

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

Petition No. 277/GT/2014

Coram:

Shri Gireesh B. Pradhan, Chairperson

Shri A.K. Singhal, Member

Shri A.S. Bakshi, Member

Dr. M.K. Iyer, Member

Date of Order: 11 July, 2017

In the matter of

Approval of tariff of Vallur Thermal Power Station (3 x 500 MW) for the period 2014-19

In the matter of

NTPC Tamil Nadu Energy Company Limited
No. 123, G- Block, Anna Nagar (East)
Chennai- 600102

...Petitioner

Vs

1. Transmission Corporation of Andhra Pradesh Ltd.
Vidyut Soudha, Khairatabad,
Hyderabad - 500 082.
2. Southern Power Distribution Company of A.P. Ltd.
D.NO:19-13-65/A Srinivasapuram,
Tiruchanoor Road Tirupathi- 517 501
3. Eastern Power Distribution Company of A.P. Ltd.
P&T Colony, Seetammadhara,
Vishakapatnam - 503 013
4. Transmission Corporation of Telangana Ltd.
Vidyut Soudha Khairatabad,
Hyderabad - 500 082
5. Northern Power Distribution Company of Telangana,
H.No. 1-1-504, Opp. NIT petrol Pump,
Chaityanayapuri colony, Hanmkonda,
Warangal - 506 004
6. Southern Power Distribution Company of Telangana
2nd Floor, H. No. 6-1-50, Mint Compound,
Hyderabad-500 063
7. Power Company of Karnataka Limited
KPTCL Complex, Kaveri Bhawan,
Bangalore - 560 009
8. Bangalore Electricity Supply Company Ltd
Krishna Rajendra Circle, Bangalore-560 001
9. Mangalore Electricity Supply Company Ltd
Paradigm Plaza, A.B. Shetty Circle,
Mangalore-575 001



10. Chamundeshwari Electricity Supply Co. Ltd.,
Corporate Office No. 927, L.J. Avenue,
New Kantharaj Urs Road Saraswathipuram,
Mysore - 570 009

11. Gulbarga Electricity Supply Company Ltd.,
Main Road, Gulbarga, 585102

12. Hubli Electricity Supply Company Ltd.
Corporate office, P.B. Road, Navanagar
Hubli - 580 025

13. Kerala State Electricity Board
Vaidyuthi Bhavanam, Pattom
Thiruvananthapuram - 695 004

14. Tamil Nadu Generation & Distribution Corporation Ltd.
144, Anna Salai,
Chennai - 600 002

15. Electricity Department,
Government of Puducherry,
137, NSC Bose Salai,
Puducherry-605 001

Parties present:

Shri M.G. Ramachandran, Advocate, NTECL
Ms. Poorva Saigal, Advocate, NTECL
Shri Nishant Gupta, NTECL
Shri Patanjali Dixit, NTECL
Shri Rohit Chahabra, NTECL
Shri S. Vallinayagam, Advocate, TANGEDCO

ORDER

This petition has been filed by the petitioner, NTPC Tamil Nadu Energy Company Limited (hereinafter 'NTECL'), a joint venture company of NTPC and Tamil Nadu Electricity Board, for approval of tariff of Vallur Thermal Power Project (3 x 500 MW) ('the generating station') for the period 1.4.2014 to 31.3.2019 based on the Central Electricity Regulatory Commission (Terms and Conditions of Tariff) Regulations, 2014 (referred to as "the 2014 Tariff Regulations").

2. The investment approval of the project was accorded on 14.7.2007 by the Board of the Petitioner company for Stage-I, Phase-I comprising of two units of 500 MW at a cost of ₹5552.78 crore and Phase-II comprising of one unit of 500 MW at a cost of ₹3086.78 crore on 19.5.2009. The petitioner has entered into Power Purchase Agreement (PPA) with the respondents herein for supply of power generated from the project to the respondents in terms of the allocation made by the Ministry of Power, Government of India vide letter dated 28.9.2010.



3. The generating station with a capacity of 1500 MW comprises of two units of 500 MW each in Phase-I and one unit of 500 MW in Phase-II. The dates of commercial operation of the units of the generating station are as under:

Unit-I	29.11.2012
Unit-II	25.8.2013
Unit-III	26.2.2015

4. The Commission vide order dated 8.2.2016 in Petition No.198/GT/2013 had approved the tariff of the generating station from the date of COD of Unit-I (29.11.2012) to 24.8.2013 and for Units- I and II (combined) from the COD of Unit-II (25.8.2013) to 31.3.2014. Aggrieved by the said order dated 8.2.2016, the petitioner had filed review petition (Petition No. 28/RP/2016) on various issues and the Commission vide order dated 18.4.2017 had disposed of the same, revising the tariff of Units-I and II of the generating station. Accordingly, the annual fixed charges determined vide order dated 18.4.2017 is as under:

(₹ in lakh)

	2012-13		2013-14	
	29.11.2012 to 31.3.2013		1.4.2013 to 24.8.2013	
	123 days		146 days	
	1 Unit		1 Unit	
				2 Units
Return on Equity	4608.81	5564.20	14910.91	
Interest on Loan	8776.71	10408.64	25412.02	
Depreciation	5379.78	6560.17	16452.66	
Interest on Working Capital	1412.82	1658.53	6576.92	
O&M Expenses	2580.98	3248.00	9744.00	
Secondary fuel oil cost	618.83	736.56	2114.02	
Total annual fixed charges	23377.94	28176.10	75210.54	

5. The opening capital cost as on 1.4.2014 and 26.2.2015 and the annual fixed charges for the period 2014-19 claimed by the petitioner are as under:

Capital cost

(₹ in lakh)

	1.4.2014 to 25.2.2015	26.2.2015 to 31.3.2015
Opening Capital Cost on Cash basis	577317	852103.56
Notional IDC capitalised as on 31.3.2014	6445.34	1241.76
Additional capitalization	71.03	1551.20
Liabilities Discharged	8103.17	7288.91
Closing Capital cost	591936.57	862185.43



Annual Fixed charges

(₹ in lakh)

	2014-15		2015-16	2016-17	2017-18	2018-19
	1.4.2014 to 25.2.2015	26.2.2015 to 31.3.2015				
Return on Equity	27335.00	39886.09	52955.15	56401.27	58374.99	59134.21
Interest on Loan	42158.70	62054.08	62322.62	61487.68	58573.12	53890.98
Depreciation	29234.76	43216.25	45350.08	48449.86	50038.23	50644.74
Interest on Working Capital	9859.41	14735.04	15188.11	15386.50	15506.09	15540.87
O&M Expenses	16441.00	23641.00	25200.91	26714.33	28398.75	30186.60
Secondary fuel oil cost	0.00	0.00	0.00	0.00	0.00	0.00
Total annual fixed charges	125028.87	183532.46	201016.87	208439.64	210891.19	209397.40

6. The petition was heard on several dates and the Commission after hearing the matter on 16.2.2016 reserved orders in the petition after directing the petitioner to submit certain additional information vide record of proceedings of the said hearing. In compliance with the said directions, the petitioner has submitted the additional information and has served copies on the respondents. The respondents, KSEB and TANGEDCO have filed their replies and the petitioner had filed its rejoinder to the said replies. Based on the submissions of the parties and documents available on record, we proceed to determine the tariff of the generating station, on prudence check, as stated in subsequent paragraphs.

Schedule of Commissioning

7. The scheduled COD and the actual COD of the three units of the generating station are as under:

Unit Nos.	Date of LOA	Schedule COD as per LOA	Actual COD	Time Overrun (in months)
I	13.8.2007	10.2.2011	29.11.2012	21.63
II		10.8.2011	25.8.2013	24.53
III	28.7.2009	27.1.2013	26.2.2015	25.0

8. The Commission in order dated 8.2.2016 had examined the issue of time overrun in respect of Units-I and II and had allowed the time overrun of 16 months for Unit-I and 18 months for Unit-II of the generating station. Hence, the time overrun in respect of Unit-III of the generating station has only been considered in this order.

9. The investment approval for Unit-III of the generating station was approved in May 2009 and the main plant for Unit-III was awarded on 28.7.2009 (zero date). The schedule date for



declaration of commercial operation of Unit III was 27.1.2013 and the actual date of COD of Unit-III is 26.2.2015, thereby resulting in the delay of 25 months.

Admissibility of Additional Return on Equity

10. In terms of the provisions of the 2014 Tariff Regulations, the timeline specified for completion of different units of green field projects (Coal/lignite) with a unit size of 500 MW from the date of investment approval is 42 months for first unit and thereafter, at an interval of 6 months each for subsequent units. The actual COD of Unit-III/ generating station is 26.2.2015 and the date of investment approval is May, 2009. Thus, the time taken for COD of Unit-III is 69 months from the date of Investment approval which is beyond the timeline of 54 months as specified under the 2014 Tariff Regulations. Accordingly, the generating station is not entitled to Additional Return on Equity of 0.5% for timely completion in terms of the 2014 Tariff Regulations.

Time and Cost Overrun

11. As stated above, the time overrun in case of Unit-III is 25 months as the COD of the said unit is 26.2.2015 as against the schedule COD of 27.1.2013 and the same is being examined in this order. The petitioner vide affidavit dated 18.8.2014 has furnished the reasons for time overrun. However, the Commission vide ROP of the hearing dated 16.2.2016 had directed the petitioner to furnish details with respect to the delay in the COD of Unit-III and also for clarification as to whether there was any overlapping of time overrun due to common activities with regard to other units. In compliance with the above directions, the petitioner vide affidavit dated 3.5.2016 has furnished the major reasons for time overrun of Unit-III as detailed under:

Sl No	Period	Total months	Reasons for the delay
1.	November, 2010 to June, 2011	8	On account of cyclone JAL
2.	December, 2011 to August, 2012	8	On account of cyclone THANE
3.	September, 2012	1	On account of civil contractor M/s Gammon
4.	July, 2014 to February, 2015	8	On account of NGT ban on Earth quarrying

Delay due to Cyclones (JAL & THANE)

12. The petitioner has submitted that two cyclones namely JAL in November, 2010 and THANE in December, 2011 had affected the progress of the work adversely leaving behind a trail of



devastation. Accordingly, the submissions of the petitioner under this head are summarized as under:

- (a) Cyclone and heavy rainfall has created huge impact on the infrastructure like approach road, construction, supply etc. for carrying out the project activities. The approach roads were completely washed away and this caused problems in movement of the trucks affecting the delivery of materials to the site, movement of material handling equipments like hydra, cranes etc affecting the progress of the work. This has brought down the project works to a standstill.
- (b) While the material supply was affected due to damage to the approach road on one hand, the manpower was completely de-mobilized due to cyclones and heavy rainfall on the other hand. The project is situated in close proximity to sea and hence aftermaths of cyclones are hugely felt in the project premises. The Cyclones have caused severe damages to the temporary sheds of contracts & the labor colony. The heavy rainfall accompanied by cyclone has resulted in flooding of labor colony necessitating the laborers to be mobilized to safe locations. NTECL took swift action in ensuring that the laborers were rescued to safer locations by collaborating with the agencies. However, on account of panic that was caused during that time, lot of laborers left to their home towns and it took lot of time to re-mobilize the laborers to the site back to work.
- (c) In addition to the damage caused to the labor colonies, severe damage also happened to the established infrastructure inside the site premises such as failure of construction supply due to falling of electrical poles carrying HT lines. Power supply was affected causing added difficulties in accomplishing rescue operations. Also, in order to bring the labor back to the site, labor colonies were to be re-built to provide safe accommodation to the laborers which also took lot of time on its part. To re-build the labor colonies, water logging happened on account of heavy rainfall needed to be de-watered. All these activities took lot of effort and time for NTECL such that project works almost came to standstill condition for a period of 08 months each for cyclone JAL and THANE. The newspaper clippings showing the damage caused by the cyclones in the city of Chennai is annexed in Annexure IV a of the petition.
- (d) All the structural works in the generating station were fabricated in the fabrication yard set up in premises of the generating station. The fabrication yards were completely washed away and the activities were affected thereby causing delay in completion of structural and thereafter subsequent civil works.
- (e) The unprecedented rains in 2010 and 2011 had a monthly maximum rainfall of 418 mm and 637mm respectively. There was huge water logging and flooding during periods of



heavy rainfall. All the civil foundation works which were started and in their early stages were completely water logged. The water logged areas were to be de-watered to commence the works but since all the surrounding areas were also water logged, there was no way out for the water to be de-watered to other areas. This process of de-watering the complete water logged areas and then preparing the foundation area for carrying out further civil works took a lot of time.

- (f) The boiler erection work of Unit-III was hugely affected due to JAL in November 2010 and this has caused delay of 08 months for completion of the activity.
- (g) There was a delay of 16 months in completion of TG deck and TG foundation works on account of cyclones and incessant rainfall in 2010 (8 months) and 2011 (8 months). This has caused delay of about 13 months in commencement of condenser erection works and 16 months in commencement of TG erection works, both being parallel activity was however completely dependent on the casting of TG deck & TG civil foundation works.
- (h) In case of completion of TG foundations, the civil contractor could not recover from the damage caused by cyclones and rainfall since civil works are the most affected works in case of natural calamities. The momentum with which the work has to progress, especially civil works, could not be regained after the devastating effects of cyclones. The civil contractor required a lot of time and energy in order to bring the condition to normal and thereafter commence the works such as re-establishing the labour colony, bringing the de-mobilized manpower to site, de-watering the foundation works, removing the debris etc and after all these works were completed and when the situation was brought back to workable condition, only then further works could be taken up. As stated above, the devastation caused by the cyclone/heavy rainfall and its impact in bringing the site conditions to the point where work could be taken up again was huge.
- (i) There is a delay of 17 months in actual synchronization with respect to scheduled date of synchronization. As stated above, 16 months of delay is attributable to cyclones and heavy rainfall and 1 month delay in completion of boiler foundations is attributable to the poor performance of the contractor.

