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December 22, 1999

BEFORE THE MAHARHTRA ELECTRICITY REGULATORY COMMISSION MUMBAI

In the matter of Case No. 1/99 regarding MSEB's proposal for retail tariff

1. Background and Limitations: In November 1999, through a "Notice of Inquiry" in the newspapers, MERC invited comments from public on the MSEB's proposal for retail tariff. Based on the said notice, the applicant obtained copies of the MSEB's proposal and tried to analyze the reasonableness of the MSEB's claimed revenue expenditure.

But, due to inadequate justifications and data provided in the MSEB's proposal, applicant was unable to evaluate the reasonableness of the costs. The applicant wrote to the MSEB and MERC requesting additional data, but received no further information from MSEB despite directions from MERC. Additionally, MERC has not formulated regulations governing it's functioning and principles for tariff determination. As a result of these circumstances, the applicant was forced to file a separate petition to the MERC on December 21, 1999, requesting MERC to formulate regulations, to direct MSEB to resubmit the proposal. The said petition pointed out; a) understating of revenue to the tune of Rs. 210 Cr. in the MSEB's proposal, b) ignoring opportunities of revenue increase without increasing tariff (at least Rs. 500 Cr, only through reduction in commercial T & D loss) and c) costs to the tune of Rs. 1900 Cr., the reasonableness of which cannot be ascertained due to lack of justifications and data. Further, the said petition also pointed out several inconsistencies and deficiencies in the MSEB's proposal.

On this background, we are making this application in response to MSEB's proposal to ensure that our view point is represented in case the MERC decides to go ahead with the process of deliberations on the proposal, but without prejudice to what has been said in the earlier petition.

As pointed out in our petition mentioned above, MSEB's proposal raises more questions than answers. In the absence of adequate justifications and data, the reasonableness of the MSEB's costs cannot be evaluated and costs to the tune of Rs. 1900 Cr. remain unjustified. Even if we assume that just 25 % of these costs cannot

be passed on to the consumers then it amounts to Rs. 475 Cr. Further, MSEB has understated the revenue to the tune of Rs. 210 Cr. and it is possible to raise additional Rs. 500 Cr. through reduction in commercial losses. Considering these facts, MSEB's proposal to increase tariff for raising additional revenue of Rs. 1219 Cr. is totally unjustifiable, and MERC should not allow any tariff increase.

- 2. Possibilities for Cost reduction: There is a need to undertake, on first priority, investigations to evaluate whether MSEB costs are properly spent and whether there exists some scope for reduction in these cost. Since the last few years, the maximum limit of SEB investments that does not require CEA clearance has rapidly increased. As a result, there is an urgent need to evaluate the major investment decisions made by MSEB (that did not require CEA clearance).
 - 2.1. Some of the areas that may be important in this regard are listed here. (a) MERC should study whether the LT capacitors leased by MSEB are properly functioning. This study should also evaluate whether the cost incurred for the capacitors by MSEB is justified. (b) The economics of out-souring (contracting out) work such as pole erection, meter reading, line laying, etc. should be evaluated. The study should include evaluation of alternate ways of getting the work done (including doing work in-house by MSEB, by increasing staff if necessary). (c) Reasonableness of manpower devoted to and financial cost incurred for non-core activities such as vehicle maintenance, or cultural actives such as drama and sports should be evaluated.
 - 2.2. Power Purchase: As mentioned in our letter (dated 29th Nov 1999) to the MSEB and in the petition mentioned above, evaluation of reasonability of quantity and cost of power purchase, and plant dispatching needs to be studied. All relevant data should be made available in public domain as a matter of routine. In fact, as done in USA, this should be put on the utility web site as a mandatory requirement. In USA, several states have mandated that vital data (such as plant generation level, plant performance, fuel cost, per unit total cost, load on major transmission links) is freely available to ordinary citizen through the same mechanism as that of the utility. Such transparent system is easily feasible due to advances in computers and internet, and is considered essential for maintaining efficiency.
 - 2.2.1. The commission should direct MSEB to furnish detailed information of daily (maximum and minimum) demand forecast and likely need for power purchase for the next year. The commission can then get this peer-reviewed.
 - 2.2.2. In the case of peak power shortage, possible purchase of power from DG sets installed by industry (as a back-up) should be explored. Several industries own DG sets, that are operated only in case of power failure. If MSEB offers attractive tariff for such emergency power purchase, these industries may be willing to supply power. This will reduce the power

shortage at a relatively low cost (compared to addition of new power plant of equivalent capacity).

