

## CHAPTER – 4

### TARIFF ORDER FOR APGCL FOR 2007-08

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#### 4.1 Introduction

This order relates to petition number 2 of 2007 filed by the Assam Power Generating Company Limited (APGCL) before the AERC for determination of Multi Year tariff for sale of electricity to be sold to ASEB by APGCL for FY2007-08, 2008-09 and 2009-10. APGCL is the owner of the generating plants previously owned by ASEB. APGCL has started functioning as separate entity from 10<sup>th</sup> December, 2004 as per the Assam Electricity Reform First Transfer Scheme which was notified by the Government of Assam vide PEL.151/2003/pt/165 dated 10<sup>th</sup> December 2004. The Government of Assam vide notification no. PEL.151/2003/Pt/349 dated 16<sup>th</sup> August, 2005 issued orders to give effect to the reorganization of the Assam State Electricity Board and the finalization of the provisional transfers effected as per the provisions of the Electricity Act, 2003 and the First Transfer Scheme.

The Commission notified the AERC (Terms and Conditions for Determination of Tariff) Regulations, 2006 vide No. AERC. 2005/19 dated 28<sup>th</sup> April, 2006, which was published in The Assam Gazette on 24<sup>th</sup> May, 2006. It was stated that it shall come into force from the date of their publication in the official Gazette of the Government of Assam i.e. w.e.f. 24<sup>th</sup> May, 2006. As per clause 1.2 (d), the Regulations shall apply to all generating companies operating in the state of Assam who are not subject to the jurisdiction of the Central Electricity Regulatory Commission which include generating companies owned or controlled by the Central Govt. or generating companies with a composite scheme of generation and sale in more than one state. The State Government vide Notification No. PEL.133/2003/416 dated 7<sup>th</sup> June, 2007 (**Annexure-III**) allowed to continue the Assam State Electricity Board (ASEB) to undertake the limited functions of Bulk purchase and bulk supply upto 9<sup>th</sup> December, 2007 in respect to the existing generating capacity and existing contracted capacity for the said period. It would be necessary to revisit the arrangement here to understand allocation of capacity by the State Government. As per the Notification, bulk purchase and bulk supply functions, namely, purchase of electricity in bulk from the

generating companies including APGCL and supply of electricity in bulk to the DISCOMs have been specified as functions retained by ASEB. Even though the State Government had not specifically allocated the generating capacity of stations of APGCL to the ASEB, the Government had notified that the purchase of electricity in bulk from the APGCL would be the responsibility of ASEB and ASEB would also supply electricity in bulk to the DISCOMs. As such, it can be construed that entire generating capacity of the APGCL had been allocated to the ASEB who, at present, is operating as a trading licensee in the State. As per section 86(1)(a) of the Act, the State Commission shall determine the tariff for generation, supply, transmission and wheeling of electricity, wholesale, bulk or retail, as the case may be, within the State. As per Section 86(1)(b) of the Act, the 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. As the APGCL will be supplying electricity in bulk to ASEB, and ASEB, as trader, in turn will be supplying electricity in bulk to the DISCOMs, the Commission has determined the tariff for the generating stations of the APGCL in this order in line with the terms and conditions stipulated in the Regulations notified on 24<sup>th</sup> May'06 as far as practicable within the limitation of other related matters.

As per clause 5.3 of the Regulations, for multi year tariff principle the tariff will be determined on the basis of the principles enunciated for a period of five years commencing from 1st April 2006 for generation. As per clause 6.5, tariff in respect of a Generating Company under the Regulations shall be determined station wise and the Generating Company shall submit separate calculations in respect of each generating station. In the MYT Petition submitted by APGCL, a three year control period was considered by the petitioner and the Commission admitted the same due to uncertainty of required data for longer control period. After thorough scrutiny of the petitions submitted by the utilities the Commission decided to adopt the principle of MYT in a cautious manner due to non availability of reliable data and therefore recalculated the ARR for 2007-08 in this Tariff Order and will take up the matter of ARR for 2008-09 and 2009-10 in due course on receipt of authentic records like Audited Annual Financial Statements of relevant years, Assets Registers etc. from the Utilities.

The Commission already admitted a Petition No. 1 of 2007 from ASEB for approval of ARR and Bulk supply Tariff for FY 2007-08 making available to the Commission full details of its operations including the quantum and the price of electricity purchased by it from the Central Generating Stations and other traders or generators and details of the price paid for the electricity supplied to Distribution Licensees to enable the Commission to discharge its functions under Section 86(1)(b) of the Act as stated earlier.

In the Tariff Order for 2006-07, the Commission had drawn the attention of the State Government to the situation resulting from non-allocation of generating capacities of the State Generating Stations and the respective share of the Central Generating Stations among the distribution licensees of the State which is sought to be addressed through an agreement made between ASEB and the distribution licensees with differential bulk sale rates. The Commission was of the view that the Deemed Trading Licensee does not have the discretion of charging differential bulk sale rates to different distribution companies. Meanwhile the Commissioner & Secretary, Power (Elect) Department, Government of Assam vide his letter No. PEL.41/2006/132 Dated 8<sup>th</sup> May, 2007 (**Annexure-IV**) informed the Commission that the Government is re-examining the issue of distribution configuration of the power companies in the state and contemplating to reorganize the distribution companies into one after examining the pros and cons of the legal as well as technical aspects in the greater interest of the people of Assam. The Commission has been requested to keep this aspect in view while finalizing the Tariff Proposals on the petitions of the distribution companies. The Commission had kept in mind the views of the Government and feels that if the three distribution companies are combined into one, the question of charging differential Bulk Supply Tariff will not arise.

The Commission has fixed the bulk sale rate for ASEB for the electricity supplied to it by APGCL and CSGS. The tariff for APGCL units is based on tariff as per this order and for CSGS units as per orders of the CERC. The ARR of ASEB is inclusive of its cost of operation, which the Commission considered under section 86(1)(j) of the Act.

Having stated its policy, the Commission determines the tariff for the generating stations of APGCL in the subsequent paragraphs.

## 4.2 Procedural history

In the Commission's Regulations namely the Assam Electricity Regulatory Commission (Terms and Conditions for Determination of Tariff) Regulations, 2006, the State Generation Company is required to file the proposal for determination of generation tariff annually with the Commission for the next year by 1<sup>st</sup> of December. On 29<sup>th</sup> November, 2006, APGCL along with other petitioners requested for extension for filing of the Petition from 01.12.2006 to 28.02.2007 on the following grounds

1. Filing of Multi-Year Tariff Petition requires collection of large amount of data for its analysis so that reasonable assumptions can be made for next three years. Other items of expenditure like O&M also need to be analysed thoroughly. This being the first MYT control period, APGCL will require special efforts to compile all the information.

2. The Tariff Order for 2006-07 was made effective from 4<sup>th</sup> August, 2006. As such the actual data after implementation of the Tariff is available for four months only, which make it very difficult for projecting the figures for the remaining part of the year. At least six months actual figures will be needed for the realistic projection of the same.

