CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

Petition No. 199/GT/2013

Coram:
Shri Gireesh B. Pradhan, Chairperson
Shri A.K. Singhal, Member
Shri A.S. Bakshi, Member

Date of Hearing: 09.12.2014
Date of Order: 31.08.2015

In the matter of

Approval of tariff for Block-I (Unit-I) of Palatana Combined Cycle Gas Turbine Power Project (363.3 MW) of ONGC Tripura Power Company Ltd for the period from 4.1.2014 to 31.3.2014.

ONGC Tripura Power Company Ltd.
6th Floor, A-Wing, IFCI Tower-61, Nehru Place,
New Delhi-110019 **…Petitioner**

Vs

1. Assam Power Distribution Company Ltd, Guwahati
2. Department of Power, Government of Arunachal Pradesh, Itanagar
3. Department of Power, Government of Nagaland, Kohima
4. Electricity Department, Government of Manipur, Imphal
5. Power and Electricity Department, Government of Mizoram, Aizwal
6. Meghalaya Energy Corporation Ltd, Shillong
7. Tripura State Electricity Corporation Ltd, Agartala **...Respondents**

Parties present

For Petitioner: Shri. Arup Ch. Sarmah, OTPCL
Dr. G. R. Nagendran, OTPCL
Shri. Chetan Jain, OTPCL
Ms. Rashmi Wattal, OTPCL
Ms. Namrata Mukherjee, OTPCL
Shri. Bibhu Biswal, OTPCL
Shri. Neeraj Nanavaty, OTPCL
Shri. Parag Naringlear, OTPCL
Shri. Rajat Kumar, OTPCL

ORDER

The petitioner, ONGC-Tripura Power Company Ltd (OTPCL) has filed this petition for approval of tariff of Palatana Combined Cycle Gas Turbine Power Project (2 x 363.3

MW) ('the generating station") for the period from the date of commercial operation (COD) of Block-I i.e. from 4.1.2014 to 31.3.2014, in terms of the provisions of the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2009 ('the 2009 Tariff Regulations').

2. The generating station with an installed capacity of 726.60 MW comprises of two blocks of 363.30 MW each. The petitioner is a joint venture of ONGC, IL&FS (through its affiliate IEDCL) and the Govt. of Tripura with the major share holding by ONGC (50%), IEDCL (26%), Govt. of Tripura (0.5%) and Residual Equity (23.5%) for setting up the project. The beneficiaries of the North Eastern States have been allocated a capacity of 628 MW from the generating station and the balance capacity of 98 MW is towards merchant sale.

3. The petitioner had prayed for determination of tariff of the generating station for the period from the anticipated COD of Block-I (31.7.2012) and from COD of Block-II (31.10.2012) to 31.3.2014. Since the units of the generating station could not be declared under commercial operation, the petitioner had filed Interlocutory Application I.A No.15/2013 and submitted that Block-I of the generating station was expected to be declared under commercial operation on 20.6.2013 and Block-II on 31.10.2013. It also prayed that tariff for the proposed sale of power to respondents from Block-I may be granted and also liberty be granted to approach the Commission for determination of tariff of Block-II as and when the same is declared under commercial operation. Subsequently, the petitioner vide affidavit dated 30.9.2013, prayed for grant of provisional tariff for Unit-I of the generating station. Thereafter, the Commission vide order dated 20.12.2013 in Petition No.199/GT/2013 granted provisional tariff for Block-I of the generating station for the period from anticipated COD of Unit-I (Block-I) to 31.3.2014. Subsequently, the petitioner vide affidavit dated 19.6.2014 revised the petition along with the tariff filing

forms for determination of final tariff of Block-I considering the actual COD of Block-I from 4.1.2014 to 31.3.2014. The Commission thereafter directed the petitioner to file certain additional information which was filed by the petitioner vide affidavit dated 13.10.2014.

4. The petition was heard on 9.12.2014 and the Commission while reserving orders for determination of tariff of the generating station directed the petitioner to file certain additional information, which was filed by the petitioner vide affidavit dated 15.12.2014.

5. The annual fixed charges claimed by the petitioner vide affidavit dated 14.6.2014 are as under:

(₹ in lakh)

	4.1.2014 to 31.3.2014
Depreciation	2671
Interest on Loan	3483
Return on Equity	2191
Interest on Working Capital	5.21
O&M Expenses	1638
Total	**10503**

6. Reply to the petition has been filed by one of the respondents, Assam Power Distribution Company Ltd and the petitioner has filed its rejoinder to the said reply.

Commissioning Schedule

7. Based on the evaluation report prepared by the Technical Consultants-M/s FITCHNER Consulting Engineers (India) Private Ltd on the price bid of M/s BHEL submitted on 12.6.2008, the Board of directors of the Petitioner Company in its 21st meeting held on 23.6.2008 issued Notice of Award (NOA) to M/s BHEL on 23.6.2008 for completion of the project within 42 to 45 months from the date of NOA (zero date). Thus, the scheduled date of commissioning from the zero date and the actual COD for Block-I of the generating station is as under:

	Scheduled COD	Actual COD	Time overrun
Block-I	22.12. 2011	4.1.2014	744 days

8. Thus, there is significant time overrun in commercial operation of Block-I and the same is discussed in subsequent paragraphs.

Admissibility of Additional Return on Equity

9. The Board of Directors of the Petitioner Company has approved the project and capital cost in its 23rd meeting held on 18.12.2008. Accordingly, the date of investment approval of the project is 18.12.2008. In terms of the provisions of the 2009 Tariff Regulations, the time line specified for the completion of a green field gas based combined cycle project above 100 MW (ISO rating) from the date of investment approval is 30 months for the first Unit with subsequent units at an interval of 4 months each. The actual COD of Block-I (Unit-I) is 4.1.2014 which is about 60 months from the date of investment approval. Since Block-I (Unit-I) of the generating station has been declared under commercial operation beyond the timeline specified under the said regulations, the same is not entitled to the additional Return on Equity (RoE) of 0.5% allowed for timely completion of the project.

Time Overrun

10. As stated above, the time overrun in case of Unit-I of the generating station is about 744 days. The petitioner by affidavit dated 20.7.2012 has submitted that there is time overrun in the project but the overall cost of the project remains within the approved cost approved by the Board in the Investment Approval. It has also submitted that part of the delay in the commissioning schedule is attributable to the EPC contractor and the Liquidated damages to be recovered from the EPC contractor will be crystallized after completion of the project. It has further submitted that there are various other aspects for time overrun other than BHEL and hence it is difficult to quantify the LD amount at this

stage. Thereafter, the petitioner by affidavit dated 17.6.2013 in I.A.No.15/2013 has submitted the reasons for the delay in the commissioning of the project, which has been reiterated by affidavit dated 20.6.2014. The petitioner was also directed to furnish the reasons for time overrun with the help of PERT chart in order to examine the period of delay in commercial operation of the project and in response, the petitioner vide affidavit dated 15.12.2014 has furnished the "Milestone of Major Activities" along with reasons for the said delay of 744 days in case of Block-I of the generating station.

Reasons for Time Overrun

11. The reasons for time overrun submitted by the petitioner vide affidavits dated 17.6.2013 and 20.6.2014 is extracted as under:

> "***Over Dimensional Cargo (ODC)***
>
> *To set up this power project, 90 Over Dimensional Cargo (ODC) were needed to be transported to the site. Maximum weight of these ODC was around 300 MT, maximum width was around 5 mtr, maximum height around 5.1 mtr and maximum length around 24 mtr.*
>
> ***ODC Logistics Constraints***
>
> *To transport the Over Dimensional Cargo (ODC) from mainland India to the plant site, all possible transport routes (Air/Waterway/Rail/Road) were explored. It was only the combined waterways and road route that was found feasible for transportation of ODC as other modes of transport faced challenges of tunnels & bridge capacities (Rail route), runway length & aircraft capacity (Air route) and limited bridge capacity and railway over bridge spans (Road route). The road route also posed other constraints like many weak bridges could not be bypassed, high bypass construction cost on some of the bridges, low clearance span for bowstring girder bridges and electrified railway crossings having low height clearance for ODC.*
>
> ***Long Winding Roadways and Waterways Route***
>
> *The waterways and road route earlier envisaged was Kolkata-Karimganj(Assam)-Palatana route which had a total distance of 1650 Km. On this route, the water draft was available from May to September. Between Karimganj and Palatana, the bridges were not strong enough and bypasses needed to be constructed. Road transportation too involved hilly terrain (125 Km ghat section) where bypass construction was extremely difficult. Bypass construction and road transportation on this route was possible during dry season from November to April.*
>
> ***Transportation through Foreign Country Territory***
>
> *Limited transportation window and risk involved in transportation of ODCs through ghat section led us to explore transportation through Bangladesh territory i.e. Kolkata-*

Ashuganj(Bangladesh)-Palatana route which had a total distance of 966 Km. This route brought distinct advantages over Karimganj route e.g. waterways navigable throughout the year, very small ghat section to be traversed and comparatively smaller distance to be travelled. However it required permission from Bangladesh government for declaring Ashuganj as port-of-call in Indo-Bangla Water Transport Protocol and allowing movement of ODC through Bangladesh after construction of jetties and bypasses.

With full support from Government of India (GoI) and Govt.Of Tripura, Bangladesh government included Ashuganj as port-of-call in Protocol in August 2010 and gave permission for movement of ODCs through their territory on 30th November 2010 by signing the MOU.

Onset of Early Monsoons/Jetties and Bypasses

Bypass/jetty construction takes nearly three months and it was only in mid March 2011 that bypasses were ready. 24 bypasses were constructed, 15 in Bangladesh and 9 in India. Also 4 jetties were constructed, 1 in India and 3 in Bangladesh. Early onset of monsoon in Bangladesh gave OTPC time to transport only 35 ODC (of total 90 ODCs) till mid April 2011. The bypasses/jetties were washed out in monsoon and the remaining ODC could be transported only after the monsoon.

The jetties and bypasses were washed out several times and had to be repaired and reconstructed time and again. Barges were used to cross perennial river in Bangladesh at places where bypass construction was not possible. This delayed the transportation of materials and the project as a whole. It required a great effort on the part of OTPC to develop roads, bypasses and jetties in a foreign country for the transportation of ODC's and other critical items. The 90 ODCs were transported to Palatana site from Trichy / Hyderabad/Bhopal/Haridwar covering an average distance of nearly 3000 Km each. For commissioning the project as per scheduled COD, BHEL had to provide the material/equipment for both units at the site by December 2010. However the last ODC for both units reached site in January 2012. Due to this late arrival of equipments at site, which primarily happened due to delay in receipt of permission from Government of Bangladesh (MOU signed in November 2010) and early onset of monsoon, as explained earlier, project got delayed. OTPC was earnestly exploring all the routes for safe transit of ODC cargo from the very start of the project. The details of these efforts are captured in the Board Minutes annexed with this petition.

Also as per the schedule provided by BHEL, all erection and commissioning work at site had to be finished by December 2011 i.e. within one year of receipt of all material at the site. But all the material/equipment was received late at site in January 2012 due to the above mentioned difficulties. Still OTPC was able to synchronise the Unit-1 of the project in combined cycle mode on 22nd October 2012 i.e. in less than one year of the receipt of all material/equipment at site.

Project in Remote Area/Difficult Terrain/Manpower-Material Problem

Being situated in a difficult terrain the region faces a scarcity of construction materials, construction equipments and skilled manpower. Due to its remote location the connectivity of the project location with mainland India was a challenge and posed great difficulty in transportation of materials, equipment and manpower to the site. Most of the construction material is brought to the project site from different states. The manpower for the project activities is not available locally and is sourced from other places. These factors delayed the civil works at the site.

Reasons for further delay after Date of First Synchronization (22nd Oct'12)

Since 22nd October, 2012, the unit was running as per load (not full load) provided by the NERLDC and teething problems of the Unit were attended from time to time. Thereafter the NERLDC was not in a position to provide sufficient load for testing purposes due to evacuation system constraints till February 2013 and this resulted in delay in completion of PPA Test during this time period.

Later during the course of operation of the Unit-1, a defect was detected in the Heat Recovery Steam Generator (HRSG). This had caused a plant outage from 14th February 2013 to 9th May 2013. The defect was the insulation failure of cladding sheets in the inlet duct of HRSG. The whole cladding sheets including insulation had to be replaced and the material had to be brought from BHEL, Trichy.

Since end May 2013, the problems with the quality of the fuel gas supplied by Oil & Natural Gas Corporation (ONGC), supplier of Fuel to the Palatana Project hampered the balance commissioning activities. Contamination of foreign particles was observed with the fuel gas thereby restricting drawl of gas. This contamination damaged two of the gas booster compressors (GBC) which were sent to BHEL Hyderabad works for repair.

Meanwhile ONGC made further efforts to provide clean gas to OTPC by changing some of the filters and scrubbers and also by installing a cyclone separator, to ensure supply of clean fuel gas to OTPC. Some parts of the cyclone separator were also imported, further leading to the delay. Also as the contamination in the gas was still there, ONGC also undertook the pigging of the pipeline again using PIGs imported from USA under the supervision of US experts. The details were submitted to the Hon'ble Commission. After Commissioning of the Cyclone Separator in the month of December 2013, the remaining commissioning tests on Unit-1 were completed.

It is evident that all these reasons were beyond the control of the petitioner. Also we request the Hon'ble Commission to consider the logistic challenges under the provisions of Change in Law as it included transportation in foreign territory and the Government of Bangladesh law was applicable for the approval of transportation of materials. The details for Unit-2 will be submitted at the time of determination of tariff for the project at the time of COD of Unit-2."