- 2.3. Commission should investigate whether major expenditure (such as large substations and transmission lines for power evacuation) that were made in the past are prudent. It is possible that some of the expenditure is required in course of time but was made in the past and could have been delayed. If the expenditure could have been postponed, then the interest on the expenditure for that period should be treated as unfair cost.
- 2.4. The Rajadhakshaya committee set up by the Government of Maharashtra has made several recommendations for cost reduction of MSEB. MERC should direct MSEB to submit an "Action Taken Report" regarding the committee's recommendations.
- **3. Possibilities for Increase in Revenue (without Increasing Tariff)**: Some of the illustrative areas where revenue increase is feasible are listed below.
 - 3.1. Reduction of commercial losses (theft of power) is potentially a very major source for increase in revenue. Complete metering and energy audit are extremely important for identifying and localizing the pockets of theft.
 - 3.1.1. After each six-month period, MSEB should publish the results of energy audit at district (or even for smaller area) level. The results should be put on its' web-site and also prominently displayed at the office of the local Executive Engineer. The method used for accessing the consumption of unmetered categories (till they exist) should be spelt out in detail. If commission desires, we will be glad to furnish the details of data that should be recorded and displayed.
 - 3.1.2. Use of advanced electronic meters can be critical for this purpose. Due to the importance of the issue, it is taken up as a separate point.
 - 3.1.3. The MSEB should maintain a database of hourly consumption of all HT consumers. This is feasible by use of above mentioned meters. This will help early identification of theft and, moreover, it will be extremely valuable data for demand management.
 - 3.2. Some HT industries, having captive DG sets, use oil for these sets. The cost of oil today ranges around Rs 2 to 2.50 per kWh. This cost of fuel is the variable cost for the industry. During the off-peak hours, when the system frequency is higher than 50 Hz (implying that grid has excess power), MSEB can encourage these industries to stop using their DG sets and purchase power from it. This would be economical assuming that the variable cost (fuel cost + HT transmission loss) of power supply from MSEB plants would be lower than Rs 2.0/unit. For these industries, a special tariff can be devised. Under this system

when power would be available MSEB would communicate it to these users (say half-an-hour in advance) and, similarly, when power would not be available, MSEB would give one-hour notice. The tariff for such off-peak sale of power (depending on availability) can be fixed mid-way between variable cost of supply for MSEB and avoided variable cost of self-generation for industry.

Availability of such low cost off-peak power (including availability of coal) and availability of transmission capacity (in that area) are the two constraints for feasibility of such a measure. Information about these constraints is readily available with MSEB. Here, it is worth noticing that CERC is proposing to create a power pool for non-peak hours. When such a pool will come into existence, NTPC power will be available at the rate of fuel cost for non-peak hours (implying a cost of about Rs. 1 to 1.5/unit).

To quantify the benefits of such a tariff, let us assume that such sale of power is feasible for 5 hours a day, differential between variable cost of MSEB and the variable cost of industry is Rs 1/unit, and tariff is set so as to share this difference equally. For each 5 MW captive DG set, MSEB will be able to sale power for 1,825 hours a year (= 9125 MW hours = 9.125 Million units). The benefit to MSEB (and also to industry) will be Rs 45 lakh per year. The oil import will be reduced by 2,281 Kilo Liter and the PLF of the MSEB thermal plants will also improve (implying reduced oil support).

