

ANDHRA PRADESH ELECTRICITY REGULATORY COMMISSION
4th & 5th Floors, Singareni Bhavan, Red Hills, Hyderabad-500 004

O.P.No. 7 of 2006

Dated: 17-06-2011

Present
Sri A.Raghotham Rao, Chairman
Sri R.Radha Kishen, Member
Sri C.R.Sekhar Reddy, Member

Between

Andhra Pradesh Power Generation Corporation LimitedPetitioner

And

1. APTRANSCO
2. APCPDCL
3. APEPDCL
4. APNPDCL
5. APSPDCLRespondents

This petition coming up for hearing on 06.02.2010, in the presence of Sri. K. Gopal Choudary, Advocate for the petitioner and Sri. P Shiva Rao, Advocate for the Respondents, and having stood over for consideration to this day, the Commission delivered the following:

ORDER

This petition filed under clause 9 of the Conduct of Business Regulation, 1999 for approval of the revised project cost of Srisailam Left Bank Power House (SSLBPH).

2. The petitioner has stated in his petition as follows:
 - (a) The Central Electricity Authority (CEA) on 13.05.1986 and the Planning Commission in the letter dt.OI.09.1986 have accorded in principle clearance for installation of 990 MW (9XII0MW) pump turbine units at an estimated cost of Rs.418 Crores on Srisailam Left Bank.
 - (b) Subsequently, after detailed studies made by' the CEA, the Central Water Commission (CWC) and M/s Electric Power Development Corporation, it was

decided by the erstwhile Andhra Pradesh State Electricity Board for installation of 6x 150MW units at an estimated cost of Rs.1166.66 Crores (which includes revised estimated cost of Rs.883.30 Crs. and the interest during construction (illC) of Rs 295.79 Crores), with financial assistance from JBIC. The Planning Commission in the letter dt.09.09.1991 has approved the revised estimate for Rs.1166.66 Crores.

(c) During actual execution from 1990 onwards, there was abnormal increase in the wages of labour, cost of materials due to the gulf, war, devaluation of rupee and liberalization of market. All these have resulted in double-digit inflation in general and the increase was much more in the construction industry. These increases have reflected on the work cost and rate structure. It was necessitated to revise the estimated rates for almost all the major civil works.

(d) Moreover during excavation, it was observed that the rock structure encountered was not as originally anticipated. Poor rock and fault zones have necessitated thicker concrete lining with heavy reinforcement and permanent steel supports. This also necessitated revision in the estimate.

(e) Accordingly revised estimate, was prepared in 1996 which worked out to Rs.2324.55 Crores and submitted to the CEA. Government of India confirmed the estimated project cost as ₹ 77,578 Million duly considering April' 1997 as base year, exchange rate of Rs.1/- = ₹ 3.41 and annual price escalation of 2.0% and 8.6% respectively for foreign and local currency.

(f) The first 150 MW unit of the Project was commissioned on 26.04.2001, and the last 6th unit was commissioned on 04.09.2003.

(g) At present the RCC weir is under construction at about 14 KM down stream of Srisaillam dam to store one TMC of water to run the units in pump mode operation during off peak hours. The construction of the weir was commenced in April' 2004 and completed up to 155.8 MEL out of 170 MEL, but works have been presently

stopped during July'05 due to good water flows and will be taken up and completed during 2006-07.

(h) In the order dated.15.03.2004, the Commission had disposed of review petition No. 13 of 2003 in O.P .No.402 of 2002 and has opined that pump mode operation of SSLBPH should be established as envisaged in the project report for consideration of capacity of this station to allow fixed charges in respect of the plant. This is to submit that with present full reservoir level of Nagarjuna Sagar Dam, it is now possible' for APGENCO to operate SSLBPH units in pump mode operation on commercial basis even with out completion of the weir.

(i) The State .Load Dispatch Center has been issuing instructions for Pump Mode Operation of SSLBPH from 07.12.2005. Accordingly SSLBPH has been successfully kept in Pump Mode Operation whenever required by the State Load Dispatch Center.

(j) Based on the actual expenditure incurred on the project works, the present estimate of the project has been prepared, according to which the estimated cost of the project along with IDC works out to Rs.3440.12 Crores/, comprising of Rs.2776.07 Crores of actual expenditure, proposed expenditure of Rs.16.11 Crores towards completion of weir construction and Rs.20.73 Crores towards spares + IDC of Rs.626.48 Crores) The amount required to complete the construction of Weir is also included in the estimate.