12. Similar submissions have been made by the petitioner in response to the directions of the Commission on 5.9.2014. Thereafter, the Commission, pursuant to the hearing of the petition on 9.12.2014, directed the petitioner to provide a detail break-up of time overrun in a tabular form giving reasons for the each delay including the period of delay, number of working days lost including the time period, the activities which had suffered due to such reason along with a PERT chart. In response the petitioner vide affidavit dated 15.12.2014 has submitted the detail break-up of time overrun in commissioning of Unit-I of the generating station as under:

Sl. No.	Reasons for Delay	Activities Suffered	Start Date		Completion Date		No of Days Lost	If some activity suffered simultaneously due to two or more than two reasons, effective days lost	Description in detail indicating the manner in which the specified reason delayed the COD along with supporting documents and PERT/BAR chart whenever necessary
			Scheduled	Actual	Scheduled	Actual			
1.	Late Receipt of material/ equipment for both units at Plant Site due to logistics challenges as ODC were transported through foreign territory i.e. via Bangladesh	Transportation of ODC Materials and Receipt at Site	May 2010	August 2010	10.12.2010	13.1.2012	399 Days		Last ODC reached site in January 2012. A delay of around one year due to delayed permission from Government of Bangladesh. With support from Govt of India, Ashuganj in Bangladesh was included as port of call in the Indo-Bangla Waterways Protocol Treaty to include Ashuganj as Port of Call (Change in Law). Some of the material was started to getting ready for dispatch with BHEL at BHEL works by May 2010. RO-RO jetties, Roads and a number of bypasses had to be prepared and repaired time and again in Bangladesh due to washout by rains. 35 out of 90 ODC were transported to site by mid April 2011. Early onset of monsoons delayed further transport of ODC and led to delay. We have also attached a presentation capturing the logistical hurdles with the submission.

2.	Logistics challenges as ODC were transported through foreign territory i.e. via Bangladesh	Erection of ODC materials	October, 2010	August, 2011	28.6.2011 (Revised scheduled date for erection of ODC is 31.7.2012 due to 399 days delay in logistics)	29.6.2012	0	0	Scheduled date for erection of ODC was revised to 31.7.2012 due to 399 days delay in receipt of ODC at site due to logistical challenges in transportation of ODC. The petitioner was actually able to complete the erection of ODC on 29.6.2012, thereby making a saving of 32 days. The same has been captured in the pert/bar chart submitted by the petitioner.
3.	Inability of NERLDC to provide full load for trial run and conducting commissioning tests.	Trial Run and Declaration of COD			22.12.2012 (The Unit was synchronized in Combined Cycle mode)	1.3.2013 (NETC Silchar-Byrnihat section was declared under COD)	70 Days		The delay was due to logistical challenges faced while transporting ODC via foreign territory. OTPC was still able to synchronize Block-I in CC mode on 22.10.2012, well within one year of material receipt at site. The NERLDC was not in a position to provide sufficient load for testing purposes due to evacuation system constraints and this resulted in delay in completion of PPA Test during the time period beyond October 2012. We have attached the NERPC meeting minutes expressing the inability to provide load and the COD letter from NETC for Silchar-Byrnihat section.

4.	Defects in Heat Recovery Steam Generator (HRSG)	Trial Run and Declaration of COD			14.2.2013	9.5.2013	84 Days	69 Days effectively	During the course of operation of the Block-I, a hotspots were detected in the Heat Recovery Steam Generator (HRSG). The HRSG had to be rapired and this caused a plant outage from 14.2.2013 to 9.5.2013. To minimize delay in rectifying defects in HRSG, large amount of materials were brought to site by air freight and work was carried out round the clock. Unit was restarted on 9.5.2013.Since defect in HRSG could not be foreseen, the delay in commissioning from 1.3.2013 to 9.5.2013 may kindly be waived off by the commission. We had already submitted the details to the Commission.
5	Contamination in Fuel Gas	Trial Run and Declaration of COD			9.5.2013	3.1.2014	238 days		Since October, 2012 to February, 2013 contamination free gas was being received by OTPC. Block-I was restarted on 9.5.2013 after rectification of defects in HRSG. Suddenly in May, 2013 contaminated gas started to flow to the project. So since May 2013, the problems with the quality of the fuel gas hampered the balance commissioning activities. Contamination of

									foreign particles was observed with the fuel gas thereby restricting drawl of gas. This contamination damaged two of the gas booster compressors (GBC) which were sent to BHEL Hyderabad works for repair. Extensive pigging was carried out of the entire pipeline nearly 50 times to remove the contamination in fuel gas. However the contamination in form of black dust remained in spite of numerous pigging of the pipeline, making it difficult to complete the balance trial run/commissioning tests. Meanwhile further efforts were undertaken to remove the contamination and provide clean gas to OTPC by changing some of the filters and scrubbers and also by installing a cyclone separator. Also as the contamination in the gas was still there, subject matter experts were also called from USA. After Commissioning of the Cyclone Separator in the month of December 2013, the remaining commissioning tests on Block-I were completed. Block-I of Palatana Project

									successfully completed its Trial Operation including Commissioning Tests on 30.12. 2013. As advised by NERLDC a 3 days notice was given to the beneficiaries and concerned regulatory agencies as per regulations and accordingly the said block was declared was under commercial operation w.e.f. 00:00 Hrs. of 4.1.2014.
Total delay (a)								776 days	
Days saved (b)								32 days	
Effective delay (a-b)								**744 days**	

13. The gist of the reasons for time overrun as submitted by petitioner is as under:

"Logistic Constraints (18.11.2011 to 22.10.2012)

(a) 90 Over Dimensional Cargo (ODC) movement through Bangladesh.

(b) Permission was required from the Government of Bangladesh for:

(i) Amendment of Indo-Bangla Waterways Protocol Treaty to include Ashuganj as Port of Call (Change in Law).

(ii) Permission required from Government of Bangladesh for transportation of equipments through Bangladesh Territory.

(iii) Permission required from Government of Bangladesh for construction of Jetties and Bypasses in Bangladesh.

(c) OTPC started pursuing the matter in year 2007. The Government of India and OTPC both took up the matter with Government of Bangladesh for allowing movement of ODCs through their territory.

(d) Process speeded up after Awami League Government came in power in Bangladesh and Hon'ble Prime Minister of Bangladesh visited India in January 2010.

(e) Indo-Bangla Waterways Protocol Treaty was amended on 31.5.2010 and Ashuganj was included as Port of Call.

(f) MOU was signed between OTPC and the Government of Bangladesh on 30.11.2010 allowing construction of by-passes and jetties and movement of ODC from Ashuganj to Agartala via Akhaura checkpost.

(g) Construction of by-passes and Jetties started in December 2010 and was completed in March, 2011. As such activity was being done for the first time and custom clearance also took long time.

(h) Due to arrival of rain, several by-passes and jetties got washed-out / submerged. These were repaired/ reconstructed and movement continued during monsoon season. Last ODC reached site in January, 2012.

(i) As per original schedule, these ODCs were to reach site by December, 2010. However, due to Change-in-law and Force majeure condition of rains and washout of bypasses, delivery of ODCs was delayed by more than 12 months.

(j) As per original schedule Combined Cycle (CC) mode synchronization was to be completed within 11 months of receipts of ODCs at site. However, by strict project monitoring and augmentation of resources, CC mode synchronization was completed within 10 months of receipt of ODCs at site.

Evacuation Constraint

(a) For commissioning of Unit, power evacuation of full capacity was required. At the time of CC mode synchronization in October 2012, 400 KV line was charged upto Silchar only. Due to this evacuation of power was restricted.

(b) Full load evacuation required backing down of generation by other generators in the grid. It required close coordination of activities. However, uncertain nature of activities involved in commissioning, on many occasions backing down could not be synchronized with running of Unit. This heavily restricted commissioning activity till line up to Byrnihat was commissioned on 1st March 2013.

(c) Since, evacuation constraint was beyond control of OTPC, Hon'ble commission may kindly allow this delay from 22nd October 2012 till 1st March 2013.

Defects in HRSG

(a) On 14th February 2013, while unit was in operation for commissioning activities, hotspots were observed in HRSG.

(b) It was found out that liners of HRSG had given way and required to be replaced.

(c) To minimize delay in rectifying defects in HRSG, large amount of materials were brought to site by air freight and work was carried out round the clock. Unit was restarted on 9th May 2013.

(d) Since defect in HRSG could not be foreseen, the delay in commissioning from 1st March 2013 to 8th May 2013 may kindly be waived off by Hon'ble commission.

Gas Contamination

(a) Unit was restarted on 9th May 2013 after rectification of defects in HRSG and commissioning activities were restarted.

(b) In May 2013, first time contamination of gas was observed. Measures were taken to control the contamination by repeated pigging.

(c) In spite of all possible measures taken, contamination of gas continued to increase. Following actions were taken in order to clean the gas:

i. *Called subject matter expert from USA.*
ii. *Repeated and continuous pigging of pipeline done.*
iii. *Additional Cyclone Separator installed.*
iv. *Filters replaced with fine filters.*

(d) After continuous effort and taking above mentioned action, gas became reasonably clean in December 2013 after which trial operation was completed on 31st December 2013 and COD was declared on 4th January 2014.

(e) Such contamination of gas is beyond ONGC / OTPC's control. Also as all possible steps were taken to make gas contamination free which is expected from a prudent operator, it is prayed to Hon'ble Commission to kindly waive delay from 9th May 2013 to 4th January 2014 on account of contamination of gas.

It may also be noted that the occurrence of the black powder in the gas transportation pipelines is a rare but worldwide phenomenon. It happens in both dry gas and wet gas pipelines and under dry conditions it can take form of a very fine dust. The occurrence of this black powder phenomenon can only be known at the time of running the machines and cannot be anticipated beforehand. In case of the petitioner too this problem cropped up in May 2013 when the HRSG defects had been rectified and the petitioner was preparing to undertake commissioning tests on the machines. As such it was an unanticipated situation and beyond the control of the petitioner. The petitioner made its best efforts to solve this problem in co-ordination with the gas supplier by undertaking repeated pigging of the entire gas pipelines nearly 50 times, calling experts from US and installing the cyclone separator. A research paper supporting the occurrence of this black powder phenomenon has also been annexed to this submission for reference of the Hon'ble Commission."

Submissions of Respondent, APDCL

14. The respondent, APDCL vide affidavit dated 31.7.2014 has filed its response as under:

"Over Dimensional Cargo (ODC)

(i) The size of the machineries was well known beforehand to the petitioner at the time of conceivement of the project. Therefore any delay in transportation of Cargo is attributable to the petitioner.

ODC Logistic Control

(ii) Transportation delay could have been avoided by proper time schedule.

Long Winding roadways and water ways route

(iii) These facts are known to the petitioner from the days of preparation of DPR. Moreover, these are not sudden and overnight developments.

Transportation to foreign country territory
(iv) Commission may kindly see when Bangladesh Government was approached by the petitioner/ Indian Government.

Onset of early monsoon/ Jetties and Bypasses
(iv) It is well known to all including the petitioner that the monsoon in NER normally starts from mid of April.

Project in Remote Area

(v) Analyzing the location, the petitioner should have planned everything considering the time factor.

Reasons for delay after first synchronization

(vi) The beneficiary states of NER were ready to allow full load testing to Palatana even by backing down/shutting down of other generators. But considering the size of Palatana machines vis-à-vis power exchange of NER Grid, NERLDC advised to load Palatana machine step by step basis without backing down/de-synchronization of other machines for security point of NER Grid."

Analysis

15. We have examined the submissions of the parties and the documents available on record. The Appellate Tribunal for Electricity (the Tribunal) in its judgment dated 27.4.2011 in Appeal No. 72 of 2010 has laid down the following principle for prudence check of time overrun and cost overrun of a project as under:

"7.4. The delay in execution of a generating project could occur due to following reasons:

Due to factors entirely attributable to the generating company, e.g.,

i. imprudence in selecting the contractors/suppliers in executing contractual agreements including terms and conditions of the contracts, delay in award of contracts, delay in providing inputs like making land available to the contractors, delay in payments to contractors/suppliers as per the terms of contract, mismanagement of finances, slackness in project management like improper co-ordination between the various contractors, etc.

ii. Due to factors beyond the control of the generating company e.g. delay caused due to force majeure like natural calamity or any other reasons which clearly establish, beyond any doubt, that there has been no imprudence on the part of the generating company in executing the project.

iii. Situation not covered by (i) & (ii) above.

In our opinion in the first case the entire cost due to time over run has to be borne by the generating company. However, the Liquidated damages (LDs) and insurance proceeds on account of delay, if any, received by the generating company could be retained by the generating company. In the second case the generating company could be given benefit of the additional cost incurred due to time over-run. However, the consumers should get full benefit of the LDs recovered from the contractors/supplied of the generating company and the insurance proceeds, if any, to reduce the capital cost. In the third case the additional cost due to time overrun including the LDs and insurance proceeds could be shared between the generating company and the consumer. It would also be prudent to consider the delay with respect to some benchmarks rather than depending on the provisions of the contract between the generating company and its contractors/suppliers. If the time schedule is taken as per the terms of the contract, this may result in imprudent time schedule not in accordance with good industry practices.

7.5 In our opinion, the above principle will be in consonance with the provisions of Section 61(d) of the Act, safeguarding the consumers' interest and at the same time, ensuring recovery of cost of electricity in a reasonable manner."

