

**BEFORE THE MAHARASHTRA REGULATORY COMMISSION,
MUMBAI**

Filing No: _____
Case No. 05 of 2017
and 25 of 2017

Date: 5th May 2017

IN THE MATTER OF

Petition filed by Reliance Infrastructure Limited (Generation) (RInfra-G) and Reliance Infrastructure Limited –Distribution (RInfra-D) under Section 86 (1) (a), 86(1) (b) of EA 2003 and Regulation 20.1 of MERC MYT Regulations, 2015 for approval of Power Purchase Arrangement between Reliance Infrastructure Limited–Generation (RInfra-G) and Reliance Infrastructure Limited–Distribution (RInfra-D) - Case No. 05 of 2017

Petition of The Brihanmumbai Electric Supply & Transport Undertaking (BEST) for Approval of Power Procurement Plan for FY 2018-19 to FY 2027-28 for the BEST Undertaking under Regulation 19 & 20 of MERC (MYT) Regulations, 2015 - Case No. 25 of 2017

Reliance Infrastructure Limited (RInfra)
Brihanmumbai Electric Supply & Transport Undertaking (BEST)

Petitioner
Petitioner

Prayas (Energy Group), Pune

Consumer Representative / Applicant

**SUBMISSION FROM PRAYAS (ENERGY GROUP) REGARDING MATTERS IN CASES 5 OF 2017
AND 25 OF 2017**

Vide the daily order dated 28th February 2017 in the case no 5 of 2017 the commission directed the State Transmission Utility (STU), the Maharashtra State Transmission Company Ltd. (MSETCL), to *“...furnish different realistic scenarios of the possible transmission capacity enhancement, which could cater to the load of Mumbai with lower levels of embedded power generation in Mumbai, and the time required for augmentation of such transmission capacity in such scenarios.”* Similarly vide the daily order dated 9th March 2017 in case no 25 of 2017 the Commission *“asked STU to submit its analysis of various realistic transmission availability scenarios over the next three years assuming long or medium term PPAs for power from outside Mumbai, which may include the possibility of pre-poning certain transmission projects which are proposed for future implementation.”*

Accordingly, the STU made a presentation before the commission in presence of the petitioners and consumer representatives on 10th April 2017.

This submission by Prayas (Energy Group) or PEG, is in response to the said presentation as well as the other issues concerning transmission planning, islanding scheme and renewal of existing PPAs.

We request the commission to accept this submission on record to allow us to make further submissions in these matters, if any.

I. Comments regarding the presentation made by STU

a. Capacity of tie lines

The STU has stated that the Total Transmission Capacity (TTC) of MSETCL tie lines is around 2011 MW. However, Rlnfra and BEST have considered this capacity to be 1550 MW. In this context, the following needs to be clarified:

- i. What is the total transmission capacity for Mumbai? How much is it considering reliability margins?
- ii. How much of it is used to serve load in MSEDCL's Mumbai licence area? How much for the rest of Mumbai?
- iii. If indeed the transmission capacity available for Mumbai (excluding MSEDCL's area) is 1550 and the maximum demand was 3531 MW (Summer 2016). With only 1877 embedded generation available, was there load shedding to the extent of 104 MW in Mumbai in the summer of 2016? If not, how is this demand being managed?

b. Transmission capacity and peak load projections

The scenarios presented by the STU (proposed transmission schemes and maximum exchange possible) in case no. 5 of 2017 and case no. 25 of 2017 show different capacity augmentations for the same years, as shown in Table 1.

Table 1: Peak load and transmission capacity from scenario analysis presented by STU

Sr. No.	Year	Peak Load (MW)		Transmission Capacity (MW)	
		Case no. 25 of 2017	Case no. 5 of 2017	Case no. 25 of 2017	Case no. 5 of 2017
1	2016-17	3531	3824	2011	2011
2	2017-18	3636	3929	3024	2286
3	2018-19	3746	4038	3144	2624
4	2019-20	3858	4154	3667	2977
5	2020-21	3973	4278	3667	2977
6	2021-22	4098	4332	4019	3818
7	2025-26	4617		4528	-
8	2030-31	5352		5366	-

If the assumptions are same across the scenarios, it is not clear why the figures are different for the two cases. We request the STU to clarify this issue.

c. Technical minimum

Technical minimum is a very important generation parameter that strongly influences the system's ability to cost effectively integrate high shares of variable renewable energy, contribute to system flexibility to meet load variation and allow for more optimal and least cost generation.

In case no. 25 of 2017, the STU has presented the rated capacity and technical minimum capacity for the various embedded generation stations feeding Mumbai. The technical minimum of all the units of the two embedded generators is different, ranging from 50% to as high as 70%, as can be seen from Table 2.

