considering the tariff for sale of energy on the basis of an MOU entered into between VVNL and KPTCL. KPTCL had proposed the tariff based on the MOU between KPTCL and VVNL in the ERCs for the above period which the Commission has considered and allowed the same provisionally in the ERCs approved by the Commission. If the norms approved by the Commission in the present order are applied to Yelahanka Diesel Plant retrospectively from 1.4.2000 it may significantly alter the financial statements of VVNL and KPTCL for the above period. VVNL and KPTCL being companies completely owned by the State Government, any retrospective revision in the tariff for sale of energy by Yelahanka Diesel plant for the above period would be revenue neutral. **Therefore, the Commission considers it appropriate and approves to apply the norms indicated in this Order for the tariff applicable for**

**sale of energy by VVNL to KPTCL for the period commencing from 1.4.2003 until further orders.**

9. The draft PPA in respect of the Yelahanka Diesel Generating station is approved subject to the condition that the PPA would stand assigned to the particular Distribution licensee/electricity trader who will buy power from the Yelahanka Diesel generating plant when such change takes place,

**Salient features of the Draft PPA**

10. The salient features of the Draft PPA are as follows:

A	Installed capacity	6 units of 18 MW each – Total 108 MW
B	Plant Load Factor	72.5% on the basis of installed capacity of 108 MW for recovery of full annual fixed charges. Below this normative value of PLF, payment of fixed charge will be reduced on pro rata basis.
C	Incentive	Annual incentive payments – the total incentive to be computed at the end of each billing month at the rate of Re.0.40/KWH for every additional KWH delivered at the interconnection point beyond a PLF of 72.5%.
D	Operating Norms 1. Station heat rate 2. Auxiliary consumption 3. Lube oil consumption	1995 Kcal/KWH of gross generation  4.5% or actual auxiliary consumption, whichever is lower  1.1 gms/KWH or actual consumption, whichever is lower
E	Deemed Generation	Shall be allowed to the extent the PLF (computed without Deemed generation) falls short of 72.5%
F	Return on equity	16% of equity
G	O&M and Insurance expenses	Average of actual for the period 1998-99 to 2001-02 considered as base, exclusive of insurance expenses and non-recurring expenses. To be escalated in each subsequent year after the 1 <sup>st</sup> Tariff year by 6% plus O&M charge adjustment
H	Letter of credit (LOC)	KPTCL to provide LOC equal to 1.5 months projected payment on 72.5% PLF.

11. The Commission examined the draft PPA and sought clarifications vide its letter No.S/02/3/829 dated 1.5.2003 on issues such as installed capacity, dates of commercial operation of individual units, operational and financial norms, performance details for the past 10 years, involvement of KPTCL in fuel procurement, etc. KPTCL was also requested to furnish copy of the project report, existing fuel supply agreement, performance test report etc. A Draft Notice was also forwarded to KPTCL along with the same letter for arranging publication to call for objections from the public within one week from the date of receipt of the letter.

12. KPTCL arranged for publication of the notice on 16.7.2003 and 17.7.2003 inviting objections from the public. No objections were received from the public within the due date fixed for receiving objections, viz., 16.8.2003. However, Mysore Grahakara Parishat (Regd), represented to the Commission vide their undated letter received in the Commission's office on 28.8.2003 that "summary of the proposal" was not made available to them by KPTCL on their representation dated 29.7.2003 and requested the Commission to direct KPTCL to make available the documents for enabling them to file their objections within a week's time from the date of receipt of the said documents. A copy of the representation filed by Mysore Grahakara Parishat (Regd) was forwarded to KPTCL with directions to comply with their request. Mysore Grahakara Parishat (Regd) filed their objections dated 3-9-03 and the same was received by the Commission on 15-9-03 and forwarded to KPTCL on the same day for filing a rejoinder to the objector. As on the date of this order KPTCL has not furnished to the Commission copy of their rejoinder if any sent to the objector in spite of reminder. The Commission has however considered the following objections raised by M/s. Mysore Grahakara Parishat (Regd):

- a) The draft PPA filed for approval does not contain the quantity and sale price offered and the terms and conditions for the purchase of power. Hence it is not qualified for consideration by the Hon'ble Commission and any proceeding on the application will be a wasted exercise.
- b) The clauses and covenants in the draft agreement are loosely constructed and mutually contradictory which will make the implementation very difficult and will lead to misinterpretation and disputes at every step.

The Commission notes that the terms and conditions have in fact been furnished in the draft PPA and sample calculation of tariff has been furnished to the Commission subsequently. The terms and conditions and other provisions in the PPA have been examined by the Commission and are discussed in this order.

13. KPTCL furnished their clarifications on various points raised by the Commission vide their letter No.KPTCL/B-36/5703/T-1/10-386 of 15.7.2003. Some additional technical information and details regarding clearance of CEA for estimated project cost of Rs.122.03 crores, completed project cost and other financial particulars etc. were also obtained from VVNL in respect of the Yelahanka Diesel Generating Plant.

