MAHAVITARAN
Maharashtra State Electricity Distribution Co. Ltd.
(A Govt. of Maharashtra Undertaking)
CIN: U40109MH2005SGC153645

Maharashtra State Electricity Distribution Co. Ltd.
Office of the Director (Commercial)
"Prakashgad", 5th Floor, Station Road, Bandra (E), Mumbai -400 051.
Tel.: (P) 26478747, (O) 26474211, Fax : (022) 2658 0656
Email: edcomm@mahadiscom.in Website: www.mahadiscom.com

Ref.: Dir(Comm)/PP/ 26064

Date: 31.10.2018

To,
The Secretary,
13th Floor,Centre No.1, EWorld Trade Centre,
Cuff Parade,Mumbai 400005

Sub: Comments on MERC' Draft guidelines for operation of Merit Order Despatch in Maharashtra

Ref: 1) MERC's Public Notice dated 02.10.2018

Dear Sir,

MERC vide notification dated 02.10.2018 issued Draft guidelines for operation of Merit Order Despatch in Maharashtra.

In this regards, please find attached herewith the point wise comments of MSEDCL.

Thanking You,

Encl: As above

Satish Chavan
Director (Commercial)

Copy s.w.rs.to:-
Hon.C.M.D., MSEDCL, Mumbai.

COMMENTS OF MSEDCL ON DRAFT MOD GUIDELINES OF MERC

MSEDCL submits its point wise comments on the Draft MOD guidelines issued by the Hon'ble MERC in October 2018 as under :

1. **Periodicity and the date of preparation of MOD**

1.1. "The Variable Charge of the immediately preceding month and in case the Variable Charge of immediately preceding month is not available, the latest available Variable Charge needs to be considered and submitted to MSLDC-OD for preparation of the MOD Stack by the 14th day of every month..."

MSEDCL's Comments:

The Variable Charge for the month for which MOD is being prepared should only be considered. MSEDCL further submits that the Variable Charge for the N^{th} month should be considered for which MOD is being prepared since if the (N-2) Variable Charge is considered, there are chances to schedule costly energy in the N^{th} month on the basis of low Variable Charges reflected in the (N-2) month which may not be the reality. A demonstration of the same issue has been enclosed as **Annexure A**.

Further, the variable charge for MOD purpose should be determined by each Distribution Licensee considering the calculated FAC/ Change in Law on normative basis and shall submit the same to the MSLDC-OD for preparation of the MOD Stack by the 14^{th} day of every month. The Variable Charge depends on the following -

a) Source of Coal
b) GCV of Coal
c) Transportation cost of coal
d) Change in Taxes/ levies duties, etc. since last MOD
e) Anything specific to the power plant

As all the above information is available with the Suppliers for the month for which MOD is being prepared. Therefore, there should not be any difficulty in getting the Variable Charge from all the Suppliers for the current month.

Further, after determining the variable charge for the N^{th} month for which MOD is being prepared, there may be variations on account of unknown factors. But such factors which may vary on account of unforeseen events may also occur when MOD for N^{th} month is prepared considering variable cost of (N-1) (N-2) month.

MSEDCL additionally submits that the separate MOD shall be prepared for all the Distribution Licensees instead of a single State MOD till Frequency Based Settlement Mechanism (FBSM) is operational in the State. It has been observed in the past that due to a single MOD being prepared for the entire State, MSEDCL is incurring losses to the tune of Rs 4228.40 Crores. In regard to this MSEDCL has already filed a petition before the Hon'ble MERC on dated 17/10/2018 annexed as **Annexure B** wherein MSEDCL has p`rayed for compensating the above mentioned loss that MSEDCL has incurred on account of implementation of FBSM. In the current FBSM mechanism, the high variable charge stations

which have tied up with the distribution licensees in Mumbai are being backed down and are drawing power from the FBSM pool which comprises of the low variable charge power of MSEDCL and the settlement for the same is being done after almost two (2) years. Due to this, MSEDCL is incurring losses and hence there is a need to prepared separate MOD for each distribution licensee instead of a single State MOD.

It is further submitted that MSLDC is totally insensitive and oblivious of the commercial aspects and concerns of the distribution licensees. Prior to March 2016, MSLDC was never giving Zero Schedule to the Generators and after a number of correspondences, MSEDCL decided to implement Zero Schedule on its own. Therefore MSLDC cannot be made responsible for preparing the MOD and only the concerned distribution licensee shall prepare its own MOD.