3. As per the above Tariff Order, except for the month of November, 2006, the availability of power is shown as surplus, estimated at 424 MU. But due to low monsoon actual position is quite different. ASEB has to make arrangement for extra purchase of power from Traders to overcome the crisis. This has made the projection more difficult as the period of consideration is for three years.

4. The APGCL has also stated that due to non finalization of Balance Sheet for 2005-06, they are not in a position to submit the same before the Commission along with their Tariff petition within the scheduled date.

The Commission reserved its order till 22.12.2006 vide its order dated **18.12.2006 (Annexure-V)**. The Commission granted extension of time till 28<sup>th</sup> February, 2007 with condition detailed in the order dated **22.12.2006 (Annexure-VI)**. The APGCL filed the petition on 28.02.07 which was not admitted by the Commission as the petition suffered from infirmity of incomplete submission of important and vital documents in support of their claim

of ARR vide order dated **08.03.2007 (Annexure-VII)** and directed the Utilities to furnish all detail information supporting their claims on ARR as per provision of AERC (Terms and Conditions for determination of Tariff) Regulations, 2006 within 30<sup>th</sup> March, 2007. The Petitioner submitted their revised Tariff petitions on 29.03.2007.

The revised Tariff Petition filed by the utilities still contained some discrepancies /anomalies which were brought to their notice. A meeting was also held on 27.04.2007 for clarifying the discrepancies in the revised Tariff Petition. The minutes of the meeting is annexed at Annexure-VIII. The petitioners having assured the Commission that they will make necessary rectification and remove the discrepancies, the Commission admitted the petition vide its order dated **11.05.2007 (Annexure-IX)** for further action as per provisions of the AERC (Conduct of Business) Regulations, 2004.

In the meantime, the Commission received a communication from the Government of Assam vide letter No PEL.41/2006/132 Dated 8<sup>th</sup> May, 2007 on the Distribution configuration in Assam. The Commission vide its letter no AERC.251/2006/199 dated 14<sup>th</sup> May, 2007 (**Annexure-X**) had informed the Government that the Commission had admitted the Tariff petitions filed by the ASEB and successor entities and requested the Government of Assam to intimate if the Government had contemplated /decided to give any subsidies to the utilities.

### **4.3 Processing of Tariff Petition**

The Chief General Manager (CF), ASEB sent a letter dated 14.05.07 on behalf of all the Utilities on the points raised in the letter dated 24<sup>th</sup> April, 2007 and also on the points raised in the meeting held on 27.04.2007. While processing this letter, it was felt that a few more clarifications/additional information were needed for Tariff formulation and a letter dated 4<sup>th</sup> June, 2007 was sent to all the petitioners on the matter. A meeting was again held on 22.06.07 with representatives of ASEB, APGCL and AEGCL for clarification on some of the issues on the Tariff petitions of these companies. The minutes of the meeting are at

**Annexure-XI.** The Chief General Manager, APGCL submitted additional documents/information on 25.06.2007 and 29.06.2007.

Summary of the Petition filed by APGCL is given below:

**(A) Annual Revenue Requirements (ARR) of APGCL**

	Rs. crore		
	FY 07-08	FY 08-09	FY 09-10
Power Generation			
Energy generated (MU)	1,535.00	1,819.27	2,119.08
Sale of Power (MU)	1,476.34	1,747.03	2,037.35
Aux Consumption Loss %	3.8%	4.0%	3.9%
<b>INCOME</b>			
Revenue from tariffs & Miscell. Charges	<b>329.26</b>	<b>394.41</b>	<b>464.02</b>
<b>EXPENDITURE</b>			
Generation Cost	154.59	171.14	158.15
R&M Expense	8.04	8.52	9.03
Employee Expenses	48.41	61.26	71.52
A&G Expense	3.63	3.84	4.08
Depreciation	40.78	69.43	100.27
Interest & Finance Charges	61.59	77.79	116.80
Less: Interest & other expenses capitalised	12.31	29.41	55.68
Other Debits (incl. Prov for Bad debts, int on wk cp	11.23	9.67	8.63
Extraordinary Items	-	-	-
Other (Misc.)-net prior period credit	-	-	-
<b>Total</b>	<b>315.95</b>	<b>372.25</b>	<b>412.79</b>
ROE	20.21	23.88	41.45
Less: Other Income	5.20	5.22	5.24
Add: Provision for taxes	6.23	9.22	19.01
<b>Annual Revenue Requirement</b>	<b>337.19</b>	<b>400.13</b>	<b>468.01</b>

**(B) Salient Features of Tariff Petitions for FY 2007-08**

- |     |                               |                  |
|-----|-------------------------------|------------------|
| (a) | Anticipated Gross Generation: | 1535.00 MU       |
| (b) | Anticipated net generation    | 1476.34 MU       |
| (c) | Annual Fixed Cost             | Rs 174.66 Cr     |
| (d) | Annual Variable Charge        | Rs 162.53 Cr     |
| (e) | Average Tariff                | Rs. 2.2839 / Kwh |

#### **4.4 Public Hearing**

As per direction of the Commission notice incorporating the summary of the ARR proposed by the petitioner APGCL and also the tariff suggested by APGCL was published by the APGCL in two leading Assamese dailies, two leading English dailies and one leading Bengali daily newspaper inviting responses /objections from the public fixing last date of submission of objection on 21.06.2007. The notice was published on different dates in the following newspapers:

- i) The Assam Tribune
- ii) The Sentinel
- iii) Ajir Dainik Batori
- iv) Asomia Protidin
- v) Dainik Jugasankha

The date for filing objection was extended till 10.07.2007 on request from different consumer groups. The Commission held a public hearing on the objections received from the consumer bodies /individuals on the tariff petitions of APGCL in the Assam Administrative Staff College, Khanapara, Guwahati on 20<sup>th</sup> July, 2007.

#### **4.5 State Advisory Committee**

The members of the State Advisory Committee were apprised of the Tariff Proposal of APGCL in its meeting held on 27<sup>th</sup> June, 2007. A thorough discussion ensued where a number of clarifications were given to points raised by the members. The minutes of the Meeting is at **Annexure-XII**.

### **STATUS OF THE GENERATING COMPANY**

2.1 APGCL is a company incorporated under the Companies Act, 1956 and has come into being on 10<sup>th</sup> December, 2004. The Government of Assam notified the transfer scheme vide its notification No. PEL.150/2003/Pt/349 dated 16<sup>th</sup> August, 2005 as per

which the APGCL was assigned assets and liabilities, on a provisional basis as per the table shown in page 86 of Tariff Order 2006-07.