- 3.3. Situations where shortages exist (such as taking new connections) or where the official payments are perceived as high (such as connected load charges), are areas where possibility of malpractice also exists. This coincides with a general feeling among consumers that these situations are prone to corruption. MERC should ensure that consumers who are ready to pay higher do get a priority connection (such as OYT telephone connection). Or the charges for un-disclosed connected load of residential and commercial consumers is reduced for a fixed period (similar to one time VDIS). This will increase MSEB's revenue and also reduce difficulties faced by consumers. The Commission should identify more of such areas and address the root-causes of mal-practice (i.e. misappropriations of revenue).
- 4. Service Quality: The consumer s' willingness to pay and the quality of service provided to consumers are intrinsically linked. But, unfortunately, the MSEB proposal does not even make any mention of service quality in its proposal. We request the Commission to take up this issue. The Commission should evolve a 'Service Charter' for MSEB to follow and make its frequent and regular evaluation a prerequisite for future tariff applications of MSEB. We would like to do a more detailed submission on this topic at a later date. Here, we wish to point out some of the key and relatively easy to implement issues. We request the Commission to direct MSEB to implement following measures of service quality monitoring / improvement.

4.1. Frequent supply interruptions, low and varying voltage, and changing frequency result in dramatic increase in cost for consumers. These problems cause tremendous loss to economy and country. Not just for the continuous process industry, but even for a simple lathe machine, sudden power interruption implies loss of not just time (manpower, ideal equipment, reduced out-put), but also loss of raw material. The investment done by urban residential and commercial consumers in equipment—like voltage guard, emergency lamps, electronic generators (battery- powered electronic inverters), IC engine-based generation sets—is very high. It is an indication of what <u>some</u> consumers are ready to pay for improved service quality. If this money could have been directed to strengthen the grid, everyone would have benefited.

Today, there exists no mechanism (as far as we know) that monitors the frequency of supply interruptions, cause for the interruption (power shortage, emergency break-down, or routine maintenance), or time for which low voltage persisted. Voltage levels below a particular level should be treated as partial interruption. We suggest that each sub-station should have a simple black board giving these details. The information should be updated monthly. This notice board (made prominently visible) should display the number of times supply was interrupted and reasons for the same. The estimated loss of consumption should also be estimated if feasible. This and other such procedures to measure service-quality should be evolved and results should be made public even at the state level.

As per our knowledge, a frequent cause for supply interruptions is local maintenance work. This is a serious matter considering the loss and inconvenience borne by the consumers, but is also a relatively low cost area to improve the situation.

4.2. The second issue is related to wrong billing. In sizable number of cases, due to the fault in the process of meter reading or malfunctioning of meter, abnormal bills are issued. With computerized billing, already implemented by MSEB, it should be very easy to prevent such incidents. All bills above the amount that is double the normal bill (average of last three bills) should be treated as null and void (unless cross-checked by higher officer). The consumer should not be put to trouble to go to MSEB office and get the bill corrected. In fact, comparing normal consumption while issuing the bill can be used very effectively even for identification of possible places of theft. Some utilities have simple but elaborate procedures for such cross-check followed by personal visit to the consumer premises.

During our meetings with farmers, it was an eye opener for us, to hear that their concern related to wrong meter reading (and excess bill) was one of the serious reasons for their opposition to meters. This issue is revisited in Point 5 on metering.

4.3. MSEB should be asked to prepare guidelines for typical time required for repairing different kinds of faults. This, after approval of commission should be

given wide publicity. For example the Regulatory Commission in Harayana has prepared a draft norms for service quality, which improve over a five year period. MSEB should maintain a record of consumer complaints received, type of complaint, and time required to rectify the same. Such systems exists in telecom sector, some banks, or even in service centers of some consumer appliance companies. The notice board out side the Executive Engineer (or officer of a lower rank) should display the summary of this statistics against the target time.

- **5. Metering**: Proper metering and bill preparation are crucial aspects of power sector business. For several years, we have been suggesting mandatory metering for all consumers.
 - 5.1. We recommend that electronic meters should be made mandatory for all consumers above a particular connected load (say 50 kW).

Good-quality meters available in the market are largely tamper proof. The meters to be installed should be capable of (a) remote meter reading and be compatible for computerized bill preparation (b) charging differential tariff by Time of Day (ToD), and (c) switching off the supply from a central point. The continuous-process industry can be identified and spared from power interruption using these meters. The non-emergency loads such as agriculture can be selectively shut off (only) for the peak duration of say one to two hours, allowing them a lower tariff while minimizing inconvenience to users.