(k) Under the present regulatory scenario of the power sector, the Commission has to admit/approve the project cost for consideration of the same in fixed charges of the tariff. The Central Electricity Regulatory Commission (CERC) in the Terms and Conditions of Tariff Regulations, defined the 'Original Project Cost' of Hydel Power Generating Station as the actual expenditure incurred by the generating company, as per the original scope of project up to the first financial year closing after one year of the date of commercial operation of the last unit.

3. Based on the above submissions the petitioner prayed that
“In view of the above it is requested for in principle approval of the Commission for the revised estimated project cost of SSLBPH for Rs.3440.12 Crores, so as to consider the same for fixed charges in tariff. It is also requested to consider capacity of this station to allow fixed charges in respect Srisailam Left Bank Power House, as APGENCO has successfully established the Pump Mode Operation of SSLBPH”.

4. A counter affidavit is filed by the respondents in the petition and it is stated as follows:

(a) The crux of the matter in issue is for determination of fixed charges of LBPH. Therefore inevitably it requires, capital cost of the project. But as on today since the project is not in complete form as contemplated in project report i.e., Pump mode system. Therefore the capital cost of the project cannot be determined hence the petition under reply is not maintainable.

(b) It is necessary to mention here that the APERC in its Order dt. 15-3-2004 in R.P.No.13 of 2003 in O.P.No.402 of 2002 held that "It is pertinent to go in to the back ground based on which Srisailam Left Bank power house was conceived. The project report for SSLBPH envisages installation of (9) numbers reversible type pump turbine motor generating units of total capacity of 990 MW.

(c) The project report envisaged that the changing scenarios of water use at the up stream will lead to diminishing of total water availability and release pattern will be dictated fully by irrigation needs.

(d) The project report says that it is essential to install reversible pump turbine units at SSLBPH, which would ensure confirm utility of the power to provide peaking capacity. It is also stated that based on the scenarios discussed, it was assessed that SSLBPH would operate in conventional mode up to the year 2000 without pump turbine installation, the power station would loose its capacity value and its utility would only be in the months of seasonal energy generation.

(e) It is obvious that the seasonal surplus of 1000 Million units cannot translate in to peak power capability during non/monsoon period when the system demand will be high. Therefore it is necessary that pump mode operation should be established as contemplated in the project report for consideration capacity from this plant to arrive at the fixed charges.

(f) APGENCO has come up with a proposal of constructing weir of one TMCFT capacity with the approval Irrigation Department to facilitate pump mode operation even when the reservoir level at Nagarjunasagar Dam is below 531.5 ft. Therefore it is of view that capacity from the plant could be considered after the pump mode operation is fully established.

(g) The applicant filed this petition for approval of capital cost and fixed cost, stating that pump mode operation of SSLBPH was established from 7.12.2005. The said contention is not correct; APGENCO yet to construct weir/tail pond as proposed by them to facilitate pump mode operation even when the reservoir level at N. Sagar Dam is below 531.5 ft.

(h) Though as per directions of SLDC, the applicant has been operating SSLBPH units in pump mode operation, so far only three units were operated at a time. Even the said operation could be done due to good monsoon and availability of adequate water level in Sagar Dam. It is not a permanent arrangement. Therefore at present the units of SSLBPH cannot be considered as establishment of pump mode operation for consideration of capacity from this plant to allow fixed charges, as the APGENCO has not yet constructed weir for all the units as stipulated by the Commission in its Order dt.15.3.2004.

5. A reply is filed by the petitioner to the respondents counter and it is stated as follows:-

(a) The Petitioner denies all the allegations made in the Counter except to the extent specifically admitted herein. The Respondents are put to strict proof of the allegations and averments made in the Counter. 1

(b) It is true that the recognition and acceptance of the project cost of the SSLBPH is for the determination of fixed charges in the tariff for the supply of electricity generated from the project to the distribution licensees. It is not correct to suggest that the capital cost of the project cannot be determined as the project is not in complete form. It is also not correct to suggest that the petition is not maintainable for the reasons set out in the counter filed by the Respondents. It is submitted that the determination of capital cost of the project as completed so far, and which is generating electricity being supplied to the distribution licensees, is necessary for the purpose of determination of tariff.

(c) The SLBP Project was planned to utilise seasonal surpluses for seasonal energy generation and to provide peaking capacity with reversible pump turbine units by utilising the large live storage capacities of Srisailam and Nagarjunasagar reservoirs.