**Discussions and Commission's decisions:**

14. CEA issued an Office Memorandum vide 1-3(2)/95-Secy/ dated 14<sup>th</sup> December 1995 on norms for operation of Diesel Engine Generating Stations in exercise of powers conferred by Sub Section (2) of Section 43A of the Electricity (Supply) Act 1948, subject to subsequent modifications if any, in accordance with which the tariff for sale of electricity by Generating Companies to the Board and to other persons shall be determined.

15. Subsequently, CEA issued another Office Memorandum vide No: 1-3(3)/07-Secy/DG dated 4<sup>th</sup> February 1997 in exercise of the same powers as above, in supersession of relevant norms laid down vide Office Memorandum dated 14-12-1995, again subject to subsequent modifications, if any.

16. The above Norms of CEA dated 1997 were adopted by CERC and circulated inviting objections or comments from interested persons in order to determine the terms and conditions of Tariff for the period 1-4-2001 to 31-3-2004. However, the Notification issued by CERC dated 26-3-2001 does not contain the norms in respect of Diesel Engine Generating Stations.

17. In this connection, the Commission notes that the GOI has omitted sub-section (2) of Section 43 (A) of ES Act (1948) in so far as State of Karnataka is



concerned w.e.f 14-9-2000. In the light of this, the Commission considers the above OMs dated 1995 and 1997 issued by CEA as guidelines only for arriving at operational and other financial norms that could reasonably be adopted for fixation of tariff.

**Installed Capacity:**

18. This term is defined in the Draft PPA as follows:

“The installed capacity of each unit shall be 18 MW. The installed capacity for the facility will be the product of Installed capacity of each unit and the No. units in the facility i.e., 108 MW”. In the Recitals of the draft PPA also, the total capacity of the power station is mentioned as 108 MW. In the single line diagram of the power plant annexed to the draft PPA, the capacity is indicated as 120 MW. In the daily load sheets furnished to the Commission by the Load Despatch center, the installed capacity of the Yelahanka Diesel Generating Plant is indicated as 127.92 MW.

19. On seeking the clarification on this point, KPTCL have stated in their letter dated 15-7-2003 that “ The detailed project report of the plant envisaged setting up of 6 units of 21.32 MW totaling to a capacity of 127.92 MW. The units were installed, tested and commissioned for a capacity of 127.92 MW. However, the manufacturer of the DG set namely viz., M/s. SEMT Pielstick, France has recommended to operate these engines at an optimum power i.e., at 80 % of MCR value in order to reduce the wear and tear on the engine and the fuel consumption to achieve better efficiency. Therefore, during finalization of the PPA, a capacity of 18 MW per unit and hence a total capacity of 108 MW was agreed to”.

20. In CEA norms of 1997, Installed Capacity has been defined as “In relation to the generating station, Rated capacity or sum of the Demonstrated capacities of the units in the generating station whichever is less”.

21. The Commission notes from the Schedule of Guarantees annexed to KPTCL's letter dated 15.7.2003 that the supplier has guaranteed the capacity

of DG Plant as follows:

- a) output of DG sets at generator terminals (MCR) 21,320 KW  
 b) overload capacity over MCR in every 12 hours for one hour: 10%

The Commission further notes that the project cost incurred is also for the same capacity as above. **In view of the above, for the purpose of the PPA the Commission approves that the installed capacity shall be reckoned as 21.32 MW per unit totaling to 127.92 MW for the power plant as against 18 MW per unit totaling to 108 MW for the plant as indicated in the Draft PPA.**

**Plant Load Factor:**

22. In the draft PPA, this parameter for any period is expressed by the following formula:

$$PLF = \frac{\sum 10^2 (NME+DG+AC)}{\text{(Installed capacity of the facility in KW)} \times \text{HR}}$$

where NME = Net Metered Energy for the station measured in KWH at the interconnection point

DG = Deemed Generation

AC = Auxiliary Consumption of the Power station in KWH

HR = Total number of hours in the period

23. In the statement furnished by KPTCL containing details of performance of the station during the past 10 years, PLF based on installed capacity of 108 MW is given for each year as follows:

(PLF calculated on the basis of installed capacity of 127.92 MW is also indicated hereunder for reference):

Year	Gross Generation In Mus	PLF based on Installed capacity of 108 MW %	PLF based on installed capacity of 127.92 MW %
1993-94	148.46	--	--
1994-95	364.646	38.54	32.54
1995-96	542.539	57.19	48.41
1996-97	536.734	56.73	47.90
1997-98	665.450	70.34	59.38
1998-99	625.005	66.06	55.77
1999-00	707.489	74.58	63.13
2000-01	658.402	69.59	58.75
2001-02	768.725	81.25	68.60
2002-03	706.817	74.71	63.07

The PLF figures indicated above are based on actual generation during each year.