- 2.2 **It was stated in the notification that the opening balance has been prepared based on the approved accounts of Assam State Electricity Board as on 31<sup>st</sup> March, 2004 and such opening balance sheet shall all be subject to all consequential adjustments on the update, finalization and audit of accounts of ASEB as on 31<sup>st</sup> March, 2005.**
- 2.3 The Audited Financial statement of ASEB for 2004-05 ending as on 31<sup>st</sup> March, 2005 was published in August, 2006 after the Tariff Order for FY 2006-07 was notified by the Commission on 28<sup>th</sup> July, 2006.
- 2.4 Based on the Audited Financial Statement of FY 2004-05, the Opening Balance Sheet (OBS) was updated for all unbundled entities as per the GOA Notification No. PEL.150/2003/Pt/349 dated 16<sup>th</sup> August, 2005 and sent to Government of Assam vide ASEB.AXT/FIN/21/48 dated 19<sup>th</sup> Sept, 2006 for notification.
- 2.5 After consequential adjustment of accounts as per the GOA notification, the OBS as on 01.04.2005 is modified as below :-

Particulars	APGCL
	Rs. Crs.
<b>ASSETS</b>	
Gross Fixed Assets	712.37
Less: Accumulated Depreciation	(512.09)
<b>Net Fixed Assets</b>	<b>200.28</b>
Capital Work in Progress	398.89
Investment	18.90
<b>Total Current Assets</b>	<b>163.79</b>
<b>Total Current Liabilities</b>	<b>(48.08)</b>
<b>Net Current Assets</b>	<b>115.71</b>
<b>Total Assets</b>	<b>733.78</b>
<b>FINANCED BY</b>	
Borrowing for Working Capital	0

Payment due on Capital Liabilities	19.68
Capital Liabilities	175.73
Fund / Loan from State Govt.	31.50
Equity Share Capital	455.81
Contribution, Grants & subsidies towards cost of capital assets	10.85
Reserve & funds	40.21
Deficit / Surplus	0
<b>Total Fund</b>	<b>733.78</b>

### Capital Cost for Tariff Calculation:

As per the provision of Section 131(2) of the Electricity act 2003 the transfer scheme notified by the Govt. is the value of assets transferred. Section 131(3) (a) stipulates that “*The transfer scheme involves the transfer of any property or rights to any person or undertaking not wholly owned by the state Government, the scheme shall give effect of the transfer only for fare value to be paid by the transferee to the state Government*”. The GOA vide Notification dated 16<sup>th</sup> August, 2005 notified a provisional transfer scheme which was subjected to consequential adjustment of Audited Financial Statement of ASEB for 2004-05. The final scheme has already approved by ASEB and sent to GOA for notification. The ASEB and other entities have prepared the Balance Sheet and Financial Statement based on this final transfer scheme.

In the transfer scheme both GFA and NFA has been shown considering NFA for the purpose of balance sheet. In the Scheme, the GFA is a cumulative addition of assets since inception of erstwhile ASEB’s generating assets without having any information in form of asset register showing residual life of assets as on date of transfer. The cumulative depreciation shown in the scheme was similar to the GFA without any information about cumulative depreciation of individual assets, many of the assets might have been fully depreciated during the years of operation.

As an example of APGCL, where GFA is shown as Rs 712.37 Cr. along with cumulative depreciation of Rs 512.09 Cr the NFA is at Rs 200.28 Cr. Considering the available information of DOCO (Date of Commercial Operation) of all the generating units

along with useful life as per the depreciation schedule, most of the units of all old generating stations have crossed the useful life and 90% of GFA as depreciation. Accumulated depreciation and NFA might be for the assets which has not yet cross the useful life and may be due to addition of assets during the process of operation under R&M (Renovation and modernization) schemes etc.

Similar is the case of all other entities where asset wise record to ascertain the asset crossing the useful life is not available.

The AERC has stressed the need of “Assets register” since its first Tariff Order of 2001-02, however the same has not yet materialized in spite of repeated directions in subsequent Tariff Orders. In this petition the utilities submitted before the Commission that the same is under process.

In the AERC T&C for tariff regulation also, the OBS as per transfer scheme has been stated as capital cost for first year of operation.

Considering above, in the absence of asset register, the GFA with cumulative depreciation of the notified transfer scheme is considered as value of assets under operation for all entities as on 01.04.05 and updated to arrive at the value for 2007-08.

In the following paragraphs the Commission has determined the station wise cost of all the generating stations that are being operated and maintained by APGCL based on the updated opening balance sheet notified by the Govt. of Assam and the additions made during FY 2005-06 to 2007-08 as stated in the petitions

APGCL has 5 (five) power plants namely Namrup Thermal Power Station(NTPS), Lakwa Thermal Power Station(LTPS), Bongaigaon Thermal Power Station(BTPS), Chandrapur Thermal Power Station (CTPS) and Karbi Langi Hydro-electric Power Station (KLHEP). The conditions of each of the plants are given below;

#### **4.6 Namrup and Lakwa Thermal Power stations**

For the year 2007-08, it is expected that the generation from NTPS and LTPS under APGCL will be about 984.69 MU on gross basis. The utility is constrained from effectively

utilizing its entire machine available capacity due to gas availability constraints at Lakwa Thermal Power Station and machine health issues at Namrup Thermal Power Station — which will likely be addressed to some extent during FY 2007-08. Along with this, APGCL also has evacuation capability constraints at the stations which has not affected generation levels till date as despatch capability was constrained at levels below the network congestion levels on account of issues stated earlier. However, once the generation constraints are, by and large, resolved it is feared that evacuation bottlenecks may well prove to be a limiting factor on more than one occasion.

In the petitions, APGCL has given a generation target of LTPS for 2007-08 at 601.0 MU (net). But later it revised its generation target in view of uncertainty regarding commencement of supply of additional 0.55 mmscmd of gas by OIL to LTPS. It may be mentioned that necessary gas agreement with OIL for supply of 0.55 mmscmd gas from OIL through AGCL pipelines to LTPS signed on 2<sup>nd</sup> September, 2005. The additional was expected by March, 2007 as envisaged did not materialize. Hence, generation target of LTPS for 2007-08 was brought down to 477.41 MU considering availability of 0.40 mmscmd gas from ONGC /GAIL and 0.15 mmscmd gas on fall back basis from OIL /AGCL.

**Namrup TPS: (134 MW):-** At present the power station is generating 60 MW on an average. The details of shut down /de-rated units are as under:

**Unit-1 (23 MW, GT)** Unit is running presently at full load capacity.

**Unit-2 (23 MW, GT)** is under forced shut down since August, 2001. Capital restoration work of the unit is going on in full swing with the financial assistance of PFCL. The major turbine spares were received at site. It is expected to re-commission the unit by September, 2007.

**Unit-3 (23 MW, GT)** Unit is running presently at full load capacity.

**Unit-4 (12.5 MW, GT)** had to be put under shutdown due to failure of its starting Diesel Engine. On investigation, cracks were observed on both the cylinder heads. M/s Cummins had already discontinued manufacturing this model of the engine. Cracked cylinder heads were repaired and the unit was put into service but the repair did not last long. So for procurement of a new Starting diesel Engine for the unit, NIT was floated on 23.06.07 and offers are now being evaluated.

Steam Turbine **Unit 5 (30 MW)** and Waste Heat **Unit 6 (22.5 MW)** are also able to generate only up to 20 and 14 MW respectively due to technical constraint. The proposal for de-rating of these units is currently under consideration of CEA.

The installed capacity of Unit 5 and Unit 6 are taken as 20 MW and 14 MW respectively as per petition pending finalisation by appropriate authority. Hence, total installed capacity of NTPS is taken as 115.50 MW instead of 134 MW.