16. The factors which had led to the total delay of 776 days (effective delay of 744 days=total delay of 776 days minus 32 days saved in erection of ODC)] in the completion of the project are:

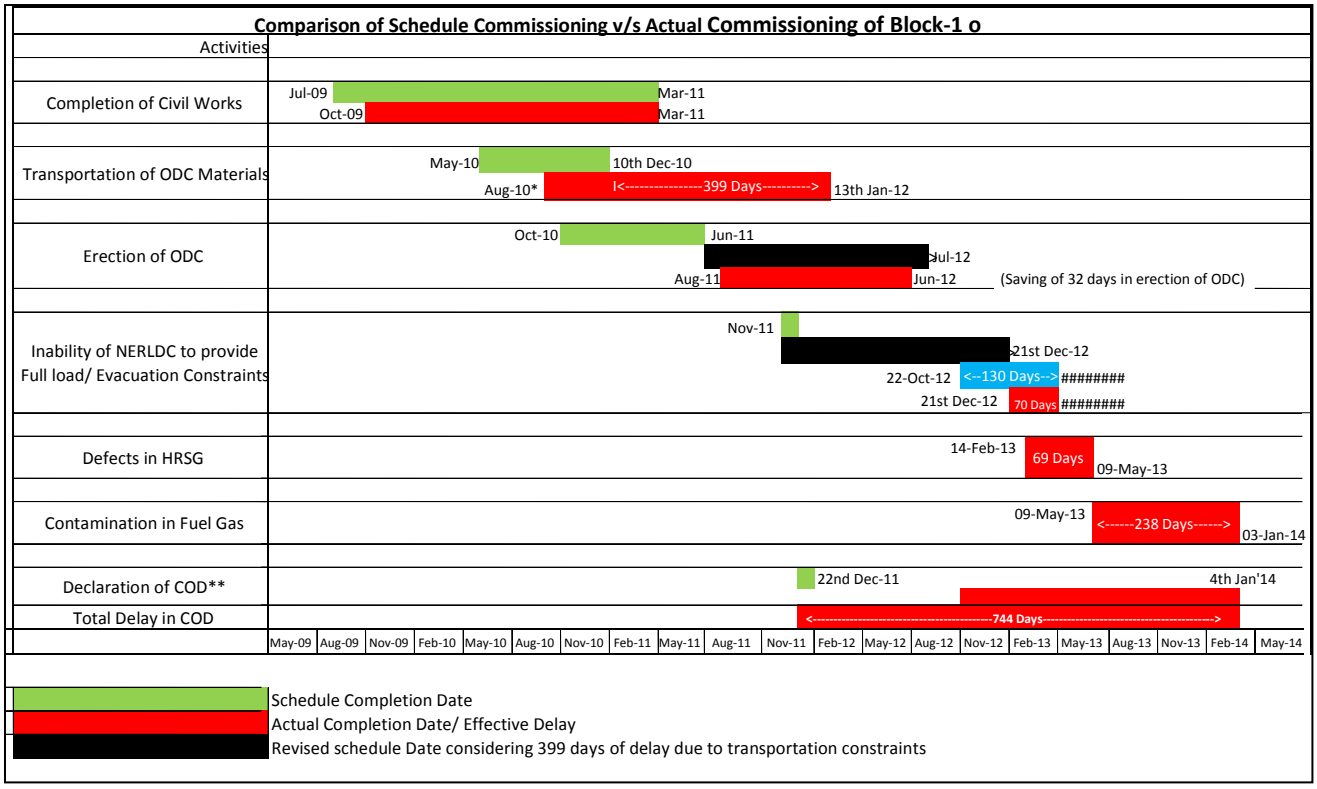
(i) delay of 399 days on account of delay in transportation of ODC materials and receipt at site;

(ii) delay of 70 days due to inability of NERLDC to provide full load for trial run and commissioning tests;

(iii) delay of 69 days due to hot spots detected in Heat Recovery Steam Generator (HRSG) and

(iv) delay of 238 days due to contamination in fuel gas.

17. The petitioner has submitted a chart giving the scheduled date of commissioning and the actual commissioning of Block-I of the generating station as per major milestones such as., the completion of civil works, transportation of ODC materials, erection of ODC, inability of NERLDC to provide full load for trial run & commissioning tests etc. The details of the works which got delayed thereby resulting in the delay in COD of the Block-I of the generating station as submitted by the petitioner are as under:



Logistic Constraints

18. It is evident from the above that there is delay of 399 days (from 10.12.2010 to 13.1.2012) on account of Transportation of ODC materials and receipt of materials at site. From the justification submitted by the petitioner, it is clear that the delay was due to various constraints such as, requirement of amendments to the Indo-Bangladesh Protocol on Inland Water Transit & Trade for inclusion of Ashuganj as port of call (i.e Change-in-Law) and permission from the Government of Bangladesh for transportation of equipment through Bangladesh and permission required from Government of Bangladesh for construction of jetties, and a number of bypasses. MOU was signed between the petitioner and the Government of Bangladesh on 30.11.2010 and the construction of bypasses and jetties had started in December, 2010 and were completed in March, 2011, as such activity was being done for the first time and which also involved custom clearance. It is further noticed that the early onset of monsoons (as

Force Majeure) had further delayed transportation of ODC since as per original schedule, the ODCs were to reach the site by December, 2010.

19. Tripura is surrounded by Bangladesh on the three sides and the States of Assam and Mizoram on the other. The access route through Assam passes through a hilly terrain with steep roads and multiple sharp, hairpin bends. In order to address the issues relating to logistic arrangements, it is noticed that the petitioner had appointed Assam Bengal Carriers Consultants India Ltd (ABC) as Consultants for a detailed transportation study and the said consultant had prepared a comprehensive transportation plan considering the weight (Max weight of consignment-290 Tons) and maximum Dimension of consignment 10 x 5 x 5 meters. It is further noticed that two routes were considered for shipment of ODC as detailed under:

Route -1: Kolkata Port – Ashuganj - Akhaura (Indian Border) – Palatana, using modal route through Bangladesh (a protocol treaty between India & Bangladesh) Water draft: adequate around the year. Total distance: 979 Km (854 Km-Waterways and 125 Km Roadways)

Route- 2: Kolkata Port –Badarpur/Karimganj (Indian Border) – Palatana Water draft: May –September. Total Distance: 2090 Km (1755 Km–Waterways and 335 Km –Roadways)

20. Route –1 was adopted for the project due to availability of required water draft throughout the year in the river Meghna up to Ashuganj as against the limitations of Route-2 on account of availability of water draft during the 5 months period (May - September) in a year to reach Karimganj in lower Assam and the road route from Ashuganj to Palatana is on plains and there are no hilly terrains while the road route from Karimganj to Palatana passes through tough hilly terrains of Manu and Ambasa totaling 83 Km with sharp curves.

21. Accordingly, Indo-Bangladesh Protocol on Inland Water Transit & Trade was amended on 31.5.2010 and Ashuganj was included as Port of Call and MOU was

signed between the petitioner and Government of Bangladesh on 30.11.2010 allowing construction of bypasses and jetties and movement of ODC from Ashuganj to Agartala via Akhaura check post. Construction of bypasses and Jetties started in December, 2010 and were completed in March, 2011 and it took time due to activity being done for the first time which also involved custom clearance. Further, the Jetties and bypasses got washed out / submerged due to rain but movement of ODCs continued after repair & reconstruction of the same simultaneously and the last ODC reached at site in January, 2012.

22. We find that Route-1 adopted for transportation of ODC is better in comparison to Route-2. Further, delay of 399 days (from 10.12.2011 to 12.1.2012) in transportation of ODC materials occurred due to (a) MOU between Govt. of Bangladesh and the petitioner was signed on 30.11.2010 for allowing the construction of bypasses and jetties and movement of ODCs from Ashuganj to Agartala via Akhaura Checkpost (b) As per the joint communiqué, Govt. of India then agreed to make necessary investment for purpose of improvement of infrastructure which was necessary for transportation of ODCs through waterways (from Raimangal to Ashuganj) and by road (from Ashuganj to Akhaura check post) in Bangladesh. The bypasses and jetties were completed in March, 2011 to transport ODCs from Ashuganj to Agartala via Akhaura check post. Once the road infrastructure was strengthened by March, 2011, the consignments of 96 numbers of ODCs were transported from Kolkata to the project site in Tripura within 10 months time as against the original schedule of 7 months. Thus, there is a delay of 3 months excluding the delay of 6 months in the signing of MOU (i.e. May, 2010 to 30.11.2010) between India and Bangladesh and a delay of 4 months for improvement of infrastructure by March, 2011. Considering the above facts in totality, we are of the considered view that the reasons for the delay of 399 days from 10.12.2010 to 13.1.2012 on account of Transportation of Over Dimensional Cargo

(ODC) materials and receipt of materials at site were beyond the control of petitioner and the petitioner cannot be held responsible. Accordingly, in terms of the principles laid down by the Tribunal in its judgment dated 27.4.2011 [(situation (ii) above)], the total delay of 399 days towards the transportation of ODC materials is for reasons beyond the control of the petitioner for which the petitioner cannot be held responsible and the generating company is given the benefit of additional cost incurred due to time overrun. However, the LD recovered from the contractor and the insurance claim proceeds, if any, would be considered for reduction in capital cost.

Erection of ODC

23. The erection of ODC was to be completed in June, 2011 as per original schedule. However, considering the delay of 399 days in receipt of ODC material, the revised scheduled date for erection of ODC is 31.7.2012. The petitioner has submitted that the erection of ODC was completed in June, 2012, which is 32 days prior to the schedule date of 31.7.2012. As stated above, the delay of 399 days towards transportation of ODC materials has been condoned as the same is not attributable to petitioner. In this background, we are of the view that there has been no delay in the erection of ODC as the same has been completed in June, 2012 which is 32 days ahead of the schedule.

Trial run and declaration of COD

24. There has been delay of 70 days (from 22.12.2012 to 1.3.2013) on account of inability of NERLDC to provide sufficient load for testing purposes due to evacuation system constraints thereby resulting in the delay in completion of PPA test during the time period. It is observed from the documents that the Unit-I was synchronized in combined cycle mode on 22.10.2012 and at that point in time the 400 kV line was charged up to Silchar only due to which evacuation of power was restricted. The Operating Co-ordination Committee (OCC) of NERLDC in its meeting held on 7.2.2013

had decided that (a) the generating Unit-I at full load may cause grid disturbance (b) trial operation of machine with full generation may be deferred till 400 kV Silchar-Byrnihat line is ready by 15.1. 2013 and (c) trial run operation may be carried out after 15.2.2013.

25. Unit-I was synchronized on 22.10.2012 for trial operation for declaration on commercial operation and the same is required to run at full / base load for continuous operation for minimum period of 72 hours. However, the generator was restricted to run at part load (due to evacuation problem at full load on account of the non-commissioning of 400 kV Silchar-Byrnihat line which was declared under commercial operation only on 1.3.2013). From the documents available on record including the various deliberations in OCC meeting of NER constituents with NERPC & NRLDC, it is evident that evacuation of full load from the generating station was dependent on the completion of 400 kV line from Silchar to Byrnihat. In our view, the delay in declaration of COD of Unit-I after synchronization and trial operation was partially due to evacuation problem on account of the non-commissioning of 400 kV Silchar-Byrnihat line. This was beyond the control of petitioner and the delay on this count cannot be attributed to the petitioner. Accordingly, in terms of the principles laid down by the Tribunal in its judgment dated 27.4.2011 [(situation (ii) above)], the total delay of 70 days is for reasons beyond the control of the petitioner for which the petitioner cannot be held responsible and the generating company is given the benefit of additional cost incurred due to time overrun. However, the LD recovered from the contractor and the insurance claim proceeds, if any, would be considered for reduction in capital cost.

Defects in Heat Recovery Steam Generator

26. Out of the total delay of 84 days under this head, the delay of 69 days (after subsuming 15 days towards evacuation constraints) is on account of hot spots detected in the Heat Recovery Steam Generator (HRSG). This had caused outage of plant from

14.2.2013 to 9.5.2013 leading to a delay of 69 days from 1.3.2013 to 9.5.2013. The petitioner vide affidavit dated 17.10.2014 has submitted that the unit was running as per load (not full load) since 22.10.2012 and teething problems of the unit were attended from time to time. It has also submitted that thereafter, NERLDC was not in a position to provide sufficient load for testing due to evacuation constraints till February 2013 and this has resulted in the delay in completion of PPA Test. The petitioner has further submitted that subsequently, on 14.2.2013 while Unit-I was in operation for commissioning activities, a defect was detected in the Heat Recovery Steam Generator (HRSG) and the same was on account of the insulation failure of cladding sheets in the inlet duct of HRSG, thereby leading to the replacement of whole cladding sheets including insulation and the material (SS cladding sheet, Insulation material, SS binding wire & cladding pin etc.) had to be brought to site from M/s. BHEL, Trichy. The petitioner has stated that the Unit-I was finally restored on 9.5.2013.

27. From the documents available on record, the issues identified in the report of cross-functional team (CFT) for resolution of issues after joint inspection / deliberations by BHEL and the petitioner are as under:

(i) Hot spots at different locations.
(ii) Failure of studs which were used for holding cladding sheets.
(iii) Bulging of cladding sheets.
(iv) Cladding material mismatch.
(v) Displacement of Superheater module guide support plate.
(vi) Corner plate erection mismatch, and
(vii) Breakage of MTM guide pipe.