Table 2: Embedded Generation of Mumbai and its technical minimum assumed by STU

Utility	Generation	Fuel	Rated Capacity (MW)	Technical Minimum Capacity (MW)	Tech minimum as a percentage
Tata Power Company Ltd.	Trombay Unit 5	Coal	500	314	63%
	Trombay Unit 6	Oil	500 **	0	
	Trombay Unit 7A & 7B	Gas	180	90	50%
	Hydro - Bhira, Bhivapuri and Khopoli	Hydro	447	447	Must run
	Trombay Unit 8	Coal	250	189	76%
	TPC Total		1377	1040	76%
Reliance Infrastructure Ltd.	Dahanu Thermal Power Station	Coal	2 x 250	2 x 189	
	RInfra Total		500	378	76%
	Mumbai Total		1877	1418	76%

** This unit is under Economic shutdown

In this regard it is important to note that from the fourth amendment to the Indian Electricity Grid Code regulations the technical minimum for operation is now fixed at 55% of MCR or installed capacity for all central sector generating units and inter-state generating stations under the jurisdiction of CERC. The CERC conducted a comprehensive review of this issue and also noted that the value of 50% of MCR as the technical minimum specified in the CEA Technical Standards for Construction of Electric Plants has to be followed by all power plants in India.

The MSEDCL has already filed a petition under case no. 15 of 2017 seeking a common, lower technical minimum in line with the CERC norm for all the capacity contracted by it. This would allow cheaper power plants to operate at higher capacities and hence reduce cost of power purchase.

In light of these developments there seems no reason to allow a different and significantly higher technical minimum for certain generators. The CERC approved norm of 55% should be uniformly applied in all scenarios as well as in actual dispatch.

II. Transmission planning

This has been a long-standing problem in Mumbai and remains unresolved even today. It limits procurement options and makes pre-identified cost-plus contracts fait accompli. With increasing demand and falling embedded generation, Mumbai finds itself in a strange place where half the power is imported into the city, but, with the exception of VIPL, most of it is not under any long-term contract.

a. Approach to transmission planning

Given the current embedded generation capacity of 1877 MW, Mumbai still needs to import another 1800 MW in 2017-18 to meet its peak demand. By 2030-31, the STU estimates that even with embedded generation, tie-line capacity of 3385 MW would be needed to meet Mumbai's demand of 5262MW. Hence, independent of whether embedded generation is to be backed down or not, there is an urgent need to augment transmission capacity of Mumbai. This would of course allow for more power purchase options to distribution companies and for consumers looking to migrate under open access, but this is also crucial for meeting Mumbai's demand going forward. The distribution utilities have failed to appreciate this important point, and seem more concerned about the sale of

embedded generation than meeting Mumbai's demand in a sustainable and reliable manner. While both the utilities have found several issues with the STU's study; however, neither has proposed any alternative to embedded generation nor suggested any ideas for network augmentation.

b. Delays in commissioning of transmission projects

This issue was repeatedly raised during the discussion following the STU presentation and from the utilities' presentations it seems that on an average 5-6 years delay is expected in the commissioning of transmission projects. Such delay is indeed an important issue and merits serious discussion on its own. However, such delays do not take away from the need of network augmentation, but rather add to its urgency. For the last few years, Mumbai has been just about managing to meet its demand and there have been instances when this has led to grid disturbances and partial blackouts. The MERC itself has noted as far back as August 2011 that "Mumbai network is very Fragile" and "Network Strengthening [needs] to be taken up on top priority"¹

More than five years later Mumbai's transmission system continues to be as fragile and in fact two grid disturbances have occurred in the intervening period. Therefore, it is high time that the transmission system is strengthened to improve stability and increase supply options. Delays should be a reason to undertake this process urgently and immediately. We request the MERC to initiate a separate process to periodically review progress of critical transmission projects so as to avoid such issues.

c. Load growth in other states and districts

TPC and RInfra, both, have claimed that for load flow studies, the growth in the load of the entire state of Maharashtra, as well as other states, needs to be taken into account. TPC has stated that "STU has increased loads of Vashi and Mumbai areas only. Loads of other states and districts of Maharashtra had been kept constant" and that "It must be appreciated that transmission constraints are upstream of Mumbai with Padghe - Kalwa corridor becoming chicken neck for meeting the loads of Western Maharashtra". Thus, the embedded generators have expressed concern over the increase in load in districts of Maharashtra and its impact on the transmission of power to Mumbai.