**Lakuwa TPS: (120 MW):-** All the machines of LTPS are currently available. However, Unit 7 (20 MW) is not in operation due to on going works of W.H.P. But the generation from the plant has been adversely affected due to chronic short supply of gas by ONGC /GAIL.

Current generation of the plants is around 55 MW with gas 0.43 mmscmd from ONGCL/GAIL and 0.08 mmscmd from OIL/ AGCL.

For supply of additional 0.50 mmscmd gas, of late, Oil has committed to supply the said gas by Dec 07. On receipt of the same, the overall generation of the station is expected to increase to 80 MW with supply of gas from both GAIL/ OIL (0.4/ 0.4 mmscmd).

The detailed status of the shutdown units are as under:

**Unit 7 (20 MW)** is available. However, it will be under shut down till September, 2007 for by pass stack work of on going Waste Heat project.

#### **4.7 Status of implementation of Bongaigaon Thermal Power Project (3x250 MW) by NTPC**

As per decision of Government of India, NTPC Ltd. is setting up a 750 MW coal based thermal power project with advanced Fuel Gas De-sulphurisation (FGD) technology at BTPS using Assam Coal. The project will replace the existing 4x60 MW BTPS. The foundation stone of the project was laid on January, 2006.

Government of Assam approved signing Tripartite Transfer Agreement among NTPC, APGCL & Government of Assam for taking over BTPS by NTPC. NTPC has been requested to send a team for joint verification and prepare a schedule of assets to be taken over by

NTPC. Meanwhile, the inventory of unserviceable items lying at BTPS has been prepared and tender is being invited from interested bidders by 1<sup>st</sup> week of June, 2007 for its disposal (not to be used by NTPC). Further, the working group constituted for the purpose decided in its meeting dated 10.05.2007 to complete the process of disposal of unserviceable materials at BTPS by 30<sup>th</sup> June, 2007.

#### **4.8 Status of CTPS as on 14.05.2007**

The first unit of 2x30 MW Chandrapur Thermal Power Station was commissioned in March, 1973 and second unit in January, 1989. Both the units were using Low Sulphur Furnace Oil (LSFO) and Low Sulphur Heavy Stock (LSHS) as primary fuel. Oil was supplied under administered price mechanism.

The unit-I was supplied and installed by Mitsubishi Heavy Industries, Japan. Unit-II was installed by BHEL – with the boiler from Mitsubishi and the turbo-generator from BHEL.

Operation of Chandrapur Thermal Power Station was suspended in June, 1999 due to steep increase of fuel price consequent to deregulation and application of import parity mechanism as per directive of MOP & NG, GOI. Prior to suspension of operation of Chandrapur Thermal Power Station the cost of generation of the station was Rs. 2.92/unit and fuel cost was Rs. 2.32/unit on sent out basis.

Seasonal acute shortages of power in the state have on occasions compelled Government of Assam to direct APGCL to come forward with proposal for running CTPS with oil. However the estimated cost of generation was prohibitively high. The latest estimate for cost of generation as on 01.08.2006 worked out at Rs. 10.48/unit.

Department of Power, GOA, directed the Managing Director, APGCL to take measures to prevent deterioration of CTPS so that it does not have to face the same fate as that of BTPS.

Both the boilers of the station were kept under preservation since 1999, but conditions of other auxiliaries have deteriorated over the years. To gear up the preservation activities of CTPS, an amount of Rs. 20 lakhs, part of the sales proceeds received from the sale of the

mobile gas turbines was provided. A major portion of this amount is already spent as re-commissioning activities were taken up in anticipation of Government of Assam's directives to start one unit of CTPS. This amount will be adjusted soon to make up for the lack of maintenance of many of the auxiliaries due to inadequate provision of O&M fund over the years. APGCL placed a proposal to the Government of Assam for grant of Rs. 1.5 crore for proper preservation of the station which was turned down.

Earlier various alternatives for revival of the plant were considered including firing naphtha, lean natural gas with slight modification in the boiler. Cost of naphtha was found to be prohibitively high. Piped gas was not expected to be available in foreseeable future. Even if piped gas is available it would not be advisable to burn this in the present boiler as the designed heat rate of the units are in the range of 3300 to 3500 Kcal/Kwh which when compared with a modern Combined cycle plant is in the range of 2000 Kcal/Kwh.

An earlier request of reviving CTPS by converting the boilers to coal fired ones did not find favour with the Mitsubishi, Japan the Original Equipment Manufacturer for space limitation and incompatible existing boiler design.

Replacing both the boilers with fluidized bed boilers may be an answer to the space limitation.

**Present Status:**

1. Proposal has been placed before CEA for temporary retirement of unit-I of CTPS. Unit-2 is in a position to run after overhauling.
2. To this effect Expression of Interest has been invited through news papers to revive CTPS (both units) through LROT or Joint Venture route. Responses from parties are encouraging.

**4.9 Karbi Langpi Hydro Electric Project (KLHEP)**

The Project on the river Borpani in the Karbi Anglong district of Assam was envisaged as a run of the river scheme with installation of two units of 50 MW each. The project was sanctioned by the Planning Commission in 1979 at a cost of Rs. 36.16 Crore with

a target of commissioning by December, 1986. However, for various reasons, the project could not be commissioned in time.

Ultimately, the balance portion of the project work was restarted in 2004 with PFCL loan assistance of Rs. 125.0 Crore and State Plan fund. The 1st Unit (50 MW) and 2<sup>nd</sup> Unit (50 MW) were commissioned successfully on 31.01.2007 and 20.03.2007 respectively. The project was dedicated to the people of Assam by Hon'ble Chief Minister of Assam on 06.04.2007. The units are now on commercial operation since April, 2007.

Both the units of KLHEP were commissioned and generated 15.442 MU upto March, 2007. As the commercial operation of the project was declared in April, 2007 only, the power generated from KLHEP prior to April, 2007 was considered as infirm power. Assuming a rate of 40.53 paise per unit as the primary energy charge, the value of the infirm power comes to Rs. 62.58 lakh which was adjusted against project cost of KLHEP.

Total cost of the project as on 31.03.2007 was Rs. 446.45 crore and the sources of fund were as given below:

Public Bond	: Rs. 113.75 crore
State Government Loan	: Rs. 58.27 crore
PFCL Loan	: Rs. 125 crore
Grant from GoA	: Rs. 51.66 crore
Equity /Advance against	
Share capital pending allotment	: Rs. 68.11 crore
Interest during construction	: Rs.29.66 crore
<b>Total</b>	<b>: Rs. 446.45 crore</b>

The design energy of the KLHEP is 395.28 MU. KLHEP is expected to yield the above design energy with the expectation of good hydrology in the coming years.