28. From the issues identified as above, it is evident that the insulation failure of cladding sheets in the inlet duct of HRSG was due to poor workmanship on the part of EPC contractor / sub-contractor. In our view, the delay on this count is not beyond the control of the petitioner and the consequential impact on IDC, IEDC etc. are attributable to the petitioner. According to us, the beneficiaries of the petitioner cannot be burdened

on account of the impact of the delay caused under this head. Accordingly, the total delay of 69 days is attributable to the petitioner and is therefore covered by the principle in [(situation (i)] of the judgment of the Tribunal dated 27.4.2011. Based on this, the entire cost for time overrun is required to be borne by the petitioner. However, the LD /Insurance proceeds recovered in such cases may be retained by the petitioner.

Contamination in fuel gas

29. The unit was restarted on 9.5.2013 after rectification of defects in HRSG and the commissioning activities started on 25.5.2013 and for the first time contamination of gas was observed. On the request of the petitioner and M/s BHEL on 1.6.2013, the ONGC opened manhole of one of the gas scrubber which was full of black metal and sand dust. The petitioner has also provided photographs of these metal & sand contents in the gas as documentary evidence in support of its submissions. The petitioner took up the issue of gas contamination with ONGC vide its letter dated 3.6.2013. The persistent gas contamination had damaged two of the Gas Booster Compressors (GBC) and the same were sent to M/s BHEL, Hyderabad works for repair. It is observed from the document that the petitioner had also taken up the matter with the Ministry of Defence, GOI for air lifting of GBCs from Agartala Airport to M/s BHEL Hyderabad works in order to cut the transit time for long distance. The petitioner has stated that ONGC had carried out extensive pigging of the entire pipeline from Agartala to Palatana site nearly 50 times to remove the contamination in fuel gas. However, the contamination in form of black metallic dust remained in spite of numerous pigging of the pipeline, thereby making it difficult to complete the balance trial run/commissioning tests.

30. On 24.6.2013, the petitioner had urged ONGC to give a detail program of the gas pipe line cleaning activity receiving the pig from Ahmedabad. Meanwhile efforts were also made to provide clean gas by changing some of the filters and scrubbers and also by installing a

cyclone separator, in order to ensure the supply of clean fuel gas. It is also noticed that some parts of the cyclone separator were also imported, thereby leading to further delay. Also, as the contamination in the gas was still there, pigging of the pipeline was carried out again using PIGs imported from USA under the supervision of US experts. The petitioner has stated that after commissioning of the cyclone separator in the month of December, 2013, the trial run operation including commissioning tests on 31.12.2013, the Unit-I/Block-I was finally declared under commercial operation on 4.1.2014.

31. From the above discussions, it is observed that the contamination in fuel gas started just after the machine was restarted on 9.5.2013, after rectification of the defect in HRSG. It is also noticed that the petitioner had made continuous efforts by taking up the matter with ONGC, the Ministry of Defence, GOI, for airlifting in order to reduce the transit time required for sending the damaged GBCs to BHEL works in Hyderabad and back to site after repairs. Also, from the photographs submitted by the petitioner, as documentary evidence, the quantum of metallic dust and sand ingressed in the gas could be gauged. Further, Unit-I/Block-I was put under trial operation after the commissioning of the cyclone separator during December, 2013 and the said unit could be declared under commercial operation only on 4.1.2014. Considering the above factors in totality, we are of the considered view that the technical problems which had arisen due to contamination of gas was beyond the control of the petitioner and the same is not attributable to the petitioner. Accordingly, in terms of the principles laid down by the Tribunal in its judgment dated 27.4.2011 [(situation (ii) above)], the total delay of 238 days is for reasons beyond the control of the petitioner for which the petitioner cannot be held responsible and the generating company is given the benefit of additional cost incurred due to time overrun. However, the LD recovered from the contractor and the insurance claim proceeds, if any, would be considered for reduction in capital cost.

32. Based on the above discussions, out of the total delay of 744 days, the delay of 675 days in the declaration of COD of Unit-I has been condoned as the same is found beyond the control of the petitioner. Accordingly, the time overrun allowed in the commissioning of Unit-I is summarized as under:

Unit No.	SCOD from 23.6.2008 (zero date)	Actual COD	Time overrun considering SCOD (months)	Time over run Allowed (months)
Unit-I / Block-I	22.12.2011	4.1.2014	744 days	675 days

33. Accordingly, the schedule COD (reset) for the purpose of computation IDC due to time overrun is summarized as under:

Units	SCOD from 23.6.2008 (zero date)	SCOD shifted to	Actual COD	Time overrun (days)
Unit-I/ Block-I	22.12.2011	27.10.2013	4.1.2014	69

Apportionment of Cost

34. The petitioner has apportioned the cost of Unit-I and Unit-II in the ratio of 55:45. Hence, the petitioner was directed to furnish the basis for adopting such ratio and also the methodology adopted for allocating the capital cost between Units-I and II in the audited financial statements. In response the petitioner vide affidavit dated 15.12.2014 has submitted that the cost of Unit-I and Unit-II has been apportioned in the ratio of 55:45 due to the fact that many facilities are common to both the Units. The common facilities listed by the petitioner are as under:

(i) 400 kV and 132 kV Switchyard
(ii) Instrument & Service Air Compressor
(iii) River Water Pump House
(iv) Raw Water Treatment Plants(PT Plant & DM Plant including Chemical lab)
(v) Effluent Treatment and Disposal Plant
(vi) Fire Fighting System for Common BOPs
(vii) Stores & Workshop
(viii) Plant lighting, Buildings & Offices, Plant Green Belt Area Maintaining
(ix) Hydrogen Plant & Nitrogen Plant

(x) Cranes in Plant (Common facility areas like GT & ST hall, CW Pump House etc)
(xi) GT Off-line Washing Skid (Common for both Blocks)

35. The petitioner has submitted that the common facilities are already in place and are being utilized for the operation of Unit-I. It is also stated that, most of the common facilities are to be commissioned along with the commissioning of the Unit-I. Accordingly, the petitioner has clarified that the cost of common facilities has been considered as 5% for arriving at capital cost of Unit-I. The petitioner has further stated that the same methodology for allocating the cost between Unit-I and Unit-II in the ratio of 55:45 has been considered in the audited financial statements submitted in the Commission.

36. We have examined the matter as regards the apportionment of capital cost in the ratio of 55:45 for Unit I and II. The submissions of the petitioner that many facilities are common for most of the units and that the capitalization of common facilities to the extent of 5% for arriving at the capital cost of Unit-I has been considered as most of the common facilities are required to be operated / or used for generation of electricity from Unit-I is in our view justified. Hence, the same is accepted.

Interest During Construction (IDC)

37. The petitioner has submitted the details of IDC of the project comprising of Unit-I and Unit-II. As stated, the petitioner has allocated 55% of the entire IDC to Unit-I of the generating station. The IDC for the entire project and the IDC claimed for Unit-I by the petitioner (55% of the total IDC) is as under:

(₹ in lakh)

Total IDC upto COD	61426.96
IDC allocated to Unit-I (55%)	33783.48

Computation of IDC

38. As stated in para 33 above, the scheduled COD of the generating station has been revised to 27.10.2013 for the purpose of computation of IDC due to time overrun after condoning the delay of 675 days. Accordingly, IDC has been worked out on the basis of the

loan for the entire project and after allocation of 55% of the total IDC. Thus, the admissible IDC, after reduction of IDC corresponding to time over run, has been worked out as under:

(₹ in lakh)

	IDC (Project)	IDC (Block-I)
Interest upto COD	61426.96	33784.83
IDC disallowed (from revised SCOD to actual COD)	5733.61	3153.48
IDC allowed upto revised SCOD (including period of delay condoned)	55693.36	30631.35

Incidental Expenditure during Construction (IEDC)

39. The petitioner vide affidavit dated 15.12.2014 has submitted that the cost overrun of the Block-I is primarily on account of IDC. It has also submitted that the estimated IDC in the original project cost of ₹3429 crore was ₹317 crore and the actual IDC as on COD of Unit-I was ₹613.30 crore. The petitioner has stated that out of this actual IDC of ₹613.30 crore, 55% has been allocated to Unit-I as IDC impact of ₹337.34 crore. The petitioner has also stated that the IDC has not increased for Unit-I during the period from COD on 4.1.2014 to 31.3.2014. It has accordingly submitted that the impact of time delay has not adversely affected the contract prices of material contracts. The petitioner has added that the EPC contract was awarded to M/s BHEL through International Competitive Bidding (ICB) process, which takes care of the best prevalent prices of Gas Turbines at that point of time.

40. We have considered the submissions made by the petitioner that there is no cost overrun in the contractual price due to time overrun. However, due to delay in the declaration of commercial operation of the units, the overhead expenses in establishments under IEDC such as salary, transportation, office expenditure etc. have increased. Since the delay of 69 days in the completion of Unit-I has not been condoned, *pro rata* disallowance of the Overhead expenses for the said period as on COD of Block-I has been made. The establishment cost as on COD of Block-I is ₹25.98 crore. As stated,

there has been a delay of 744 days in the declaration of commercial operation of the project. Considering the length of time taken for completion of the project, the cost of ₹25.98 crore towards Salary & Wages, Transportation, Office expenditure and other expenses etc., appear to be lower as compared to similar other Units/block size of the Combined Cycle project of Sugen CCPP of Torrent Power Ltd and Pragati-III CCPP of Pragati Power Corporation Ltd. Accordingly, the *pro rata* deduction of Overhead expenses on account of the delay of 69 days in the COD of Block-I is worked out as under:

(₹in lakh)

Total IEDC claimed for the total period of completion (2020 days)	2598.00
Less: Pro-rata IEDC disallowed (69 days)	**89.00**
IEDC allowed	2509.00

Capital Cost

41. Regulation 7(1) of the 2009 Tariff Regulations, provides as follows:

> *"The expenditure incurred or projected to be incurred, including interest during construction and financing charges, any gain or loss on account of foreign exchange risk variation during construction on the loan- (i) being equal to 70% of the funds deployed, in the event of the actual equity in excess of 30% of the finds deployed, by treating the excess equity as normative loan, or (i) being equal to the actual amount of loan in the event of the actual equal less than 30% of the funds deployed, up to the date of commercial operation of the project, as admitted by the Commission, after prudence check;*
>
> *Capitalized initial spares subject of the ceiling rates specified in regulation 8; and*
>
> *Additional capital expenditure determined under regulation 9:*
>
> *Provided that the assets forming part of the project, but not in use shall be taken out of the capital cost.*
>
> *The capital cost admitted by the Commission after prudence check shall form the basis for determination of tariff;*
>
> *Provided that in case of the thermal generating station and the transmission system, prudence check of capital cost may be carried out based on the benchmark norms to be specified by the Commission from time to time.*

Approved Capital Cost

42. The petitioner vide affidavit dated 22.5.2012 has submitted that the capital cost of the project is estimated at ₹3429.30 crore and the capital expenditure of nearly ₹2219.60

crore has already been incurred on the project till 31.3.2012. The petitioner has further submitted that the Board of Directors of Petitioner Company has approved the project and capital cost of ₹3429.30 crore in the 23rd meeting held on 18.12.2008. It has also submitted that the project capital cost is based on the actual exchange rate of US $ and Euro prevalent at the time of making payments till 31.3.2012 and for the balance unpaid portion Euro rates are assumed at ₹70 till COD. It has stated that Interest During Construction (IDC) is ₹280.27 crore, assuming loan drawl schedule of 49 months and 52 months for the two units respectively. The petitioner vide affidavit dated 17.6.2013 has submitted that on account of the delay in the commissioning of the project , the project cost has gone up and the Board of Directors of the Petitioner Company in its 47th meeting held on 23.5.2013 has approved the Revised Cost Estimate (RCE) of the project as ₹3804 crore. The petitioner has further submitted that the project cost has increased mainly due to increase in IDC, increase in associated margin money, increase in provision for price variation, supply of equipments, including commissioning spares and increase in Non-EPC costs like green belt and landscaping, ERP implementation and commissioning gas expenses.

Capital Cost claimed

43**.** In response to the directions of the Commission, the petitioner vide affidavit dated 17.10.2014 has furnished audited capital cost up to COD of Block-I duly reconciled with books of accounts and as on 31.3.2014 as under:

(₹in lakh)

	Audited Capital cost as on COD of Unit-I/ Block-I (4.1.2014)	Audited Capital cost as on 31.3.2014
Capital cost including IDC & FC	207101.88	207101.88
Less: IDC , FC, FERV & Hedging cost	36268.00*****	36268.00
Less: Capital Liabilities	27512.24	22027.52******
Capital cost excluding IDC & FC and liabilities	**143321.64**	**148806.36**

*******IDC, FC and FERV have been considered based on actual investments made by the petitioner as discussed in subsequent paragraphs.* ********It is observed that the capital liabilities have been reduced by ₹55.00 crore from COD (4.1.2014) to 31.3.2014.*

Initial Spares

44. The petitioner vide affidavit dated 17.10.2014 has submitted that the cost of initial spares capitalised as on the actual date of COD of Block-I (4.1.2014) is ₹17329 lakh. However, as per Form-5C filed vide affidavit dated 19.6.2014 it is observed that the petitioner has capitalized initial spares of ₹13122 lakh and the remaining amount of ₹4207 lakh (17329-13122) is stated to have been capitalized along with the capitalization of main equipments including tools & tackles. In terms of Regulation 8 of the 2009 Tariff Regulations, initial spares, subject to the ceiling norm of 4% is allowed to be capitalised as a percentage of the original capital cost of the project. The original project cost as on COD of Block-I claimed by the petitioner is ₹207101 lakh and additional capitalisation of ₹5500 lakh has been considered from COD to 31.3.2014. Since the capital cost upto COD undergoes revision due to disallowance of IDC, un-discharged liabilities, FERV, the corresponding admissible initial spares will undergo change. Accordingly, the admissible initial spare for the purpose of tariff is worked out as under:

(Rs. in lakh)

Name of the Asset	Capital Cost claimed as on Cut-off date	Initial Spares claimed	Capital Cost after adjusting IDC, Capital liabilities, FERV	Initial Spares claimed	Ceiling limit as per Regulation	**Initial Spares worked out**	Excess Initial Spares
Block- I	212601.88	17329	172470.03	14057.89	4%	**6600.51**	7457.38

45. Based on the above, the value of initial spares works for ₹6600.51 lakh has been considered for the purpose of tariff. However, the admissible initial spares will be reviewed at the time of considering the additional capital expenditure upto the cut-off date of the generating station which is beyond 31.3.2014.