Delay by Civil Contractor (1 Month)

13. The petitioner has submitted that in case of Unit-III the civil foundation works were progressing at a rapid pace and hence the delay at site activities due to effect of cyclones and rainfall were hugely felt or impacted at Unit-III. It has however submitted that in order to comply with the time schedule by increasing the pace of work to compensate for the time lost, the



petitioner has expressed deep concerns about progress of civil works to M/s Gammon India Ltd. several times. The petitioner has also submitted that even after a lot of reviews, follow-ups and deliberations at top management level, M/s Gammon India Ltd. could not speed up the pace of progress of work. The petitioner had insisted the civil contractor that the condenser and turbine erection works could be taken up only after casting of TG Deck and sought the personal intervention to ensure that no further delays happen. Accordingly, the petitioner has submitted that it has taken best efforts to bring back the project as close as possible to the scheduled timeline. However, despite the efforts of the petitioner the delay could not be compensated due to the above said uncontrollable reasons not attributable to the petitioner. The petitioner has submitted that in addition to the delay caused due to cyclone and incessant rainfall, there has been minor delays in completion of specific milestones on account of contractor such as boiler pressure parts erection, acid cleaning, etc. However, the same is compensated by exceptionally high performance in activities like steam blowing for which 50 days has been envisaged as schedule duration but completed in 19 days. Accordingly, the petitioner has submitted that the major delay causing time overrun in achieving synchronization of Unit-III was on account of cyclones and unprecedented rainfall in 2010 and 2011 which is completely beyond the control of the petitioner.

National Green Tribunal ban on Earth quarrying (8 months)

14. The petitioner has submitted the following causes of delay under this head:

(a) The delay of 8 months was due to ban on earth quarrying by National Green Tribunal (NGT) vide order dated 28.3.2014 which resulted in the non-issuance of Environment Clearance (EC), which is a pre-requisite for digging/quarrying. All this had ultimately stopped the Ash dyke works and consequently delayed the declaration of COD of Unit-III. NGT finally lifted the restriction of the issuance of EC by SEIAA vide order dated 13.1.2015. Consequent upon this EC was issued on 11.2.2015 for mining / excavation of earth to be used for ash dyke works at the project. Subsequently, allout efforts were made and Unit-III was declared under commercial operation on 26.2.2015. Thus, the stoppage of earth quarrying from July, 2014 to February, 2015 resulted in a delay of 8 months which was beyond the control of the petitioner.

15. The petitioner has submitted that there was no overlapping of time overrun in Unit-III due to common facilities with respect to Units I and II. It was also submitted that the time overrun in



Unit-III was due to reasons exclusive in Unit-III only thereby affecting the main plant works (TG and boiler works) of Unit-III only. In response to the directions in ROP of the hearing dated 10.7.2015, the petitioner has submitted that the declaration of COD of Unit-III got delayed upto 25 months considering a delay of 16 months in TG & condenser erection and 9 months delay is attributed to the delay in declaration of COD alone. It has further submitted the following reasons for delay from synchronization to COD of Unit-III.

- a) Unit-III was synchronized and commissioned on 28.2.2014. After assessing the progress of works, the petitioner initially planned to declare the commercial operation of Unit III within 6 months of initial synchronization i.e 28.8.2014. However, despite the best efforts by the petitioner, COD could not be declared due to delay in completion of 'In plant coal handling system' for bunkering coal for regular operation.
- b) The petitioner had filed miscellaneous petition seeking permission for injection of infirm power beyond six months i.e. 28.8.2014 from the date of initial synchronization for a period of three months beyond 28.8.2014 in terms of Regulation 8 (7) of the CERC (grant of connectivity and long term access and medium term open access in interstate transmission and related matters) Regulations 2009 as amended from time to time.
 - i. Coal Handling System contract was awarded to M/s BHEL ISG on 29.3.2010 and as per contract all the facilities related to Units I, II and III were to be completed by November, 2011, May, 2012 and November, 2012 respectively.
 - ii. M/s BHEL-ISG has sub-contracted various works relating to 'In plant CHP' package to M/s Tecpro (Mechanical Works), M/s CGL (Electrical) and M/s Prasad & Co (Civil/Structural works).
 - iii. The progress of the work was unsatisfactory even after a lot of reviews and follow ups. On 10.1.2014 the petitioner communicated to M/s BHEL-ISG intimating slow progress of work in all areas of CHP due to issues of BHEL with their sub-agencies. The agency M/s Tecpro had practically stopped working due to various internal problems.
 - iv. On 25.2.2014, the petitioner intimated BHEL about the planned commissioning of Unit III in February 2014 and made a specific remark that BHEL-ISG is not able to take up erection activities due to non-availability of materials and erection agencies and insisted to deploy erection agency on war footing to complete the system latest by May 2014 to facilitate declaration of commercial operation of the unit.
 - v. As the progress of the work was not satisfactory and the unit was already commissioned, a meeting was held at M/s BHEL- ISG office on 14.03.2014 to discuss the execution status of In-plant Coal Handling system. The petitioner pointed out that its Unit III is synchronized on 28.2.2014 and was targeting COD in July 2014. It was also pointed out that trial operation of the unit needs to be completed before



COD for which all associated facilities of CHP was required to be completed latest by June, 2014.

- vi. Subsequently on 26.3.2014, M/s BHEL - ISG had terminated erection contract with M/s Tecpro citing reasons of non-performance and delay in completion of project as per schedule. Further, M/s BHEL - ISG decided to award the pending works to other agencies.
- vii. On 25.4.2014, the petitioner emphasized BHEL-ISG that as per CERC's Regulations, COD is to be declared within six months otherwise there could be issues relating to injection of infirm power.
- viii. After highlighting and representing the issues in various forums, M/s. BHEL- ISG finally awarded the erection works of CHP In plant package to two sub-agencies namely M/s ESENTEE and M/s UK MECON and the works commenced only in the first week of June 2014.
- ix. With all essential systems being ready and with only conveyor works pending at the time of initial synchronization, the petitioner was of the view that, it shall achieve COD of unit III well before the stipulated time of six months from initial synchronization. Further, with respect to the CHP works, the petitioner has put all out efforts from all possible directions to ensure that M/s BHEL and its sub-agencies complete the works for timely commercialization of Unit III.
- x. The petitioner had submitted in Petition No. MP/129/2014 that it had taken up the issue of delay in erection and commissioning in various forums and had also written several letters to M/s BHEL-ISG. The petitioner made all efforts from all possible directions to pressurize M/s BHEL- ISG to complete the works on time to ensure Unit III readiness for COD.
- xi. The petitioner approached the Commission seeking permission to inject infirm power beyond six months from the date of first synchronization (28.8. 2014). Keeping in view the delay and the Commission vide order dated 25th August, 2014 granted permission to Unit III to inject infirm power into the grid up to 15.10. 2014.
- xii. After completion of the In-plant CHP works, bunkering was carried out and the petitioner was preparing to go ahead with the trial operation of Unit III, but due to catastrophic failure of one of the CW Pump, trial operation could not be completed. Sea water with IDCT was envisaged for the generating station as circulating water for condenser cooling system. The generating station has been provided with 6 no's of CW pumps for three units (2 per unit). The pumps are of vertical wet pit and impeller pull out type pumps manufactured by M/s WPIL in collaboration with MHI (Japan). Since the pumps are of impeller pull out type pumps, stand by pumps are not envisaged in the scheme. The petitioner had been facing severe problems with the availability of pumps owing to high pump vibration and high motor thrust bearing temperature.
- xiii. The petitioner took up the problems associated with pumps with the manufacturer, reviewed and revised several engineering aspects of the pump to overcome the vibration problem. The pump had undergone several modifications such as



modification at site, modification at WPIL (manufacturer) works and redesign/design ratification by WPIL in association with MHI (Japan). The modifications carried out at site reduced the failure rates, however, the manufacturer proposed to change the design of impeller like introduction of additional shells in the suction bell, flow stream liner in the bowl guide, provision of leather gaskets between the taper seating surface of the bowl and bowl guide to address the vibration problem. All the above modifications have been made in one of the pump.

- xiv. The petitioner relied on the availability of pumps, since the various ratifications carried out has reduced the failure rates of pumps. On 2.9.2014, the petitioner had given a letter to M/s WPIL intimating the major failure of the said CW pump and asked M/s WPIL to perform inspection and root cause analysis.
- xv. On 10.9.2014, the petitioner wrote to M/s WPIL expressing serious concerns over sustained high vibration level and repeated failure of pumps and motors and also insisted on the requirement of all the 6 pumps in proper working condition for declaration of commercial operation of the Unit by September, 2014.
- xvi. NETRA (Research & Development wing of NTPC Ltd) also studied the vibration problems of CW pumps in Vallur and reviewed the possibilities to overcome the problem.
- xvii. In view of the above circumstances, the petitioner approached the Commission for injection of infirm power beyond 15.10.2014 and up to 31.12.2014 for demonstrating full load trial run and before declaration of the COD of the said unit. The Commission vide order dated 17.10.2014 allowed the petitioner to inject infirm power up to 31.12.2014. In line with the Tariff Regulations specified by the Commission, the petitioner completed 72 hours full load trial operation on 10.12.2014 before declaration of COD. During the preparatory activities for COD, high vibration was observed in the Turbine shaft. To accomplish sustained and reliable operation of the Unit, it was decided along with the Turbine manufacturer M/s BHEL to rectify the vibration problem before declaration of COD. After rectifying the turbine vibration problem, Unit III was declared under commercial operation w.e.f. 26.2.2015.

16. In the above circumstances, the petitioner has submitted that it took best efforts from all possible directions to declare COD within 28.8.2014 but due to continuous unforeseen problems and difficulties, the COD was delayed from the target date and could be done only on 26.2.2015. It has further submitted that the failure of CW pump and problem of turbine vibration were last minute surprises and completely unforeseen instances which had caused the delay of a further period of 6 months from the planned date of declaration of commercial operation. The petitioner has submitted that the Commission while granting extension of time for injection of infirm power had considered the bonafide reasons and circumstances on account of which the petitioner had sought extension of time for injection of infirm power. Accordingly, the petitioner has prayed that



the delay in declaration of COD due to reasons as stated above may be considered to be beyond the control of the petitioner.

Submission of Respondents

KSEB

17. The respondent, KSEB vide affidavits dated 24.11.2014 and 9.1.2015 has submitted as under:

(a) The reasons furnished by the petitioner that there was delay in tendering process and consequential delay in award of packages due to inclusion of Unit-3 requirement also in balance of Plant packages and that the delay in award of site levelling package and main plant civil package for Stage-1 and retendering issues connected with Cooling Water equipment and Coal Handling Plant may not be allowed as these reasons are purely attributable to the petitioner and hence the delay due to awarding contracts may not be admitted and the IDC due to this delay may be disallowed from the capital cost.

(b) The submission of the petitioner that the work has been affected adversely due to unprecedented rains in 2010 and 2011 is not justifiable and may not be admitted. These delays are attributable to the petitioner as the petitioner ought to have carried out necessary follow ups for speedy execution of the work. Moreover, the petitioner before preparation of the original scope of work ought to have done necessary earth work study, pre-commissioning survey including soil investigation at the planning stage itself before preparation of scope of work.

(b)The delay due to non availability of start-up power may be admitted only after the petitioner submits the supporting documents as regards the submission that the boiler light up of unit 1 was delayed by 13 months due to delay in getting start up power as PGCIL could not make available start up power due to RoW issues and court cases.

(e) Since the petitioner is joint venture of NTPC and TANGEDCO, proper care and attention could have been taken by the petitioner to prevent theft of fabricated material. Further, the petitioner ought to have taken timely initiatives to stop the local disturbances with the help of local administration. Hence the reasoning provided by the petitioner does not substantiate the delay and may be disallowed.

TANGEDCO

18. The respondent, TANGEDCO vide affidavit 22.9.2015 has submitted that the reasons furnished by the petitioner for delay in COD clearly exhibits the inefficiency on part of the



petitioner to execute the project. It is also submitted that improper planning and coordination led to the delay in commissioning of the project. The respondent has further submitted that the beneficiaries should not be burdened with the escalated project cost as scheduled and hence the Commission may negate the claim of the petitioner as the delay does not fall within the parameters for uncontrollable factors. In response, the petitioner in its rejoinder has submitted that the project activities/ items are inter-related and completion of one activity has a consequential effect on the commencement of the following activity. It is also stated that any delay in an activity/ item shall cause delay in commencement of other activities. Accordingly, it has submitted that the time overrun in the COD of the project may be condoned.

Analysis and decision

19. 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 and 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.



20. The factors responsible for the delay in the commissioning of the unit III of the generation station as summarized by the petitioner are as under:

	Period
On account of cyclone JAL	8 months (November, 2010 to June, 2011)
On account of cyclone THANE	8 months (December, 2011 to August, 2012)
On account of delay by Civil Contractor M/s. Gammon	1month (September, 2012)
On account of NGT ban on Earth Quarrying	8 months (July, 2014 to February, 2015)

21. As stated, the schedule COD of Unit-III is 27.1.2013 against which the actual COD of the said unit is 26.2.2015. Thus there is a time overrun of 25 months. From the above submissions of the petitioner, the delay of 25 months in the COD of Unit-III can be categorized and examined as under:

- a) *Delay of 13 months during the construction of the project till the first synchronization of Unit-III; and*
- b) *Delay of 12 months for Unit-III from the synchronization to actual COD*

Delay on account of cyclones (JAL and THANE) and unprecedented rainfall during 2010 and 2011 (16 months)

22. The petitioner vide affidavit dated 3.5.2016 has submitted that the unprecedented rains during the years 2010 and 2011 had hampered the progress of work of TG deck and TG foundation work for 8 months from November, 2010 to June, 2011 and for a further period of 8 months from December, 2011 to August, 2012. In justification of the same, the petitioner has submitted that the material supply was affected due to damage to the approach road and manpower was completely demobilized. Accordingly, the petitioner has submitted that there was a delay of about 13 months in commencement of condenser erection works and 16 months in commencement of TG erection works as both the activities were completely dependent on the casting of TG deck and TG civil foundation works. It has further submitted that the heavy rainfall was followed by cyclone which damaged the labour colony and due to panic labourers left for their hometown. The respondent, KSEB has stated that the submissions of the petitioner that work has been affected adversely due to unprecedented rains in 2010 and 2011 is not justifiable and may not be admitted.