## ANALYSIS OF APGCL

### 4.10 Introduction

Net generation from the power stations of APGCL namely LTPS , NTPS and KLHEP and corresponding fixed and variable cost of generation have been determined for financial year 2007-08 based on the norms and principles as laid down in AERC (Terms and conditions for determination of Tariff) Regulations, 2006

The details of plant characteristics of NTPS, LTPS and KLHEP are given in the tables O, P and Q below:

**Table - O**

Plant Characteristics						
Name of the Company	<u>Assam Power Generating Corporation Ltd</u>					
Name of the Power Station	<u>Namrup Thermal Power station</u>					
Basic characteristics of the plant	(I) 4 Gas Turbines (II) 1 Gas Fired Steam Turbine (III) 1 Waste Heat Recovery Unit					
Fuel type	Natural Gas					
Details	Module number of Unit number					
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6
Rated Capacity (MW)	23	23	23	12.5	30	22.5
Date of synchronization	Apr - 65	Apr - 65	Apr - 65	Sep - 75	Apr - 76	Mar - 85
Capacity at the date of synchronization	23	23	23	12.5	30	11.25 (Single Boiler)
Date of entry into commercial operation	Apr - 65	Apr - 65	Apr - 65	Sep - 75	Apr - 76	Apr - 90
Date of stabilisation	Apr - 65	Apr - 65	Apr - 65	Sep - 75	Apr - 76	Apr - 90
Capacity at the date of stabilisation	23	23	23	12.5	24	15
Has any performance test been performed	No	No	No	No	No	No
If yes, capacity at test	NOT APPLICABLE					
Type of cooling system for condenser	-	-	-	-	Water	Water
Type of Boiler Feed pump	-	-	-	-	BF-20 WEIR Make	BF-20 WEIR Make
Type of cooling system for electric generator	Hydrogen	Hydrogen	Hydrogen	Air	Air	Air
Any other special feature	-	-	-	-	Could not be loaded upto rated capacity	Could not be loaded upto rated capacity
Has the station received any notice or shut down the power station of penalty imposed for violation of any environmental standard by the Central/State Statutory Authorities						No

**Table - P**

FORM-2							
<b>Plant Characteristics</b>							
<b>Name of the Company</b>	<b><u>Assam Power Generating Corporation Ltd</u></b>						
<b>Name of the Power Station</b>	<b><u>Lakwa Thermal Power station</u></b>						
<b>Basic characteristics of the plant</b>	<b>Gas Turbine</b>						
<b>Fuel type</b>	<b>Natural Gas</b>						
Details	Module number of Unit number						
	Unit 1	Unit 2	Unit 3	Unit 4	Unit 5	Unit 6	Unit 7
Rated Capacity (MW)	15	15	15	15	20	20	20
Date of synchronization	30-07-83	26-04-81	02-08-81	28-11-86	03-01-94	26-07-94	24-05-99
Capacity at the date of synchronization	15	15	15	15	20	20	20
Date of entry into commercial operation	30-07-83	26-04-81	02-08-81	28-11-86	03-01-94	26-07-94	24-05-99
Date of stabilisation	02-08-83	29-04-81	05-08-81	01-12-86	06-01-94	29-07-94	27-05-99
Capacity at the date of stabilisation	15	15	15	15	20	20	20
Has any performance test been performed	Yes	Yes	Yes	Yes	Yes	Yes	Yes
If yes, capacity at test	15	15	15	15	20	20	20
Type of cooling system for condenser	-	-	-	-	-	-	-
Type of Boiler Feed pump	-	-	-	-	-	-	-
Type of cooling system for electric generator	Air	Air	Air	Air	Air	Air	Air
Any other special feature	Scrubbers	Scrubbers	Scrubbers	Scrubbers	Scrubbers	Scrubbers	Scrubbers
Has the station received any notice or shut down the power station of penalty imposed for violation of any environmental standard by the Central/State Statutory Authorities					No		

**Table - Q**

FORM-2	
<b>Plant Characteristics</b>	
<b>Name of the Company</b>	<b>Assam Power Generating Corporation Ltd</b>
<b>Name of the Power Station</b>	<b>Karbi Langpi HEP</b>
<b>Basic characteristics of the plant<sup>1</sup></b>	<b>(I) 2 Water Turbines</b>
<b>Fuel type<sup>2</sup></b>	<b>NIL</b>

Details	Module number of Unit number	
	Unit 1	Unit 2
Rated Capacity (MW)	50	50
Date of synchronization	31-01-07	20-03-07
Capacity at the date of synchronization	50	50
Date of entry into commercial operation	06-04-07	06-04-07
Date of stabilisation	06-04-07	06-04-07
Capacity at the date of stabilisation	50	50
Has any performance test been performed	Yes	Yes
If yes, capacity at test	50	50
Type of cooling system for condenser <sup>3</sup>	Not applicable	Not applicable
Type of Boiler Feed pump <sup>4</sup>	Not applicable	Not applicable
Type of cooling system for electric generator <sup>5</sup>	Air	Air
Any other special feature <sup>6</sup>	-	-
Has the station received any notice or shut down the power station of penalty imposed for violation of any environmental standard by the Central/State Statutory Authorities		
If yes, furnish full details		
<p><sup>1</sup> Describe the basic characteristics of the plant e.g. in the case of a coal based plant whether it is a conventional steam generator or circulating fluidized bed combustion generator or sub-critical once through steam generator etc.</p> <p><sup>2</sup> Coal or natural gas or naphta or lignite etc.</p> <p><sup>3</sup> Closed circuit cooling, once through cooling, sea cooling etc.</p> <p><sup>4</sup> Motor driven, Steam turbine driven etc.</p> <p><sup>5</sup> Air cooled, water cooled, hydrogen cooled etc.</p> <p><sup>6</sup> Any special feature such as merry-go-round, scrubbers etc. Specify all such features.</p>		
		PETITIONER

#### 4.11 Availability and Plant Load Factors

As per Clause 39 of the AERC (Terms and Conditions for Determination of Tariff) Regulation, 2006 full fixed charges shall be recoverable from beneficiaries if the availability for FY 2007-08 is as per table given below:

**Table – R**

**Target availability Percentage (%)**

<b>NTPS</b>	<b>50%</b>
<b>LTPS</b>	<b>50%</b>

Fixed charges shall be recoverable on pro rata basis if actual availability is lower than that indicated in the above table

Availability shall be computed in accordance with the relevant provisions of the Regulations. SLDC shall verify the availability figures submitted by APGCL for claiming the fixed charges.

#### 4.12 Plant Load Factor

The Plant Load Factor for computing the variable cost for FY 2007-08 is as per Table given below:

**Table – S**

**Target Plant Load Factor for Incentive Percentage (%)**

<b>NTPS</b>	<b>50%</b>
<b>LTPS</b>	<b>50%</b>

The gross generation from the two generating stations of APGCL in FY 2007-08 is expected to be as given in the table below:

**Table – T****Gross Generation (MU)**

Generating Station	FY07-08 (Filed)	FY07-08 (approved)	FY 06-07 (as approved in Tariff Order)
NTPS	505.00	507.28	586.92
LTPS	477.41	477.41	525.60
KLHEP	394.00	395.28	
Total	1376.41	1379.97	1112.52

**4.13 Auxiliary Consumption (MU)**

The auxiliary consumption as a percentage of gross generation in FY 2007-08 are as given below:

Generating Station	Filed FY07-08	FY07-08 (approved)	FY 06-07 (as approved in Tariff Order)
NTPS	4.3%	4.3%	4.5%
LTPS	5.59%	5.59%	5.5%
KLHEP	0.5%	0.5%	

In the FY 2006-07 petition, the APGCL has suggested auxiliary consumption rates of 4.8% for NTPS and 6.9% for LTPS against which the Commission allowed 4.5% for NTPS and 5.5% for LTPS.