24. The formula used in the draft PPA for computation of PLF takes into account deemed generation also and the normative value for recovery of annual fixed charges is indicated as 72.5%.

25. The norms for plant load factor as per CEA Office Memorandum dated 1995 is 68.5%. This is amended to 75% in the CEA Memorandum dated 1997 issued in super session of the norms dated 1995.

26. The following method is laid down in the norms dated 1997 for calculation of Plant load factor –

To consider the extent of backing down generation as ordered by the Regional Electricity Board, concept of deemed annual plant load factor is brought into the norms. The deemed annual plant load factor is calculated by the following formula:

$$\text{Deemed Annual Plant Load factor} = \frac{\text{Sum of Deemed daily plant load factors}}{365}$$

The deemed daily plant load factor is defined by the following formula:

$$\text{Deemed daily plant Load factor} = \frac{\text{Sum of available capacity for each settlement period of the day}}{\text{Installed capacity} \times \text{No. of settlement periods in the day}}$$

27. It is further stipulated in the norms that, in case of backing down as ordered by the Regional Electricity Board, the Available capacity shall be reckoned as Power generated.

28. In view of the foregoing, **the Commission approves that the Plant load factor of the Yelahanka Diesel Generating station shall be calculated for each**

day and the Annual Plant load factor shall be determined as follows:

$$\begin{aligned} \text{Deemed Daily Plant Load factor} &= \frac{\text{Sum of Available capacity for each hour of the day}}{\text{Installed Capacity x 24}} \\ \text{Deemed Annual Plant load Factor} &= \frac{\text{Sum of Deemed Daily plant Load Factors}}{365} \end{aligned}$$

29. The Commission approves that the annual fixed charges shall be recoverable at a deemed annual plant load factor of 75%. Incentive shall become payable for every 1% increase in annual PLF beyond 75% based on actual generation. Under article 3.2 of the draft PPA the rate of incentive proposed is Rs.0.40 per kwh. This amounts to approximately 0.6% return on equity for every 1% increase in PLF. **The Commission approves the incentive of Rs.0.40/kwh proposed in the PPA. For the purpose of Incentive PLF should be computed based on actual generation and deemed generation shall not be considered.**

**Station Heat Rate:**

30. This parameter is defined in the Draft PPA as “ the amount of fuel energy required in kilo calories per kwh of gross generation and shall be equal to 1995 kilo calories per kwh”.

31. This definition does not conform to the definition in the CEA norms dated 1997 which lays down that the Gross heat rate of 2000 Kcal/Kwh is at Standard Reference conditions as per latest version of ISO 3046 based on net calorific value of fuel.

32. It is further stipulated that the Gross heat rate of the diesel generating unit shall be 2000 Kcal/Kwh at standard reference condition as stated above or the guaranteed heat rate corresponding to MCR, whichever is lower.

33. It is also stipulated that “the Gross heat rate indicated above shall remain applicable for various loading conditions of the station. Generally the heat rate of the DG Unit does not vary significantly between 70% and 100%. In

case Station load comes down to 70% or less, some DG unit(s) can be shut down maintaining higher loading of the working DG sets"

34. In the performance details of Yelahanka diesel plant for the past 10 years (1993-94 to 2002-03), Gross heat rate values are however furnished for the years 2001-02 and 2002-03 only. It is clarified by KPTCL that the calorific value of fuel was not being monitored regularly up to the year 2001 and only specific fuel consumption was monitored and monitoring of net calorific value was started from the year 2001-02 onwards after the formation of VVNL.

35. The values of weighted average net calorific value, specific fuel consumption and weighted average gross heat rate for the years 2001-02 and 2002-03 are furnished in the following table

Year	Weighted Average Net calorific value of fuel Kcal/Kg	Specific fuel cons. Gms/Kwh	Weighted average gross Heat rate Kcal/Kwh
FY 02	9805	196.97	1931
FY 03	9751	196.74	1919

36. The schedule of guarantees furnished by the supplier of DG sets gives the following guaranteed figures of specific fuel oil consumption only at site conditions at various loadings of the DG sets with a lower calorific value of fuel at 10200 Kcal/Kg subject to tolerance of 3%. Calculated values of gross heat rate are also indicated in the table.

Specific fuel oil consumption with lower calorific value of fuel at 10,200 Kcal/Kg	At alternator terminals in gms/Kwh	calculated values of gross heat rate Kcal/Kwh
at (a) 100% load:	186.3	1900.26
(b) 90% "	185.1	1888.02
(c) 75% "	184.4	1880.88
(d) 50% "	189.8	1935.96

37. Specific fuel consumption values obtained in the performance test on one of the DG sets at the time of commissioning at 100%, 75% and 50% loading as furnished in test reports are as follows (the tests have been conducted for a duration of 30 Minutes each at the above loadings):

(The guaranteed values as per schedule of guarantees are also tabulated for reference).