1.1. *"...MSLDC-OD shall prepare the MOD Stack on the 15th day of the month, which would be effective from the 16th day of the month till the 15th of the subsequent month unless revised by MSLDC-OD. MSLDC shall upload the monthly MOD Stack on its website in the format given at Annexure-1 by 15:00 hours on the 15th of every month."*

MSEDCL's Comments:

MSLDC-OD shall publish all the individual MOD Stacks of each Distribution Licensee on the 15th day of the month, which would be effective from the 16th day of the month till the 15th of the subsequent month unless the MOD stack for any Distribution Licensee is revised by it. MSLDC shall upload the monthly individual MOD Stack of each distribution licensee on its website in the format given at Annexure-1 by 15:00 hours on the 15th of every month.

1.2. *"The MOD Stack uploaded on the 15th of the month may be subsequently revised by MSLDC-OD in the following circumstances:...."*

MSEDCL's Comments:

No comments.

1.3. *"...MSLDC-OD shall prepare the MOD Stack on the 15th day of the month, which would be effective from the 16th day of the month till the 15th of the subsequent month unless revised by MSLDC-OD. MSLDC shall upload the monthly MOD Stack on its website in the format given at Annexure-1 by 15:00 hours on the 15th of every month."*

MSEDCL's Comments:

The Generating Company shall consider the latest possible actual GCV of Coal for the Nth month for furnishing Variable Charges to Distribution Licensees for MOD purposes. However due to uncontrollable factors, in case the GCV of coal of Nth month is not available, the estimated GCV of the planned coal for the month shall be considered.

2. Basis and preparation of MOD stack including Variable charge to be considered

2.2. *"For Generating Stations/Units whose Tariff is being determined by the Commission under Section 62 of the EA, 2003, the Variable Charge for MOD purposes shall be the Energy*

Charge (including 'other variable charges', if any) approved by the Commission in the relevant Tariff Orders plus the actual Fuel Surcharge Adjustment (FSA) billed in the immediately preceding (n-1) month. In case the FSA for the preceding month has not been billed by the Generating Company to the Distribution Licensee, the last FSA billed by it shall be considered by the Distribution Licensee."

MSEDCL's Comments:

MSEDCL's comments are as submitted above in Clause 1.1.

2.4. *"For Central Section Generating Stations (CSGS), the Variable Charge for MOD purposes shall be the landed variable cost at the State periphery for the immediately preceding month, including the injection losses."*

MSEDCL's Comments:

For Central Sector Generating Stations (CSGS), the Variable Charge for MOD purposes shall be the landed variable cost at the State periphery for the immediately preceding month, including the injection losses, drawl loss of CTU and other such charges like ED Cess of exporting state (state where the generating plant is located) to be considered to bring variable rate at STU periphery.

2.5. (a) *"For the PPAs entered into under Section 63, the Variable Charge for MOD purposes shall be the Energy Charge payable as per the terms of the PPA for the immediately preceding month."*

MSEDCL's Comments:

For the PPAs entered into under Section 63, the Variable Charge for MOD purposes shall be the Energy Charge payable as per the terms of the PPA for the N^{th} month.

2.5. (c) *"In case the Generating Company has not submitted its claim towards a Change in Law event affecting the Energy Charge within one month of its occurrence, the Generating Company shall not be allowed to raise such claim thereafter."*

MSEDCL's Comments:

The suggested guidelines is welcomed and a need of the hour.

3. Guidelines for operating Generating Units

3.2. *"No special treatment shall be given by MSLDC to any particular Generating Unit, and Units shall be backed down or ramped up strictly as per the MOD Stack."*

MSEDCL's Comments:

No special treatment shall be given by MSLDC to any particular Generating Unit, and Units shall be backed down or ramped up strictly as per the MOD Stack of the particular distribution licensee.

3.5. *"As a basic principle, MSLDC is required to finalise the despatch schedule based on least-cost principles. In exceptional cases, however, some Units with higher Variable Charges which would not normally be permitted under MOD principles to operate, may be required to operate for various uncontrollable reasons such as transmission constraints in any part of Maharashtra, grid security constraints in importing power to the island city of Mumbai, etc.). MSLDC shall maintain details of such deviations from the MOD principles in the format at Annexure-3 and upload them on its website daily. MSLDC shall also prepare the daily backing down report in the format at Annexure-2 and upload it on its website daily."*

MSEDCL's Comments:

MSEDCL accepts this guideline subject to the fixed time line set by Hon'ble MERC to set right transmission constraints issued by STU so as to avoid the unnecessary burden of such costly power on consumers. It is proposed to pass on such burden on STU or the concerned in case such time line is not followed.