The Commission considered explanation given by APGCL regarding high Auxiliary Consumption of LTPS due to requirements of running two sets of Gas Booster Compressor System of stage 1 (4x15) & stage 2 (3x20) when units of both stages are in operation. In the last Tariff Order the Commission directed APGCL to measure actual consumptions by the Gas Booster Compressors separately by installing adequate energy meter to support their claim for consideration of the Commission to grant higher Auxiliary Consumption in future.

The CGM (Gen), APGCL vide his letter no.APGCL/MD/Tariff/115/Pt-III/86 dated 31.03.07 informed that they had installed separate Energy Meters to each of the Gas Booster Compressors of LTPS. The readings of the energy meters indicated that the auxiliary consumptions of Gas Booster Compressors for May'07 and June'07 were 5.71% and 6.15% respectively. Therefore, the Commission allowed auxiliary consumption rates of 5.59% for LTPS for F.Y 2007-08 as suggested by APGCL

#### 4.14 Net Generation (MU)

The ex-bus (net) generation in FY 2007-08 is as given in the table below:

Generating Station	FY07-08 (Filed)	FY07-08 (approved)	FY 06-07 (as approved in Tariff Order)
NTPS	483.29	485.46	560.51
LTPS	450.74	450.75	496.69
KLHEP	392.03	393.30	
	1326.06	1329.52	1057.20

#### 4.15 Determination of Energy Charges

As per the Regulations, the energy (variable) charges shall be computed as follows:

Energy (variable) charges shall cover fuel costs (landed cost) and shall be worked out on the basis of ex-bus energy delivered from the generating station as per the following formula:

Energy Charges (Rs.) = Rate of Energy Charges in Rs./ kWh X Energy delivered (ex-bus) for the month in kWh

(a) Rate of Energy Charges (REC) shall be the sum of the cost of normative quantities of primary and secondary fuel for delivering ex-bus one kWh of electricity in Rs./kWh and shall be computed as under :

$$REC = \frac{100\{P_p \times (Q_p)_n + P_s \times (Q_s)_n\}}{(100 - (AUX)_n)} \quad (Rs./kWh)$$

Where,  $P_p$  = Price of primary fuel namely coal or lignite or gas or liquid fuel in Rs./Kg or Rs./cum or Rs./litre, as the case may be.

$(Q_p)_n$  = Quantity of primary fuel required for generation of one kWh of electricity at generator terminals in Kg or litre or cum, as the case may be, and shall be computed on the basis of normative Gross Station Heat Rate (less heat contributed by secondary fuel oil for coal/lignite based generating stations) and gross calorific value of coal/lignite or gas or liquid fuel as fired.

$P_s$  = Price of Secondary fuel oil in Rs./ml, (including transportation cost)

$(Q_s)_n$  = Normative Quantity of Secondary fuel oil in ml/kWh as per clause 40.3, as the case may be, and

$AUX_n$  = Normative Auxiliary Energy Consumption as % of gross generation as per clause 40.4, as the case may be.

#### 4.16 Station Heat Rate (kCal/Kwh)

The allowable station heat rate for FY 2007-08 as per the AERC (Terms and conditions for determination of Tariff) Regulations, 2006 is as given in the table below:

Generating Station	FY07-08 (approved)	FY 06-07 (as approved in Tariff Order)	FY 07-08 (filed)
NTPS	3266	3266	3542
LTPS	3600	3658	3600

The APGCL had submitted a report on the SHR of NTPS and LTPS to the Commission which had been forwarded to Head of the Mechanical Engineering Deptt. of Assam Engineering College for review. Subsequently, a team of faculty members from

Mechanical Engineering Deptt. of Assam Engineering College had visited LTPS and NTPS on 7<sup>th</sup> and 8<sup>th</sup> February, 2006 and submitted a review report. The review report has been sent to M.D, APGCL and he forwarded his comments on the report to the Commission on 14.08.2006.

#### 4.17 Calorific Value of Fuel (kCal/1000Scm)

The calorific values of the gas used in NTPS and LTPS are as given below:

Generating Station	Filed FY 07-08	FY07-08 (approved)	Ratio between ONGC and OIL gas
NTPS	8250(OIL)	8250(OIL)	
LTPS	8850(ONGC)	8850 (ONGC)	73%
	8250(OIL)	8250( OIL)	27%
	8686(Weighted Average)	8688(Weighted Average)	

NTPS receives gas from M/s Oil India Limited only whereas LTPS receives gas from M/s ONGCL as well as from M/s Oil India Limited in the ratio of 73%:27%. Hence the weighted average calorific value of the gas is calculated in the above ratio.

#### 4.18 Energy Cost

The energy (variable) cost to be paid on the basis of approved operating parameters, gas cost etc shall be as per the table below:

### Variable Charge

#### APGCL proposed Table

#### APGCL

2007-08

Station	Sp Fuel consumption (Scm/unit)	Gross Generation in MU	Fuel price in Rs/1000 scm	Fuel Req. (mscm)	Cost of fuel in crore	Transportation Charge in Rs/1000 scm	Transportation charge in crore	Total fuel cost in Crore	CV of fuel in Kcal/1000 Scm	Var cost of Gen in Rs/KW/hr	Auxiliary (MU)	Auxiliary (%)	Net Generation (MU)	Base PLF (%)
LTPS (ONGC Gas)		348.51	2363.80	144.44	34.1435		0.2873		8850.00	<b>Gross</b>	<b>Net</b>			
LTPS (OIL Gas)		128.90	4454.15	53.42	23.7959	209.440	1.1189		8250.00	1.243	1.317	5.59%	450.75	45.00%
<b>Total LTPS</b>	<b>0.4145</b>	<b>477.41</b>		<b>197.87</b>	<b>57.9394</b>		<b>1.4062</b>	<b>59.346</b>	<b>8686.00</b>	<b>1.113</b>	<b>1.163</b>	<b>4.30%</b>	<b>483.30</b>	<b>50.00%</b>
NTPS	0.4293	505.00	2197.10	216.81	47.6361	394.230	9.2092	56.193	8250.00					
								<b>115.539</b>						

#### Total Variable Cost

Note: Minimum demand charge Qty. of 233.60mmscm is taken as Gas Qty for calculation of Transportation Charge