Output	Specific Consumption Gms/KWH at LCV of 9956.22 Kcal/Kg	Calculated Gross heat rate Kcal/KWH	Specific consumption Gms/KWH Guaranteed value @ LCV of 10,200 Kcal/Kg	Calculated gross Heat rate Kcal/KWH
100% MCR (21300 KW)	186.6	1858.0	186.3	1900.26
75% MCR (16000 KW)	189.6	1887.7	184.4	1880.88
50% MCR (11000 KW)	196.6	1957.4	189.8	1935.96

38. From the foregoing it is seen that:

- a) The draft PPA stipulates the station heat rate (same as gross heat rate as in CEA norms) without reference either to ISO conditions or LCV of fuel.
- b) The CEA norms are with reference to ISO conditions and LCV of fuel.
- c) The Supplier of DG sets of Yelahanka DG plant has guaranteed specific fuel consumption only at various loadings with LCV of 10200 Kcal/Kg.
- d) Test results of specific fuel consumption at the time of commissioning of DG sets are with LCV of 9956.22 Kcal / Kg.
- e) The weighted average specific fuel consumption values for the years 2001-02 and 2002-03 are with weighted average LCV of 9805 Kcal/Kg and 9751 Kcal/Kg respectively.

39. It is also seen that the values of gross/station heat rate on the basis of details furnished in the schedule of guarantees, test results obtained in performance tests and data furnished for the years 2001-02 and 2002-03 are significantly lower compared to the normative figure in the draft PPA (1995 kcal/kwh) and also the normative values given in the CEA memorandum dated 1997 (2000 kcal/kwh).

40. Accordingly, it would be necessary to revise the definition of Station heat rate in the draft PPA to include reference to site conditions and also the LCV of fuel. Allowing a reasonable margin over the results achieved during the performance in 2001-02 and 2002-03, **the Commission approves a Station heat rate of 1950 Kcal/Kwh with reference to site conditions based on Lower Calorific Value of fuel.**

**Auxiliary Consumption:**

41. This parameter is defined in the PPA as "the ratio expressed as a percentage with respect to the facility of:

Gross energy in kwh generated at generator(s) terminals minus net energy in kwh delivered at the interconnection point(s); to

Gross energy in kwh generated at generator(s) terminals or 4.5%, whichever is lower."

42. The above definition is in conformity with that in the CEA OM dated 1997.

43. The values of Auxiliary consumption achieved by the plant during the 9 year period from 1993-94 to 2002-03 are furnished here under.

Sl.No.	Year	PLF based on 127.92 MW	Auxiliary consumption %
1	94-95	32.72%	4.22
2	95-96	48.68%	3.80
3	96-97	48.16%	3.70
4	97-98	59.72%	3.39
5	98-99	56.09%	3.53
6	99-00	63.49%	3.01
7	00-01	59.08%	2.96
8	01-02	68.98%	2.96
9	02-03	63.43%	3.09

44. It is seen that auxiliary consumption of 4.22% has been achieved even at a very low plant load factor of 32.72%. During the six year period from 1997-98 to 2002 - 03 with PLF above 55%, the average value for the 6 year period works out to 3.16%. In view of the foregoing and after providing a margin, **the Commission approves a normative value of auxiliary consumption at 3.5% subject to considering either the normative value or the actual auxiliary consumption, whichever is lower for computation of variable charges.**

#### **Lube Oil Consumption**

45. In the draft PPA the normative value of specific lube oil consumption is considered at 1.1 gm/kwh and for computation of variable charges this normative value or the actual specific consumption, whichever is lower is considered. In the norms of CEA dated 1997 issued in supersession of the norms dated 1995, the normative value is indicated as 1.0 gm/kwh.

46. In the Schedule of guarantees furnished by the manufacturer, the guaranteed specific lube oil consumption of the following values at various MCR loadings are indicated for a DG set after the set has run for 500 hours:

a) at 100% load	22,730 gms/hour	1.066 gms/KWH
b) at 90% load	21,400 gms/hour	1.115 gms/KWH
c) at 75% load	17,820 gms/hour	1.114 gms/jKWH
d) at 50% load	14,850 gms/hour	1.393 gms/KWH

47. In the performance test results furnished for one of the DG sets specific lube oil consumption of 1.39 gms/kwh is indicated for 86% MCR loading.

48. It is also seen from the performance details furnished for the period between 1993 – 94 and 2002 – 03, in respect of the years in which a PLF of more than 55% is achieved the specific lube of consumption has varied between 1.322 gms/kwh to 1.488 gms/kwh.

**49. In view of the foregoing the normative value of specific lube oil consumption of 1.1 gms/kwh negotiated in the draft PPA is approved by the Commission.**

#### **Deemed Generation**

50. Since recovery of fixed charges is based on Deemed Plant Load Factor, provision for Deemed Generation in the PPA is not required. The Commission therefore decides that provisions relating to Deemed Generation in the PPA shall be deleted.