23. It is observed from the bar chart furnished by the petitioner vide affidavit dated 3.5.2016 that the schedule of boiler foundation work was from 28.7.2009 to 27.5.2010. The start date of the boiler foundation work was as per the original schedule date i.e. 28.7.2009 but its completion was delayed by one month with respect to the date of completion. The petitioner has furnished the reasons for the delay of one month for the work of the boiler foundation due to poor performance of the contractor. The petitioner can settle this delay as per the contractual provisions. Accordingly, we are not inclined to condone this delay of one month in completion of boiler foundation work. The original schedule of the boiler erection work up to drum lifting was five months from 28.5.2010 to 28.10.2010. However, due to consequential delay of one month in boiler foundation work, the boiler erection work was commenced on 1.7.2010 and was actually completed on 29.7.2011. Accordingly, the total time of 13 months taken for completion of boiler erection work up to drum lifting instead of 5 months as per original schedule thereby resulting in a delay of 8 months. This delay of 8 months was on account of cyclonic storm JAL in November, 2010 followed by heavy rain in December, 2010 when the boiler foundation work was in progress. It is observed from the rainfall data furnished by the petitioner that the average rainfall during the month of November and December for the previous three years i.e. 2007, 2008 & 2009 is 442.7 mm and 143.73 mm respectively, and whereas the actual rainfall was 230 mm during November, 2010 and 418 mm during December, 2010. From the bar chart furnished by the petitioner, it is noticed that there is consequential delay in boiler drum lifting, condenser erection and boiler hydro test. Thus, it could be inferred from the above that Cyclone JAL in November, 2010 followed by unprecedented rains with monthly maximum rainfall of 418 mm during the month of December, 2010 the boiler erection work, fabrication yard and civil works of TG foundation were hugely affected. Also the process of de-watering the water logged area and to carry out further civil work took considerable amount of time. In addition to this, there was disruption of labours and their colonies were damaged and accordingly rebuilding and labour colonies and remobilization to the site took considerable amount of time. Considering the fact that the delay in the above said works was on account of natural calamities, we are inclined to condone the delay due to cyclone JAL and rainfall as the same was beyond the control of the petitioner.



Accordingly, in terms of the principles laid down by the Tribunal in the judgment dated 27.4.2011 [(situation (ii))], the total delay of 8 months is condoned.

24. The petitioner has also submitted that there has been a delay of 8 months in the completion of the work on account of cyclone THANE during December, 2011. It is noticed from the bar chart furnished by the petitioner that the original schedule of TG erection work was for 12 months from 28.5.2011 to 27.5.2012. It is observed that the work could not be started as per original schedule of 28.5.2011 due to consequential delay because of cyclone JAL in November, 2010. Besides this, severe cyclone THANE, in December, 2011 had added to the delay in the work of TG erection which was finally started on 15.9.2012 and was subsequently completed on 24.9.2013. It is observed from the rainfall data furnished by the petitioner that the average rainfall during the month of November and December for the previous four years (i.e. 2007, 2008, 2009 & 2010) is 389 mm and 212.3 mm respectively while the rainfall remained 637 mm and 117.8 mm for the months of November, 2011 and December, 2011 respectively. In view of these facts, we find that there was heavy rain during November, 2011 prior to the month of cyclone while the rainfall during December, 2011 is lower than the monthly rainfall data of previous four years. This disruption caused by wind and rain hampered the commencement of TG erection work. Though the rainfall data alone cannot be the basis to evaluate the amount of devastation caused by cyclone, we noticed that the similar problems faced by the petitioner like water logging, disruption of labourers, etc during the Cyclone JAL in November, 2010 was also faced by the petitioner due to cyclone THANE in December 2011. Thus, as per the submission of the petitioner, there has been a total delay of 16 months up to the start of TG erection work, (i.e. 8 months each due to Cyclone JAL in November, 2010 and THANE in December, 2011). Considering the fact that the generating station was severely affected by cyclone and rain, the delay, in our view, is attributable to natural calamities and is beyond the control of the petitioner.

25. From the perusal of the documents on record, discussion above and summary of delay, out of the total delay of 25 months as submitted by the petitioner, it is observed that there is delay of 12 months from the date of first synchronization (28.2.2014) to actual COD (26.2.2015). Therefore the total delay from date of erection/ construction to synchronization is 13 months (25-



12). Considering the delay of 1 month in boiler foundation work which is not condoned and 1 month delay by the civil contractor M/s Gammon, which has been discussed in the subsequent paragraphs, there is a total delay of 11 months (8 months due to cyclone JAL and 3 months due to cyclone THANE), from the above discussion it is inferred that delay due to cyclone THANE is only 3 months. The schedule for start of TG erection work was from 28.5.2011 and the consequential effect of cyclone JAL during November, 2010 was upto June, 2011 and hence the TG erection work should have been started by July, 2011. Accordingly, there is gap of 5 months from the effect of cyclone JAL (June, 2011) to occurrence of cyclone THANE in December, 2011. It is noticed that the petitioner has not furnished any justification regarding this gap of 5 months and has also not made out a case that there was actual delay of 8 months due to cyclone THANE in December, 2011. The petitioner has also not quantified the post cyclone activities which were undertaken by the petitioner for normalization of the effect of cyclone. In this background, we are of the considered view that there was consequential delay of 3 months due to cyclone THANE in December, 2011 which was beyond the control of the petitioner. Accordingly, in terms of the principles laid down by the Tribunal in the judgment dated 27.4.2011 [(situation (ii))], the total delay of 3 months due to cyclone THANE is condoned.

26. Based on the above discussions, the total delay of 11 months has been condoned on account of cyclone JAL in November, 2010 (8 months) and cyclone THANE in December, 2011 (3 months). Accordingly, in terms of the principles laid down by the Tribunal in the judgment dated 27.4.2011 [(situation (ii))], the total delay of 11 months is condoned and the generating company is given the benefit of the additional cost incurred due to time overrun. However, the LD recovered from the contractor and the insurance proceeds, if any, would be considered for reduction in the capital cost.

Delay due to civil contractor (1 month)

27. The petitioner has submitted that the delay of 1 month during September, 2012 is attributable to the working of the civil contractor M/s Gammon. It has submitted that despite persistent efforts, the contractor failed to mobilize its resources and had failed to give the desired results after the impact of the cyclones. However, from the submissions of the petitioner it is not clear as to which



work was delayed by one month due to failure of the contractor M/s Gammon to mobilize its resources and whether the said delay of one month was subsumed in the delay due to other reasons. In our view, it is the responsibility of the petitioner to maintain proper coordination, follow ups and check up in the award of and execution of contract and ensure that the work is completed within the scheduled date. It appears to us that there has been failure on the part of the petitioner in project management due to lack of coordination and accordingly, the work has been delayed. Moreover, as per contract procedure, there is declared completion date with terms and conditions and any violation of the terms and conditions of the contract would entail the contractor with imposition of penalty or recovery of LD. Hence, the delay in completion of work by the contractor cannot be said to be beyond the control of the petitioner and the responsibility squarely lies with the petitioner. Accordingly, in terms of the principles laid down by the Tribunal in the judgment dated 27.4.2011 [(situation (i))], the delay of one month cannot be said to be beyond the control of petitioner and hence not condoned. Therefore, the increase in cost on account of the said delay has to be borne by the petitioner. However, the Liquidated Damages (LD) and Insurance proceeds if any, received by the generating company, on account of the said delay, could be retained by the generating company.

On account of NGT ban on Earth Quarrying (8 months)

28. The petitioner vide affidavit dated 3.5.2016 has submitted that the delay of 8 months was due to ban on earth quarrying by National Green Tribunal (NGT) vide order dated 28.3.2014 which resulted in the non-issuance of Environment Clearance (EC), which is a pre-requisite for digging/quarrying. It has also submitted that the stoppage of Ash dyke works consequently delayed the declaration of COD of Unit-III. It has further submitted that NGT finally lifted the restriction of the issuance of EC by SEIAA vide order dated 13.1.2015 and thereafter, EC was issued on 11.2.2015 for mining / excavation of earth to be used for ash dyke works at the project. Accordingly, the petitioner has submitted that the stoppage of earth quarrying has caused delay of 8 months and same is beyond the control of the petitioner.

29. It is observed that the petitioner vide affidavit 10.7.2015 had submitted that its third unit was first synchronised on 28.2.2014 with a scheduled COD as 28.8.2014 and the actual COD is



26.2.2015. Thus, there is a gap of 12 months from the date of first synchronisation to the actual COD. The petitioner has stated that the delay of 12 months from the date of synchronisation to actual COD is due to the non-completion of CHP work which was hampered by local disturbances, contractual problems, re-tendering and award of CHP work to different agencies. From the submissions of the petitioner, it is noticed that that CHP work was awarded on 29.3.2010 with a scheduled completion date of November, 2012. The progress of the work was unsatisfactory which was cascaded by problems of local disturbances in which one worker of Sub-agency of M/s BHEL was murdered and on account of that total work on Internal CHP inside Vallur TPP got stopped for one month and contractual problem of M/s BHEL with its sub-contractor. A discussion regarding the delay of CHP work was held at Chennai by the petitioner on 26.12.2013 and accordingly the first communication was sent to BHEL by the petitioner only 10.1.2014 followed by further correspondences on 25.2.2014 and 10.3.2014. The petitioner has not indicated the steps taken by it during the period between November, 2012 (completion date of CHP work) to December, 2013 (meeting regarding delay of CHP work) and has also not furnished any documentary evidence showing the efforts taken by it or with the contractor for settlement of the outstanding issues during the period from November, 2012 to December, 2013. It is however noticed that M/s BHEL being dissatisfied with the progress of work of sub-contractor M/s Tecpro, had terminated the work of CHP on 26.3.2014 and the same was re-tendered and awarded only during the first week of June, 2014 to two sub-contractors, namely, M/s Esentee and M/s UK Mecon. Moreover, the petitioner has not furnished the actual completion date of CHP work by the said contractors in the petition.

30. However, in Petition No. 129/MP/2014 filed by the petitioner for extension of time for injection of infirm power, the petitioner had furnished the target completion date as 7.6.2014. It had also submitted in the said petition that the scheduled date of COD of 15.10.2014 could not be achieved due to high vibration and high motor thrust bearing temperature in CW pump has lead to unexpected heavy leakage in pipe lines of HVAC (AC & Ventilation) resulting in tripping of air-conditioning system of unit control room. It has further submitted that the problems associated with CW pump was taken up with the manufacturer and subsequently in Petition No. 392/MP/2014 filed by the petitioner before the Commission seeking injection of infirm power for testing including full



load testing of Unit-III of the generating station beyond six months of initial synchronization, it had indicated the target completion date as 20.11.2014 for repair of pumps. Also, the petitioner has stated that after completion of CW pump works, the 72 hour trial run operation was completed on 10.12.2014, but high vibration was observed in the turbine shaft and after rectifying the turbine shaft vibration problem, the COD of Unit-III was finally declared on 26.2.2015.

31. It is evident from the above submissions that the delay of 12 months from first synchronisation (28.2.2014) to the actual COD of Unit-III (26.2.2015) was due to the non-completion of CHP work, failure of CW pump and excessive turbine shaft vibration. In our considered view, the period of delay from July, 2014 to February, 2015 which was due to order of NGT banning earth quarrying had actually coincided with the delay due to non completion of CHP work, failure of CW pump and excessive turbine shaft vibration etc. In fact, the petitioner was not in a position to declare COD of Unit-III, even if there would have been no ban order of NGT on earth quarrying. In our view, the delay in CHP work except one month which was due to local disturbance and murder of worker and the delay due to technical problems/failure in CW pumps and turbine shaft vibration were due to non-performance of the sub-contractor of M/s BHEL /delay on the part of the contractor and cannot be said to be beyond the control of the petitioner. The petitioner is also entitled to recover the LD from the contractor for violation of the terms of the contract/non-performance of the contract and the liabilities on this count cannot be imposed on the beneficiaries. As stated, the petitioner has taken 12 months for declaration of COD of Unit-III from the date of synchronisation. Since there has been time overrun of 13 months prior to the synchronisation, the petitioner should have taken necessary steps for declaration of COD of the said unit, within 3 to 6 months after synchronisation. However, due to technical problem in machines and also due to delay in completion of CHP work, the petitioner was able to declare the COD only after 12 months from synchronisation. Considering the fact that it would normally take about 3 to 6 months for declaration of COD after synchronisation and keeping in view that some technical problems was faced by the petitioner to complete the pending works after synchronisation, we are inclined to grant a reasonable period of time from synchronisation of the unit to declaration of COD. Hence, out of the total delay of 12 months from the date of



synchronisation to declaration of COD, we are inclined to condone the delay of one month in CHP due to local disturbance and 6 months normally taken from synchronisation to COD to stabilize the unit on the ground that the said delay was beyond the control of the petitioner. Accordingly, in terms of the principles laid down by the Tribunal in the judgment dated 27.4.2011 [(situation (ii))], the total delay of 7 months is condoned and the generating company is given the benefit of the additional cost incurred due to time overrun for this period. However, the LD recovered from the contractor and the insurance proceeds, if any, would be considered for reduction in the capital cost. For the balance period of five months delay which has not been condoned, the increase in cost has to be borne by the petitioner. However, the Liquidated Damages (LD) and Insurance proceeds if any, received by the generating company, on account of the said delay, could be retained by the generating company.

32. To summarise, the delay of 11 months (out of 13 months) from the date of erection to the synchronisation of Unit-III, has been condoned due to natural calamities i.e. cyclone JAL in November, 2010 and THANE in December, 2011 as the same is beyond the control of the petitioner. However, out of the total delay 12 months from the date of synchronisation to the actual COD of Unit-III due to non completion of CHP work, failure of CW pump and excessive vibration in turbine shaft, a period of 7 months has been condoned for reasons beyond the control of the petitioner and the balance period of delay of five months is attributable to the petitioner, as narrated above.