#### AERC Approved (12 mths)

Station	Specific Fuel consumption (Scm/unit)	Gross Generation in MU	Fuel price in Rs/1000 scm	Fuel Req. (mscm)	Cost of fuel in crore	Transportation Charge in Rs/1000 scm	Transportation charge in crore	Total fuel cost in Crore	CV of fuel in Kcal/1000 Scm	Var cost of Gen in Rs/KW/hr	Auxiliary (MU)	Auxiliary (%)	Net Generation (MU)	Base PLF (%)
LTPS (ONGC Gas)		348.51	2230.00	144.41	32.20		0.274		8850.00	<b>Gross</b>	<b>Net</b>			
LTPS (OIL Gas)		128.90	4202.03	53.41	22.44	199.47	1.065		8250.00	1.173	1.242	5.59%	450.75	45.00%
<b>Total LTPS</b>	<b>0.4144</b>	<b>477.41</b>		<b>197.82</b>	<b>54.65</b>		<b>1.339</b>	<b>55.986</b>	<b>8688.00</b>	<b>0.993</b>	<b>1.038</b>	<b>4.30%</b>	<b>485.46</b>	<b>50.00%</b>
NTPS	0.3959	507.28	2072.74	200.82	41.62	375.46	8.771	50.395	8250.00					
								<b>106.382</b>						

#### Total Variable Cost

Note 1: The ratio of OIL / ONGC gas of LTPS is taken as 27.73. Hence, the total fuel requirement of 197.82 mscm is divided in that ratio.

Note 2: Variable Charges are calculated for Thermal Stations. NTPS & LTPS only. Variable cost of KLHEP for the purpose of scheduling will be based on AGBPP's variable cost which is lowest among the Central Sector Power Generating Stations in the NER region.

$$REC = \frac{100\{PpX(Qp)n + PsX(Qs)n\}}{(100 - (AUXn))} (Rs / kWh)$$

LTPS		NTPS	
Pp (Price of primary fuel)=	2.762	Pp (Price of primary fuel) (Rs./scum)	2.073
(Qp)n (quantity of primary fuel for 1 kWh) (in scum/Kwh)	0.4144	(Qp)n (Quantity of primary fuel for 1 kWh) (in scum/Kwh)	0.3959
Ps (Price of secondary fuel)=	0.000	Ps (Price of secondary fuel)=	0.000
(Qs)n (Norm qty of second fuel)=	0.000	(Qs)n (Norm qty of second fuel)=	0.000
AUXn (Norm energy cons)=	5.500	AUXn (Norm energy cons)=	4.300
LTPS REC =	<b>1.211</b>	NTPS REC = Rs/ kWh	<b>0.857</b>
Transportation Charges (Rs / kWh) LTPS	0.0297	NTPS	0.181
Total Variable Charge (Rs./kwh) <b>LTPS</b>	<b>1.241</b>	<b>NTPS</b>	<b>1.038</b>

#### 4.19 Fixed cost

The Commission has reviewed the estimates of each ARR cost element submitted by the APGCL and made its own assessment of the level of expenditure required. In most cases the Commission has approved the figures based on principles given in the Regulations. The table below presents the estimate filed and the approved ARR cost elements disaggregated between NTPS, LTPS, CTPS, BTPS and KHELP.

2007-08

## Fixed Cost Analysis

## APGCL

PARTICULARS	Filed						Approved					
	NTPS	LTPS	BTPS	CTPS	KHELP	Total	NTPS	LTPS	BTPS	CTPS	KHELP	Total
Employees cost	14.54	13.62	7.51	6.03	6.70	48.40	14.54	13.62	7.51	6.03	6.70	48.40
Repair and Maintenance	4.34	2.92	0.65	0.13	0.00	8.04	3.94	2.65	0.60	0.11	0.00	7.30
Admin and General exp.	1.67	0.99	0.61	0.36	0.00	3.63	0.66	0.39	0.24	0.14	0.59	2.02
<u>Interest and finance charges</u>	6.52	7.40	1.14	0.42	33.80							
:Interest on Term loans	3.88	3.71	0.27	0.09	31.97	39.92	0.00	0.00	0.00	0.00	32.34	32.34
:Interest on Working Capital	2.64	3.69	0.87	0.33	1.83	9.36	2.05	2.08	0.00	0.00	1.41	5.54
Depreciation	9.93	10.18	4.44	1.11	15.12	40.78	7.34	6.57	0.00	0.00	7.79	21.71
Return on Equity	7.49	12.72	0.00	0.00	0.00	20.21	3.88	3.48	0.00	0.00	9.54	16.89
Taxes on Income	1.94	2.82	0.24	0.15	1.08	6.23	0.00	0.00	0.00	0.00	0.00	0.00
Less Misc Receipts	1.25	1.15	2.24	0.56	0.00	5.20	(1.25)	(1.15)	(2.24)	(0.56)	0.00	(5.20)
<b>Total Fixed Cost</b>	<b>45.18</b>	<b>49.50</b>	<b>12.35</b>	<b>7.64</b>	<b>56.70</b>	<b>171.37</b>	<b>31.16</b>	<b>27.65</b>	<b>6.11</b>	<b>5.72</b>	<b>58.36</b>	<b>135.00</b>

## **4.20 Employee Expenses**

The petitioner has claimed an amount of Rs. 48.42 Crore. The Commission has fully allowed the amount considering the merger 50% D.A into Basic Pay and recruitment of new employees in the organisation

## **4.21 Repairs and Maintenance Expenses**

R&M expenses are important to maintain and improve reliability of power generation and to reduce fuel costs. The Commission has also accepted the claim of petitioners about minimum R&M needed for BTPS and CTPS. A rise of 6% has been allowed among the different elements of R&M expenses. While allowing 6% increase, the Commission has taken into account normal inflation @ 5% and 1% cushion to take care of any additional expenditure.

## **4.22 Administration and General Expenses**

The Commission has estimated the Administration and General expenses by giving a rise of 6% for all the items over the figures of Tariff order for 2006-07. While allowing 6% increase, the Commission has taken into account normal inflation @ 5% and 1% cushion to take care of any additional expenditure.

## **4.23 Calculation of Capital Cost, Equity and Debt**

The Commission re-calculated the Capital Cost, Equity component and Debt component of APGCL on the basis of the AERC (Terms and conditions for determination of Tariff) Regulations 2006. The Gross Fixed Assets value as on 01-04-2005 after deducting there from the contributions, grant and subsidy, if any, as per updated OBS based on Audited Financial Statement of ASEB for the FY 2004-05 has been considered as the capital cost as on 01-04-2005. The entities didn't show any addition of assets during FY 2005-06 in their petition but the entities made additions during the FY 2006-07. Any contributions grants and subsidies towards the cost of the Capital assets are deducted to arrive at the figure of the

approved Gross Capital Cost as on 01.04.2007. As such, the capital cost as on 01-04-2007 has been approved by the commission as detailed vide **Annexure-XIII**.

To arrive at the Equity component of this capital cost, the commission first considered the actual equity as on 01-04-2005, as per updated OBS based on Audited Financial Statement of FY 2004-05. The entities didn't show any addition of equity during FY 2005-06 and FY 2006-07 in their petition. As such, the equity as on 01-04-2005 has been considered as the actual equity as on 01-04-2006. This amount of actual equity has been approved by the commission as Equity on 01-04-2007, subject to a ceiling of 30% of the approved capital cost as on 01-04-2006 detailed at **Annexure-XIII**.