#### **Capital Expenditure**

51. Capital Expenditure is defined as the aggregate capital costs incurred by the seller and as per Article 3.01 (i) and Schedule 1 of the Draft PPA, the Capital Expenditure as on the Effective Date (the Date of executing the PPA) shall be the Gross Block as on 31.03.2002, i.e., Rs.264.13 crores and the amount towards work in progress as on that date is Rs.1.57 lakhs which will be added to the Capital Expenditure when it gets capitalized. **The Commission directs that these figures shall be updated as on 31.3.2003.**



In the Project Abstract cost estimate annexed to the detailed project report, it is seen that, out of a total estimated cost of Rs.226 crores, cost of transmission lines is also included. **The Commission therefore directs that if the cost towards transmission lines is included in the gross block of Rs.264.13 crores, the same shall be deleted.**

52. Article 3.01 (ii) deals with Additional Capital Expenditure as on Effective date. This shall be modified as Additional Capital Expenditure to be incurred subsequent to the Effective Date towards renovation, modernization, replacement and/or uprating works of the Yelahanka Diesel Generating Plant with the consent of the buyer and KERC from time to time after giving due consideration to the need for expenditure and demonstration of benefits accruing out of such expenditure. Necessary modification to this effect shall be incorporated in the PPA.

#### **Financial Norms:**

53. According to Article 3.1.1 of the initialed draft PPA, the annual Fixed Charge shall consist of (a) Depreciation, (b) Return on Equity, (c) Interest on Loan capital, (d) Interest on Working Capital, (e) O&M and Insurance expenses, (f) Foreign Exchange Variation and (g) O&M Charge Adjustment. Each of these components are discussed and the decisions of the Commission are indicated below.

#### **Depreciation:**

54. Draft PPA states that the depreciation charge on the Capital Expenditure shall be at the rates as notified by GOI from time to time. According to the tariff working provided by VVNL, the depreciation in the first tariff year amounts to Rs. 22.32 crores on a capital expenditure of Rs. 264.13 crores. This amounts to an average depreciation rate of 8.45 %.

GOI had issued notification on the rates of depreciation in 1992/1994 under the provisions of Electricity (Supply) Act 1948 according to which notification the rate of depreciation applicable to Diesel Electric Plant was 8.24 %. Yelahanka Diesel Plant, having been commissioned in 1993-94 has already accrued depreciation amounting to Rs.189.86 crores till 31.3.03 according to the details provided by VVNL. With the repeal of the Electricity (Supply) Act, 1948 in the Electricity Act, 2003, the notification issued by GOI in 1994 on the rates of depreciation will not be valid.

According to the provisional accounts produced by VVNL for FY03, the balance of loan outstanding for this project as on 31.3.03 was Rs. 42.07 crores and as per the details provided by VVNL, the loan repayment amounts to Rs.9.35 crores per year from 2003-04 to 2006-07 and Rs. 4.67 crores in 2007-08.

The Commission is of the view that the actual loan repayment in each of the years should be provided for in the annual fixed charge irrespective of the rates/amount of depreciation which is only an accounting requirement. Accordingly, **the Commission approves to include the actual loan repayment as indicated above in the Annual Fixed Charge in each tariff year instead of depreciation.**

**Return on Equity (ROE):**

55. Return has been provided in the draft PPA at 16 % on Equity capital. According to the details provided by KPTCL/VVNL, the equity capital invested in the project is Rs.78.02 crores as on 31.3.2002, which amounts to 29.54% of the total capital expenditure. In the sample tariff working provided by KPTCL, it is indicated that ROE is on lower of (1) Actual Equity and (2) 30% of Capital Cost, but this has not been reflected in the PPA. This condition shall be incorporated in the PPA.

The Commission notes that 16 % ROE was fixed by the GOI in the 1992 norms in order to attract private investments. When this 16% ROE was fixed, the Bank Rate (RBI rate) was 11 % and the interest rates on long term borrowing was

much above 16 %. The bank rate has steeply fallen over the period and has come down to 6 % now and interest rates on long term borrowings have also been reduced substantially. If 5% margin over the bank rate is considered, the allowable ROE would be 11%. Hence there is no justification for ROE of 16 % and therefore KPTCL was requested by the Commission to renegotiate the ROE with VVNL.

KPTCL has stated in their reply dated 15.7.03 that the bank interest rates though are lower as on date, are subject to fluctuations from time to time and that VVNL has no other source of income to take up any expansion works or new projects for the growth of the corporation. KPTCL has also stated that CERC has also supported this cause and has provided 16% ROE to the Central Generating Stations in the notification dated 26.3.2001 and as such ROE of 16% is proposed.