Impact of time overrun on contract price, IDC and IEDC etc.

33. The petitioner vide ROP of the hearing dated 16.2.2016 was directed to furnish the details of the impact of time overrun on cost of Plant & Machinery under different packages separately. In response, the petitioner vide affidavit dated 03.05.2016 has submitted that price variation is calculated on the basis of date of scheduled COD and not on actual COD unless L2 schedule is revised. The petitioner has further submitted that L2 schedule has not been revised for any other packages except for two packages and there has not been any increase in prices of contract packages due to time overrun from the scheduled COD to the actual COD of Unit-III except for the following two packages:



(₹ in Crore)				
Sl. No.		Price variation clause (PVC) as per original L2	PVC as per revised L2	Difference
1	Station piping, FO unloading & storage package.	2.41	4.00	1.59
2	Air conditioning package	0.22	0.45	0.23
Total		2.63	4.45	1.82

34. The petitioner vide affidavit dated 30.08.2016 has submitted that on the basis of books of account no price escalation has been paid or included in the capitalization value beyond the scheduled date prescribed in the contract agreement for the work of main plant & offsite civil works Phase-II, CW system & makeup water and these amount is inclusive of cost of free issue material provided by the company. The package wise details of total capital expenditure incurred as on COD of Unit-III certified by the auditor is as under:

(₹ in crore)				
	Contract value as per LOA (excluding taxes & duties)	Payment to the contractor including escalation up to scheduled dates only	Material issued by the petitioner	Total Capital cost
C.W. system & makeup water system civil	57.00	55.54	51.54	107.08
Main plant & offsite civil works of Phase-II	160.12	120.25	135.06	255.31

35. The submission of the petitioner that there is no cost overrun in the contractual price due to time overrun has been verified from the revised project cost furnished in Form-5B of the affidavits dated 3.5.2016 and 30.8.2016. It is noticed that there is no increase in Land, Civil work, EPC and non-EPC cost but there is increase in the cost of two packages as submitted by the petitioner above. Accordingly, the pro rata reduction on account of cost overrun due to time overrun of the two packages for the said period as on COD of Unit-III is worked out as under:

(₹ in lakh)			
Total exceeded Capital expenditure till the completion or COD whichever is earlier	Total period taken from zero date to actual COD (Months)	Time overrun disallowed (Months)	Pro-rata due to Time overrun disallowed for Unit-III
	Unit-III	Unit-III	
(1)	(2)	(3)	(4)=((1)x(3))/(2)
182.00	25	7	50.96

36. The petitioner vide ROP of the hearing dated 16.2.2016 was also directed to furnish details of impact of time overrun on increase in IDC & IEDC from the scheduled COD to the actual COD of Unit-III. In response, the petitioner vide affidavit dated 3.5.2016 has submitted the break-up of the increase in IDC & IEDC from the scheduled COD to the actual COD as under:



Cost Element	(₹ in crore)		
	As per approved Revised Cost Estimate	As per actual as on COD of Unit-III (26.02.2015)	Increase in IDC & IEDC for the station
	(1)	(2)	(2-1)
IDC	1427.89	1564.73	136.84
IEDC	425.94	408.46	(-)17.48

37. The petitioner has furnished the increase in IDC & IEDC of the generating station as on COD of Unit-III as compared to IDC & IEDC as per RCE. However, the petitioner had not submitted the increase in IDC & IEDC for Unit-III from scheduled COD to the actual COD. It is observed from Form-5B that IDC of Unit-III as on COD is ₹57815.48 lakh and Overhead expenses in the form of establishment charges is ₹15039.40 lakh. Due to time overrun in COD of Unit-III, there is requirement of reduction in IDC & IEDC due to the disallowance of time overrun of 7 months. Thus, the pro rata deduction in Overhead expenses due to the delay of 7 months in the COD of Unit-III is worked out as under:

(₹ in lakh)				
	Total period taken from zero date to actual COD (in months)	Time overrun disallowed (in months)	Overhead Expenses under IEDC	Pro-rata reduction = (4x 3)/2
(1)	(2)	(3)	(4)	(5)
As on COD of Unit-III (26.2.2015)	69.25	7	15039.40	1737.40

Capital Cost

38. Clause (1) of Regulation 9 of the 2014 Tariff Regulations provides that the capital cost as determined by the Commission after prudence check in accordance with this regulation shall form the basis of determination of tariff for existing and new projects. Clause 3 of Regulation 9 of the 2014 Tariff Regulations provides as under:

“9(3)-The Capital cost of an existing project shall include the following:

(a) the capital cost admitted by the Commission prior to 1.4.2014 duly trued up by excluding liability, if any, as on 1.4.2014;

(b) additional capitalization and de-capitalization for the respective year of tariff as determined in accordance with Regulation 14; and

(c) expenditure on account of renovation and modernisation as admitted by this Commission in accordance with Regulation 15.”

39. The capital cost claimed by the petitioner as on 1.4.2014 and 26.2.2015 for tariff purpose as submitted in Form-I(i)(part-I) vide affidavit dated 10.7.2015 are as follows:



	(₹ in lakh)	
	1.4.2014 to 25.2.2015	26.2.2015 (COD of Unit-III) /Station to 31.3.2015
Opening Capital Cost on Cash basis	577317.00	852103.56
Notional IDC capitalised as on 31.3.2014	6445.34	1241.76
Additional capitalization	71.03	1551.20
Liabilities Discharged	8103.17	7288.91
Closing Capital cost	591936.57	862185.43

Approved Cost

40. The Investment Approval of Phase-I of the project (Units- I & II) was accorded by the Board of the Petitioner Company on 14.7.2007 at a cost of ₹5552.78 crore including IDC and FC of ₹ 497.01 crore and Working Capital Margin (WCM) of Rs 129.225 crore at a price level of second quarter of 2007. Subsequently the investment approval of Phase-II (Unit-III) was accorded by the Board of the Petitioner Company on 19.5.2009 at a cost of Rs 3086.779 crore including IDC and FC of Rs 334.65 crore and WCM of Rs 66.74 crore in the first quarter of 2009. Accordingly, the total project cost as approved by the Board for three units (Phase- I & II) is Rs 8639. 557 crore. The total cost of the project (Phase-I & II) excluding WCM works put to Rs 8443.592 crore. The petitioner vide affidavit dated 3.5.2016 has furnished the Revised Cost Estimate (RCE) of Rs 10080.50 crore which includes the project cost of ₹9799.84 crore and WCM of ₹280.57 crore.

Admitted Capital Cost

41. The Commission in its order dated 8.2.2016 in Petition No. 198/GT/2013 had approved the capital cost of ₹553348.08 lakh as on 31.3.2014 including IDC of ₹73139.32 lakh, Normative IDC of ₹1533.54 lakh and additional capital expenditure of ₹2921.00 lakh. Thereafter, the Commission vide order dated 18.4.2017 in Petition no. 28/RP/2016 had revised the capital cost as ₹ 558876.17 lakh including IDC of ₹73139.32 lakh, FC of ₹329.88 lakh, and notional IDC of ₹1533.54 lakh as on 31.3.2014. This has been considered as the opening capital cost as on 1.4.2014.

Interest during Construction

42. As stated, there is a time over-run of 25 months in the declaration of commercial operation of Unit-III of the generating station. The time overrun involved in the COD of Unit-III has been examined and out of the total time overrun of 25 months, a delay of 17 months has been condoned



by this order on the ground that the same was not attributable to the petitioner. Based on the condonation of delay of 17 months in case of Unit-III as above, the date of scheduled COD is reset for computation IDC, IEDC etc. due to time overrun as follows:

Schedule COD as per LOA	SCOD shifted to	Actual COD	Time overrun disallowed (months)
27.1.2013	25.7.2014	26.2.2015	7

43. The petitioner has claimed IDC of ₹156473.26 lakh as on 26.2.2015 and the break-up of the same as per Form- 5B is as under:

(₹ in lakh)	
Opening IDC as on 1.4.2014	98177.19
Add: IDC in add-cap during 1.4.2014 to 25.2.2015	480.59
IDC as on 25.2.2014 pertaining to 2 units	98657.78
Add: IDC capitalised as on 26.2.2015 pertaining to Unit-III	57815.48
Total IDC claimed as on 26.2.2015 (COD of Unit-III)	156473.26

44. It is observed that the petitioner has availed loan for the project from M/s Rural Electrification Corporation Limited. As per the balance sheet as on 26.2.2015, the total loan outstanding as on 26.2.2015 is ₹589798.49 lakh (₹371464.92 lakh for Phase-I and ₹218333.57 lakh for Phase-II). IDC which is to be allowed for capitalisation has been calculated based on the details furnished by the petitioner such as loan agreements, drawl/ interest rate resets/ repayment etc and the same has been restricted up to the rescheduled COD (25.7.2014). The petitioner has not furnished the basis of allocation of IDC. Hence, details such as total interest charged to Profit and loss Account out of the total interest on the loan, amount of IDC transferred to fixed assets and IDC lying in CWIP as on COD of Unit-III have all been obtained from the financial statements for the generating station since inception of fund infusion till COD of the generating station. The total IDC computed till rescheduled COD of the generating station has been apportioned as under based on the proportion worked out with the above-mentioned details:

(₹ in lakh)	
	IDC Allowed
IDC allowed as on COD of Unit-I and Unit-II vide order dated 8.2.2016 in Petition No. 198/GT/2013	73139.32 (38660.53 for Unit-I and 34478.79 for Unit-II)
IDC allowed as on COD of Unit-III	51969.73
Total IDC allowed for capitalization till Scheduled COD	125109.05



The IDC allowed as above is subject to revision, based on the allocation details to be furnished by the petitioner at the time of truing-up in terms of Regulation 8 of the 2014 Tariff Regulations.

Normative IDC

45. The petitioner has claimed normative IDC of ₹1241.76 lakh from 1.4.2014 to 25.2.2015, based on the deployment of equity in excess of 30% of the total expenditure based on the computation vide Form-14A. Accordingly, the normative IDC has been computed and allowed based on the details namely actual deployment of debt and equity on quarterly basis, cash expenditure incurred and rate of interest on actual loan portfolio furnished by the petitioner. The Normative IDC (restricted upto 25.7.2014) allowed for the purpose of tariff is under:

<i>(₹ in lakh)</i>	
Normative IDC already allowed up to 31.3.2014	2412.88
Normative IDC from 1.4.2012 to 25.7.2014	435.75
Normative IDC allowed till 25.7.2014	2848.63

Incidental Expenditure during Construction

46. The petitioner has claimed Incidental Expenditure during Construction (IEDC) of ₹30430.76 lakh in Form-13D. The petitioner was directed vide ROP of the hearing dated 16.2.2016 to furnish the reconciliation of IEDC claimed vide Form 13D as against Form 5B and in response, the petitioner vide affidavit dated 3.5.2016 has submitted that the amount of IEDC capitalised as on COD of Unit-III is ₹275.426 crore (on cash basis) and does not include IEDC pertaining to CWIP. The IEDC as per Form 13 D includes IEDC pertaining to CWIP amounting to ₹28.8808 crore. As stated above, the pro- rata reduction in overhead expenses due to the delay of 8 months in COD of Unit-III as worked out in the table above is ₹1520.23 lakh. This amount has been considered for the purpose of capital cost and the same is subject to revision based on the details of increase in IDC and IEDC for Unit-III from scheduled COD to the actual COD along with the break-up of expenditure to be furnished by the petitioner at the time of truing- up of tariff of the generating station.

Initial Spares

47. Regulation 13 of Tariff Regulations 2014 provides for initial spares as under:



“13. Initial Spares: Initial spares shall be capitalised as a percentage of the Plant and Machinery cost upto cut-off date, subject to following ceiling norms:

(a) Coal-based/lignite-fired thermal generating stations - 4.0%

Provided that:

i. where the benchmark norms for initial spares have been published as part of the benchmark norms for capital cost by the Commission, such norms shall apply to the exclusion of the norms specified above:

iv. for the purpose of computing the cost of initial spares, plant and machinery cost shall be considered as project cost as on cut-off date excluding IDC, IEDC, Land Cost and cost of civil works. The transmission licensee shall submit the breakup of head wise IDC & IEDC in its tariff application.”

48. The Commission vide order dated 8.2.2016 in Petition No.198/GT/2013 had allowed the capitalization of initial spares amounting to ₹1190.00 lakh as on actual date of COD of Unit-I and ₹982.00 lakh as on actual date of COD of Unit-II. Accordingly, the total initial spares capitalized as on COD of Units-I&II (combined) is ₹2172.00 lakh. The COD of the Unit-III of the generating station is 26.2.2015 and accordingly, the cutoff date of the generating station is 31.3.2018. The petitioner vide affidavit dated 10.7.2015 has claimed Initial spares of ₹8700 lakh during 2015-18 (₹1600 lakh in 2015-16, ₹3500 lakh in 2016-17 and ₹3600 lakh in 2017-18) on projection basis. Thus, the total initial spares up to cut-off date of the generating station works out to ₹10872 lakh (2172+8700). The petitioner vide Form 5B of the affidavit dated 10.7.2015 has furnished the anticipated Plant and Machinery cost of ₹500369.49 lakh up to 31.3.2018. Therefore, the projected initial spares of ₹10872 lakh claimed by the petitioner up to cut off date of the generating station works out to 2.17% of the Plant & Machinery cost which is within the ceiling limit specified under the above regulations and hence allowed. The petitioner is however directed to furnish the break-up of actual plant & machinery cost and the details of initial spares capitalized up to the cut-off date at the time of truing-up.

Infirm Power

49. The petitioner vide affidavit dated 10.7.2015 has submitted that the revenue earned from sale of infirm power as on COD of Unit-III is ₹1740.85596 lakh as on COD of Unit-III. It has also submitted that the infirm power has been capitalized with the respective units of the generating station. In view of this submission, no adjustment in the capital cost has been made towards revenue earned from sale of Infirm Power from Unit-III of the project till the COD of Unit-III.



