

TPL/SUGEN/COMMERCIAL/2018-19/073

29th November, 2018

To,
Secretary
Central Electricity Regulatory Commission
Third Floor, Chandralok Building,
36, Janpath, New Delhi 110001

**SUGEN
MEGA POWER PROJECT**

Off.: National Highway No.8,
Tal.: Kamrej,
Dist.: Surat - 394155 India
Phone : +91-2621-661000
Fax : +91-2621-661151

Sub: Additional submission (in continuation of earlier) for advanced F class GT
Ref: 1147.5 MW Sugen Mega Power Project

Dear Sir,

The Hon'ble Commission had released a Staff Consultation Paper in May 2018 on approaches to be considered for Tariff Regulations covering the period 2019-24. We had submitted our observations on the same for kind consideration of the Hon'ble Commission.

The Hon'ble Commission, amongst other things, also considers the past data for determination of each normative parameter in the Tariff Regulations. In this context, we would like to submit that the operating regime of 2014-19 was fraught with many uncertainties like (a) capacity addition outpacing the demand (b) comparatively slow growth in electricity demand (c) severe cut (almost NIL) in domestic gas supply (d) rising price of LNG in international market (e) financial distress in general and (f) unprecedented penetration of renewable. Due to such situation, the operating data of this period is not a proper representation of a normal operating situation. It is an established regulatory practice that operating parameters & norms should be based on normal operating conditions. Therefore, we submit that appropriate adjustment for abnormal conditions in the past data on various operating parameters must be considered before finalizing the normative parameters for Tariff Period 2019-24.

We set up the advanced F class gas based power plant (i.e. SUGEN Mega Power Project) in 2009-10. It was one of first advanced F class GT to be commissioned in India. The following is a brief on specific feature of such advanced class machine.

- o The advance class machines have achieved efficiency levels of the order of 55%-60% by targeting a firing temperature of around 1300°C or more. However, a quantitative risk assessment becomes more critical due to selection of such advance technologies. To reduce financial exposure to technical risk, long-term supply and services agreements (LTSA/LTMA) with the OEM are prevalent and desirable in order to get appropriate confidence level for the availability and efficiency levels of operation of the advance class machine.



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TORRENT POWER LIMITED

Regd. Office : "Tapovan", 600 Tapovan, Ambawadi, Ahmedabad-380015 India. Website : www.torrentpower.com
Phone : 079 26628000 CIN : L31200GJ2004PLC044068

- Advanced class gas turbines require close monitoring plus a factor depending upon operating regime and loading & unloading cycles. Such monitoring calls for services of specialists especially factory trained for the purpose and having sufficiently long experience. Such experts carry out periodic close inspection of internals of Gas Turbine. The inspection and logged EOH together form the basis of requirement of replacement and/or refurbishment of these highly specialized active components which are not available in open market and are proprietary to respective Gas Turbine OEMs and have to be necessarily sourced from them.
- As the technology is proprietary, the cost of spare parts and services of specialists who possess the requisite technical knowhow results in higher O&M expenses. Therefore, it is a common practice throughout the world for users of advanced class (F-class) gas turbines to avail long term service and supply from the Gas Turbine OEMs. Such services cover monitoring and inspection of the machines, management of spares and components that require replacement, repairs and refurbishment.
- Accordingly, the Long Term Service Agreement (LTSA) and the Long term Maintenance Agreement (LTMA) are executed with Siemens (Original Equipment Manufacturer) for each GT of Sugan.

The above-mentioned LTSA/LTMA contract has been structured with the following salient features which has benefited both the generator and beneficiaries.

- Availability of ~92% (minimum) over the contract period.
- Heat Rate within 3.6% of the base heat rate over the contract period.
- Power Output within 5% of base output over the contract period.
- Availability of Program Parts and Misc. Hardware for the machine.
- Carry out unexpected maintenance work.
- Irrespective of the issue, immediately undertake remedial actions for unscheduled outage.
- Ensure availability of all tools, tackles, consumable for providing service in the contract.
- Complete outage within defied duration e.g. minor inspection in 7 days, major inspection in 37 to 40 days.
- Responsible for execution of the Performance Test.
- Provide technical support and assistance for real time issue related to GT.
- Assist in warranty / insurance claim.
- Provide power diagnostic service for GT.