If in case MSLDC fails to upload Annexure – 3 as per the Draft MERC Guideline then a penalty may be levied on MSLDC as per a suitable mechanism determined by the Hon'ble MERC.

MSEDCL further submits that it has to operate its Nashik plant due to long standing transmission constraint which is well known to MSLDC and Hon'ble MERC. However, the Honb'le MERC does not consider the costs associated with this Nashik plant while determining the tariff of MSEDCL which is resulting in loss to MSEDCL. Despite repeated follow ups with MSETCL and the Standing Committee, the transmission constraint issue has not been resolved and the financial loss because of running the Nashik plant is to the tune of Rs. 200 Crores per annum annexed as **Annexure C**.

4. GUIDELINES FOR 'ZERO SCHEDULE' FOR GENERATING UNITS

4.2. *"If the anticipated generation availability is more than the anticipated demand, the Distribution Licensee may consider giving Zero Schedule to some of its contracted sources for the period during which the demand is expected to be lower than the total contracted sources availability put together. This should be a conscious decision of the Distribution Licensee in consultation with MSLDC taking into account the demand supply position and transmission constraints."*

MSEDCL's Comments:

MSEDCL submits that consultation with MSLDC is not required as Zero Scheduling is being smoothly implemented by MSEDCL since July 2016. Further, MSLDC has been reluctant to implement Zero Schedule since the beginning.Since MSEDCL has implemented Zero Scheduling it has saved Rs. 305 Crores per annum (Savings in FY 2016-17) annexed as **Annexure D**.

4.3. *"Distribution Licensee shall ensure that the Zero Scheduling does not result in all the Units of a Generating Station whose entire installed capacity is tied up with Distribution Licensee in the State of Maharashtra, being shut down. For such stations, one Generating Unit (in case there are more than one) should be operational to meet the Auxiliary Consumption of the Generating Station."*

MSEDCL's Comments:

This is not required as the generating station is provide with the power supply by distribution licensee for start-up as well as for auxiliary use in case of total plant shut down. This will unnecessary increase the power purchase cost.

To keep atleast one unit of generating station on bar for auxillary consumption may sometimes compel MSEDCL to back down generating unit with less variable cost compared to the station which shall result in additional burden on consumers.

In this regard MSEDCL would like to highlight the case of Rattan India, wherein all the five (5) units of the power station were mostly under Zero Schedule for the FY 2016-17 resulting in savings of Rs. 138 Crores to MSEDCL. If in this case, one (1) unit of Rattan India had been operational as per the provisions of this guideline, MSEDCL would have incurred a loss to the tune of Rs. 33 Crores per annum annexed as **Annexure E**.

Further, MSEDCL submits that if the Hon'ble MERC is concerned about the rate of power for Auxiliary Consumption, it can decide a separate rate/tariff for the same if all the units of the generating power station are under shut down.

4.4. *"If grid constraints prevent the Zero Scheduling of the Unit with the highest Variable Charge in the MOD Stack, the Unit with the next highest Variable Charge needs to be considered. However, MSLDC should publish the details of such grid constraints on its website, along with the period for which it is likely to persist."*

MSEDCL's Comments:

MSEDCL submits that this is acceptable subject to the condition mentioned above in sub clause 3.5.

4.5. *"Reserve Margin equivalent to twice the contracted capacity of the largest Generating Unit of a Power Station, contracted by a Distribution Licensee needs to be maintained, when resorting to Zero Scheduling."*

MSEDCL's Comments:

MSEDCL submits that the Zero Scheduling implemented by it has been operational since the last 2 years without any problems. Thus the requirement of Reserve Margin equivalent to twice the contracted capacity of the largest generating unit of the power station is hypothetical and is not required. In case of MSEDCL, the largest installed capacity of contracted thermal unit is 660 MW and hence the reserve margin as per provision of the Draft guidelines is in the tune of 1320 MW which shall increase the power purchase cost due to backing down of lower cost plant. The increase in power purchase cost is expected to the tune of Rs 494 Crores per annum annexed as **Annexure F** which shall ultimately be passed on to the consumers. Hence there is no need of specifying the reserve margin in MoD guidelines.