We would like to make following points in this regard:

1. The issue of bottlenecks in the system should be of concern independent of the fate of embedded generation and should equally apply for all power being imported into Mumbai, which at present is 50% of consumption.
2. As Mumbai's demand grows and more power is brought from outside, this is an issue that will anyway need to be dealt with. Therefore, it cannot be portrayed as a problem concerned solely with replacing embedded generation.
3. Curiously, when TPC and RInfra were proposing to sign long-term cost-plus PPAs with IEPL and VIPL², respectively, both located in Nagpur district of Maharashtra, neither of the companies raised such concerns.
4. This concern does not take away from the urgency of providing higher transmission capacity for Mumbai. Even if the STU has not considered the load growth for the rest of the country,

¹ [http://www.mercindia.org.in/pdf/Order%2058%2042/3_Team_Mumbai_Transmission_VLS\(MERC\).pdf](http://www.mercindia.org.in/pdf/Order%2058%2042/3_Team_Mumbai_Transmission_VLS(MERC).pdf)

² Case no. 65 of 2015 (IEPL) and Case no. 3 of 2013 (VIPL)

it has considered the same for Mumbai and has demonstrated the need for more transmission capacity based on that consideration.

d. Reliability and the risks of dependence on embedded generation

While the existence of embedded generation is being portrayed as a guarantee of reliable power, it can also be a risk. It needs to be noted that the islanding scheme is designed considering a disturbance external to Mumbai. It can isolate Mumbai in the event of a problem in the larger grid, but it leaves Mumbai with no alternatives in the case of any failure of the embedded generation units. While the rest of the grid has largely been stable, problems with the embedded generation have resulted in partial blackouts in the recent past. These incidents are not rare, having occurred recently on September 2, 2014³ when large parts of the city were without power. In fact, in light of such disturbance in the Mumbai grid a strong argument was made in 2012 to improve and strengthen Mumbai's transmission network and this issue was also discussed in the state advisory committee meetings. In fact the committee appointed by MERC following the grid disturbances of November 2010 has noted that if Mumbai's demand rises to 5000 MW and the embedded generation remains at around 2277 MW, islanding scheme cannot be implemented.

Therefore, it is misleading to assume that islanding always improves system reliability. More specifically, with more than 50% power being imported from outside, the issues of reliability and islanding needs to be thoroughly reviewed.

III. Islanding scheme for Mumbai

a. Review of the islanding scheme

The distribution companies have projected the islanding scheme as extremely necessary for Mumbai, even when acknowledging that the embedded capacity is insufficient to meet 100% load, and falls short even of the arbitrary threshold of 65% load that was mentioned as the minimum optimum capacity needed for islanding.

However, the islanding scheme needs to be reviewed in light of the following facts:

1. Given Mumbai's demand and insufficient embedded generation capacity, only half of Mumbai's load can be met today in the event of islanding, and this will reduce with time as Mumbai's demand increases further.
2. As submitted by the STU, there has been no incident of islanding in Mumbai since 2007, but as mentioned above, there have been incidences of failure of embedded generation units.
3. With strengthening of the grid, many cities, such as Pune and Nagpur, have reliable supply without islanding.
4. With increasing open access many big consumers such as the railways, airport, industries, and commercial complexes are likely to migrate away from the distribution companies. In such an event, it is not clear on what basis the priority allocation of power can be done in case islanding.

³ Trombay Unit 5 was shut down due to a technical glitch while Unit 8 had been on shutdown due to a fire since January 2014. Transmission constraint did not allow for additional demand to be met and large parts of the city were without power. See <http://www.financialexpress.com/archive/powering-up-mumbai-a-distant-island/1289859/>.

5. Finally, a valid argument could be made as to why consumers who will not get the benefit of islanding should pay for its costs.

Therefore, a thorough review of islanding scheme is necessary and should be undertaken through public consultation with regards to its need (given that the grid is much stronger today), coverage (what will be considered “critical load”) and its costs (costs of maintaining embedded generation for this purpose, and its alternatives).

b. Load shedding protocol

If it is decided after due public process that islanding is to continue, then the necessary load shedding protocol in the event of such islanding should also be publicly deliberated. The companies claim that there already exists a load-shedding protocol for islanding; however, no such protocol is in the public domain. Given that all consumers cannot enjoy the benefits of islanding, the protocol should be decided based on public consultation regarding what qualifies as critical load. It is important to note that the load shedding protocol for MSEDCL was decided via a comprehensive public process with public hearings in all revenue headquarters. A similar process needs to be followed for Mumbai as well.