The economics of installing such meters is very attractive. As per the information available to us, good quality (3 phase) meters are available at a cost of less than Rs. 9,000/- per meter (inclusive of meter reading instrument, computer software, and accessories). The cost of meters can be recovered in just one year even if it can curb theft to the tune of only 1.5%.

- 5.2. The issue of purchase and installation of these meters is not a routine investment decision. It is a matter of accountability and efficiency of MSEB. It is an investment having a long-term effect. Hence, we suggest that the MERC should direct MSEB to prepare a plan and obtain MERC's approval for the same. MERC should conduct open consultations before approving such plan.
- **6. Tariff Structure**: For the first time, in the last two decades, MSEB is proposing a reduction in industrial tariff and a sharp increase in the agricultural tariff. Though our comments on this attempt to rebalance the tariff structure are elaborated under point number 7, here we briefly mention other issues that need commission's attention.
 - 6.1. Domestic Tariff: As shown in figure 1 below, the small domestic consumer consuming less that say 20 units / month, pays tariff of more than Rs. 2/ unit. This is a result of 60% increase in the minimum charges, and increase in meter rent. Thus, the proposed tariff structure is very harsh for consumers using just couple of tube lights / bulbs. Hence, the commission should disallow increase in the minimum charges.

Figure 1 : Present and Proposed Effective Tariff for Households



Household Tariff by Consumption

- 6.2. Agricultural Tariff: It is a welcome move that MSEB has proposed to meter all consumers over a period of time. It has been a long-standing demand of several researchers, organisations, and officials. MSEB has proposed a tariff of Rs. 1.25/u for HT and LT (above 10 Hp) agricultural pumps. At present, these consumers pay Rs 0.4/u (based on Rs 700/Hp/yr and 2400 hrs operation as assumed by MSEB). This implies a tariff increase of 200%. In addition, the assumed usage of 2,400 Hrs/year, is on the lower side. Several Lift Irrigation Societies (LIS) operate for more than 3,000 Hrs. In which case, they pay Rs 0.31/u. For such consumers the tariff increase amounts to nearly 300%. Such a steep tariff increase in one stroke may be difficult to implement, and may lead to increase in defaults, unless the state government is ready to subsidise these consumers. Options can be thought of, to make this transition more smooth and sustainable. Two such options are briefly discusses below :
 - 6.2.1. Typically large, co-operative LIS are financed by government or bank loans, having maturity of 8-10 years. The LIS that have repaid the loan will find it easier to pay higher power tariffs. To take advantage of this situation the commission could think of time-slice tariff structure, in which old LIS will be charged higher tariff than the new LIS.
 - 6.2.2. Another option could be to implement a duel tariff structure. In such a scheme, the agricultural consumer should be charged on the basis of both, the connected load as well as actual metered consumption. In the initial years the connected load tariff can be higher and metered tariff can be

nominal. Over the years this can be reversed and finally only metered tariff can be maintained.

Such a gradual, but a well-defined approach will go a long way in building consumer confidence and increase acceptance of meters. This will especially be useful to overcome the fear of metering amongst agricultural consumers. After two decades of flat rate tariff, shifting to metered tariff is difficult process for any one. Many farmers cannot even visualise the approximate quantum of metered bill. Further, they are also worried about the increased possibilities of harassment from MSEB staff and problems of excess bill. Thus, a gradual shift will also allow farmers and LIS members to plan for increasing end use efficiency, of both power and water use and for changes in cropping patterns, if necessary.

Rather than installing standard meters, MSEB could be more consumer friendly, if it incorporates facilities like, voltage guard, automatic starter, and timers in the electronic meters. Instead of seeing it only as a meter, it should be viewed as an integrated electronic device that can fulfill needs of the users as well. The details of facilities desired by farmers will vary by size of pump, but it is important that MSEB starts thinking in that direction.

Further procedures and precautions mentioned in point 4 (about service quality) should also be made applicable to agricultural consumers.