Infirm Power

46. The petitioner vide affidavit dated 19.6.2013 has submitted that the power produced from the project after first synchronization was injected into the grid as infirm power and

the accounting of the same has been done as per Regulation 11 of the 2009 Tariff Regulations and NERLDC accounts of infirm power. The petitioner was directed to submit the details of infirm power generated from synchronization to COD of Unit-I (excluding the cost of fuel) and whether any revenue earned from infirm power has been adjusted in the capital cost as on COD of Unit-I in Form 5C of the petition. In response, the petitioner vide affidavit dated 17.10.2014 has submitted that the Form-5C captures only the cost components and the earnings from infirm power have been set off against the gas cost during the pre-commissioning period. The petitioner has submitted that the income from injection of infirm power from synchronization to COD is ₹65.85 crore and the cost of pre-commissioning gas is ₹ 71.79 crore. Thus, an excess amount of Rs 5.94 crore has been incurred during the synchronization till COD of Block-I. However, it is observed from Form-5C that the petitioner has adjusted an amount of ₹2.81 crore (instead of the excess amount of ₹5.94 crore incurred) for which no additional details/clarification has been submitted by the petitioner. In the absence of any information and since the amount adjusted is less than the excess amount of ₹5.94 crore incurred, the same has been considered for the purpose of tariff.

Un-discharged liabilities

47. The petitioner has claimed capital cost on accrual basis. As per Auditor certificate furnished by the petitioner vide affidavit dated 16.10.2014, the following amounts corresponding to un-discharged liabilities as on 4.1.2014 and 31.3.2014 have been included.

(₹ in lakh)

As on 4.1.2014	27500.00
As on 31.3.2014	22000.00

48. It is noticed from the Auditor's statement that the petitioner has discharged an amount of ₹5500.00 lakh after the COD of Unit-I i.e. from 5.1.2014 to 31.3.2014. In terms of

Regulation 7 of the 2009 Tariff Regulations, the capital cost as on COD shall include the expenditure incurred or projected to be incurred upto COD. Hence, the claim of the petitioner for capitalization of un-discharged liabilities is not permissible. The capital cost incurred after COD shall be considered as part of additional capital expenditure as on the date of discharge.

Foreign Exchange Rate Variation (FERV)

49. The petitioner has claimed FERV of ₹21.91 crore included in the capital cost as on COD of Unit-I of the generating station. The petitioner was directed by letter dated 27.8.2014 to furnish the details regarding the FERV claimed and in response, the petitioner vide affidavit dated 17.10.2014 has submitted the break-up of FERV of Unit-I/ Block-I of the project. However, in the absence of any calculation towards computation of FERV, the admissible FERV, after adjustment of FERV corresponding to the period of delay could not be worked out at this stage. As submitted by the petitioner, the FERV of ₹ 271.03 lakh in respect of Unit-I/Block-I has been paid as on the COD and the balance amount is yet to be paid. As stated, the petitioner has not furnished the exchange rate considered for calculation of FERV. In the absence of any information, the FERV claim of the petitioner cannot be verified. Hence the petitioner's claim for FERV is restricted to the actual payment of FERV (after adjusting FERV gain amount) for the purpose of capital cost and after apportionment on the basis of 55% of the total project cost. Accordingly, FERV of ₹ 271.03 lakh has been allowed to be capitalized upto COD of Unit-I (Block-I). The petitioner is however granted liberty to approach the Commission with proper details regarding the computation of FERV at the time of revision of tariff based on truing-up in terms of Regulation 6 (1) of the 2009 Tariff Regulations.

Capital Cost as on COD of Unit-I/Block-I

50. Based on the above, the capital cost as on COD of Unit-I/Block-I has been worked out considering the capital liabilities, IDC, IEDC and cost of initial spares as under:

(₹in lakh)

Capital Cost including IDC & FC, FERV & hedging cost of ₹41243.00 lakh	207101.88
Less: Interest During Construction disallowed due to Time overrun	3153.48
Less: Incidental Expenditure During Construction	89.00
Less: Un-discharged liabilities as on COD	27512.00
Less : Foreign Exchange Rate Variation	1919.98
Less: Difference in cost of Initial Spares	7457.38
Capital Cost on cash basis as on COD	**166970.03**

Reasonableness of Capital Cost

51. Since the estimated project cost worked out by the petitioner is on the higher side the petitioner was directed to provide justification of the capital cost compared to contemporary projects of advanced class machines commissioned in India and the gas turbine prices in the world market when the EPC contract was awarded. In response the petitioner vide affidavit dated 15.12.2014 has submitted the comparison of hard cost of its project with hard cost of other contemporary project using advance class machine as under:

Capital Cost Comparison			
	Pragati-III	**Uno Sugen**	**Block-I of OTPCL (*the generating station*)**
Project Cost *(₹ in crore)*	5195.81	1808.65	2071
Less IDC, FC, Overheads, un-discharged liabilities etc *(₹ in crore)*	403.58	313	638
Project Specific Cost *(₹ in crore)*	-	-	160
Hard Cost *(₹ in crore)*	4792.23	1495.65	1273
Installed Capacity (MW)	1371	382.5	363.3
Hard Cost (crore/MW)	3.50	3.91	3.50

52. From the table above, the petitioner has pointed out that the per MW hard cost of its project is very close to per MW hard cost of UNO Sugen project of Torrent Ltd. It has also submitted that though the per MW hard cost of its project is higher as compared to Pragati-III gas power plant, that there is variation in the scope of Pragati-III project with a

different configuration of two gas turbine and one steam turbine in each module. The petitioner has further stated that both the above projects (UNO Sugen and Pragati-III) had no transportation/ logistic constraints when compared to the project of the petitioner. The petitioner has further submitted that the high capital cost of the project can also be attributed to the following site specific features:

> *(i) High cost of transportation due to logistic requirements of ODC.*
> *(ii) High transportation cost due to long distance between place of manufacture and place of installation.*
>
> *(iii) Use of gas booster compressors.*
>
> *(iv) Water storage and pumping facility.*
>
> *(v) Township and Non-Plant buildings were required due to remoteness of the project site.*
>
> *(vi) Complete IT infrastructure required as it is first project of the petitioner.*
>
> *(vii) 132 kV switchyard is generally not present in other projects whilst the petitioner has both 132 kV and 400 kV Switchyards.*
>
> *(viii) Infrastructure for security like security hostel, security equipment as the plant is near international border.*
>
> *(ix) Also as forest land was diverted for the project, the green belt development and afforestation had to be done by the petitioner.*

53. Accordingly, the petitioner has submitted that after adjusting the project specific costs (around ₹160 crore) due to project location of the North Eastern Region (NER), the hard cost for purpose of comparison works out to ₹1273 crore i.e. ₹3.5 crore/MW which is comparable to Pragati-III power plant of 1371 MW.

54. The petitioner has also submitted that Assam Gas Based Power Project of NEEPCO which had achieved COD during 1999-2000 had a capital cost of ₹1446.02 crore for a capacity of 291 MW, i.e., cost of ₹4.97 crore/MW in 2000. It has also stated that the investment approval for an estimated cost of ₹4375 crore for 750 MW (3X250) Coal based thermal power project of NTPC at Salakati in Assam was accorded by the

NTPC Board on 30.1.2008 which is equivalent to a capital cost of ₹5.83 crore/MW in 2008. Accordingly, it has pointed out that the estimated project cost of the petitioner was only ₹3429 crore i.e.₹4.72 crore/MW in 2008 which has been subsequently revised to ₹3804 crore, i.e.,₹5.23 crore/MW. The petitioner has also contended that the Commission in order dated 6.12.2013 in Petition No.175/GT/2013 pertaining to approval of generation of tariff of UNO Sugen had observed that the capital cost in respect of the projects in NER are generally higher as compared to projects in other region. The petitioner has therefore submitted that the project cost of its generating station is duly justified and raesonable, considering the fact that the project is situated in a very difficult terrain and using advance class machines.

Analysis

55. As regards, the reasonableness of the capital cost as on COD, there is no denying the fact that the project of the petitioner is located in a very remote place in NER and the transportation of heavy materials like BTG package, etc., from M/s. BHEL works to plant site is difficult. Moreover, the petitioner had to develop new infrastructure / improvement of the existing infrastructure like roads, bridges, bypasses and jetties etc. in Bangladesh and also in India. In addition to the above, the cost of Civil works undertaken in the project of the petitioner is higher as compared to the UNO Sugen project of Torrent Power Ltd. on account of higher price index for Civil works in state of Tripura in comparison to the Northern and Western States of India. It also observed that the petitioner had also incurred an expenditure of ₹16000 lakh towards the commissioning of the project. As compared to the capital cost of the project with other similar projects, the hard cost of Block-I as on COD of the generating station, after deduction of uncontrollable cost, additional 5% cost of common facilities booked to Block-I and IDC & FC etc. works out as under:

Sl. No.	Description	₹ *in lakh*
1	Capital cost as on COD of Block-I	207102.00
2	Less; (i) Uncontrollable cost (ii) Additional 5% cost booked under common facilities (iii) IDC & FC etc.	 16000.00 18000.00 36300.00
3	capital cost excluding IDC & FC and uncontrollable cost etc. i.e. Hard Cost	136802.00
4	**Hard Cost (₹ lakh/MW)**	**376.55**

56. For the reasons stated above, we are of the considered view that the hard cost of ₹ 3.77 crore/MW, after excluding the uncontrollable cost, additional cost for civil works etc. are comparable to other contemporary projects like Pragati–III CCPP (1371 MW) power plant of Pragati Power Corporation Ltd. and UNO Sugen power project of Torrent Power Ltd. Accordingly, the capital cost considered by the petitioner is found reasonable and justified and the same is considered for the purpose of determination of tariff of the generating station.

Liquidated Damages

57. The petitioner vide affidavit dated 19.6.2014 has submitted that Liquidated Damages (LD) payable by the contractor in case of delay of completion of each part shall be as follows:

a) An amount of 0.5% of block contract price (half of the total contract price) for every week of delay or part thereof up to a maximum of 15% of contract price shall be levied for delay in commissioning/ completion of each Block.

b) The total liquidated damages for short performance shall be limited to 15% of the contract price.

c) Limits for liquidated damages: The liquidated damages attributable to delay in completion and the liquidated damages attributable to short performance together shall not exceed 25% of the contract price.

58. The petitioner has further submitted that a bank guarantee equivalent to 5% of contract price has been submitted by EPC contractor which will be settled at the time of final payment after commissioning of both the units. We direct that once the LD amount is

settled and recovered from the EPC contractor, the same shall be adjusted in the capital cost of the project.

59. We have in this order condoned the delay of 675 days in the completion of the project as the same is for reasons not attributable to the petitioner. However, in respect of the delay of 69 days which has been disallowed, the LD to be recovered in terms of the provision of the contract may be retained by the petitioner.

Additional Capital Expenditure from 4.1.2014 to 31.3.2014

60. The petitioner has not claimed additional capital expenditure in respect of Unit-I from COD (4.1.2014) to 31.3.2014. As stated, it is noticed from the Auditor's statement that the petitioner has discharged an amount of ₹5500.00 lakh after COD i.e. from 5.1.2014 to 31.3.2014. In accordance with Regulation 7 of 2009 Tariff Regulations, the amount of ₹5500.00 lakh corresponding to the liabilities discharged after the COD of the generating station and within the cut-off date has been considered as additional capital expenditure for the purpose of tariff.

Capital cost as on 31.3.2014

61. The capital cost as on COD of the generating station and the additional capital expenditure from COD to 31.3.2014 has been considered for working out capital cost as on 31.3.2014 as under:

(₹ In lakh)

Capital Cost on cash basis as on COD	166970.03
Add : Additional Capital Expenditure due to discharge of liabilities after COD	5500.00
Capital Cost as on 31.3.2014	**172470.03**

Debt Equity Ratio

62. Regulation 12 of the 2009Tariff Regulations provides as under:

(1) For a project declared under commercial operation on or after 1.4.2009, if the equity actually deployed is more than 30% of the capital cost, equity in excess of 30% shall be treated as normative loan.

***Provided** that where equity actually deployed is less than 30% of the capital cost, the actual equity shall be considered for determination of tariff.*

***Provided further** that the equity invested in foreign currency shall be designated in Indian rupees on the date of each investment*.