Liquidated Damages

50. The petitioner has not furnished any details regarding the amount of Liquidated Damages (LD) recovered. Accordingly, the petitioner is directed to submit the complete details of the amount of LD recovered for delay under the contract of different packages at the time of truing up.

Additional Capital Expenditure

51. The petitioner has claimed additional capital expenditure of ₹71.03 lakh during the period from 1.4.2014 to 25.2.2015 and ₹1551.20 lakh from 26.2.2015 to 31.3.2015. It is also submitted that liabilities amounting to ₹8103.17 lakh during 1.4.2014 to 25.2.2015 and ₹7288.91 lakh during the period from 26.2.2015 to 31.3.2015 have been discharged. These amounts have been allowed and considered in the capital cost of the generating station.

52. Regulation 14 of the 2014 Tariff Regulations provides for additional capitalization of an existing project as under:

“14. Additional Capitalization and De-capitalization: (1) The capital expenditure in respect of the new project or an existing project incurred or projected to be incurred, on the following counts within the original scope of work, after the date of commercial operation and up to the cut-off date may be admitted by the Commission, subject to prudence check:

(i) Un-discharged liabilities recognized to be payable at a future date;

(ii) Works deferred for execution;

(iii) Procurement of initial capital spares within the original scope of work, in accordance with the provisions of Regulation 13;

(iv) Liabilities to meet award of arbitration or for compliance of the order or decree of a court of law; and

(v) Change in law or compliance of any existing law:

Provided that the details of works asset wise/work wise included in the original scope of work along with estimates of expenditure, liabilities recognized to be payable at a future date and the works deferred for execution shall be submitted along with the application for determination of tariff. “

53. The capital expenditure has claimed projected additional capital expenditure under Regulation 14(1) of the 2014 Tariff Regulations in respect of the generating station for the period 2015-19 as summarized under:

<i>(₹ in lakh)</i>					
Sl. No.	Head of work / Equipment	2015-16	2016-17	2017-18	2018-19
1	Preliminary investigation & Site development	0.00	1250	0.00	0.00
2	Steam Generator Island	1759.28	0.00	0.00	0.00
3	Turbine Generator Island	2433.99	0.00	0.00	0.00



4	DM water Plant	241.00	0.00	0.00	0.00
5	Chlorination plant	17.10	0.00	0.00	0.00
6	Ash Handling system	8299.01	0.00	2760.57	0.00
7	Coal Handling Plant	7809.00	0.00	0.00	0.00
8	Air Conditioning & Ventilation system	877.70	0.00	259.50	0.00
9	Fire fighting system	126.00	0.00	0.00	0.00
10	Workshop lab (inclpp)	25.00	725.00	250.00	0.00
11	Transformer package	1223.55	0.00	0.00	0.00
12	C & I Package(incl. instn. Cable)	1384.36	251.00	96.00	0.00
13	Initial spares	1600.00	3500.00	3600.00	0.00
14	Main plant / Adm. building	5701.00	7857.00	4876.00	0.00
15	CW System	90.00	0.00	0.00	0.00
16	Ash disposal area development	1550.55	12400.0	6500.00	0.00
17	Township & colony	4182.00	9577.0	5667.00	0.00
18	Temporary Construction & enabling works	350.00	0.00	0.00	0.00
19	Chimney	416.00	0.00	0.00	0.00
20	Tools& Plant	502.33	600.00	550.00	0.00
	Total	38587.53	36160.00	24559.00	0.00

54. It is observed from the above that the petitioner has claimed total projected additional capital expenditure of ₹99306.53 lakh during 2015-18 (₹38587.53 lakh in 2015-16, ₹36160.00 lakh in 2016-17 and ₹24559.00 lakh in 2017-18). As stated, the cut-off date of the generating station is 31.3.2018. The claim of the petitioner within the cut-off date is towards deferred works on Land, Main Plant & Equipment package, Spares, Civil work, Construction & Pre-commissioning expenses. Since the claim of the petitioner is within the original scope of work and within the cut-off date of the generating station, the total projected additional capital ₹99306.53 lakh during 2015-18 is allowed under Regulation 14 (1) of the 2014 Tariff Regulations. The petitioner is however directed to submit the details of works asset wise/work wise included in the original scope of work along with estimate and actual expenditure, liabilities recognized to be payable at a future date and the works deferred for execution along with actual work of execution at the time of triung-up.

Funding Gap

55. The actual cash expenditure claimed as per Form 14A is ₹881826.00 lakh. On the other hand, it is observed that the fund raised through loan, share capital and share application money is ₹854918.71lakh, which is evident from balance sheet of the generating station as on 26.2.2015. The details are as under:



(₹ in lakh)		
a	Net loan as per Balance Sheet	589798.49
b	Share capital as per Balance Sheet	253121.22
c	Share application money as per Balance Sheet	11999.00
1	Total fund raised as per balance sheet (Net loan + Share capital + Share application money) a+b+c	854918.71
2	Actual cash expenditure as per Form 14A	881826.00
	Funding gap (2-1)	26907.29

56. Thus, there is a funding gap of ₹26907.29 lakh between the fund raised and the actual capital expenditure claimed. Moreover, the actual cash expenditure based on the cash expenditure details pertaining to fixed assets and capital work in progress as per auditor's certificate is as follows:

(₹ in lakh)				
		Gross basis	UDL	Cash flow
a	Gross Block of Fixed Assets	892587.32	47164.71	845422.61
b	CWIP	49878.17	8358.03	41520.14
c	Construction stores & Equipments	8595.02	2989.91	5605.11
1	Total Expenditure	951060.51	58512.65	892547.86
2	Total fund raised as per balance sheet	-	-	854918.71
	Funding gap (1-2)	-	-	37629.15

57. It is noticed from the above that the cash outflow toward capital expenditure as per auditor's certificate (₹892547.86) is more than the fund raised as per balance sheet by ₹37629.15 lakh. As there exists an unexplained funding gap of ₹37629.15 lakh, it may not be a correct approach to allow capital cost for tariff based on the cash expenditure as claimed by the petitioner or as per auditor's certificate which exceeds the long term sources of finance as evident from the above table. Accordingly, the said funding gap of ₹37629.15 lakh has been considered as un-discharged liability and has been deducted from the capital cost allowed for the purpose of tariff. Similar view has been taken by the Commission in Petition no. 28/RP/2016 (review of the order in Petition no. 198/GT/2013) vide order dated 18.4.2017.

The same is subject to revision, based on the justification/ explanation to be furnished by the petitioner as regards the funding gap, at the time of truing-up of tariff.

Capital cost

58. Based on the above discussions, the capital cost allowed for the purpose of tariff of the generating station is as under:



(₹ in lakh)

	2014-15 1.4.2014 to 25.2.2015	2014-15 26.2.2015 to 31.3.2015	2015-16	2016-17	2017-18	2018-19
Opening capital cost	558876.17	**827217.36	790341.99	866442.63	907730.04	933540.21
Less: unexplained gap between project funding and actual expenditure as on Unit-III COD	-	37629.15	-	-	-	-
Less: IDC/FC/FERV claimed as on Unit-III COD	-	58051.10	-	-	-	-
Less: Notional IDC included in capital cost claimed	-	1241.76	-	-	-	-
Add: IDC allowed on COD of Unit-III	-	51969.73	-	-	-	-
Add: FC allowed on COD of Unit-III	-	372.24	-	-	-	-
Add: FERV allowed on COD of Unit-III	-	235.62	-	-	-	-
Add: Notional IDC allowed	-	435.75	-	-	-	-
Less: pro-rata reduction in IEDC	-	1520.23	-	-	-	-
Less: Pro-rata reduction in two packages	-	50.96	-	-	-	-
Total Opening cost	558876.17	781737.50	790577.61	866442.63	907730.04	933540.21
Add: Additional capital expenditure	71.03	1551.20	38587.53	36160.00	24559.00	-
Add: Liabilities discharged	8103.17	7288.91	37277.49	5127.41	1251.17	-
Closing capital cost	567050.37	790577.61	866442.63	907730.04	933540.21	933540.21

(** including 260166.99 capitalized for Unit-III on 26.2.2015)

Reasonableness of Capital Cost

59. We now examine the reasonableness of capital cost as on the COD of the generating station as under:

		(₹ in lakh)
A	Capital cost including soft cost as on 26.2.2015	781737.50
B	Less: IDC, FC, Notional IDC, FERV allowed towards Unit-III	52777.72
C	Less: IDC, FC, Notional IDC, FERV allowed till 31.3.2014	75002.74
D	Capital Cost excluding notional IDC, IDC, FC, FERV as on COD (26.2.2015) (A-B-C)	653957.04
E	Projected capitalization up to the cut-off date (31.3.2018) (excluding IDC & Liabilities)	99306.53
F	Capital cost excluding IDC, Notional IDC, FERV and FC including Projected capitalization up to the cut-off date.(Hard cost up to cut off date as on 31.3.2018) (A-B-C+F)	753263.57

60. The benchmark hard cost as specified by the Commission in Order dated 4.6.2012 for thermal power stations with coal as fuel at 2011, December price level with 3 units of 500MW each is ₹4.48 crore/MW. As stated, the hard cost of the generating station as on COD



(26.2.2015) is ₹653957.04 lakh (₹4.36 crore/MW) and as on the cut-off date of the generating station is ₹753263.57 lakh (₹5.02 crore/MW). The benchmark capital cost for thermal power generating stations as per Commission`s order dated 4.6.2012 is dynamic and based on market trends, indices, subject to adjustment based on inflation. The hard cost linked to escalation in WPI for the intervening period has been taken into account to arrive at the capital cost as on COD. The indicative benchmark norms for capital cost based on December, 2011 index as base, needs to be escalated up to February, 2015 based on the WPI index for prudence check of the capital cost. As per data available with Ministry of Commerce and Industry, Government of India, the WPI index for February, 2015 is 175.60 as against the WPI index of 157.30 as on December, 2011 resulting in inflation of 1.042. Accordingly, the indicative benchmark hard cost is worked out as ₹4.66crore/MW (1.04 x 4.48). The hard cost as on COD of Unit-III/Station is ₹4.36 crore/MW which is lower than the indicative benchmark hard cost. However, the hard cost as on cut off date of the generating station including projected capitalisation is ₹5.02 crore/MW which is higher than indicative benchmark hard cost. The main reasons for higher capital cost of generating station are due to special features viz.(a) Cross country conveyor system for transportation of coal from port to site (b) Grab un-loader and (c) Desalination Plant. It is evident from the above that the hard cost of the generating Station (Units- I, II & III) up to the cut-off date is marginally higher than the benchmark cost mainly due to addition of special features. However, the actual hard cost up to cut off date can only be assessed after the end of the tariff period when capitalization is based on actuals.

Debt–Equity Ratio

61. Regulation 19 of the 2014 Tariff Regulations provides as under:

(1) For a project declared under commercial operation on or after 1.4.2014, the debt-equity ratio would be considered as 70:30 as on COD. 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:

- (i) where equity actually deployed is less than 30% of the capital cost, actual equity shall be considered for determination of tariff:*
- (ii) the equity invested in foreign currency shall be designated in Indian rupees on the date of each investment:*
- (iii) any grant obtained for the execution of the project shall not be considered as a part of capital structure for the purpose of debt- equity ratio.*

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, only if such premium amount and internal resources are actually utilized for meeting the capital expenditure of the generating station or the transmission system.

(2) The generating Company or the transmission licensee shall submit the resolution of the Board of the company or approval from Cabinet Committee on Economic Affairs (CCEA) regarding infusion of fund from internal resources in support of the utilisation made or proposed to be made to meet the capital expenditure of the generating station or the transmission system including communication system, as the case may be.

(3) In case of the generating station and the transmission system including communication system declared under commercial operation prior to 1.4.2014, debt-equity ratio allowed by the Commission for determination of tariff for the period ending 31.3.2014 shall be considered.

(4) In case of generating station and the transmission system including communication system declared under commercial operation prior to 1.4.2014, but where debt: equity ratio has not been determined by the Commission for determination of tariff for the period ending 31.3.2014, the Commission shall approve the debt: equity ratio based on actual information provided by the generating company or the transmission licensee as the case may be.

(5) Any expenditure incurred or projected to be incurred on or after 1.4.2014 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.

62. The petitioner has considered debt equity ratio of 70: 30 for calculation of normative loan and equity. As stated above, it is noticed from Form-14A and the Auditor's Certificate that there is a funding gap of ₹37629.15 lakh between the funds raised through long term loans/equity and the cash expenditure as on 26.2.2015 which is as under:

(₹ in lakh)		
a	Net loan as per balance sheet	589798.49
b	Share capital as per balance sheet	253121.22
c	Share application money as per balance sheet	11999.00
1	Total fund raised as per balance sheet (Net loan + Share capital + Share application money) a+b+c	854918.71
2	Actual cash expenditure as per Form 14A	881826.00
3	Actual cash expenditure as per auditor's certificate	892547.86
	Funding gap (3-1)	37629.15

63. Accordingly, the cash expenditure considered for debt equity ratio calculation has been restricted to the funds raised, i.e. ₹854918.71. The balance sheet also indicates that an amount of ₹11999.00 as share application money is pending for allotment as on 25.2.2015 and therefore, the same has not been considered as equity without its conversion into share capital. In this background, while calculating the debt equity ratio, actual equity has been restricted to share capital and the balance amount (which includes the long term loans as per the balance sheet ₹589798.49 and share application money of ₹11999.00 lakh) is considered as loan. Accordingly,



debt-equity ratio as on COD of the generating station (26.2.2015) has been worked out and allowed as under:

(₹ in lakh)	
Actual cash Expenditure (restricted to fund raised)	854918.71
Equity (Share capital as per B.S.)	253121.22
Debt (Balancing figure)	601797.49
Equity	29.61%
Debt	70.39%

64. It is noticed from the balance sheet as on 31.3.2015 that the share application money amounting to ₹11999.00 lakh as existed on 25.2.2015 (station COD) has been converted into share capital. The balance sheet position as on 31.3.2015 with respect to debt and equity is as below:

(₹ in lakh)		
		Amount
a	Net loan	589281.57
b	Share capital	265121.22
c	Share application money as per balance sheet	-

65. It appears from the above that the share application money pending allotment as reflected in the balance sheet as on 25.2.2015 was converted into equity share capital subsequently. Conversion of the said sum into equity has since been achieved and there has been increase in position of equity capital albeit after the date of COD to tune of ₹11999.00 lakh, the denial of return on such sum as equity capital for the entire project life of 25 years, in our view, is not justified. In view of the above, we, in exercise of power to relax under Regulation 54 of the 2014 Tariff Regulations, allow the revision of debt-equity ratio post COD. Similar view has been taken by the Commission in Petition no. 129/GT/2015 vide order dated 30.3.2017. Since the petitioner has not furnished the exact date of such conversion, the same has been considered w.e.f 1.4.2015 considering the balance sheet presented as on 31.3.2015. Accordingly, the debt- equity ratio as on 1.4.2015 is as under:

Equity (share capital)	265121.22
Debt	589281.57
Equity%	31.03%
Debt%	68.97%

As the equity as on 1.4.2015 is more than 30%, as per Regulation 19 quoted as above, the debt- equity ratio for the purpose of calculation of tariff has been considered as 70:30.