- 6.2.3. HT Industrial tariff: MSEB proposes to reduce the tariff for some HT (EHT) consumers by about 5%.¹ In this respect, MSEB should adopt a more rational policy. Either the tariff should be based on study of paying capacity of different industries or the tariff should be uniform to all industries within one category (i.e. obtaining supply at same voltage level). MSEB should clearly spell out its rational for its proposal of offering concession to a select group of industries.
- 6.2.4. Connected load v/s Contract Demand: For many consumers, a stand-by power generating equipment is a necessity. These consumers find the connected load charges illogical. From MSEB's point of view, what matters is the maximum demand (or contract demand). With the cost of electronic demand limiters coming down rapidly, it makes sense to consider shifting to tariff based on contract demand instead of connected load.
- 6.2.5. Time of Day Tariff (ToD): ToD should be introduced to all consumers with connected load (or contract demand) higher than say 50 kW. Rather than giving a small night time concession of 80 to 50 paisa/unit, the tariff should be worked out on more rational grounds. For industry, it should reflect the marginal cost of generation where the off-peak tariff will be half or less than half of the peak-tariff. It should be adjusted such that, in case the

¹ It is extremely important for MSEB that HT industrial consumers do not shift to DG sets. Each 5 MW DG set amounts to reduced profits of Rs 4 to 5 Crore per year. In other words, over the 20 year life of the DG set this loss of MSEB profit (at today's rates) would be Rs. 80 to 100 crore for each 5 MW DG set.

industry does not shift consumption from peak to off-peak period; then there will be no change in the bill. But when industry shifts consumption from peak to off-peak period, the bill would reduce. The detailed work done by researchers (such as a survey of several industries by Energy Systems Department. of IIT-Bombay) for estimating the effect of ToD tariff could be useful for this purpose.

7. Issue of Reduction in Cross-subsidy: The cross-subsidy in the power sector amounts to nearly 40% of the total turnover. The Electricity Regulatory Commissions Act specifies that the state commissions should ensure that tariffs progressively reflect cost of supply, implying progressive reduction of the cross-subsidy. But this issue has serious social implications. Though the agriculture sector receives huge subsidy from the power sector, several arguments point out a net negative subsidy for the agricultural sector as a whole. As such concentrating only on reduction of power subsidy can lead to several other distortions, with serious economic, social, and security-related implications. Hence, it is essential that before embarking on a more ambitious plan of subsidy reduction, the commission should ensure a wider public debate covering all aspects of this issue.

If equitable water distribution is a social goal, then lower tariff for water lift schemes that have to lift water to higher heights would be essential. But this would be against the principle of cost-based pricing. Another example of this is limitations of the often repeated logic that, cost based pricing leads to economic efficiency. This logic has several limitations. It assumes that choice of alternative production options exists, users have easy access to information and resources, and all players are acting in most rational manner. Issues such as these should also be part of the wider public debate.

- **8. Promotion of Efficient and Environmentally Benign Policies**: For ensuring the long term efficiency and economy of the sector, it is essential that advance action is taken.
 - 8.1. MSEB should carry out what is called "Integrated Least Cost Plan". In this planning exercise, all options of energy supply and energy efficiency (saving) are put on par and a least cost plan is evolved. Several regulatory commissions in the USA and Europe found that such planning and resultant actions are necessary to ensure least-cost of service to consumers. It has repeatedly been found that the options of energy efficiency have much higher potential than is usually believed by utilities. Moreover, the cost of saved energy is far lower than cost of new capacity addition. We suggest that the commission directs MSEB to start preparing such plan and submit it before it seeks next tariff increase or permission for new capacity addition (or power purchase). Several years ago (under World Bank loan), MSEB had appointed a consultant, SCR International, to work out a plan for energy saving (demand side management). The options suggested by the consultant, in their report submitted in August 1995, have not

been implemented despite being economical. This lack of implementation has resulted in inefficient consumption and consequently increased need for costly power purchase. The most important lapse is non-implementation of efficiency measures in the agricultural pumps.² We wish to elaborate on this aspect later.

In fact, I have personally been in touch with high officials since 1992, when we initiated carrying out such a Least Cost plan for the state of Maharashtra. But MSEB has not taken initiative in this regards leading to high cost of service to the consumers.