The Commission has examined this issue in detail. It is obvious from the reply provided by KPTCL that they have not negotiated with VVNL to reduce the ROE. The contention that VVNL has no other source of income to take up any expansion works or new projects is no reason to provide for a higher ROE. The Commission's view is that each and every project/ scheme should be treated on stand alone basis and there is no need to divert funds from one project/ scheme to another and push up the tariff in the process. The reason that CERC has provided 16% ROE to Central Generating Stations does not by itself merit consideration as such norms are only guidelines for the State Commissions. The cost of equity to VVNL is not the same as the cost of equity of any private generator. This is because GOK, who has funded the equity of VVNL, has access to low cost capital through taxation and other mechanism. Under the Electricity Act 2003, GOI will notify the National Electricity Policy and Tariff Policy.

Considering all the above factors including the prevailing bank rate (RBI rate) and interest rates, and keeping in mind that the entire equity of VVNL is held by the State Government, **the Commission decides that the ROE for VVNL shall be 12% for the present.**

**Interest on Loan capital:**

56. Draft PPA states that the interest on Loan Capital will be based on the actual schedule of liabilities and that the details have been provided in Schedule IV of the Draft PPA. **The Commission approves this provision.**

**Interest on Working Capital:**

57. According to the draft PPA, the components of working capital are:

- i) Primary Fuel (LSHS) costs for a month and Primary fuel stock limited to 30 days.
- ii) 60 day's stock of lube oil.
- iii) O & M and Insurance expenses for one month.
- iv) Maintenance spares at the existing level but not exceeding one year's requirements.
- v) Receivables equivalent to 60 days billing at an average of the last twelve months.

The Commission notes from the annual accounts of VVNL that there are no working capital borrowings in the last 3 years.

According to CEA norms of 1997 for DG sets, the working capital shall not exceed the following:

(a) One and a half month's expenses of the following items:

- i) Fuel consumption at 75% FLF.
- ii) Lubricating oil including cylinder oil consumption at 75% PLF.
- iii) Annual O & M Expenses.

(b) Expenses of the following items of stock:

- i) half a month's consumption of fuel at 75% of installed capacity.
- ii) half a month's consumption of lubricating oil including cylinder oil at 75% of installed capacity.
- iii) one year maintenance spares at 40 percent of annual O&M expenses.

According to the existing fuel supply agreement (FSA) IOC have agreed to maintain at all times sufficient stock of fuel oils and lubricants to meet the entire requirements of the Yelahanka Diesel Plant. The terms of payment to

IOC is that payment shall be made by VVNL by cheque in advance on 1<sup>st</sup>, 11<sup>th</sup> and 21<sup>st</sup> of every month for estimated ten days requirement. Difference between the estimated and actuals is to be adjusted in subsequent periods. From the provisions of the FSA it is clear that there is no requirement for VVNL to maintain any stock of fuel and lubricants under the present arrangement. Considering the advance payment cycle to IOC and considering that the bills for sale of energy are realizable by VVNL at the end of subsequent month, **the Commission considers it appropriate to allow working capital on an average of two months' consumption of fuel at 75% PLF and lubricating oil as per the above norms. No separate provision for stock of these items in the working capital is required.**

Further, **the Commission allows working capital on (i) one and a half months Annual O&M expenses and (ii) One year's maintenance spares at 40 percent of annual O&M expenses according to the CEA norms.**

**Since all the components of expenditure on which working capital is required has been provided as above, any further provision for working capital on receivables would amount to double counting of the expenses. In the CEA norms of 1997 also there is no provision for working capital on the receivables separately. Considering these aspects the Commission decides that there is no requirement to provide for working capital on receivables as proposed in the draft PPA.**

58. Regarding the rate of interest on working capital it is stated in the draft PPA that it shall be the actual interest rate charged by the commercial banks subject to the ceiling of sum of (1) a prime lending rate of the State Bank of India applicable during the relevant period and (ii) 2%. **The Commission approves this provision.**

#### **O&M and Insurance Expenses:**

59. According to Article 3 of the draft PPA, the provision for O & M and insurance expenses is as follows:-

"The O & M Expenses for first Tariff year will be equal to the average of actual O & M expenses for the period from 1998-1999 to 2001-2002 as mentioned in Schedule 2 and referred to as Base O & M expenses in this agreement (BOM). The Base O & M expenses will be exclusive of Insurance expenses and non recurring expenses.

The insurance expenses will be paid additionally which should be lower of (i) actual amount spent or (ii) 1% of Capital expenditure (pursuant to Article – 3.01)".

60. In the Article 6.8 of the draft PPA it is further stated that the amount of taxes/duties, cess etc., payable by the Seller to the Government and or any other local bodies/authorities on generation of electricity including auxiliary consumption or any other type of consumption including water, environment protection, sale or on supply of electricity and/or in respect of any of its installations associated with power stations shall be billed in the supplementary bill.