66. The debt-equity ratio allowed as above is subject to revision based on the reconciliation of actual cash expenditure and project funding as on COD of the generating station and date wise details regarding conversion of the share application money into share capital to be furnished by the petitioner at the time of truing-up of the tariff of the generating station.

Return on Equity

67. Regulation 24 of the 2014 Tariff Regulations provides as under:

“24. Return on Equity: (1) Return on equity shall be computed in rupee terms, on the equity base determined in accordance with regulation 19.

(2) Return on equity shall be computed at the base rate of 15.50% for thermal generating stations, transmission system including communication system and run of the river hydro generating station, and at the base rate of 16.50% for the storage type hydro generating stations including pumped storage hydro generating stations and run of river generating station with pondage:

Provided that:

i) in case of projects commissioned on or after 1st April, 2014, an additional return of 0.50 % shall be allowed, if such projects are completed within the timeline specified in Appendix-I:

ii) the additional return of 0.5% shall not be admissible if the project is not completed within the timeline specified above for reasons whatsoever:

iii) additionalRoE of 0.50% may be allowed if any element of the transmission project is completed within the specified timeline and it is certified by the Regional Power Committee/National Power Committee that commissioning of the particular element will benefit the system operation in the regional/national grid:

iv) the rate of return of a new project shall be reduced by 1% for such period as may be decided by the Commission, if the generating station or transmission system is found to be declared under commercial operation without commissioning of any of the Restricted Governor Mode Operation (RGMO)/ Free Governor Mode Operation (FGMO), data telemetry, communication system up to load dispatch centre or protection system:

v) as and when any of the above requirements are found lacking in a generating station based on the report submitted by the respective RLDC, RoE shall be reduced by 1% for the period for which the deficiency continues:

vi) additional RoE shall not be admissible for transmission line having length of less than 50 kilometers.

68. Regulation 25 of the 2014 Tariff Regulations provides as under:

“Tax on Return on Equity (1) The base rate of return on equity as allowed by the Commission under Regulation 24 shall be grossed up with the effective tax rate of the respective financial year. For this purpose, the effective tax rate shall be considered on the basis of actual tax paid in the respect of the financial year in line with the provisions of the relevant Finance Acts by the concerned generating company or the transmission licensee, as the case may be. The actual tax income on other income stream (i.e., income of non-generation or non-transmission business, as the case may be) shall not be considered for the calculation of “effective tax rate”.

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



Rate of pre-tax return on equity = Base rate / (1-t)
Where “t” is the effective tax rate in accordance with Clause (1) of this regulation and shall be calculated at the beginning of every financial year based on the estimated profit and tax to be paid estimated in line with the provisions of the relevant Finance Act applicable for that financial year to the company on pro-rata basis by excluding the income of non-generation or non-transmission business, as the case may be, and the corresponding tax thereon. In case of generating company or transmission licensee paying Minimum Alternate Tax (MAT), “t” shall be considered as MAT rate including surcharge and cess.”

69. The petitioner has not claimed grossing up of RoE in the year 2014-15 and has grossed up for rest of the years (2015-16 to 2018-19) with the MAT rate of 20.9605% for the year 2013-14. It is noticed from the financial statement of the generating station for 2014-15 that there is no taxable income for the said year. As such, the claim of the petitioner is in order and the RoE for the said year has not been allowed to be grossed up. However, for the rest of the years (2015-16 to 2018-19) the petitioner has claimed grossing up of RoE. In terms of the 2014 Tariff Regulations, RoE is to be grossed up with the effective tax rate. In petitions wherein tariff has been determined in 2016-17 (for the period 2014-19) on projection basis, it has been the consistent approach of the Commission to allow the grossing up of MAT rate of 2014-15. However, in the instant case, the grossing up has not been allowed as there is no taxable income/tax payable in 2014-15. Accordingly, no grossing up of ROE is allowed for the tariff period 2014-19. The petitioner is however directed to furnish the basis of effective tax rates along with the Tax Audit Report for the period 2014-19 at the time of truing-up of tariff of the generating station in terms of Regulation 8 of the 2014 Tariff Regulations. Accordingly, return on equity is worked out and allowed as under:

	2014-15		2015-16	2016-17	2017-18	2018-19
	1.4.2014 to 25.2.2015	26.2.2015 to 31.3.2015				
Gross Notional Equity	162512.91	231453.99	237173.28	259,932.79	272319.01	280062.06
Addition due to Additional Capitalisation	2376.94	2617.35	22759.51	12386.22	7743.05	-
Closing Equity	164889.84	234071.34	259932.79	272319.01	280062.06	280062.06
Average Equity	163701.38	232762.67	248553.04	266125.90	276190.54	280062.06
Return on Equity (Base Rate)	15.500%	15.500%	15.500%	15.500%	15.500%	15.500%
Tax rate for the year	0.000%	0.000%	0.000%	0.000%	0.000%	0.000%
Rate of Return on Equity (Pre Tax)	15.500%	15.500%	15.500%	15.500%	15.500%	15.500%
Return on Equity (Pre Tax)	23010.13	3360.71	38525.72	41249.51	42809.53	43409.62

(₹ in lakh)



Interest on Loan

70. Regulation 26 of the 2014 Tariff Regulations provides as under:

"26. Interest on loan capital: (1) The loans arrived at in the manner indicated in regulation 19 shall be considered as gross normative loan for calculation of interest on loan.

(2) The normative loan outstanding as on 1.4.2014 shall be worked out by deducting the cumulative repayment as admitted by the Commission up to 31.3.2014 from the gross normative loan.

(3) The repayment for each of the year of the tariff period 2014-19 shall be deemed to be equal to the depreciation allowed for the corresponding year/period. In case of de-capitalization of assets, the repayment shall be adjusted by taking into account cumulative repayment on a pro rata basis and the adjustment should not exceed cumulative depreciation recovered upto the date of de-capitalization of such asset.

(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 depreciation allowed for the year or part of the year.

(5) The rate of interest shall be the weighted average rate of interest calculated on the basis of the actual loan portfolio after providing appropriate accounting adjustment for interest capitalized:

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 beneficiaries or the long term transmission customers /DICs 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."

71. In terms of the above regulation, the normative loan outstanding as on 31.3.2014 has been considered as normative loan as on 1.4.2014. The petitioner vide Form 13 A has submitted the weighted average rate of interest based on actual loan portfolio and the same is found to be in order. Necessary calculations for interest on loan are as under:



(₹ in lakh)

	2014-15		2015-16	2016-17	2017-18	2018-19
	1.4.2014 to 25.2.2015	26.2.2015 to 31.3.2015				
Gross Notional Loan	396363.26	550283.50	553404.33	606509.84	635411.03	653478.15
Cumulative Repayment of Loan upto previous year	28392.62	54113.78	57803.31	99673.72	144408.60	190794.80
Net Opening Loan	367970.64	496169.73	495601.02	506836.11	491002.43	462683.35
Addition due to Additional Capitalisation	5797.26	6222.76	53105.51	28901.19	18067.12	-
Repayment of Loan during the period	25721.16	3689.53	41870.42	44734.88	46386.20	47036.42
Net Closing Loan	348046.74	498702.96	506836.11	491002.43	462683.35	415646.92
Average Loan	358008.69	497436.34	501218.57	498919.27	476842.89	439165.13
Weighted Average Rate of Interest on Loan	11.45%	11.45%	11.40%	11.37%	11.37%	11.37%
Interest on Loan	37183.20	5307.31	57134.24	56721.98	54225.15	49954.71

Depreciation

72. Regulation 27 of the 2014 Tariff Regulations provides as under:

“27. Depreciation: (1) Depreciation shall be computed from the date of commercial operation of a generating station or unit thereof or a transmission system including communication system or element thereof. In case of the tariff of all the units of a generating station or all elements of a transmission system including communication system for which a single tariff needs to be determined, the depreciation shall be computed from the effective date of commercial operation of the generating station or the transmission system taking into consideration the depreciation of individual units or elements thereof.

Provided that effective date of commercial operation shall be worked out by considering the actual date of commercial operation and installed capacity of all the units of the generating station or capital cost of all elements of the transmission system, for which single tariff needs to be determined.

(2) The value base for the purpose of depreciation shall be the capital cost of the asset admitted by the Commission. In case of multiple units of a generating station or multiple elements of transmission system, weighted average life for the generating station of the transmission system shall be applied. 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.

(3) 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 station, the salvage value shall be as provided in the agreement signed by the developers with the State Government for development of the Plant:

Provided further that the capital cost of the assets of the hydro generating station for the purpose of computation of depreciated value shall correspond to the percentage of sale of electricity under long-term power purchase agreement at regulated tariff:

Provided also that any depreciation disallowed on account of lower availability of the generating station or generating unit or transmission system as the case may be, shall not be allowed to be recovered at a later stage during the useful life and the extended life.

(4) 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.



(5) Depreciation shall be calculated annually based on Straight Line Method and at rates specified in Appendix-II 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 the effective date of commercial operation of the station shall be spread over the balance useful life of the assets.

(6) In case of the existing projects, the balance depreciable value as on 1.4.2014 shall be worked out by deducting the cumulative depreciation as admitted by the Commission upto 31.3.2014 from the gross depreciable value of the assets.

(7) The generating company or the transmission licensee, as the case may be, shall submit the details of proposed capital expenditure during the fag end of the project (five years before the useful life) along with justification and proposed life extension. The Commission based on prudence check of such submissions shall approve the depreciation on capital expenditure during the fag end of the project.

(8) In case of de-capitalization of assets in respect of generating station or unit thereof or transmission system or element thereof, the cumulative depreciation shall be adjusted by taking into account the depreciation recovered in tariff by the de-capitalized asset during its useful services.”

73. The weighted average rate of depreciation furnished by the petitioner vide Form 11 is examined and found to be in order. Accordingly, depreciation has been calculated as under:

	2014-15		2015-16	2016-17	2017-18	2018-19
	1.4.2014 to 25.2.2015	26.2.2015 to 31.3.2015				
Opening Gross Block	558876.17	781737.50	790577.61	866442.63	907730.04	933540.21
Additional Capitalization	71.03	1551.20	38587.53	36160.00	24559.00	-
Discharge of liabilities	8103.17	7288.91	37277.49	5127.41	1251.17	-
Closing Gross Block	567050.37	790577.61	866442.63	907730.04	933540.21	933540.21
Average Gross Block	562963.27	786157.55	828510.12	887086.33	920635.12	933540.21
Rate of Depreciation	5.0382%	5.0382%	5.0537%	5.0429%	5.0385%	5.0385%
Depreciable Value including amortization of lease land in 25 years	506666.94	707541.80	745659.11	798377.70	828571.61	840186.19
Remaining Depreciable Value	478274.33	653428.02	687855.80	698703.98	684163.01	649391.39
Depreciation (for the period)	25721.16	3689.53	41870.42	44734.88	46386.20	47036.42
Cumulative Depreciation (at the end of the period)	54113.78	57803.31	99673.72	144408.60	190794.80	237831.23



O & M Expenses

74. Regulation 29(1) (a) of the 2014 Tariff Regulations provides the following O & M norms for coal based generating stations of 500 MW capacity:

(₹ in lakh/MW)				
2014-15	2015-16	2016-17	2017-18	2018-19
16.00	17.01	18.08	19.22	20.43

75. Proviso to Regulation 29(1) (a) of the 2014 Tariff Regulations provides as under:

“Provided that the above norms shall be multiplied by the following factors for arriving at norms of O&M expenses for additional units in respective sizes for the units whose COD occurs on or after 1.4.2014 in the same station:

500 MW and above	Additional 3 rd & 4th units	0.90
	Additional 5 th & above units	0.85

76. The petitioner has claimed O & M expenses in respect of the generating station as under:

2014-15		2015-16	2016-17	2017-18	2018-19
1.4.2014 to 25.2.2015	26.2.2015 to 31.3.2015				
14909.51	2202.18	25200.91	26714.33	28398.75	30186.60

77. The respondent, TANGEDCO has submitted that the claim of the petitioner is in excess against the norms specified for 500 MW units under Regulation 29(1) (a) of the 2014 Tariff Regulations and has prayed that excess claim may be negated.

78. We have examined the matter. The CODs of the Units-I and II of the generating station are 29.11.2012 and 25.8.2013 respectively and is within the tariff period 2009-14. However, the COD of Unit-III is 26.2.2015 and is covered within the scope of the 2014 Tariff Regulations. Accordingly, the multiplication factor of 0.90 is considered for working out the normative O & M expenses (annualized) for Unit-III of the generating station for the period 2014-19 and is allowed as under:

(₹ in lakh)				
2014-15	2015-16	2016-17	2017-18	2018-19
23200.00	24664.50	26216.00	27869.00	29623.50

Additional O & M Expenses for desalination plant

79. The petitioner has claimed additional O & M expenses of ₹441.00 lakh in 2014-15, ₹468.84 lakh in 2015-16, ₹498.33 lakh in 2016-17, ₹529.75 lakh in 2017-18 and ₹563.10 lakh in 2018-19 on estimation basis, towards chemicals, filters and membranes used in the desalination plant.