IV. Costs of Power Purchase

a. Current tariffs

The distribution companies have always claimed that their identified PPAs are the most economical. However, contrary to these claims, the average per unit cost of Mumbai’s contracted coal-based generation is much higher than the average cost of other coal-based plants for which PPAs have been signed recently. Table 3 shows the average power purchase cost for coal-based thermal capacity contracted by various states between 2012 and 2017. In case of most states, with the exception of Uttar Pradesh and Bihar, the average cost of such capacity is below Rs. 4 per unit. As against this, the cost of generation for Tata’s newest coal-based unit, Trombay Unit 8, is Rs. 4.44 per unit, while that of Dahanu is Rs. 4.10 per unit and for VIPL is Rs. 4.42 per unit.

Table 3: Average power purchase cost for coal-based thermal capacity added by various states between 2012 and 2017

State	Average power purchase cost approved for the 2016-17 (Rs. per unit)	Share of private capacity in the total capacity added between 2012 and 2016
Punjab	3.11	91%
Gujarat	3.11	38%
Madhya Pradesh	3.44	50%
Rajasthan	3.46	59%
Maharashtra	3.66	64%
Haryana	3.72	66%
Bihar	4.05	30%
Uttar Pradesh	4.44	70%
Reliance Dahanu	4.10	-
VIPL	4.42	-
Tata Trombay Unit 8	4.44	-

Source: PEG compilation from various state regulatory orders. Power purchase costs as approved by the respective commissions.

b. Need to move away from cost-plus generation tariff

All the expiring PPAs are long-term “cost-plus” PPAs. It is well known that cost-plus projects have often found it difficult to stick to tariff that they promise at the time of approval. Rinfra-D’s PPA with its other sister concern, Vidarbha Industries Power Ltd. (VIPL), is a case in point.

Further, clause 5.2 of the National Tariff Policy notified on 28th January 2016 clearly states that: *“All future requirement of power should continue to be procured competitively by distribution licensees except in cases of expansion of existing projects or where there is a company owned or controlled by the State Government as an identified developer and where regulators will need to resort to tariff determination based on norms provided that expansion of generating capacity by private developers for this purpose would be restricted to one time addition of not more than 100% of the existing capacity.”*

Given such policy mandate and the difficulties in regulating cost-plus tariffs, we pray that the commission direct all the distribution licensees to undertake power procurement only through competitive bidding. It must be stated here that nothing precludes the embedded generators from participating and indeed winning the contracts.

c. Surplus power and possibility of finding better options

Certain states have turned power surplus and have been backing down capacity, such as Maharashtra (4231 MW), Madhya Pradesh (2444 MW) and Gujarat (5525 MW). Undertaking competitive bidding in such a scenario could yield economical tariffs, as many state distribution companies are keen to sell their surplus power.

Currently, apart from the cost-plus PPAs, Mumbai distribution companies buy most of their remaining power from short term market. The companies should explore replacing such short-term procurement with medium term procurement based on bidding or from platforms such as DEEP.

d. Need and relevance of long-term PPAs

The power sector is in a state of flux and this is particularly true in case of Mumbai. The prices of renewable energy (both wind and solar) are rapidly falling making renewable energy based open access a highly lucrative option. By one estimate the solar potential of Mumbai is ~1700 MW⁴; if even half is utilized, it can have major impact on the city’s demand. The network rollout plan is yet to be finalized and that will also affect consumer migration.

Under such circumstances the need and relevance for any long-term PPA itself becomes questionable. Given the changing demand of each DISCOM and the uncertainty with regards to changeover and network rollout, the commission and the utilities should explore the idea of signing medium-term contracts.

⁴ See http://www.ncpre.iitb.ac.in/research/pdf/Estimating_Rooftop_Solar_Potential_Greater_Mumbai.pdf.

Prayers

Given all the issues listed above, we make the following prayers:

- a. Power Purchase Agreements: Allow existing power purchase arrangements to continue at the tariff decided as per the MYT tariff regulations 2015, **only for the next three years, i.e. till the end of the current MYT period**. This would ensure continuity of supply till there is better clarity on the many issues enumerated above. While extending the existing PPA, care should be taken that the extended PPA does not create any liability for the consumers beyond the three-year extension period.
- b. Competitive bidding: The MERC should mandate the Mumbai DISCOMs to undertake power purchase only through the bidding route. This extension will give ample time for the utilities to undertake competitive bidding for discovering tariffs and contracting capacity.
- c. Transmission capacity: The commission and the transmission utilities can take this time to ensure augmentation of the transmission capacity which would provide more options to generators, distribution companies and individual consumers.
- d. The above three prayers are made with regard to all the Mumbai PPAs that have come up for renewal and also those that may come up soon. These points summarise our basic approach towards these issues and hence are not limited to any licensee, but should be considered applicable for all such cases.
- e. Accept this submission on record and allow us to make further submissions in this matter, if any.

Thanking you

Sincerely

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