61. According to the details provided by VVNL the O & M expenditure from 1998-1999 to 2001-2002 are as follows:

Year	O & M Expenses Rs. in lakhs
1998-1999	1936.51
1999-2000	2447.72
2000-2001	2008.21
2001-2002	1452.29
<b>Average</b>	<b>1961.18</b>

62. According to CEA norms dated 1997 the O & M expenses including insurance for the first full year after commercial operation of the plant shall be 4% of the actual capital expenditure incurred on completion of the project and where the actual expenditure exceeds the approved project cost the excess as approved by the CEA shall be deemed to be the actual capital expenditure for the purpose. The project cost that was approved by the CEA in 1990 was Rs.122.03 crores and the actual expenditure incurred is Rs.264.15 crores for 127.92 MW Diesel generation plant. The revised

estimated project cost of Yelahanka Diesel plant has been indicated as Rs.226 crores in the project report furnished to the Commission. As ascertained, VVNL has not obtained approval of the CEA for any revised estimate/actual expenditure in respect of the diesel plant. The Commission notes that the actual O & M expenses incurred by VVNL are on the higher side when compared to the norms and is still higher if the approved project cost alone is considered.

63. However, the Commission also notes from the above details of actual expenses provided by VVNL that the O & M expenditure is reducing from year to year and the reduction is mainly under repairs and maintenance charges. KPTCL has explained in its reply dated 15.7.03 that the cost of scheduled maintenance will vary according to the cycle of multiples of 12,000 hours and 24,000 hours operations apart from break down maintenance cost and hence the average of four year cost of O & M expenses has to be considered to arrive at the Base level O & M expenses.

64. When the O & M expenses are reducing from year to year the Commission does not see any valid reason to consider an average of four years expenditure as the Base O & M expenditure. The total O&M expenditure of VVNL (which includes hydro projects also) has further reduced From Rs.28.65 crores in FY02 to Rs.27.63 crores in FY03 as seen from the provisional accounts.

65. **Considering these aspects, the Commission approves to consider the actual O&M expenses of this project for FY03 as the Base level O & M expenditure for determining the tariff.**

66. The Commission notes that the O & M expenses allowed under the GOI norms dated 1997 is inclusive of manpower, spares, consumables (including water), insurance and overheads and therefore it would not be necessary to provide for insurance expenses or for taxes and duties separately as proposed in the draft PPA. Therefore **the Commission directs that the actual insurance**

**expenses and taxes and duties, if not already included, shall be included in the Base level O & M expenses for FY03 and shall not be allowed separately.**

67. Regarding the annual increase in O&M expenditure it is stated in PPA that the O & M expenses in each subsequent Tariff year after the first Tariff year will be calculated by raising the preceding Tariff year O & M expenses by 6% and adding the O & M charge adjustment determined in accordance with sub-clause 3.1.1(g). This has been further explained under 3.1.1 (g)(ii) of the draft PPA. According to this formula the annual increase shall be 6% plus O & M charge adjustment. The Commission requested for clarification from KPTCL on this issue as the proposed formula amounts to double counting of annual increase. KPTCL in their letter dated 15.7.2003 has clarified that the O&M charge to be recovered under Tariff is calculated by escalating the preceding year's O & M charge by 6% which is used for billing in that year and that at the end of the year the actual adjustment is calculated by referring to the formula under para 3.1.1 (g). **Considering the clarification provided by KPTCL, the Commission directs that in Article 3.1.1(e) and 3.1.1(g)(ii) of the PPA 6% annual increase provided for shall be deleted as it amounts to double counting of annual increase.**

68. The Commission notes the formula for O&M charge Adjustment given under article 3.1.1(g)(i) of the draft PPA. The formula provides for increase based on CPI and WPI in the case of local currency and in the case of foreign component it is based on Euro Zone harmonized Indices of Consumer Prices. The formula provides for increase based on total cost of materials and services utilised for operation and maintenance works in the preceding year. Out of the total O&M expenditure, the foreign currency component is more than 70% at present. The Commission is conscious of the difficulty in estimating the level of increase in O & M expenses to be provided for the future years as it is dependent upon many factors like the rate of inflation, the age of the plant and machinery, O&M practices, manpower planning etc. **The Commission approves the provision for the annual increase as per the formula given under article 3.1.1(g)(i) of the draft PPA.** However, while allowing such an increase, the Commission also wishes to emphasise the



need to improve the productivity of O&M expenditure so as to achieve a reduction in this expenditure in real terms. Accordingly, the inflation adjusted figure of O&M expenditure shall be reduced by 3% each year to provide for improved productivity. This offset for higher productivity shall be reviewed further. The inflation adjusted figure for any year will be arrived at by applying the relevant inflation factor on the allowable expenditure for the preceding year (after increased productivity offset for that year). **The increase in the subsequent years shall be on the O&M expenditure allowable in the preceding year based on the above formula irrespective of actual expenditure in the preceding year.**

**Foreign Exchange Variation:**

69. Article 3.1.1(f) of the draft PPA provides for payment of Foreign Exchange Variation on the basis of a formula considering the currency exchange rate on the last day of the billing month and the exchange rate at the end of the Tariff year. In order to simplify the procedure, **the Commission approves to allow the actual foreign exchange variation** instead of allowing the same on the basis of a formula.