Additionally, MSEDCL submits that in order to meet any shortfall in power supply even at the time of any exigency, MSEDCL has Koyna and other Hydro (about 2000 MW) contracted capacity as reserve capacity. Further, Gas based generation and power through exchanges

is also available. Similarly for other distribution utilities Hydro and Gas stations are available to meet out the demand.

4.6. *"The Distribution Licensee must give the Generating Company 24 hours prior notice of the Zero Scheduling to enable it to take steps for smooth removal of the Unit from the Grid."*

MSEDCL's Comments:

MSEDCL submits that the hon'ble Central Electricity Regulatory Commission has approved "detailed procedure for taking unit(s) under Reserve Shut Down and Mechanism for Compensation for Degradation of Heat Rate, Aux Compensation and Secondary Fuel Consumption, due to Part Load Operation and Multiple Start/Stop of Units" vide its order No. No. L-1/219/2017-CERC dated 5th May 2017 annexed as **Annexure G**. As per clause 5.8 of said approved procedure the guidelines are given for taking units under Reserve Shut Down in respect of ISGS station . The necessary provision reproduced as under:"

> *"If the grid conditions do not demand for providing technical minimum to a generating station, the concerned RLDC shall issue R-1 schedule based on the requisitions received. Under such situation, the generating station shall have the option to go for RSD with intimation to RLDC latest by 2100 hrs"*

MSEDCL would like to give recent event of taking Solapur Unit under RSD in the month of July-2018. The instruction was given by RLDC to NTPC Solapur at 13:49 hrs to withdraw Solapur Unit under RSD & accordingly unit was withdrawn at 16:58 Hrs. The copy of correspondence from RLDC & NTPC Solapur is annexed as **Annexure H.**

This implies that notice of 3 hours is sufficient in case of RSD of ISGS units. Hence same principle needs to be applied in case of intra state generator & there is no need to give 24 hrs intimation. Presently MSEDCL is giving zero schedule and Generating sets are withdrawn approx. 8 hrs. Which needs to be reduced further.Hence there is no any need of giving 24 hrs pre intimation for zero schedule.

4.7. *"In case a particular Unit is, in fact, required to be scheduled during the pre-declared Zero Scheduling period, the Distribution Licensee must intimate the Generating Company at least 72 hours in advance for the Unit(s) to come on bar in cold start."*

MSEDCL's Comments:

The CERC has approved procedure for taking unit under RSD. As per provision in said procedure, Unit under RSD can be taken on bar any time after 8 hours from time notified by generating company during which unit will be remained compulsorily under RSD. Infact unit can be taken even before 8 hours provided system condition requirement. The necessary clause of CERC RSD procedure is reproduced as under:

> *"7.1 Once a unit is taken out under RSD, the generating station shall notify the period for which the unit will remain under RSD and the unit can be recalled anytime after 8 hours. In case of system requirements, the generating unit can be revived before 8*

hrs as well. The time to start a machine under different conditions such as HOT, WARM and COLD shall be as per the declaration given by the generating station under the Detailed Procedure for Ancillary Services Operations"

In present condition, ISGS unit remains under compulsory RSD period of 72 Hours and after lapse of 72 hours unit can be called by beneficiary (i.e Distribution licensee). The copy of declaration given by ISGS station declaring its ramp up, ramp down , time to start a machine under Hot start condition & cold start condition is displayed on WRPC website every week alongwith bills of Ancillary services annexed as **Annexure I**. The cold & Hot start timing declared by ISGS station is reproduced as under:

Station	Unit Breakup	Installed	Technical Minimum of station	Ramp up & down rate (per Unit/min)	start up time from cold start (min)	start up time from Hot start (Min)
KSTPS I& II	200x3+ 500x3	2100	1066	1MW for 200MW unit & 2 MW for 500 MW unit	360	240
KSTPS -7	500x1	500	256.4	2	360	240
VSTPS-I	210 x6	1260	630.6	1	300	180
VSTPS-II	500x2	1000	518.4	2.33	300	180
VSTPS-III	500x2	1000	518.4	2.33	300	180
VSTPS-IV	500x2	1000	518.4	2.33	300	180
VSTPS-V	500x1	500	256.4	2.33	300	180
SIPAT-II	500x2	1000	518.4	2.3	420	330
SIPAT1	660x3	1980	1026.4	2	600	480
MSTPS-I	500x2	1000	518	2.33	420	245
MSTPS-II	660x2	1320	686	2.33	600	540
SSTPP	660x1	660	343	2	600	480

It can be seen from above table that cold start time is 10 hrs for Unit having installed capacity of 660 MW and in respect of lower capacity, it is 5 to 7 hrs.