***Explanation.-**The premium, if any, raised by the generating company or the transmission licensee, as the case may be, while issuing share capital and investment of internal resources created out of its free reserve, for the funding of the project, shall be reckoned as paid up capital for the purpose of computing return on equity, provided such premium amount and internal resources are actually utilised for meeting the capital expenditure of the generating station or the transmission system.*

(2) In case of the generating station and the transmission system declared under commercial operation prior to 1.4.2009, debt-equity ratio allowed by the Commission for determination of tariff for the period ending 31.3.2009 shall be considered.

(3) Any expenditure incurred or projected to be incurred on or after 1.4.2009 as may be admitted by the Commission as additional capital expenditure for determination of tariff, and renovation and modernisation expenditure for life extension shall be serviced in the manner specified in clause (1) of this regulation.

63. The petitioner has claimed debt-equity ratio as on COD, based on the funds deployed for the entire project as follows:

(₹ in lakh)

	Amount	Percentage
Debt	216461.00	72.21%
Equity	83309.00	27.79%
Total	**299770.00**	**100.00%**

64. As per the Form-14 of the petition, the total funds raised by the petitioner as on COD of Unit-I is as under:

(₹ in lakh)

Total Funds	299712.00
Debt	216462.00
Equity	83250.00

65. It is observed from the balance sheet of the petitioner company as on 31.3.2014, that the total equity raised for the project includes "Advance against Equity" amounting to ₹29296.10 lakh.

66. The petitioner has availed the fund as advance against equity and has utilized the same for the project. The petitioner has also considered the same as part of equity for the purpose of claiming return on equity (ROE). Since the petitioner has not converted this amount into equity, and has utilized the same for the project, the question as to whether the advance against equity used towards expenses of the project could be considered as part of equity for the purpose of tariff is required to be examined. We proceed to do so.

67. It is evident that the amount of ₹29296.10 lakh has been availed by the petitioner as advance from the shareholders. Since the amount is not converted into equity prior to its utilization, this advance amount could either be transferred to share capital or could be revoked/ rejected. It can be inferred that the advance against equity, pending allotment of shares can be refunded to the shareholders if they have not been allotted shares of the company. In this background, it could not be prudent for us to consider it as equity for the purpose of ROE.

68. Admittedly, the petitioner has utilized the advance against equity amount for the project. The funds deployed in the project are to be serviced either in the form of ROE or interest on loan and every fund deployed for the project has to be serviced. As stated above, the amount of advance against equity has not been allowed for the purpose of ROE. In order to safeguard the interest of consumers and to allow the recovery of reasonable cost to the petitioner as envisaged under Section 61 (d) of the Electricity Act, 2003 we follow a balanced approach. Accordingly, as the fund is deployed in the project by the petitioner, we consider the said amount of advance against equity as loan for the purpose of determination of tariff of the generating station. This is however, subject to revision at the time of truing up of tariff in terms of Regulation 6 (1) of 2009 Tariff Regulations or after the completion of the project based on the information to be submitted by the petitioner in due course.

69. In the circumstances above, the equity for the purpose of calculation on ROE has been worked out after deduction of the amount of advance against equity. As the said advance against equity has been utilized for the project, the same has been included in the gross block of capital cost and the corresponding normative debt for the purpose of determination of tariff. Accordingly, the debt-equity has been worked as under:

(₹ in lakh)

Total Equity (A)	83250.00	Proportion
Advance against Equity (B)	29297.00	
Net Equity C = (A-B)	53953.00	18.00%
Net loan as on 31.12.2013 (D)	216461.56	
Loan including advance against equity E = (D+B)	245758.55	82.00%

70. As indicated above, the debt-equity ratio of 82:18 has been worked out for the purpose of determination of tariff. Since the actual equity deployed is less than 30%, the debt-equity ratio of 82:18 has been considered as under:

(₹ in lakh)

	Amount	Percentage
Capital Cost as on COD of Unit-I (1.4.2014)	166970.03	100.00%
Debt	136912.69	82.00%
Equity	30057.35	18.00%

Return on Equity

71. Regulation 15 of the 2009 Tariff Regulations, as amended on 21.6.2011, provides as under:

"(1) Return on equity shall be computed in rupee terms, on the equity base determined in accordance with regulation 12.

(2) Return on equity shall be computed on pre-tax basis at the base rate of 15.5% to be grossed up as per clause (3) of this regulation.

Provided that in case of projects commissioned on or after 1st April, 2009, an additional return of 0.5% shall be allowed if such projects are completed within the timeline specified in Appendix-II.

Provided further that the additional return of 0.5% shall not be admissible if the project is not completed within the timeline specified above for reasons whatsoever.

(3) The rate of return on equity shall be computed by grossing up the base rate with the Minimum Alternate/Corporate Income Tax Rate for the year 2008-09, as per the Income Tax Act, 1961, as applicable to the concerned generating company or the transmission licensee, as the case may be.

(4) Rate of return on equity shall be rounded off to three decimal points and be computed as per the formula given below:

Rate of pre-tax return on equity = Base rate / (1-t)

Where t is the applicable tax rate in accordance with clause (3) of this regulation

(5) The generating company or the transmission licensee, as the case may be, shall recover the shortfall or refund the excess Annual Fixed charges on account of Return on Equity due to change in applicable Minimum Alternate/Corporate Income Tax Rate as per the Income Tax Act, 1961 (as amended from time to time) of the respective financial year directly without making any application before the Commission:

***Provided** further that Annual Fixed Charge with respect to tax rate applicable to the generating company or the transmission licensee, as the case may be, in line with the provisions of the relevant Finance Acts of the respective year during the tariff period shall be trued up in accordance with Regulation 6 of these regulations."*

72. Accordingly, return on equity has been worked out after accounting for the projected additional capital expenditure as under:

(₹ in lakh)

	4.1.2014 to 31.3.2014
Gross Notional Equity	30057.35
Addition due to Additional Capitalization	990.09
Closing Equity	31047.44
Average Equity	30552.39
Return on Equity (Base Rate)	15.500%
Tax rate (MAT)	20.960%
Rate of Return on Equity (Pre Tax)	19.610%
Return on Equity (Pre Tax)	**1428.09**

Interest on loan

73. Regulation 16 of the 2009 Tariff Regulations provides as under*:*

"(1) The loans arrived at in the manner indicated in regulation 12 shall be considered as gross normative loan for calculation of interest on loan.

(2) The normative loan outstanding as on 1.4.2009 shall be worked out by deducting the cumulative repayment as admitted by the Commission up to 31.3.2009 from the gross normative loan.

(3) The repayment for the year of the tariff period 2009-14 shall be deemed to be equal to the depreciation allowed for that year.

(4) Notwithstanding any moratorium period availed by the generating company or the transmission licensee, as the case may be the repayment of loan shall be considered from the first year of commercial operation of the project and shall be equal to the annual depreciation allowed.

(5) The rate of interest shall be the weighted average rate of interest calculated on the basis of the actual loan portfolio at the beginning of each year applicable to the project.

Provided that if there is no actual loan for a particular year but normative loan is still outstanding, the last available weighted average rate of interest shall be considered.

Provided further that if the generating station or the transmission system, as the case may be, does not have actual loan, then the weighted average rate of interest of the generating company or the transmission licensee as a whole shall be considered.

(6) The interest on loan shall be calculated on the normative average loan of the year by applying the weighted average rate of interest.

(7) The generating company or the transmission licensee, as the case may be, shall make every effort to re-finance the loan as long as it results in net savings on interest and in that event the costs associated with such re-financing shall be borne by the beneficiaries and the net savings shall be shared between the beneficiaries and the generating company or the transmission licensee, as the case may be, in the ratio of 2:1.

(8) The changes to the terms and conditions of the loans shall be reflected from the date of such re-financing.

(9) In case of dispute, any of the parties may make an application in accordance with the Central Electricity Regulatory Commission (Conduct of Business) Regulations, 1999, as amended from time to time, including statutory re-enactment thereof for settlement of the dispute.

Provided that the beneficiary or the transmission customers shall not withhold any payment on account of the interest claimed by the generating company or the transmission licensee during the pendency of any dispute arising out of re-financing of loan."

74. Interest on loan has been worked out as mentioned below:

(a) The petitioner has claimed the weighted average rate of interest as 11.17% (annual), calculated on the basis of the rate of interest of each individual loan corresponding to the number of days. This is in order. Accordingly, the weighted average rate of interest of 11.17% is allowed for the calculation of interest of normative loan;

(b) Depreciation allowed for the period has been considered as repayment;

(c) The interest on loan has been calculated on the normative average loan of the year by applying the weighted average rate of interest calculated and enclosed at Annexure-I to this order.

75. The necessary calculations for interest on loan are as under:

(₹ in lakh)

	4.1.2014 to 31.3.2014
Gross Notional loan	136912.69
Cumulative Repayment of loan upto previous year	-
Net Opening loan	136912.69
Addition due to additional capitalization	4509.91
Repayment of Loan during the period	1732.25
Net Closing loan	139690.35
Average loan	138301.52
Weighted Average Rate of Interest on loan	11.17%
Interest on loan	**3681.09**

Depreciation

76. Regulation 17 of the 2009 Tariff Regulations provides as under:

> *"(1) The value base for the purpose of depreciation shall be the capital cost of the asset admitted by the Commission.*
>
> *(2) The salvage value of the asset shall be considered as 10% and depreciation shall be allowed up to maximum of 90% of the capital cost of the asset.*
>
> *Provided that in case of hydro generating stations, the salvage value shall be as provided in the agreement signed by the developers with the State Government for creation of the site.*
>
> *Provided further that the capital cost of the assets of the hydro generating station for the purpose of computation of depreciable value shall correspond to the percentage of sale of electricity under long-term power purchase agreement at regulated tariff.*
>
> *(3) Land other than the land held under lease and the land for reservoir in case of hydro generating station shall not be a depreciable asset and its cost shall be excluded from the capital cost while computing depreciable value of the asset.*
>
> *(4) Depreciation shall be calculated annually based on Straight Line Method and at rates specified in Appendix-III to these regulations for the assets of the generating station and transmission system.*
>
> *Provided that, the remaining depreciable value as on 31st March of the year closing after a period of 12 years from date of commercial operation shall be spread over the balance useful life of the assets.*
>
> *(5) In case of the existing projects, the balance depreciable value as on 1.4.2009 shall be worked out by deducting 3[the cumulative depreciation including Advance against Depreciation] as admitted by the Commission up to 31.3.2009 from the gross depreciable value of the assets.*
>
> *(6) Depreciation shall be chargeable from the first year of commercial operation. In case of commercial operation of the asset for part of the year, depreciation shall be charged on pro rata basis."*

77. The weighted average rate of depreciation as calculated by the petitioner for the purpose of depreciation is 4.79% (annual). This rate has been adjusted towards the disallowances made in the capital cost on account of IDC, IEDC, FERV and Initial spares. After the adjustment as above, the weighted average rate has been worked out as 4.78% and the same has been considered for the purpose of calculation of depreciation. Accordingly, depreciation has been worked out as under:

(₹ in lakh)

	4.1.2014 to 31.3.2014
Opening Gross Block	166970.03
Additional Capitalization	5500.00
Closing Gross Block	**172470.03**
Average Gross Block	169720.03
Rate of Depreciation	4.78%
Depreciable Value	152103.63
Depreciation	**1732.25**

Operation & Maintenance Expenses

78. Clause (c) of Regulation 19 of the 2009 regulations provides that in case of Open Cycle Gas Turbine/Combined Cycle generating stations (other than small gas turbine power generating stations) the normative O&M expenses allowable for 2013-14 shall be as under:

(₹ lakh / MW)

	2013-14
O&M expenses	18.49

79. The petitioner in its petition vide affidavit dated 15.5.2012 has submitted as under:

"(a) The petitioner would be using advance class gas turbines (9FA class) in multi shaft configuration with high operating efficiency and low NOX emissions supplied by GE USA through BHEL.These machines are state of the art technology. The main features of the machines are their high reliability with competitive performance, higher thermal efficiency and low environmental emissions. These gas turbines and their auxiliaries constitute the heart of the CCPP. Critical factor for optimal performance of these machines is availability of spares and periodic maintenance of Gas Turbines by skilled manpower with specialized technical knowledge from OEM supplier. As the technology is proprietary, the supply of spare parts and services of specialist, who possesses the requisite technical knowhow is critical for maintaining the generating station. Since, O&M experience of these machines in India is limited, Indian end users are depending on the OEM for rendering services, repair as well as supply of parts through LTSA. Therefore, OTPC has entered into a Long Term Services Agreement (LTSA) for 2 numbers Frame 9FA advance class gas turbines of Palatana CCPP.

(b) In the CERC (Terms and Conditions of Tariff Regulations, 2009), the Hon'ble Commission has prescribed normative O&M expenses per MW for gas based stations for the Tariff period 2009-14. Such prescribed normative levels are general in nature and are not in particular reference to the plants with advance class gas turbines. It may be noted that F class gas turbines technology is new in the Country and accordingly, it may be difficult to draw parallel comparison to the same, including in terms of cost with existing gas turbines.