To arrive at the debt component of this capital cost as on 01-04-2007, the commission deducted the approved Equity component from the approved capital cost. The accumulated depreciation as on 01-04-2005 as per updated OBS based on Audited Financial Statement of FY 2004-05 is considered as the amount available to the entity for repayment of debt till 01-04-2005. For the FY2006-07, the commission allowed only an amount required for capital repayment as depreciation, instead of the actual depreciation filed for. As such, the accumulated depreciation as on 01-04-2005 and the amount allowed by the Commission against depreciation in the FY2005-06 and FY2006-07 has been deducted from the debt as on 01-04-2007 to arrive at the debt component as on 01-04-2007. This amount of debt capital has been approved by the Commission as Debt on 01-04-2007, subject to a minimum amount of Rs.0 (zero) if the amount so arrived is negative detailed at **Annexure-XIII**.

As APGCL could not produce the records/information in respect of different categories of generation assets against different power stations, the Commission arrived at the capital cost of LTPS, NTPS, BTPS, CTPS and KHELP by allocating the total fixed assets value on the basis of installed capacity of the respective power stations. The amounts so arrived are:-

(Rs. In Crore)

<b>Particulars</b> (as approved as at 01-04-2007)	<b>NTPS</b>	<b>LTPS</b>	<b>BTPS</b>	<b>CTPS</b>	<b>KHELP</b>	<b>Total</b>
<b>Capital Cost</b>	184.89	165.57	310.08	77.52	394.79	1132.84
<b>Equity</b>	55.47	49.67	93.02	23.26	68.11	523.97
<b>Debt</b>	0	0	0	0	326.68	326.68

#### 4.24 Capital Work-in-Progress (CWIP)

The CWIP as on *01-04-2005*, as per updated OBS based on Audited Financial Statement of FY 2004-05 was *Rs.398.89 crore*. In comparison to the Net fixed Asset of *Rs.200.28 crore as on 01-04-2005*, the CWIP seems to be very high. At every stage of completion of the schemes under progress, a part of this CWIP will be added to the Gross Fixed Assets, and thereby will become a part of Capital Cost in due course. This will add to the ARR of the entities in the form of depreciation, ROE and interest on debt capital. With the start of commercial operation of KLHEP, it is expected that the CWIP will come down to a reasonable level in the B/S for 2006-07 and 2007-08. The APGCL is directed to account for eligible amount of capital locked up in CWIP and its conversion into Gross Fixed Assets in the current FY 2007-08 and submit its report to the Commission within two months from the end of financial year 2007-08..

#### 4.25 Interest on Term Loan

Interest on term loan has been allowed at the Weighted Average Rate of Interest on debt for FY2006-07, as calculated in the Tariff Order for FY 2006-07.

For FY2007-08, the average rate of interest was taken at 9.90% per annum, as last year basis. On an approved debt capital of Rs.326.68 crore for KLHEP, Rs.32.34 crore has been allowed to KLHEP as interest on term loan as detailed at Annexure-XIII.

No interest on Debt has been allowed to LTPS and NTPS as their approved Debt Capital was found to be zero as shown in Annexure-XIII. No interest on Debt has been allowed to BTPS and CTPS also, as these two units are not in operation.

#### 4.26 Return on Equity

Though the PLFs of LTPS and NTPS in 2006-07 were below the approved PLF of 50% due to shortage of gas supply and machine constraints, the PLF of NTPS is expected to be 50% in 2007-08..It is observed that these thermal stations of APGCL have shown some improvements in their performances in the recent years. And also to maintain this pace of

improvement, the Commission believes that APGCL should not face any cash shortage. As such, the Commission approved a Return on Equity @7% to LTPS and NTPS and the Commission approved the Return on Equity @ 14% to KHELP. The higher ROE was allowed to KLHEP as the station is found to be running on full load since its date of commercial operation with the availability of water. It is expected that this trend will continue. The amount of Return on Equity approved for LTPS, NTPS and KHELP is shown as under:-

Sl. No.	Particulars	STATIONS					
		NTPS	LTPS	BTPS	CTPS	KHELP	Total
1	Approved Equity Capital as on 01-04-2007.	55.47	49.67	93.02	23.26	68.11	289.53
2	Rate of ROE Allowed	7.00%	7.00%	0.00%	0.00%	14.00%	-
3	<b>ROE Approved</b>	<b>3.88</b>	<b>3.48</b>	<b>0.00</b>	<b>0.00</b>	<b>9.54</b>	<b>16.89</b>

No Return on Equity has been allowed to BTPS and CTPS, as these two units are not in operation.

#### 4.27 Interest on Working Capital

Interest on working capital has been estimated based on the AERC (Terms and Conditions for Determination of Tariff) Regulations, 2006.

Interest on Working Capital	Allowed					
	NTPS	LTPS	BTPS	CTPS	KHELP	Total
One month fuel cost	4.20	4.67	0.00	0.00	0.00	8.87
One month O & M cost	1.60	1.39	0.00	0.00	0.61	3.59
Mainteneace Spares-1% of GFA (for LTPS, NTPS & KHELP only)01.4.07	2.17	1.95	0.00	0.00	4.46	8.59
Two month recivables	13.59	13.94	0.00	0.00	9.73	37.26
<b>Total</b>	<b>21.56</b>	<b>21.94</b>	<b>0.00</b>	<b>0.00</b>	<b>14.80</b>	<b>58.30</b>
Interest @ 9.5%	2.05	2.08	0.00	0.00	1.41	5.54

## 4.28 Depreciation

Depreciation has been calculated as per the AERC (Terms and Conditions for Determination of Tariff) Regulations, 2006. Depreciation has been allowed to LTPS, NTPS and KLHEP only, as per updated OBS based on Audited Financial Statement of FY 2004-05, including the Additions made during the Financial year 2005-06, 2006-07 and 2007-08 and the particulars submitted in the petition. The Commission calculated Depreciation on the 90% of the Gross Block as submitted at the rate prescribed in the AERC regulations on each individual category of assets as submitted in the Petition. The Commission will have the right to re-analyse these figures of depreciation on receipt of the audited financial accounts.

No depreciation has been allowed to BTPS and CTPS, as these two units are not in operation.

As APGCL could not produce the records/information in respect of different categories of generation assets against different power stations, the Commission arrived at the Fixed Assets of LTPS and NTPS by allocating the total fixed assets value on the basis of installed capacity of the respective power stations. Accordingly, depreciation for NTPS and LTPS has been calculated in proportion of their installed capacity.

## 4.29 Approved Power Purchase Agreement Charges

The PPA between APGCL and the ASEB trader will include separate energy charges for NTPS and the LTPS (on a sent out basis) and a monthly fixed charge for NTPS, LTPS and KLHEP. The approved charges are as given in the table below:

Energy Charge (net)	Approved Rs. Per Kwh
NTPS	1.038
LTPS	1.242
KLHEP	0
Fixed charge	Rs. Crore
Total Fixed Charge	129.00
Monthly fixed charge	10.75

\*\*\*\*\*