Hence in line with CERC approved RSD procedure, pre-intimation period need to be defined and there is no need of 72 hrs advance intimation to generators to come on bar in cold start.

5. GUIDELINES FOR INSTRUCTING RSD OF GENERATING UNITS BY MSLDC

5.1. "A Reserve Margin equivalent to the contracted capacity of the largest Unit of the Power Station, contracted by the Distribution Licensee needs to be maintained."

5.2. "The RSD should be implemented for the capacity available in excess of the largest Unit contracted by the Distribution Licensee."

MSEDCL's Comments:

MSEDCL submits that its comment is same as submitted above in sub clause 4.5.

In case of MSEDCL, the largest installed capacity of contracted thermal unit is 660 MW and hence the reserve margin as per provision of the Draft guidelines is in the tune of 660 MW which shall increase the power purchase cost due to backing down of lower cost plant. The increase in power purchase cost is expected to the tune of Rs 325 Crores per annum annexed as **Annexure F** which shall ultimately be passed on to the consumers.

However, MSEDCL fails to understand the rationale behind the difference in Reserve Margin in case of Zero Scheduling (twice the contracted capacity of the largest unit of the power station) and the Reserve Margin in case of Reserve Shut Down (same capacity as contracted from the largest unit of the power station).

6. 'MUST RUN' AND HYDRO GENERATING STATIONS

6.7. "As the Hydro generation capacity is flexible capacity to meet the needs of real-time operations, MSLDC shall be responsible for operating Hydro Generating Stations on a daily basis considering the month-wise water availability indicated by the Distribution Licensees. The Hydro Generating Stations shall be operated by MSLDC to meet the system requirements and conditions subject to water availability and meeting irrigation and drinking water needs. In order to meet system contingencies, MSLDC may keep Hydro capacity equivalent to the capacity of largest thermal Unit as a spinning reserve. MSLDC to ensure that the hydro capacity to be kept as spinning reserve should be a mix of hydro units from different generating stations of different generating companies (in proportion to contracted capacity of such hydro generating stations) instead of hydro units from single generating station or hydro units of one generating company. Further, MSDLC shall operate the hydro units kept as spinning reserve in consultation with the respective Distribution Licensees, who have entered into contract with respective Generating Company for such hydro units."

MSEDCL's Comments:

MSEDCL submits that for spinning reserve, the hydro generating station of each distribution licensee should be used and only Koyna hydro plant of MSEDCL should not be burdened with spinning reserve of the entire state for the benefit of distribution licensees of Mumbai at the cost of consumers of MSEDCL.

MSEDCL further submits that till FBSM mechanism is being used, utilization of Koyna hydro generating station cannot be allowed as spinning reserve for the reasons given by MSEDCL in its petition filed on dated 17/10/2018. As such the distribution licensees of Mumbai are getting undue advantage as Koyna hydro plant is being used as a spinning reserve. During the period from June 2018 to October 2018 (upto 22.10.18), Koyna hydro power station has been used as spinning reserve for Mumbai utilities wherein out of the total 21 TMC (volume) of water used for generation at Koyna hydro power plant, 3.5 TMC i.e. 16% has been utilized for providing power to the distribution licensees of Mumbai. While determining ARR of MSEDCL, the Hon'ble MERC

considers the entire generation of Koyna hydro power plant even though a part of the energy generated from Koyna hydro power plant is being utilized by the distribution licensees of Mumbai. This is leading to financial loss to MSEDCL as the low cost power of Koyna is used by Mumbai distribution licensees before the onset of the peak season and MSEDCL has to resort to purchasing costly power from the power exchange market. Also, since water from the Koyna project is used for providing power to Mumbai distribution licensees, the water available to generate power required by MSEDCL during the peak months of April – May each year reduces. Therefore, the utilization of water at Koyna project should be strictly monitored by MSEDCL only.