**Tariff Supplementary Bill:**

70. In article 5.2.1 of the draft PPA It is proposed that any amount due to VVNL under the agreement other than the amounts set out, a monthly Tariff bill shall be payable after presentation of the supplementary bill by the Seller to the Buyer. Such supplementary bill may include (a) claims of Income Tax (b) Statutory duties, taxes, cess and levies (c) monthly Tariff adjustments including default interest payments (d) the cost of HSD consumed during the starts and stops which are solely attributed to Buyers instruction or problems in the grid and (e) any other claim admissible under the agreement.

71. The provision for income tax has been further explained in article 6.7 of the draft PPA and it is stated that any tax payable on income exceeding ROE will not be charged to the Buyer. **This provision under 6.7 of the draft PPA is**

approved by the Commission. As discussed earlier, the statutory duties, taxes, cess and levies shall be included in the Base level O&M expenses itself and shall not be claimed separately. The Commission approves the other components of Tariff supplementary bill as indicated in the draft PPA, subject to due diligence by the Buyer.

**Rebate for Payment through Letter of Credit:**

72. In Article 6.3 (f) of the draft PPA it is stated that 'the Buyer shall be entitled to get a rebate of 0.016% of the amount paid for each day after payment date till due date of payment of each Tariff bill or Tariff supplementary bill'. This amounts to 0.48 % per month approximately. According to GOI norms of March 1992 as well as CERC norms dated 26.3.2001, rebate for payment of bills through letter of credit has been determined as 2.5%. Accordingly, **the Commission approves to provide in the PPA a rebate on payment of bills through letter of credit at 2.5%.**

**Fuel Supply Agreement:**

73. The cost of fuel is a very important component of the total tariff. In the initial years of the PPA, this cost would be quite substantial as a percentage of the total tariff. In subsequent years, this proportion would be even greater because of the reduction in interest and depreciation amounts. In terms of the structure of the present PPA, the entire cost of fuel is a pass through to the consumer. In this context, therefore, it is essential that the procurement of fuel is done in such a manner as to achieve the greatest efficiency and in accordance with the highest standards of transparency.

74. As per the terms of the Fuel Supply Agreement for the Yelahanka diesel Plant for the supply of POL products between Indian Oil Company and the erstwhile KEB entered into in June 1989, the price of fuel oil by the Buyer will be as fixed by the Ministry of Petroleum and Natural Gas from time to time and as applicable to power plants. The price of lubricants payable by the Buyer will be as per the price fixed by the Seller depending upon the advice of the

Ministry of Petroleum and Natural Gas from time to time. The Buyer has been buying his entire requirement of fuel oil and lubricants for the power plant on the basis of the prices as per the terms of the agreement. The fuel oils that are used in the power plant are LSHS and HSD.

75. At present, as per guidelines of Ministry of Power and Natural Gas, furnace oil and LSHS come under free trade products and accordingly the prices are determined by market conditions. Under the circumstances, the procurement of LSHS and lubricants shall be done by getting competitive offers from various suppliers. KPTCL shall fully involve itself in the procurement process to ensure that procurement is done in a transparent manner to achieve least cost. In order to ensure that the maximum possible economy is achieved in fuel purchase and to demonstrate that this is in fact achieved, VVNL in consultation with KPTCL, shall evolve a procedure for purchase of fuel and lubricants and submit it to the Commission for approval.

76. The application for approval of the process of procurement of fuel and lubricating oil shall be filed with the Commission within ninety days from the date of this Order with the following details :

- a. Specification of fuel and lubricating oil to be purchased
- b. Pre qualification conditions, if any, that are to be imposed and the justification therefor;
- c. Procedure to be adopted for tendering including the stages involved in the procedure;
- d. The evaluation criteria to be adopted for identifying pre-qualifying bids at each stage and also the criteria for selection of the winning bid;
- e. Procedures to be followed for testing and certification of the quality and quantity of the fuel and lubricating oil procured;
- f. Such other details as the Commission may prescribe

Fresh approvals of the Commission are to be obtained whenever any change in the approved process is contemplated. The VVNL shall file quarterly returns with the Commission showing the details regarding procurement of fuels as may be specified. This stipulation will be a condition precedent to full pass through of the cost of fuel purchased, subject to the operational norms given above.

The above procedure shall apply for both the fuel and lubricating oil.

77. The Commission directs KPTCL to incorporate and finalise the PPA taking into consideration operational and financial parameters as determined by the Commission in the foregoing paras of this Order and enter into PPA with VVNL for Yelahanka Diesel Generating Plant and submit three copies of the executed agreement along with all necessary annexures and schedules as directed within thirty days from the date of this Order.

This order is signed on the Tenth day of October, 2003.

Sd/-  
**(Philipose Matthai)**  
Chairman

Sd/-  
**(H.S.Subramanya)**  
Member - I

Sd/-  
**(S.D.Ukkali)**  
Member - II