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We would like to submit that due to LTSA/LTMA agreement, SUGEN has achieved plant availability of ~96% over long period and has been one of the efficient machines in terms of heat rate i.e. normative heat rate of 1850 kCal/kWh. Further, such high efficiency has come with one of the lowest possible per MW capital cost i.e. Rs. 2.61 Cr per MW (resulting into comparatively lower AFC). It may be noted that such huge benefit will be available (secured) for the life of plant. Considering the above-mentioned, the O&M expenses of F class GT (including SUGEN) for 2014-19 has been given as mentioned below.

Particulars	2014-15	2015-16	2016-17	2017-18	2018-19
Approved in Rs. Lacs per MW	26.55	28.36	30.29	32.35	34.56
Total in Rs. Cr as part of AFC	304.66	325.43	347.58	371.22	396.58
Recovered as part of AFC	254.61	271.97	282.71	301.93	322.56
Actual in Rs. Cr as per P/L	103.62	160.08	169.37	244.53	230.03
Difference between Actual and Recovered in Rs. Cr	150.99	111.89	113.34	57.40	92.53
Difference between Actual and Recovered in Rs. Lacs Per MW	13.16	9.75	9.88	5.00	8.06

Based on the above, the actual payment made under O&M expenses of 2014-19 period is lower by Rs. 9.17 Lacs per MW (average). The following are main reasons for the same.

- Continuous reduction in availability of allotted domestic gas.
- Reluctance of beneficiaries to off take capacity available on R-LNG

Due to above-mentioned (including other misc. reasons), certain service milestones related expenditure under the LTSA/LTMA Contracts has been deferred and SUGEN will have to pay such amount in subsequent period. It may be relevant to note that the Hon'ble Commission has noted (after due diligence) and considered such subsequent payment situation for LTSA/LTMA in earlier orders of 2009-14 for SUGEN.

However, the LTSA/LTMA payment is subject to escalation related to German & Indian inflation rate and the rupee depreciation vis-à-vis EURO (Rupee depreciated 6.33% over the period 2014-15 to 2018-19) at the time of payment. Hence, such deferred payment of LTSA/LTMA is carrying a risk of rise in exchange rate and other applicable escalation factors under the LTSA/LTMA contract. Considering the same, SUGEN would pay additional amount of ~Rs. 31 Crore per annum on account of such deferred payment of LTSA/LTMA due to expected rise in exchange rate and other escalation factors.



In view of the same, the Net average difference between Actual and Recovered O&M expenses in Rs. Lacs Per MW for the Period 2014-19 may be estimated as mentioned below:

Average difference between Actual and Recovered for the : Rs. 9.17 Lacs per MW
 Period 2014-19

Less adjustment due to risk of rise in exchange rate and
 other escalation factors on deferred LTSA/LTMA payment : Rs. 4 Lacs per MW

Net average difference between Actual and Recovered : **Rs. 5.17 Lacs per MW**
 O&M expenses for the Period 2014-19

It may be noted that TPL has booked the regasification capacity in Petronet LNG terminal (1 MTPA per annum) and it has been directly sourcing LNG (at very competitive rate) as per the requirement of its beneficiaries. Based on the same, the operating level of SUGEN is expected to be around base load. Further, there is a substantial increase expected in domestic gas supply from 2021-22. Hence, O&M expenses (other than LTSA/LTMA) are also expected to increase (vis-à-vis 2014-19). The O&M expenses (other than LTSA/LTMA) of SUGEN has been Rs. 11 Lacs per MW for 2017-18 which is approx. 36% higher than 2016-17 i.e. approx. Rs. 3 Lacs per MW increase. Further, if we refer the O&M expenses of other gas based plant (other than F class), it is given as Rs. 14.67 Lacs per MW for 2014-15. Based on the same, O&M expenses (other than LTSA/LTMA) is estimated at Rs. 14 Lacs per MW. Further, as per the LTSA/LTMA agreement, the estimated total LTSA/LTMA expenses for 2019-24 period is presented below.