The petitioner has submitted that the plant is located near sea coast and there will be no water charges as the water will be made available from the sea itself.

80. The respondent, KSEB has submitted that the petitioner has claimed additional O & M cost on account of desalination plant over and above the normative O & M expenses allowed by the Commission. It has also submitted that the O & M expenses allowed in accordance with the 2014 Tariff Regulations have provision for meeting the expenses for desalination plant also and hence it has prayed that the said expenditure may be disallowed. The petitioner in its rejoinder has submitted that the generating station does not have any nearby water source and therefore the claim has been made for production of RO water and for other different purposes of the generating station and has accordingly prayed that the additional O & M charges claimed for desalination plant may be allowed.

81. The matter has been examined. It is noticed that the normative O & M allowed under the 2014 Tariff Regulations do not include expenses towards desalination plant. In view of this, the O & M expenses for desalination plant as claimed by the petitioner has been allowed. This is however subject to revision based on all relevant details to be furnished by the petitioner at the time of truing-up of tariff of the generating station in terms of Regulation 8 of the 2014 Tariff Regulations.

2014-15		2015-16	2016-17	2017-18	2018-19
1.4.2014 to 25.2.2015	26.2.2015 to 31.3.2015				
399.92	41.08	468.84	498.33	529.75	563.10

(₹ in lakh)

Water Charges

82. Regulation 29(2) of the 2014 Tariff Regulations provide as under:

“29.(2) The Water Charges and capital spares for thermal generating stations shall be allowed separately:

Provided that water charges shall be allowed based on water consumption depending upon type of plant, type of cooling water system etc., subject to prudence check.

The details regarding the same shall be furnished along with the petition:

Provided that the generating station shall submit the details of year wise actual capital spares consumed at the time of truing up with appropriate justification for incurring the same and substantiating that the same is not funded through compensatory allowance or special allowance or claimed as a part of additional capitalisation or consumption of stores and spares and renovation and modernization”.



83. In terms of the above regulation, water charges are to be allowed based on water consumption depending upon type of plant, type of cooling water system etc., subject to prudence check of the details furnished by the petitioner. The details in respect of water charges such as type of cooling water system, water consumption, rate of water charges furnished by the petitioner is as under:

	Remarks
Type of Plant	Coal
Type of cooling ware system	Closed circuit cooling
Consumption of water	Sea Water at present
Rate of water charges	0.0
*Total water charges in 2013-14	0.0

84. The petitioner has submitted that at present the generating station is using sea water and is not paying any water charges. However, it has submitted that in future, if any water charges are levied on the generating station, it shall approach the Commission to claim the same under O&M expenses. The petitioner has further submitted the details on actual water charges paid for the relevant year shall be furnished at the time of truing-up of tariff and shall be subjected to retrospective adjustment. Since the petitioner has not claimed any water charges on projection basis during the period 2014-19, the same has not been considered in this order. The claim of the petitioner, if any, in future shall be considered in accordance with the 2014 Tariff Regulations.

85. Accordingly, the total O&M expenses including expenses for desalination plant and water charges claimed and allowed is summarized as under:

	2014-15		2015-16	2016-17	2017-18	2018-19
	1.4.2014 to 25.2.2015	26.2.2015 to 31.3.2015				
Normative O&M Expenses claimed	14909.51	2202.18	25200.91	26714.33	28398.75	30186.60
O&M Expenses allowed	14509.59	2161.10	24664.50	26216.00	27869.00	29623.50
Additional O&M expenses for desalination plant claimed	399.92	41.08	468.84	498.33	529.75	563.10
Additional O&M expenses for desalination plant Allowed	399.92	41.08	468.84	498.33	529.75	563.10
Water Charges claimed	0.00	0.00	0.00	0.00	0.00	0.00
Water Charges allowed	0.00	0.00	0.00	0.00	0.00	0.00
Total O&M Expenses allowed	14909.51	2202.18	25133.34	26714.33	28398.75	30186.60



Capital Spares

86. The petitioner has not claimed capital spares on projection basis during the period 2014-19. Accordingly, the same has not been considered in this order. The claim of the petitioner, if any, at the time of truing-up, shall be considered on merits, after prudence check.

Operational Norms

87. The operational norms considered by the petitioner in respect of the generating station are as under:

Target Availability	83.0
Heat Rate (kcal/kwh)	2375
Auxiliary power consumption %	6.69
Specific Oil Consumption (ml/kwh)	0.50

88. The operational norms claimed by the petitioner are discussed as under:

Target Availability

89. Regulation 36 of the 2014 Tariff Regulations provides as under:

(A) Normative Annual Plant Availability Factor

“(a) All Thermal generating stations, except those covered under clauses (b) (c) (d) &(e)- 85%.

Provided that in view of the shortage of coal and uncertainty of assured coal supply on sustained basis experienced by the generating stations, the NAPAF for recovery of fixed charges shall be 83% till the same is reviewed. The above provision shall be reviewed based on actual feedback after 3 years from 1.4.2014.”

90. The petitioner has considered the Target Availability of 83% for the period 2014-19. The Commission, due to shortage of domestic coal supply has relaxed the Target Availability norm to 83% for first 3 years from 1.4.2014 and the same shall be reviewed after 3 years. Accordingly, in terms of the Regulation 36(A) of the 2014 Tariff Regulations, the Target Availability of 83% is considered for the period 2014-17 and 85% for the period 2017-19.

Station Heat Rate (kcal/kwh)

91. Regulation 36(C)(b)(i) of the 2014 Tariff Regulations provides Station Heat Rate as under:

(C) Gross Station Heat Rate

(b) New Thermal Generating Station achieving COD on or after 1.4.2014

(i) Coal-based and lignite-fired Thermal Generating Stations

= 1.045 X Design Heat Rate (kCal/kWh)



Where the Design Heat Rate of a generating unit means the unit heat rate guaranteed by the supplier at conditions of 100% MCR, zero percent make up, design coal and design cooling water temperature/back pressure.

Provided that the design heat rate shall not exceed the following maximum design unit heat rates depending upon the pressure and temperature ratings of the units:

Pressure Rating (Kg/cm ²)	150	170	170	247
SHT/RHT (0C)	535/535	537/537	537/565	565/593
Type of BFP	Electrical Driven	Turbine Driven	Turbine Driven	Turbine Driven
Max Turbine Heat Rate (kCal/kWh)	1955	1950	1935	1850
Min. Boiler Efficiency				
Sub-Bituminous Indian Coal	0.86	0.86	0.86	0.86
Bituminous Imported Coal	0.89	0.89	0.89	0.89
Max Design Unit Heat Rate (kCal/kWh)				
Sub-Bituminous Indian Coal	2273	2267	2250	2151
Bituminous Imported Coal	2197	2191	2174	2078

Provided also that where unit heat rate has not been guaranteed but turbine cycle heat rate and boiler efficiency are guaranteed separately by the same supplier or different suppliers, the unit design heat rate shall be arrived at by using guaranteed turbine cycle heat rate and boiler efficiency:

Provided also that where the boiler efficiency is below 86% for Subbituminous Indian coal and 89% for bituminous imported coal, the same shall be considered as 86% and 89% respectively for Sub-bituminous Indian coal and bituminous imported coal for computation of station heat rate:

Provided also that maximum turbine cycle heat rate shall be adjusted for type of dry cooling system:

Provided also that if one or more generating units were declared under commercial operation prior to 1.4.2014, the heat rate norms for those generating units as well as generating units declared under commercial operation on or after 1.4.2014 shall be lower of the heat rate norms arrived at by above methodology and the norms as per the Regulation 36(C)(a)(i).

92. The petitioner has furnished the design turbine cycle heat rate and boiler efficiency of all three units of the generating station as 1932 kcal/kWh and 85% respectively. Accordingly, the Unit design heat rate worked out is ₹2272.94 kcal/kWh (1932/0.85). In terms of the Regulation 36 (C)(b)(i) of the 2014 Tariff Regulations, new thermal generating stations achieving COD on or after 1.4.2014, the Gross Station Heat Rate= 1.045 X Design Heat Rate (kcal/kWh) i.e. 1.045 X 2272.94 = 2375.223. It also provides that the design heat rate shall not exceed the maximum design unit heat rates depending upon the pressure and temperature ratings of the units as specified by the Commission, where ceiling design heat rate for plants having temperature of 537/565 °C and pressure rating of 170 Kg/cm² using sub bituminous coal is given as 2250 kcal/kwh. The Design heat rate of the generating station is 2272.94kCal/kWh which is higher than the ceiling design heat rate of 2250 kcal/kwh. In view of this, the ceiling design heat rate of 2250



kcal/kwh has been considered as the Design heat rate for this generating station. Considering the multiplication factor of 1.045, the applicable Station Heat Rate is 2351.25 kcal/kwh (1.045 x 2250). This GSHR of 2351.25 kcal/kWh has been considered for the purpose of tariff for the period 2014-19. It is pertinent to mention that GSHR for Units- I & III was considered as 2421 kCal/kWh and hence the GSHR of 2351.25 kCal/kWh considered for 2014-19 is lower than the GSHR allowed for the period 2009-14.

Auxiliary Power Consumption

93. Regulation 36(E)(a)(i) of the 2014 Tariff Regulation provides Auxiliary power consumption as under:

(E) Auxiliary Energy Consumption

(a) Coal-based generating stations except at (b) below:

	With Natural Draft cooling tower or without cooling tower
(i) 200 MW series	8.5%
(ii) 300/330/350/500 MW and above	
Steam driven boiler feed pumps	5.25%
Electrically driven boiler feed pumps	7.75%

Provided further that for thermal generating stations with induced draft cooling tower, the norms shall be further increased by 0.5%.

94. The petitioner has considered Auxiliary Power Consumption (APC) of 6.69 % which is not in accordance with the norm of 5.75% as specified by the Commission for 500 MW units with induced draft cooling, under the 2014 Tariff Regulations. The petitioner has considered APC of 6.69% to include the consumption for additional systems like coal transportation from port to project which consume about 6.0 MW and also additional electrical equipment installed for desalination of sea water through RO system which consume 5.25 MW (approx).

95. The petitioner was directed vide ROP of the hearing dated 16.2.2016 to submit the details of actual APC and the petitioner vide affidavit dated 3.5.2016 had furnished the following details:

Period	Generation	APC in MU	APC in %
COD of Unit-II (25.8.2013) to 31.3.2014	2875.55	206.32	7.17%
1.4.2014 to 25.2.2015	5025.96	355.93	7.08%
COD of Unit-III (26.2.2015) to 31.1.2016	7099.25	533.42	7.51%



96. It is noticed from the above that the APC furnished by the petitioner is higher than the APC of 6.69% considered by the petitioner. It has also submitted the additional electrical powers are required for the operation of cross country pipe conveyor system, Grab un-loader at Jetty installed for unloading of coal from the ship and desalination plant as there is no water source near the power plant and the project is designed to use sea water which will be converted as potable water for drinking, service water for different purposes and DM water for process make-up & equipment cooling make up through RO conversion. The petitioner vide affidavit dated 6.10.2015 has submitted that 5.99 MW is required for cross country pipe conveyor, 4.44 MW for Grab un-loader at Jetty(for unloading coal from the ship) and 5.26 MW electrical equipment (for desalination of sea water through RO system). Hence, it has submitted that an additional load of 15.69 MW has been considered for calculating the APC for the generating station i.e. additional 1.04% of the APC.

97. The auxiliary consumption due to special features like desalination of sea water, coal conveying system from port to station etc. have not been considered in the operational norms under the 2014 Tariff Regulations. It is observed that the station has special features for which there will be additional auxiliary consumption for running the additional systems like coal transportation from port to project and also additional electrical equipment installed for desalination of sea water through RO system. In this background, we are inclined to relax the operational norm for APC and allow the APC of 6.69% as claimed by the petitioner. The petitioner is however directed to furnish the detail of actual Auxiliary Power Consumption, PLF of the station since COD of Unit-III to 31.3.2019 at the time of truing up of the tariff.

Specific Oil Consumption

98. Regulation 36(D)(a) of Tariff Regulations, 2014 provides for Secondary fuel oil Consumption of 0.50 ml/kWh for coal-based generating stations. Hence, the Secondary fuel oil Consumption considered by the petitioner is as per norms and is allowed.



Interest on Working Capital

99. Sub-section (a) of clause (1) of Regulation 28 of the 2014 Tariff Regulations provides as under:

“28. Interest on Working Capital:

(1) The working capital shall cover

(a) Coal based/lignite fired thermal generating stations

i) Cost of coal towards stock for 15 days for pit-head generating stations and 30 days for non-pit-head generating station for generation corresponding to the normative annual plant availability factor or the maximum coal stock storage capacity whichever is lower.

ii) Cost of coal for 30 days for generating corresponding to the normative annual plant availability factor.

iii) Cost of secondary fuel oil for two month for generating corresponding to the normative annual plant availability factor, and in case of use of more than one secondary fuel oil, cost of fuel oil stock for the main secondary fuel oil.

iv) Maintenance spares @ 20% of operation and maintenance expenses specified in regulation 29.

v) Receivables equivalent to two months of capacity charge and energy charge for sale of electricity calculated on normative plant availability factor; and

vi) Operation and maintenance expenses for one month.”