(c) *As the critical parts and services are intended to be sourced from the OEM with proprietary knowhow, such spares and services are much costlier in comparison to conventional models. Generally, spares are sent out of the Country for repair/refurbishment. Moreover, cost of majority of such components and spares parts are payable in foreign exchange whose increase in rate vis-a-vis Rupee results in increase in the O&M expenditure. At this stage that the estimated project capital cost per MW is ₹4.72 crore/MW. Therefore, additional cost of operation and maintenance as may be incurred due to specialized services requirement in respect of maintenance of machines may kindly be considered and allowed.*

(d) *The petitioner humbly states that type of critical spares and components and specialized maintenance services required from the OEM due to difference in technology, it will be difficult to apply /adopt the normative O&M expenses as per CERC Regulations, 2009 for this class of machines.*

(e) *Accordingly, the petitioner respectfully submits to the Hon'ble Commission that since it has to incur additional Repair & Maintenance expenses on Gas Turbines as explained above, higher O&M expenses may kindly be allowed*."

80. The respondent, APDCL in its reply dated 18.10.2012 has submitted as under:

(a) The project is a new one there would be lesser O&M or maintenance expenses.

(b) The Commission has finalized the O&M norms in the regulation after prolonged hearing and taking the views of all stakeholders. Normally regulatory provisions are not changed on case to case basis. Already the present multiyear tariff block and the prevailing Regulations are almost to be over by 2013-14. As the machines are new there would be need of lesser O&M works. Therefore the respondent feels that in the next regulations the case of such machines can be taken care of.

(c) The project cost has included the provisions of Spares and accordingly the supplier is to provide mandatory spares. The 2009 Tariff Regulations have also provisions of Initial spares. Under the scenario there should not be any problem in the matter of spares at least during the initial period of operation.

(d) On the grounds stated above there should not be any problem in O&M as per existing O&M provision of 2009 Tariff Regulations.

(e) Water requirement of the project from a distance of 2 km seems to have no heavy O&M burden. Such items have normally bear only initial cost.

81. In response, the petitioner in its rejoinder has submitted that the 9FA machines are a proprietary technology of GE (USA) and the O&M expertise for the upkeep is not available domestically and the expenses is expected to go up due to maintenance. It has also submitted that by Commission's order dated 20.12.2013, the petitioner was granted liberty to approach the Commission for approval of higher O&M expenses in case the actual O&M expenses during operation of the generating station is more than the normative O&M expenses.

82. The petitioner vide affidavit dated 20.6.2014 has submitted as under:

"*(a) The Hon'ble Commission had allowed O&M expenses at Rs 18.49 lakh/MW in the Terms and Conditions of Tariff Regulations 2009-14. We had submitted to the Hon'ble Commission in the petition that as Palatana project is using 9FA advanced class machines for the project and the LTSA for the gas turbines is with the original equipment manufacturer (OEM) i.e. GE (USA), the O&M expenses for the project will be on a higher side.*

We had also submitted that the gas turbines and their auxiliaries constitute the heart of the CCPP. Critical factor for optimal performance of these machines is availability of spares and periodic maintenance of Gas Turbines by skilled manpower with specialized

technical knowledge from OEM supplier. As the technology is proprietary, the supply of spare parts and services of specialist, who possesses the requisite technical knowhow is critical for maintaining the generating station. Since, O&M experience of these machines in India is limited, Indian end users are depending on the OEM for rendering services, repair as well as supply of parts through LTSA. Therefore, OTPC has entered into a Long Term Services Agreement (LTSA) for 2 numbers Frame 9FA advance class gas turbines of Palatana CCPP.

The petitioner had also requested the Hon'ble Commission to allow the normative O&M expenses of Rs 18.49 Lakh/MW for the provisional tariff of Palatana Project of OTPC, and allow the petitioner to approach the Commission for approval of higher O&M expenses, in case the actual O&M during operation of the plant are more than the normative O&M expenses, at the time of truing up of the tariff.

We are now submitting the actual O&M expenses incurred during the operation of Unit-1 of the project from 4th January 2014 to 31st March 2014. The petitioner has incurred O&M expenses of ₹17.38 crore during the period January-March 2014. This is higher than the O&M expense as allowed by the Hon'ble Commission as per regulations. Also of the Rs 17.38 Crores spent on O&M during this period a major expense of Rs 4.05 Crores has been incurred on Repair and Maintenance and Repair and Maintenance-Spares. The details are captured in the table below:

O&M Expenses from January, 2014 to March, 2014	₹ in crore
Consumable (Sogex)	0.29
Manpower (Sogex)	2.37
Repair & Maintenance (GE)	4.057
Insurance (United India)	2.66
Salary & Wages (OTPC Manpower)	1.13
Admin & Other Exp (Misc Vendors)	6.87
Total O&M Expenses for Jan'2014 to March'2014	17.38
O&M charges as per CERC Regulations (₹0.1849 cr/MW) for 3 months	16.79
Difference for the period January'2014 to March'2014	0.59

In view we request the Hon'ble Commission to allow the petitioner to charge the O&M expenses of ₹17.38 crore for the period January, 2014 to March, 2014 as per actual O&M figures for the Unit-I of the project."

83. We have examined the matter. The Commission in its order dated 20.12.2013 while granting provisional tariff for Unit-I of the generating station has allowed the O&M expenses of ₹18.49 lakh/MW for 2013-14 as claimed by the petitioner in terms of the 2009 Tariff Regulations. The petitioner was also granted liberty to approach the Commission in case of actual O&M expenses being higher than the normative O&M expenses to be considered on merits at the time of determination of final tariff. The main issue raised by the petitioner is that the normative O&M expenses specified by the Commission under Regulation 19(c) of the 2009 provides for O&M expenses for "small

gas turbines" and "other than small gas turbines" and not for "advanced class gas turbines" for combined cycle gas turbine generating stations. The petitioner has submitted that it is using 9FA advanced class machines for the project and the LTSA for the Gas turbines is with the original equipment manufacturer (OEM) i.e. GE (USA) and hence, the O&M expenses for the project will be on a higher side. It is observed that the petitioner has entered into Long Term Spares & Services Agreement (LTSA) with GE, USA for supply of spares and planned maintenance of Gas Turbines (excluding compressor) for 15 years. The LTSA covers parts supply, repair and services till the units reach performance end date or 18 years from contract effective date, whichever is earlier. We notice that Gas Turbine technology is getting more and more advanced, promising the best of economic and environmental performance. The advance class machines of different make have achieved efficiency levels of the order of 55%-60% by targeting a firing temperature of around 1300°C or more. As project developers continue to select advance technologies to obtain competitive advantages in heat rate, emissions performance and specific costs, a quantitative risk assessment becomes more critical. To reduce financial exposure to technical risk, long-term services agreements (LTSA/LTMA) with the OEM are becoming more prevalent and desirable in order to have appropriate confidence level for the availability and efficiency levels of operation of the advance class machine. We notice that there are significant technological differences between `E ` class and `F` class Gas Turbines. The `F` class gas turbines have been designed for fuel firing temperature of the order of 1250 - 1320°C, which is much higher than `E` class gas turbine with firing temperature of 1090 -1100°C. It is observed that the Commission in its orders determining the tariff of Sugen Project (11.1.2010 and in Petition No.109/2009) and Uno Sugen project (order dated 6.12.2013 in Petition No.175/GT/2013) of Torrent Power Ltd for the period 2009-14 had relaxed the O&M expense norms in case of these generating stations using advance class gas turbines and had allowed the actual O&M

expenses which were higher than the normative O&M expenses. In the light of these facts and considering the submissions made by the petitioner, we are of the view that a case for relaxation of O&M expenses norms has been made out by the petitioner and there is no reason to deny the same in respect of this generating station of the petitioner, wherein advanced class machines (F class) is being used. It is also observed that the increase in O&M expenses claimed on actual by the petitioner from January, 2014 to March, 2014 is marginal and the said claim is lesser than the O&M expenses allowed to Sugen Project and Ratnagiri Gas Power Station. Accordingly, the O&M expenses for 2013-14 has been worked out and allowed as under:

(₹in lakh)

	4.1.2014 to 31.3.2014
O&M expenses as per norms (₹ in lakh/MW) - (a)	18.49
O&M expenses as per norms (₹ in lakh) (annualized) (b)	6717.42
Actual O&M expenses for 3 months (January, 2014 to March, 2014) (₹in lakh.) (c)	1738.00
Relaxed O&M expenses, on annual basis, allowed based on the actual O&M expenses for 3 months (₹ in lakh) i.e. d=(c*4)	6952.00
Relaxed O&M norm = d/363.3 (₹ in lakh/MW)	19.1357
O&M expenses allowed (*Pro rata* for the year)	**1657.05**

Interest on Working Capital

84. Regulations 18(1)(b) of the 2009 Regulations provides for the computation of the interest on working capital as under:

"18(1)(b) Open-cycle Gas Turbine/Combined Cycle thermal generating stations:

(i) Fuel cost for one month corresponding to the normative annual plant availability factor, duly taking into account mode of operation of the generating station on gas fuel and liquid fuel;

(ii) Liquid fuel stock for ½ month corresponding to the normative annual plant availability factor, and in case of use of more than one liquid fuel, cost of main liquid fuel;

(iii) Maintenance spares @ 30% of operation and maintenance expenses specified in regulation 19.

(iv) Receivables equivalent to two months of capacity charge and energy charge for sale of electricity calculated on normative plant availability factor, duly taking into account mode of operation of the generating station on gas fuel and liquid fuel.

(v) *Operation and maintenance expenses for one month."*

85. Clause (3) of Regulation 18 of the2009 Tariff Regulations, as amended on 2.6.2011 provides as under:

" Rate of interest on working capital shall be on normative basis and shall be considered as follows:

(i) SBI short-term Prime Lending Rate as on 01.04.2009 or on 1st April of the year in which the generating station or unit thereof or the transmission system, as the case may be, is declared under commercial operation, whichever is later, for the unit or station whose date of commercial operation falls on or before 30.06.2010.

(ii) SBI Base Rate plus 350 basis points as on 01.07.2010 or as on 1st April of the year in which the generating station or a unit thereof or the transmission system, as the case may be, is declared under commercial operation, whichever is later, for the units or station whose date of commercial operation lies between the period 01.07.2010 to 31.03.2014.

Provided that in cases where tariff has already been determined on the date of issue of this notification, the above provisions shall be given effect to at the time of truing up.

86. In accordance with the above provisions, interest on working capital has been worked out as under:

(a) **Fuel Cost and Energy Charges in working capital:** The fuel cost and energy charges in working capital are worked out as under:

(₹ lakh / MW)

	4.1.2014 to 31.3.2014
Fuel cost for 1 month (annualized)	2579.21
Fuel cost for 1 month (*pro rata*)	614.77

(b) **Liquid Fuel Oil:** As the petitioner has not used any liquid fuel in the generation of electricity, no expenditure has been allowed under this head.

(c) **Maintenance spares in Working Capital:** Since O&M expenses have been relaxed and allowed in the case of the generating station, the cost of maintenance spares has accordingly been worked out on annualized basis, and allowed as under:

(₹ in lakh)

	4.1.2014 to 31.3.2014
Cost of maintenance spares (annualised)	2085.60
Cost of maintenance spares (*pro rata*)	497.12

(d) **Receivables:** Receivables equivalent to two months of capacity charge and energy charge has been worked out on *pro rata basis* and allowed as under:

*(₹ in **lakh**)*

	4.1.2014 to 31.3.2014
Capacity Charges (2 months)	1506.09
Energy Charges (2 months)	1229.54

(e) **O&M Expenses (I month) :** O&M expenses for one month allowed for the purpose of working capital are as under:

*(₹ in **lakh**)*

	4.1.2014 to 31.3.2014
O&M expenses for 1 month (annualised)	579.33
O&M expenses for 1 month (*pro rata*)	138.09

Accordingly, interest on working capital has been calculated based on rate of interest of 13.20% (SBI Base Rate of 9.70% plus 350 basis points, as on 1.4.2013). The necessary details in support of calculation of interest on working capital are as under:

	4.1.2014 to 31.3.2014
Fuel Cost	614.77
Liquid Fuel Cost	0.00
Maintenance spares	497.12
Receivables	2735.63
O&M Expenses	138.09
Total working capital	**3985.60**
Rate of interest	13.50%
Interest on working capital	**538.06**

ANNUAL FIXED CHARGES

87. The fixed charges on *pro rata* basis allowed for the period from 4.1.2014 to 31.3.2014 is summarized as under:

*(₹**in lakh**)*

	2013-14
	(4.1.2014 to 31.3.2014)
Return on Equity	1428.09
Interest on Loan	3681.09
Depreciation	1732.25
Interest on Working Capital	538.06
O&M Expenses	1657.05
Total	**9036.54**

Operational Norms

88. The petitioner vide affidavit dated 19.6.2014 has considered norms of operation for the purpose of tariff are as under:

Normative Annual Plant Availability Factor (NAPAF)	85%
Guaranteed Design Heat Rate	1737.01
Gross Station Heat Rate (GSHR) (kcal/kWh)	1823.862
Auxiliary Energy Consumption-AEC (%)	3.50

89. In terms of provisions of the 2009 Tariff Regulations, the above operational norms are in order, except for the Auxiliary Energy Consumption (AEC) and the Gross Station Heat Rate, which are examined as under:

Auxiliary Energy Consumption

90. The Auxiliary Energy Consumption (AEC) for Combined Cycle Gas based Project, in terms of the 2009 Tariff Regulations is 3%. The petitioner vide affidavit dated 17.6.2013 has submitted that the gas delivered by ONGC at plant boundary will be at low pressure (15 +/-1 kg/cm2) and electric motor driven Gas Booster Compressor (GBC), which has a high electricity consumption of approximately 7 MW, will be used to increase the pressure of the gas to approximately 32 kg/cm2. It has also submitted that accordingly, the actual auxiliary consumption of the plant will be higher (approx 3.5%) due to the use of electric motor driven Gas Booster Compressor and the same may be allowed. The petitioner has stated that an electric motor driven GBC has been chosen over gas engine driven GBC as it is proven to be more reliable. Accordingly, the petitioner has prayed that AEC of 3.5% may be allowed by the Commission for the generating station in exercise of the Power to relax under Regulation 44 of the 2009 Tariff Regulations. Thereafter, the petitioner vide affidavit dated 1.10.2013 has pointed out that the Appellate Tribunal for Electricity in its judgment dated 21.11.2012 in Appeal No. 41 of 2012 (Puducherry Power Corporation Ltd. Vs Joint Electricity Regulatory Commission and anr) had confirmed the order of the Joint Commission approving the Auxiliary Energy Consumption of 5.5% of gross power generation for the year 2011-12 based on the CEA guidelines and the 2009 Tariff Regulations. The petitioner has further submitted that according to the CEA guidelines, in cases where electric driver gas booster compressors

are part of the auxiliary plant, extra auxiliary consumption can be allowed. Subsequently, the petitioner vide affidavit dated 20.6.2014 has furnished the actual AEC for the months of January, 2014, February, 2014 and March, 2014 as 3.66%, 3.91% and 4.12%. It has also submitted that though the AEC has been considered as 3.5% in tariff filing forms, in view of the actual AUX figures and the guaranteed AUX figures under the EPC contract, the Commission may allow the AEC of 3.89% as per actual for the generating station of the petitioner.