Additionally, MSEDCL submits that the drawal and injection of power by the distribution licensees of Mumbai should be monitored on real time basis as the latter draw low cost power of MSEDCL from the FBSM pool, when their power demand is more than the supply available, instead of purchasing power from open market / power exchange market. Hence, the distribution licensees of Mumbai should not be allowed to draw low cost power of MSEDCL from the FBSM pool but should be directed to purchase such power from the power exchange market / open market.

Further, MSLDC shall operate the hydro/ gas units of each distribution licensee that has been kept as spinning reserve, upon directives of each of the distribution licensee, in proportion to the contracted capacity of each distribution licensee with their respective hydro/ gas generating stations.

7. TECHNICAL MINIMUM OF GENERATING UNITS

7.1. "The technical minimum for operation in respect of a coal fired/gas fired/multi fuel based thermal generating Unit connected to the STU shall be 55% of its installed capacity."

MSEDCL's Comments:

MSEDCL welcomes this clause and further suggests that the technical minimum level shall be periodically revised as per CEA/CERC guidelines in future.

Satish Chavan
Director (Commercial)
MSEDCL

MOD Stack of variable charges for SOLAPUR STPS U-1 NTPC

N-2 month	Nov-17	Dec-17	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18
MOD stack month	Jan-18	Feb-18	Mar-18	Apr-18	May-18	Jun-18	Jul-18	Aug-18	Sep-18	Oct-18
Rates	3.209	3.3838	3.3532	3.5152	3.4547	3.2547	3.252	3.9809	4.7008	4.6247

The variable charge of Solapur STPS Unit-1 considered in MOD for the month of Jun-18 was Rs. 3.2547 but after billing, actual variable cost calculated was Rs. 3.9809 i.e a rise of 22.31% per unit, thus actual cost of energy was costly than reflected in MOD stack. Similarly, for the months of Jul-18 & Aug-18, the MOD rates were 3.252 & 3.9809 but actual variable cost were 4.7008 & 4.6247 with 44.55% & 16.17% rise.

Annex. B.

MAHAVITARAN (TM)
Maharashtra State Electricity Distribution Co. Ltd.

Maharastra State Electricity Distribution Company Limited
(A Govt. of Maharashtra Undertaking)
CIN No.:U 40109MH2005SGC153645
5th floor, Prakashgad, Plot No.G-9, Bandra (East), Mumbai – 400 051 ☎ (O) 26474211
Email : cepp@mahadiscom.in Website : www.mahadiscom.in

CE/PP/MSEDCL/ No 24579 Date: 16 OCT 2018

To,
The Secretary,
Maharashtra Electricity Regulatory Commission
World Trade Centre,
Cuffe Parade, Colaba,
Mumbai- 400 005.

Sub: Petition seeking recovery of annual fixed cost component in respect of MSEDCL for the energy supplied to the State pool, recovery of differential amount to be recovered towards variable rate, removal of anomalies and directions in regards to overdrawl by Mumbai utilities in Balancing and Settlement Mechanism as per provision of ABT Order dated 17.05.2007 in Case No 42 of 2006 in the matter of introduction of Availability Based Tariff Regime at State level within Maharashtra and other related issues

Respected Sir,

This has reference to above cited subject. Please find enclosed herewith Petition seeking recovery of annual fixed cost component in respect of MSEDCL for the energy supplied to the State pool, recovery of differential amount to be recovered towards variable rate, removal of anomalies and directions in regards to overdrawl by Mumbai utilities in Balancing and Settlement Mechanism as per provision of ABT Order dated 17.05.2007 in Case No 42 of 2006 in the matter of introduction of Availability Based Tariff Regime at State level within Maharashtra and other related issues.

This may please be taken on record & be placed before Hon'ble Commission for kind consideration please.

Thanking You.

Yours faithfully,

Chief Engineer (Power Purchase)

17-10-18

MAHARASHTRA ELECTRICITY REGULATORY COMMISSION
COLABA, MUMBAI - 400 005

Note: The payment of fees for petition has been paid vide UTR No. MAHBH 18289449886 dtd 16.10.2018 copy attached.

Annex-C.