(d) The first objective of utilising the surpluses when the reservoir level is 885 ft or more has been achieved. Units 1 and 2 were commissioned in 2001-2002, and Units 3, 4 and 5 were commissioned in 2002-2003, and Unit 6 was commissioned in 2003-2004. A generation capacity of 900 MW has thus been established and the generation of electricity from this project has significantly benefited the DISCOMs and the consumers.

(e) The second objective was that of using stored water to meet the peak demand when the reservoir level is less than 885 ft. A peaking assistance capacity of up to 900 MW is established and available, subject to reservoir level and water release constraints.

(f) The third objective of the project was to establish reverse pump mode operation at Srisailam when the Nagarjunasagar level is 531.5 ft or more. Due to poor hydrology, this objective could not be realised up to and during 2004-2005. As soon as the reservoir level rose at Nagarjunasagar with good hydrology during 2005-2006, all the six units have been operating in reversible pump mode operation as per the demands of the DISCOMs and SLDC since 7.12.2005.

(g) The construction of a weir / tailpond at Srisailam, which was not part of the original DPR for the project, was mooted to enable pump mode operation even when the Nagarjunasagar reservoir level is below 531.5 ft. This part of the project has not yet been completed because the construction of the weir and associated works cannot be taken up and completed unless the Nagarjunasagar reservoir level falls below 530 ft and so remains for some substantial time, and also for want of necessary clearances.

(h) It is submitted that the SSLBPH generated 2232 MU, including pump mode generation of the order of 224 MU, during the year 2005-2006. It is also due to the substantial generation from this project that the consumers obtained the benefit of negative fuel surcharge adjustment for the 1st and 2nd quarters of 2005-2006.

(i) It is not correct to contend that the capital cost need not be determined or fixed cost not be allowed merely because an additional feature by way of a weir / tail pond has not been completed.

(j) All the six units have in fact been operated as per the requirement of the DISCOMs and the directions of SLDC since 7.12.2005. The fact of operation of all the six units in reversible pump mode operation has been certified on monthly basis since December 2005 by the designated officer during the monthly energy meter readings at the interface point. It is necessary to point out however that neither the DISCOMs nor the SLDC have ever required the petitioner to operate all the six units simultaneously at the same time. It is submitted that, given the required reservoir level and the pumping energy and the dispatch from the DISCOM / SLDC, the

project has been since commissioning, and is, capable of operating all the six units simultaneously.

6. We have heard the arguments of the counsel for petitioner and the respondents and perused the record along with connected records in other O.P. No. 27 of 2006 which is connected to the present petition.

7. The counsels have submitted their arguments and reiterated the submissions made in the petition and counter affidavit.

8. In view of the submission made by the parties, the issue that arises for consideration is

“Whether the petitioner entitled to the relief as prayed for?”

Commission Analysis:

9. APGENCO has filed application for approval of capital cost of SSLBPH amounting to Rs.3440.12 Crs. which includes Interest During Construction (IDC) and determination of tariff vide OP No. 7 of 2006. The Commission having examined the different components of the capital cost puts forth its analysis in the following paragraphs.

10. The amount of Rs. 3440.12 Crs. claimed by APGENCO, includes an estimated cost of Rs. 81.54 Crs. towards Capital Works In Progress (CWIP), for the weir under construction at the tailrace of SSLBPH. Since there is no certain date of completion, for the present construction works of the weir, due to various reasons including force majeure conditions existing at the project site, the Commission has not considered the cost of weir towards computation of capital cost of SSLBPH. However, APGENCO shall capitalize the cost of weir, as per audited actuals, after its completion and regular storage of water for pump mode operation.

11. Hence, the Commission has limited its analysis to the capital cost of SSLBPH towards construction(including Civil Works), procurement of equipments and

services, installation, testing and commissioning of six units of 150 MW each amounting to Rs. 3358.58 Crs. (including IDC) as claimed by APGENCO.

12. The Commission has prudently examined the component wise capital cost such as Loan, Equity, Expenditure and IDC. The year wise Capital outlay under these components of capital cost, starting from FY 1988-89 to 2004-05, and amount of interest accrued there on, have been tabulated under Annexure-I to this order.

13. The Rate of Interest (RoI) on various components of loan, drawn from different sources, such as JBIC, PFC and Vidyut Bonds, have been considered as notified by Government of Andhra Pradesh (GoAP) under relevant G.O.Ms. Nos. indicated against each year at column - 7 of Annexure-I.