91. In response to the direction of the Commission to submit the detailed break-up of the actual AEC of the gas station including the gas booster station from COD to November, 2014, in support of the prayer of the petitioner for higher AEC, the petitioner vide affidavit dated 15.12.2014 has furnished the actual month-wise AEC with the corresponding PAF and PLF of the generating station as detailed under:

Month	Total Generation (MUs)	Total Export (MUs)	PAF (%)	PLF (%)	AEC (%)	Remarks
January, 2014	203.96	196.49	86.00	83.54	3.66	
February, 2014	202.07	194.18	85.07	82.77	3.91	
March, 2014	210.37	201.70	83.99	77.83	4.12	
2013-14	**616.40**		**84.99**	**81.26**	**3.90**	
April, 2014	221.70	213.14	90.90	84.45	3.86	
May, 2014	105.80	101.55	43.26	39.55	4.01	Unit under shutdown for 13 days in preparation of PG test
June, 2014	222.98	214.96	86.94	85.04	3.60	
July,2014	236.66	227.77	89.41	86.93	3.76	
August, 2014	159.00	153.20	61.69	58.08	3.65	Unit under shutdown for 11 days in preparation of combustion Inspection of GT
September, 2014	230.80	222.31	90.53	87.51	3.68	
October, 2014	224.46	216.37	83.72	82.37	3.60	
November, 2014	248.20	238.00	96.05	94.05	3.77	
2014-15	**1649.60**	**238.85**	**80.14**	**77.00**	**3.73**	
Total	**2266.00**	**2180.51**	**81.41**	**78.17**	**3.77**	

92. The AEC for the entire project as guaranteed by M/s BHEL, the EPC contractor at different base loads as submitted by the petitioner is as below:

Table-B

Base Load	Plant Gross Output (KW)	Plant AEC (KW)	Plant AEC (%)
100%	726600	24800	3.41
80%	580800	23100	3.98
60%	436200	21700	4.97

93. The petitioner has further submitted that detailed breakup of actual AEC of gas booster compressor is not available as a separate meter for each auxiliary is not incorporated in the design of the plant. It has also submitted that as per the design documents provided by the EPC contractor, AEC for the plant will not be less than 3.41% even at full load for both the units. Accordingly, the petitioner has submitted that considering a normative availability of 85% for the plant, AEC for the plant will be approximately 3.90%. It has further submitted that taking into account the actual AEC figures of the project for the period from January, 2014 to March, 2014 a higher AEC of 3.90% may be allowed for the tariff period 4.1.2014 to 31.3.2014.

94. The respondent, APDCL while objecting to the claim of the petitioner for higher AEC has submitted that the 2009 Tariff Regulations specify the AEC as 3% for Combined Cycle projects on the gross energy generated at the generator terminal of all units and the same is applicable to the generating station of the petitioner. It has also pointed out that all other combined cycle projects of NEEPCO namely, Assam Gas Based Power Project, etc are being operated with 3% AEC and therefore the Commission may not consider the prayer of the petitioner for higher AEC.

Analysis

95. The petitioner has submitted that the generating station will have higher AEC as it is using electric driven Gas Booster Compressors (GBC) that have a power consumption of approximately 7MW (each GBC with a consumption of 3.8 MW approx). It has further

submitted that the EPC contract also provides for a guaranteed AUX of 24.8 MW at 100% base load of entire plant (3.41% AUX), 23.1 MW at 80% base load of entire plant (AUX of 3.97%) and 21.7 MW at 60% base load of entire plant (AUX of 4.97%) i.e a simple AUX average AUX of 4.12% for the entire plant. It is observed that the AEC of 3% as specified under the 2009 Tariff Regulations for combined cycle gas turbine project was based on the Auxiliary Energy Consumption pattern of the gas based stations of NTPC and NEEPCO. While in the case of the gas based stations of NTPC there is no Gas Booster Stations (GBS), in case of Assam Gas Based Power Station of NEEPCO, there is GBS, using Gas engines. However, the generating station of the petitioner uses an electric driven gas booster compressor which has higher auxiliary power consumption.

96. The Commission in its order dated 20.12.2013 while granting provisional tariff for Unit-I has considered the AEC of 3% as per the 2009 Tariff Regulations and had observed that the prayer of the petitioner for grant of higher AEC (3.5%) would be considered on merits at the time of determination of final tariff of the generating station. The petitioner has furnished the actual AEC for 2013-14 (January'2014 to March'2014) and the average works out to 3.90% for 2013-14. We have examined the AEC for the period from January, 2014 to March'2014 and it is observed that though during the period Unit-I operated near its base load, yet there was variation in AEC ranging from 3.66% to 4.12%. This implies that even in case of base load or partial load, the effect of AEC due to loading is minimum in combined cycle projects. The reason for the variation in AEC from 3.66% to 4.12% during the period from January, 2014 to March'2014 is on account of different PLF and difference in gas quality. However, it is apparently evident that AEC could be more than 3% (as per specified norm) even at 85% PLF or higher PLF. This higher AEC, in our view, is on account of the fact that the generating station uses electric driven Gas Booster Compressors (GBCs) which consumes significantly higher energy. As stated, the EPC contractor has also

guaranteed the AEC of 3.41% at 100% base load which is close to the AEC of 3.50% as claimed by the petitioner. In this background and considering the factors in totality, we are of the considered view that the petitioner has made out a case for relaxation of the AEC specified under the 2009 Tariff Regulations for the generating station. Accordingly, we, in exercise of the Power to relax under Regulation 44 of the 2009 Tariff Regulations allow the AEC of 3.50% to the generating station of the petitioner for the period 2013-14. The relaxation granted to this generating station by this order cannot be cited as a precedent and is subject to revision during the tariff period 2014-19.

Gross Station Heat Rate

97. The petitioner in the petition has submitted that Gas Sale Purchase Agreement (GSPA) provides that gas computations will be at Net Calorific Value (NCV) of 8250 kcal/SCM and the Gross Station Heat Rate (GSHR) on the basis of the Net Calorific Value (NCV) of the fuel provided by the EPC contractor. It has also submitted that the EPC contractor was requested to provide GSHR at the Gross Calorific Value (GCV) for Energy Charge Calculations and the certified GSHR calculations as received from the EPC contractor BHEL has been submitted. As per values of GSHR for different loads and the EPC contract, the weighted average GSHR at GCV as submitted by the petitioner is as follows:

> Weighted average GSHR at GCV = 0.4*1670.7+0.4*1735.4+0.2*1872= 1736.84 kcal/kWh
>
> Accordingly, the petitioner has prayed that GSHR for tariff may be considered as 1.05 x 1736.84 = 1823.862 kcal/kWh

98. The respondent, APDCL has submitted that the petitioner has considered a GSHR of 1823.862 kcal/kWh which is higher in comparison to the GSHR of 1644 kcal/kWh (1565.4*1.05) claimed vide affidavit dated 29.3.2014. It has also submitted that the advance class machines of 9FA type are more advanced than the existing old machines

in the country. It has therefore prayed that the Commission may examine the matter of GSHR and allow the Heat Rate after prudence check.

Analysis

99. It is observed that the Design Guaranteed Heat Rate on NCV basis at 100% load at 27^{o} C ambient Temperature and 0% make up is 1565.4 kcal/kWh. The methodology for converting NCV based Heat Rate to GCV based Heat Rate as submitted by the EPC contractor is as under:

GCV based Heat Rate = GCV of Fuel x LCV based Heat Rate / LCV of Fuel, where
GCV of Fuel = 9203.10 kcal/m^3
LCV of Fuel = 8294.36 kcal/m^3

100. As per above methodology, considering the design heat rate of NCV basis of 1565.4 kcal/kWh the:

(i) GCV based Design Heat Rate = 9203.10 x 1565.4 / 8294.36 = 1736.907 kcal/kWh
(ii) Gross Station Heat Rate = 1.05 X 1736.907 = 1823.75 kcal/kWh
(iii) GCV based Design Heat Rate as submitted by petitioner = 1736.84 kcal/kWh
(iv) Gross Station Heat Rate as submitted by petitioner = 1.05 x 1736.84 = 1823.682 kcal/kWh

101. The petitioner has computed the Gross Station Heat Rate as 1823.862 kcal/kWh instead of the Gross Station Heat Rate of 1823.682 computed based on the Design Heat Rate of 1736.84 kcal/kWh. This in our view appears to be typographical error on the part of the petitioner. Accordingly, the Station Heat Rate of 1823.682 kcal/kWh has been considered.

102. The respondent, APDCL has stated that the Heat Rate of 1644 kcal/kWh may be considered. We have examined the matter. It is observed that the Commission in its tariff orders pertaining to the generating stations namely, Uno-Sugen power project, Pragati-III Project, and Ratnagiri Power Project (RGPPL) had allowed the Gross Station Heat Rate of around 1850 kcal/kWh for the reasons stated there under. Moreover, Pipavav CCGT, Block-I

& II of 702 MW of Gujarat State Energy Corporation Ltd, which has advanced class machines (supplied by BHEL) with a capacity similar to that of this generating station has the Gross Station Heat Rate of 1850 kcal/kWh. Taking these into consideration, we find no merit in the contentions of the respondent to consider the Heat rate of 1644 kCal/Kwh for this unit of the generating station. Accordingly, the Gross Station Heat Rate of 1823.682 kcal/kWh has been considered for this generating station.

103. Based on the above discussions, the norms of operation considered for the purpose of tariff of Unit-I/Block-I of this generating station are as under:

Normative Annual Plant Availability Factor (NAPAF)	85%
Gross Station Heat rate (GSHR)-(kcal/kWh)	1823.682
Auxiliary Energy Consumption (%)	3.50

Energy Charge Rate (ECR)

104. Based on the norms of operation allowed, the GCV and price of Natural Gas for the preceding three months from COD of Unit-I (Block-I), the Energy Charge Rate (ECR) in ₹/kWh on ex-power plant basis, considered for the purpose of tariff is as under:

Description	Unit	4.1.2014 to 31.3.2014
Capacity	MW	363.3
Normative PLF (85% PLF)	hours/kw/year	7446.00
Gross Station Heat Rate	kCal/kWh	1823.682
Auxiliary Energy Consumption	%	3.50
GCV of Gas (average)	kCal/SCM	9216
Price of Gas (average)	₹ /1000 SCM	5781.92
Rate of Energy Charge P/kWh (ex-bus)	Paise/kWh	**118.564**

105. The Energy charge on month to month basis shall be billed by the petitioner as per Regulation 21 (6) (a) of the 2009 Tariff Regulations.

Application fee and the publication expenses

106. The petitioner has made publication of the tariff application in accordance with Regulation 3(6) of the Central Electricity Regulatory Commission (Procedure for making of application for determination of tariff, publication of application and other related matters)

Regulations, 2004. In terms of our decision contained in order dated 11.1.2010 in Petition No.109/2009, the expenses towards filing of tariff application and the expenses incurred for publication of application are to be reimbursed. Accordingly, the expenses incurred by the petitioner for petition filing fees in connection with the present tariff petition (Unit-I) and the publication expenses incurred shall be directly recovered from the beneficiaries, on *pro rata* basis. The excess filing fee if any paid, shall be adjusted against the tariff petition in respect of Unit-II (Block-II) of the generating station of the petitioner.

107. The petitioner is already billing the respondents on provisional basis in accordance with the provisional tariff granted vide order dated 20.12.2013. The provisional billing of tariff shall be adjusted in terms of proviso to Regulation 5(3) of the 2009 Tariff Regulations as amended on 21.6.2011.

108. Petition No. 199/GT/2013 is disposed of in terms of the above.

Sd/-	***Sd/-***	***Sd/-***
(A. S. Bakshi)	**(A. K. Singhal)**	**(Gireesh B. Pradhan)**
Member	**Member**	**Chairperson**

Annexure-I

Calculation of Weighted Average Rate of Interest on Loan

	No of days	Rate of Interest
Loan -1	1.00	10.50%
Loan-2	30.00	12.50%
Loan-3	31.00	10.50%
Loan-4	28.00	10.50%
Weighted Average Rate of Interest		**11.17%**