- 8.2. For moving towards environmentally benign policies, it is necessary to encourage the energy conservation among consumers. As a small step towards this, the commission should direct MSEB to initiate programs for energy saving among the consumers. The MSEB can opt for an open bid where Energy Service Companies (ESCos) can quote for such saving. The MSEB would pay the ESCo after confirming that the claimed savings have been achieved. To start with, the annual target for such saving can be kept at 1% of increase in the peak load.
- 8.3. While the MSEB is proposing a steep increase in the agricultural tariff (especially for the large pumping units), as a part of its social responsibility as well as being a responsible commercial organisation, it should educate farmers and LIS societies about the possibilities for reducing consumption (through improved pumping efficiency). We suggest that MSEB conducts / sponsors training workshops for interested farmers on practical ways to increase the pumping efficiency. The information is not sufficient for improving efficiency. Agencies capable of implementing the suggestions need to be ready and known to the public. MSERC should ensure that lacuna in this are addressed.
- **9. Power Purchase Agreements with IPPs**: As per the Electricity Act, the MSEB is expected to supply power in most economical and efficiency manner. If the cost of power arising from such agreements exceed the normative costs (of efficient and economical supply), then the commission should not pass on this extra cost to the consumers. How to absorb this cost should be left to MSEB.

When the cost of generation of a mega project is higher than inefficient option of DG sets, it is a matter of serious concern. The cost of bulk purchase from DPC is expected to cost Rs 3.82 per unit (as per the MSEB proposal, page 46). Adding cost of Transmission investments, this would go well over Rs 4 per unit. This is higher than the cost of self generation (using DG sets of 5 to 10 MW).³ This is a clear indication of the inefficient contracting by MSEB. The commission should investigate the reasonability of the tariff embedded in the purchase agreements of DPC and other IPPs. We are sure that, as per its mandate, the Commission would not

 $^{^{2}}$ The study found that, if MSEB takes initiative, it could reduce the agricultural consumption with far lower investment (and overall cost in terms of Rs/unit) than the investment necessary (and tariff of IPPs) for supply / procurement of additional power.

³ This is evident from the fact that industry wants to shift to the DG sets even at today's MSEB tariff of Rs 3.6/u, implying that the industry finds it cheaper to put up a DG set and generate its own power.

make consumers pay for inefficiency of MSEB in negotiating contracts, which was done in secret manner.

10. Summary and Prayer before the Commission

1] The MERC should expeditiously formulate the rules and regulations governing the procedural as well as substantive aspects of it's own functioning through a consultative (including open, public debate) process.

2] Considering that the present MSEB proposal is for raising additional revenue of Rs. 1219 Cr. and considering that, as pointed out in paragraph 1 of this application, it would be possible to meet the revenue gap projected by MSEB by (a) reducing commercial losses (Rs. 500 Cr.), (b) disallowing unjustifiable costs (Rs. 475 Cr.) and (c) acknowledging the understated revenue (Rs. 210 Cr.), the Commission should reject MSEB's proposal in the present form and situation.

3] The MERC should ensure that all the future proposals for tariff increase and the MERC's decision- making procedures as well as the decisions on the same would consist of following:

- **§** In-depth analysis and evaluation of costs to identify cost reduction possibilities such as :
 - **§** Bad / unproductive investments
 - **§** Costs and Benefits of contracting out activities v/s in house implementation
 - **§** Uneconomic plant dispatch and power purchase
- § Effective and immediate implementation of measures such as energy audit and electronic metering to reduce commercial losses and increase metering efficacy
- **§** Effective mechanisms and procedures to establish service standards (w.r.t. voltage and frequency, supply interruptions, billing and metering) and linking the same to the tariff charged to consumers
- § Open, public debate with wider participation on issues that have broader economic, social, and security-related implications—which include reduction in subsidies, shift from social to cost-based pricing, and choice of fuel and power generation / conservation options.
- **§** All the information, data and justifications by MSEB and MERC are made available in public domain in timely, expeditious, user-friendly, and easily accessible manner.

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