14. The amount of loan drawn by APGENCO, from the sources mentioned supra, amounts to Rs. 2233.10 Crs. as shown under column - 2 and the equity amounts to Rs. 499.89 Crs. as shown under column-3 of Annexure-I. The actual IDC computed, based on the GoAP notified RoI, amounts to Rs. 1639.72 Crs. as shown under column – 6. As against the computed IDC of Rs. 1639.72 Crs., the amount claimed by APGENCO towards IDC, amounts to Rs. 617.24 Crs. as shown under column – 8 of Annexure-I, based on the books of accounts available with APGENCO.

15. APGENCO has declared the Commercial Operation Date (COD) for each unit as and when that unit is tested and successfully commissioned to deliver the designed energy, i.e. on different dates as mentioned in their petition, the COD for last unit being 04-09-2003. IDC has been considered for each unit upto the date of its COD. However, expenditure on some un-finished items of work have been allowed till the cut off date, as defined in the relevant regulation, which is the completion of first financial year, subsequent to the year in which the COD for the last unit occurs, as per APERC Regulation No 1 of 2008.

16. Thus, the above capital cost of SSLBPH includes Rs 414.41 Crs. towards capital cost, in the revised estimate of 2005 (i.e., Rs. 3440.12 Crs. minus IDC of Rs. 618.51 Crs. minus Rs. 81.54 Crs. towards the cost of weir) based on actuals as

compared to the estimated capital cost of 1996 (i.e. Rs. 2325.66 Crs.), due to foreign exchange variation (Rs 114.87 Crs.), price escalations (Rs 121.69 Crs.), additional expenditure on civil works and other works (Rs.177.85 Crs.) related to power project incurred upto 31-03-2005, i.e. the cut off date.

17. After COD of each unit, revenue was earned on sale of energy generated by each unit. The revenue earned and expenditure incurred towards Operation and Maintenance (O &M) and Interest charges, starting from FY 2002-03 to 2005-06, have been tabulated in Annexure-II. It may be noted that the revenue earned during the said period amounts to Rs. 271.54 Crs. as against an expenditure of Rs. 915.61 Crs. during the same period. Thus, there is no adjustment of revenue earned as reduction against the above capital cost.

18. The capital cost of Rs 2321.20 Crs. as approved by Ministry of Power (MoP), Govt. of India in 1997 (excluding IDC) was based on the estimated project cost of 1996 amounting to Rs. 2325.66 Crs.(excluding IDC). In its Tariff Orders for FY 2009-10, 2010-11 and 2011-12, the Commission has provisionally considered Rs 2321.20 Crs. towards capital cost of SSLBPH.

19. In the First Transfer Scheme notified by GoAP vide G.O. Ms. No. 11, dated 31-01-2000, the capital expenditure for SSLBPH was computed as Rs. 2204.76 Crs. (including IDC of Rs. 355.89 Crs.) as on 31-01-1999. The Commission considers this figure as the base capital expenditure as on 31-01-1999. Subsequently, actual capital expenditure of Rs. 1145.47 Crs. (including IDC of Rs. 261.35 Crs.) as on 31-03-2005 (i.e, as on the Cut-off date) based on audited accounts has been considered to be added to the base capital expenditure as on 31-01-1999. Hence, the total capital cost of SSLBPH works out to Rs. 3350.23 Crs.

20. The capital cost per MW for 6x150MW SSLBPH works out to Rs. 3.72 Crs. which is approximately Rs. 1.00 Crs. less than that of a comparable Hydro-Electric Project, named Nathpa-Jhakri Hydro-Electric Project (NJHEP) in Himachal Pradesh. The 6x250 MW NJHEP was constructed during the same period as SSLBPH (i.e., during 1989 to 2004) with a capital cost of Rs. 7010.57 Crs. (excluding Dam

cost of Rs. 1177.14 Crs.) which works out to Rs. 4.67 Crs. per MW as shown in Annexure-III.

21. In view of the above analysis, the Commission approves the total capital cost of SSLBPH amounting to Rs. 3350.23 Crs. as per details given in Annexure-I with the effective date of 07-12-2005 (i.e., date of establishing pump mode operation) to be reckoned for the purpose of determination of Fixed Cost component of Generation Tariff for SSLBPH in the subsequent period as prayed for by the petitioner (APGENCO).

The order is corrected and signed on this 17th day of June, 2011

Sd/-	Sd/-	Sd/-
(C.R.SEKHAR REDDY)	(R.RADHA KISHEN)	(A. RAGHOTHAM RAO)
MEMBER	MEMBER	CHAIRMAN

The order in O.P.No.7 of 2006 was prepared and signed by the demitting Member on 15.06.2011 i.e., on his last working day. On the same day, the Chairman accepted the same and signed on 15.06.2011. Where as Member/Finance, who was at Delhi in the meeting of FOIR and returned to office on 17.06.2011 and after reading the same, he signed the order on 17.06.2011. Hence, the Secretary of the Commission is directed to put the date of the order as 17.06.2011, on which date the last signature was subscribed.