Fuel Components and Energy Charges in working capital

100. The petitioner has claimed the cost of fuel component in working capital based on price 'as fired' GCV of coal procured and burnt for the preceding three months i.e. January, 2014, February, 2014 and March, 2014 and secondary fuel oil for the preceding three months i.e. January, 2014, February, 2014 and March, 2014 as under:

	2014-15		2015-16	2016-17	(₹ in lakh)	
	1.4.2014 to 25.2.2015	26.2.2015 to 31.3.2015			2017-18	2018-19
Cost of Coal towards stock	11731.59	17734.87	17734.87	17686.41	17686.41	17686.41
Cost of Coal towards Generation	11731.59	17734.87	17734.87	17686.41	17686.41	17686.41
Cost of Secondary fuel oil 2 months	304.94	460.98	460.98	459.72	459.72	459.72

101. The respondent, KSEBL has submitted that the claim of the petitioner on this count is not in accordance with the 2014 Tariff Regulations. It has further submitted that the petitioner has not produced the certified copies of the bills showing the price of domestic coal, imported coal, GCV of domestic coal, GCV of imported coal. The respondent has also submitted that



receivables for calculation of working capital be revised based on the averments of the respondent for all components of fixed cost. The respondent, TANGEDCO has submitted that the claim of the petitioner for considering the GCV of coal on 'as fired' basis for the purpose of tariff determination is in deviation of the provisions specified under the Regulations. In response, the petitioner has submitted that the measurement of GCV was being carried out on 'as fired' basis till the month of March, 2014 as per the 2009 Tariff Regulations till 31.3.2014 and as such the petitioner was maintaining data of GCV on 'as fired' basis till March, 2014.

102. The Computation of Energy Charges and fuel component (coal cost) in working capital for the period 2014-19 is based on 'as received' GCV of coal. The Commission vide ROP of the hearing dated 27.2.2015 directed the petitioner to submit the GCV of coal on 'as received' basis. In response, the petitioner vide affidavit dated 4.6.2015 has submitted that they did not have suitable infrastructure for measurement of representative GCV on 'as received' basis.

103. The issue of 'as received' GCV for computation of energy charges was challenged by NTPC and other generating companies through writ petition in the Hon'ble High Court of Delhi. The writ petition was heard on 7.9.2015 and Hon'ble High Court of Delhi has directed that the Commission shall decide the place from where the sample of coal should be taken for measurement of GCV of coal on as received basis within 1 month on the request of petitioners.

104. The petitioner has furnished as billed GCV and as fired GCV of coal during preceding three months. However, the petitioner has not furnished the 'as received' GCV of coal as per the Commission's order dated 25.1.2016 in Petition no.283/GT/2014.

105. As per the directions of the Hon'ble High Court, the Commission vide order dated 25.1.2016 in Petition No. 283/GT/2014 has decided as under:

"In view of the above discussion, the issues referred by the Hon'ble High Court of Delhi are decided as under:

(a) *There is no basis in the Indian Standards and other documents relied upon by NTPC etc. to support their claim that GCV of coal on as received basis should be measured by taking samples after the crusher set up inside the generating station, in terms of Regulation 30(6) of the 2014 Tariff regulations.*

(b) *The samples for the purpose of measurement of coal on as received basis should be collected from the loaded wagons at the generating stations either manually or through the Hydraulic*



Auger in accordance with provisions of IS 436(Part1/Section1)-1964 before the coal is unloaded. While collecting the samples, the safety of personnel and equipment as discussed in this order should be ensured. After collection of samples, the sample preparation and testing shall be carried out in the laboratory in accordance with the procedure prescribed in IS 436(Part1/Section1)-1964 which has been elaborated in the CPRI Report to PSERC.”

106. The petitioner has claimed Energy Charge Rate (ECR) of 211.264 Paise/kWh based on the weighted average price, GCV of coal (as fired basis) & Oil procured and burnt for the preceding three months of January, 2014, February, 2014 and March,2014. It is observed that the petitioner has not placed on record the GCV of coal for preceding 3 months on ‘as received’ basis. In compliance with the direction of the Hon’ble High Court of Delhi, the Commission in its order dated 25.1.2016 in Petition No. 283/GT/2014 has clarified that the measurement of GCV of coal on as received basis shall be taken from the loaded wagons at the unloading point either manually or through the Hydraulic Augur. In the absence of GCV of coal on as received basis the present petition cannot be kept pending. Hence, the Commission has decided to compute the fuel components and the energy charges in the working capital by provisionally taking the GCV of coal on ‘as billed’ basis and allowing on adjustment for total moisture as per the formula given as under:

$$\frac{\text{GCV} \times (1-\text{TM})}{(1 - \text{IM})}$$

Where: GCV= Gross Calorific value of coal
 TM=Total moisture
 IM= Inherent moisture

107. In view of the above, the cost for fuel components in working capital have been computed at 83% NAPAF for the years 2014-15, 2015-16 and 2016-17 and at 85% NAPAF for the year 2017-18 & 2018-19 and based on ‘as billed’ GCV of coal and price of coal procured and secondary fuel oil for the preceding three months from January, 2014 to March 2014 and allowed as under:

	(₹ in lakh)				
	2014-15	2015-16	2016-17	2017-18	2018-19
Cost of Coal for stock- 30 days	15700.93	15700.93	15700.93	16079.26	16079.26
Cost of Coal for Generation- 30 Days	15700.93	15700.93	15700.93	16079.26	16079.26
Cost of Secondary fuel oil 2 months	457.90	459.15	457.90	468.93	468.93



108. Energy charges for 2 months on the basis of “as billed” GCV of coal for the purpose of interest on working capital have been worked out as under:

(₹ in lakh)				
2014-15	2015-16	2016-17	2017-18	2018-19
32295.89	32384.37	32295.89	33074.10	33074.10

O & M Expenses (1 month)

109. O&M expenses for 1 month claimed by the petitioner for the purpose of working capital in Form-13 B is as under:

2014-15		2015-16	2016-17	2017-18	2018-19
1.4.2014 to 25.2.2015	26.2.2015 to 31.3.3015				
1370.08	1970.08	2100.08	2226.19	2366.56	2515.55

110. Regulation 28 (a) (vi) of the 2014 Tariff Regulations provides for O & M expenses for one month for coal based generating station. Accordingly, O&M expenses including water charges for 1 month is allowed as under:

2014-15		2015-16	2016-17	2017-18	2018-19
1.4.2014 to 25.2.2015	26.2.2015 to 31.3.3015				
1242.46	183.52	2094.45	2226.19	2366.56	2515.55

* The difference in the claim of the petitioner and as allowed by the Commission for year 2014-15 is due to the fact that the petitioner has claimed the normative O & M and the Commission has allowed the actual O & M

Maintenance Spares

111. The petitioner has claimed maintenance spares in the working capital as under:

2014-15		2015-16	2016-17	2017-18	2018-19
1.4.2014 to 25.2.2015	26.2.2015 to 31.3.3015				
3288.20	4728.20	5040.18	5342.87	5679.75	6037.32

112. Regulation 28(1)(a)(iv) of the 2014 Tariff Regulations provide for maintenance spares @ 20% of the Operation & Maintenance expenses as specified in Regulation 29 of the 2014 Tariff Regulations. In terms of Regulation 29(2) of the 2014 Tariff Regulations and in line with Commission’s order dated 6.10.2015 in Petition No. 186/GT/2014 (Sugen CCPP), the maintenance spares @ 20% of O & M expenses allowed is as under:



(₹ in lakh)

2014-15		2015-16	2016-17	2017-18	2018-19
1.4.2014 to 25.2.2015	26.2.2015 to 31.3.2015				
2981.90	440.44	5026.67	5342.87	5679.75	6037.32

* The difference in the claim of the petitioner and as allowed by the Commission in year 2014-15 is due to the fact that the petitioner has claimed the normative maintenance spares and the Commission has allowed the actual maintenance spares.

Receivables

113. Receivables equivalent to two months of capacity charges and energy charges has been worked out and allowed as under:

(₹ in lakh)

	2014-15		2015-16	2016-17	2017-18	2018-19
	1.4.2014 to 25.2.2015	26.2.2015 to 31.3.2015				
Fixed charges	18627.20	2634.40	29377.36	30537.69	30993.28	30794.83
Variable charges	29287.51	3008.38	32384.37	32295.89	33074.10	33074.10

Rate of interest on working capital

114. Clause (3) of Regulation 28 of the 2014 Tariff Regulations provides as under:

“Interest on working Capital: (3) Rate of interest on working capital shall be on normative basis and shall be considered as the bank rate as on 1.4.2014 or as on 1st April of the year during the tariff period 2014-15 to 2018-19 in which the generating station or a unit thereof or the transmission system including communication system or element thereof, as the case may be, is declared under commercial operation, whichever is later.”

115. In terms of the above regulations, SBI PLR of 13.50% has been considered for the purpose of calculating interest on working capital. Accordingly, Interest on working capital has been computed as under:

(₹ in lakh)

	2014-15		2015-16	2016-17	2017-18	2018-19
	1.4.2014 to 25.2.2015	26.2.2015 to 31.3.2015				
O&M expenses	1242.46	183.52	2094.45	2226.19	2366.56	2515.55
Receivables (Fixed Charges)	18627.20	2634.40	29377.36	30537.69	30993.28	30794.83
Receivables (Variable Charges)	29287.51	3008.38	32384.37	32295.89	33074.10	33074.10
Maintenance Spares	2981.90	440.44	5026.67	5342.87	5679.75	6037.32
Cost of secondary fuel oil for two months	415.25	42.65	459.15	457.90	468.93	468.93
Cost of coal for stock (30 days)	14238.37	1462.55	15700.93	15700.93	16079.26	16079.26
Cost of coal for generation (30 days)	14238.37	1462.55	15700.93	15700.93	16079.26	16079.26
Total Working Capital	81031.06	9234.49	100743.84	102262.39	104741.14	105049.25
Interest Rate %	13.50%	13.50%	13.50%	13.50%	13.50%	13.50%
Interest on Working Capital	10939.19	1246.66	13600.42	13805.42	14140.05	14181.65



116. Accordingly, Annual fixed charges approved for the generating station for the period from 1.4.2014 to 31.3.2019 is summarized as under:

(₹ in lakh)						
	2014-15		2015-16	2016-17	2017-18	2018-19
	1.4.2014 to 25.2.2015	26.2.2015 to 31.3.2015				
Return on Equity	23010.13	3360.71	38525.72	41249.51	42809.53	43409.62
Interest on Loan	37183.20	5307.31	57134.24	56721.98	54225.15	49954.71
Depreciation	25721.16	3689.53	41870.42	44734.88	46386.20	47036.42
Interest on Working Capital	10939.19	1246.66	13600.42	13805.42	14140.05	14181.65
O&M Expenses	14909.51	2202.18	25133.34	26714.33	28398.75	30186.60
TOTAL	111763.20	15806.39	176264.14	183226.13	185959.69	184769.00

Energy Charge Rate

117. The petitioner has claimed an energy charge rate (ECR) of 211.264Paise/kWh for the period 2014-15 to 2018-19 based on the weighted average price, GCV of coal (as fired basis) & Oil procured and burnt for the preceding three months. The energy charge rate (ECR) as worked out based on operational norms specified in 2014 Regulations and on "As Billed" GCV of coal for preceding 3 months i.e. January, 2014 to March, 2014 to January 2014, as worked out under may be considered for allowing 2 months Energy Charge in Working capital:

SI no.		Unit	2014-19
1	Capacity	MW	1500
2	Weighted average Gross Station Heat Rate	Kcal/kWh	2351.250
3	Weighted average Aux. Energy Consumption	%	6.69
4	Weighted average GCV of oil (as fired)	Kcal/lit	9960
5	Weighted average GCV of Coal (as Billed)	Kcal/kg	3998.517
6	Adjustment on account of coal received at the generating station for equilibrated basis (Air dried) in the billed GCV of Coal India		*
7	Weighted average price of oil	₹/KL	50382.035
8	Weighted average price of Coal	₹/MT	2985.00
9	Rate of Energy Charge ex-bus	Paise/kWh	190.413**

* To be calculated by the petitioner based on the adjustment formula

** To be revised as per the figures at Sr. No. 6

118. The GCV of coal as computed above shall be adjusted in the light of the GCV of coal on 'as received basis' computed by the petitioner as per our directions in order dated 25.1.2016 in Petition No. 283/GT/2014. The GCV of coal needs to be measured from the sample collected at the jetty for considering 'as received' basis in terms of provision of para 5 (sampling from ship during loading or unloading) and para 8 (sampling from loaded ships) of IS 436(Part-1/Section-1) -1964.



119. The petitioner shall compute and claim the Energy Charges on month to month basis from the beneficiaries based on the formulae given under Regulation 30(6)(a) of the 2014 Tariff Regulations read with Commission's order dated 25.1.2016 in Petition No. 283/GT/2014.

120. The Commission in its order dated 19.2.2016 in Petition No. 33/MP/2014 (TPDDL v NTPC & anr) had directed as under:

"The respondents shall introduce help desk to attend to the queries and concerns of the beneficiaries with regard to the energy charges. The contentious issues regarding the energy charges should be sorted out with the beneficiaries at the senior management level, preferably at the level of Executive Directors."

Accordingly, in line with the above decision, help desk shall be introduced by the petitioner and contentious issues if any, which arise in respect of energy charges for this generating station shall be sorted out with the beneficiaries at the Senior Management level.

Application filing fee and Publication Expenses

121. The petitioner has sought reimbursement of filing fee and also the expenses incurred towards publication of notices for application of tariff for the period 2014-19. The petitioner has deposited filing fees of ₹4604800/- for the year 2014-15, ₹6600000/- for the year 2015-16 and ₹6600000/- in terms of the provisions of the Central Electricity Regulatory Commission (Payment of Fees) Regulations, 2012. Accordingly, in terms of Regulations 52 of the 2014 Tariff Regulations, we direct that the petitioner shall be entitled to recover *pro rata*, the filing fees and the expenses incurred on publication of notices directly from the respondents, on production of documentary proof. The filing fees for the remaining years of the tariff period 2017-19 shall be recovered *pro rata* after deposit of the same and production of documentary proof.

122. The annual fixed charges approved for the period 2014-19 as above are subject to truing up in terms of Regulation 8 of the 2014 Tariff Regulations.

123. Petition No. 277/GT/2014 is disposed of in terms of above.

Sd/-

Sd/-

Sd/-

Sd/-

(Dr. M.K. Iyer)
Member

(A.S. Bakshi)
Member

(A.K. Singhal)
Member

(Gireesh B. Pradhan)
Chairperson