LTSA/LTMA	2019-20	2020-21	2021-22	2022-23	2023-24	Total
Rs. in Cr	190.53	187.83	256.86	259.87	241.81	1,136.90
In Rs. Lacs Per MW	16.60	16.37	22.38	22.65	21.07	19.82

Based on the above, we hereby submit the following estimated O&M expense (inclusive of reconciliation of 2014-19 O&M expenses) for the Tariff Period 2019-24.

Sr. No.	Particulars	Unit	Amount
1	LTSA/LTMA expenses for 2019-24	In Rs. Lacs per MW	19.82
2	Other than LTSA/LTMA expenses for 2019-24	In Rs. Lacs per MW	14
3	Less: Adjustment for 2014-19 O&M expenses	In Rs. Lacs per MW	(5)
4	Total O&M expenses for base year of the Tariff Period 2019-24	In Rs. Lacs per MW	28.82

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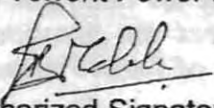
Sir, we understand that the normative parameters with operating margin provide incentives to strive for the efficiency. However, considering past abnormal performance if such norms are made more stringent without operating flexibility and provision for known risks then it would discourage generators to achieve better efficiency (i.e. no need to adopt prudent management practices in operation as norms are provided on actual basis only). Therefore, we reiterate that appropriate adjustment for abnormal conditions in the past data on various operating parameters must be considered before finalizing the normative parameters for Tariff Period 2019-24.

We look forward to the Hon'ble Commission's positive consideration of above-mentioned additional submission and our requests.

Thanking you.

Yours faithfully

For Torrent Power Limited


Authorized Signatory

Needless to mention, the above-mentioned O&M expenses are necessary for maintaining high reliability and efficiency of the machine. However, such O&M expense is part of overall package of the plant duly compensated by other benefits like (a) one of the lowest per MW capital cost (b) 96% availability of the machine (c) heat rate of 1850 kCal/kWh as against 2000-2100 kCal/kWh for conventional 'E' class machines and (d) limited degradation of power output and heat rate.

Further, it may be noted that the operating life of gas based power plant has been revised from 15 years to 25 years from the Tariff Regulations 2009-14. Hence, the support of OEM is required to be extended. TPL has successfully negotiated the extended terms of LTSA/LTMA from 12 years to 14 years (with a provision to extend it to 17 years). However, such extended operating life would lead to higher risk of fast change in technology including obsolescence of parts / technology upgradation. OEM has already indicated Rs. 60 Cr for up gradation of DCS system and it has stopped support for BOP.

In view of above, the Hon'ble Commission may also provide some margin of Rs. 2-3 Lacs per MW over the above-mentioned O&M expenses of ~Rs. 29 Lacs per MW for 2019-24. **Considering our submission, we humbly request to provide O&M expenses of Rs. 32 Lacs per MW for F Class GT at base year of Tariff Period 2019-24.**

As far as the heat rate is concerned, we would like to submit that the heat rate has been varying on month to month basis and the maximum value has been 1784 kCal/kWh (average for the month). Further, the same has also been degrading. In view of the same, it is submitted that the existing heat rate of 1850 kCal/kWh may be reviewed upward based on the following rationales.

- o There is a wide variation in operation during the day (which should be covered in operating margin)
- o There may also be some margin provided for degradation. Further, such degradation is expected to be accelerated due to increased thermal stress (based on load variation). As per the LTSA/LTMA agreement, approx. 3% degradation is expected.

We would like to highlight that the existing normative heat rate of other Gas Turbine is provided in the range of 2500 - 1975 kCal/kWh. Further, there is already a provision for continuous (on month to month basis) truing up of the said parameter (controllable parameter) on month to month basis.

In view of the above, it is requested to consider 3% margin for degradation and 5% margin for operating flexibility. **Based on the same, the normative heat rate may be allowed as 1875 kCal/kwh.**