Sd/-
CHAIRMAN

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Annexure III

Cost comparison

Similar under ground power house has been established by Satluj Jal Vidyut Nigam in Himachal Pradesh.

(Rs in Crs)

S.No	Description	SLBPH cost	NJHEP cost
		(6x150 MW)	(6x250 MW)
1	Major Civil works	925.25	3108.273
2	Electro Mechanical works	1771.51	1266.82
3	IDC	617.24	2031
4	Establishment	36.23	610
5	Less infirm power	---	-5.52
	Total	3350.23	7010.573
6	Completion cost / MW		
	(excluding dam portion)	3.72	4.67
7	Cost of Dam	---	1177.14
8	Total project cost including dam	---	8187.713 (5.46 Cr/MW)
9	Project envisaged	1988	1989
10	Commissioning of last unit	Sep , 2003	May , 2004
11	Project commissioning Duration	15 years	15 years

Sd/-
(C.R.Sekhar Reddy)
Member

Sd/-
(R.Radha Kishen)
Member
//Certified Copy//

Sd/-
(A.Raghotham Rao)
chairman

Annexure II

Details of Revenue and expenditure of SLBHES

(Rs in Crs)

Year	Revenue	Expenditure
2002-03	46.98	245.99
2003-04	23.32	250.86
2004-05	64.29	206.15
2005-06	136.95	212.61
Total	271.54	915.61

Sd/-
(C.R.Sekhar Reddy)
Member

Sd/-
(R.Radha Kishen)
Member
//Certified Copy//

Sd/-
(A.Raghotham Rao)
Chairman

Annexure I

(Rs in Lakhs)

Year	Loan	Equity	Expenditure	Cumulative loan	IDC	Base or IDC computation	IDC claimed
1988-89	6.80	1.52	8.32	6.80	1.05	G.O.Ms.No. 25 dt 12.2.1993, RoI 15.5%	35589
1989-90	31.61	7.08	38.69	38.41	5.95	G.O.Ms.No. 56 dt 23.3.1993, RoI 15.5%	
1990-91	1999.69	447.91	2447.60	2038.10	315.90	G.O.Ms.No. 66 dt 30.3.1993, RoI 15.5%	
1991-92	4980.85	1115.66	6096.51	7018.95	1087.94		
1992-93	2531.41	567.01	3098.42	9550.35	1467.65	G.O.Ms.No. 53 dt 22.3.1995, RoI 15%	
1993-94	5011.03	1122.42	6133.45	14561.38	2294.47	G.O.Ms.No.107 dt 06.7.1995, RoI 16.5%	
1994-95	28837.47	6459.31	35296.78	43398.85	7052.65	G.O.Ms.No. 31 dt 30.3.1996, RoI 16.5%	
1995-96	36778.28	8237.97	45016.25	80177.13	13121.07		
1996-97	19012.77	4258.67	23271.44	99189.89	15877.92	G.O.Ms.No. 75 dt 31.3.1999, RoI 14.5%	
1997-98	22354.08	5007.10	27361.18	121543.98	19119.26		
1998-99	29508.87	6609.70	36118.57	151052.85	23545.59	G.O.Ms.No. 109 dt 17.11.2000, RoI 15.5% and PFC loan @ 10% and Vidyut bonds @ 15%	886
1999-00	6962.49	1559.53	8522.02	158015.34	24589.96		8013
2000-01	16761.65	3754.45	20516.10	174776.99	27104.21		8183
2001-02	20073.78	4496.33	24570.11	194850.77	20076.85	G.O.Ms.No. 39 dt 31.3.2001, RoI 15.5%and PFC loan @ 10% and Vidyut bonds @ 15%	5209
2002-03	17837.72	3995.47	21833.19	212688.49	5465.16		2493
2003-04	9132.64	2045.62	11178.26	221821.13	2846.74	G.O.Ms.No. 117dt 17.10.2002, RoI 15.5%and PFC loan @ 10% and Vidyut bonds @ 15%	1351
2004-05	1489.02	303.52	1792.54	223310.15			
Total	223310.14913	49989.28087	273299.43		163972.36		61724
							35589
Total capital cost excluding weir cost			335023.43				26135

Sd/-
(C.R.Sekhar Reddy)
Member

Sd/-
(R.Radha Kishen)
Member

Sd/-
(A.Raghotham Rao)
Chairman

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