FINANCIAL BURDEN DUE TO NASHIK STATION

MAHAVITARAN
Maharashtra State Electricity Distribution Co. Ltd

Month	No of units on Bar	Gross Generated Energy (Mus)	Aux Consumption (%)	Ex-Bus Generated Energy (Mus)	Nashik Variable Cost (Rs/Unit)	Average Cost of high Cost Unit on bar	Financial Burden (Rs Crs)
Apr-16	2	362	11	322	3.4328	2.9082	16.9
May-16	3	379	11	337	3.5432	2.9109	21.3
Jun-16	3	307	11	273	3.3158	2.9136	11.0
Jul-16	2	259	11	231	3.2298	2.6000	14.5
Aug-16	2	252	11	224	3.4377	2.4654	21.8
Sep-16	2	248	11	221	3.4749	2.4590	22.4
Oct-16	2	263	11	234	3.6529	2.4914	27.2
Nov-16	2	246	11	219	3.5200	2.8800	14.0
Dec-16	2	254	11	226	3.4168	2.8800	12.1
Jan-17	2	259	11	231	3.2605	2.9912	6.2
Feb-17	2	242	11	215	3.5244	2.9527	12.3
Mar-17	2	257	11	229	3.7972	2.9426	19.6
Total							199.4

REDUCTION IN POWER PURCHASE COST BECAUSE OF ZERO SCHEDULING TO HIGH COST GENERATORS FOR THE PERIOD APR-16 TO MAR-17

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Maharashtra State Electricity Distribution Co. Ltd

Utility	Deemed Energy claimed (Mus)	Technical Minimum Energy (Mus)	Average Variable Cost (Rs/Unit)	Average Cost of high Cost Unit on bar (Rs/Unit)	Saving (Rs Crs)
Mahagenco	7681	5999	2.89	2.61	165
RIPL	8421	5912	2.93	2.70	138
APML	849	592	2.40	2.37	2
Total					305

- **Reduction in Power Purchase cost because of Zero scheduling for FY 2016-17 - 305 Crs**

Annex. E.

Additional Financial Burden due to Running one Unit of RIPL

Generation from the Reserved Generators for Sholapur (344 MW)

A. One generating unit of RIPL kept on bar

Sr. No.	Name of the Generating Unit	Variable Cost	Capacity	Availability	Per Day Generation	per day Variable Cost	Monthly Generation	Variable Cost	Annual Generation	Variable Cost
1	RIPL Unit 1	3.0712	270	149	3.37	1.034	101.0394	31.0312205	1229.313	377.54652

B. Generating Units from which power is not scheduled due to RIPL Unit 1

Sr. No.	Name of the Generating Unit	Variable Cost	Capacity	Availability	Per Day Generation	per day Variable Cost	Monthly Generation	Variable Cost	Annual Generation	Variable Cost
1	MSEDCL Pool Power	2.80	270	149	3.37	0.943	101.0394	28.291032	1229.313	344.20756

Financial Burden on MSEDCL due to spinning reserve for RSD (A-B)					
	Financial Burden on MSEDCL due to spinning reserve for RSD (A-B)		Rs. In Crs.		33.33896

Note: Technical Minimum considered as 55%

Additional Financial Burden due to Reserve Capacity

Generation from the Reserved Generators for Sholapur (344 MW)

A. Generating Units to be kept under spinning reserved

Sr. No.	Name of the Generating Unit	Variable Cost	Capacity	Availability	Per Day Generation	per day Variable Cost	Monthly Generation	Variable Cost	Annual Generation	Variable Cost
1	Mouda Stage I	3.5772	424	233	5.29	1.892	158.6693	56.7591748	1930.476	690.56996
2	Mouda Stage II	3.3206	285	157	3.56	1.181	106.6527	35.4150956	1297.608	430.88366
3	Parli Unit 06 and 07	3.274	500	275	6.24	2.042	187.11	61.259814	2276.505	745.32774
			709	665	15.08	5.11	452.43	153.43	5504.59	1866.78

B. Generating Units from which power is not scheduled due to spinning reserve for RSD

Sr. No.	Name of the Generating Unit	Variable Cost	Capacity	Availability	Per Day Generation	per day Variable Cost	Monthly Generation	Variable Cost	Annual Generation	Variable Cost
1	MSEDCL Pool Power	2.80		665	15.08	4.223	452.432	126.680954	5504.589	1541.2849

Financial Burden on MSEDCL due to spinning reserve for RSD (A-B)					
	Financial Burden on MSEDCL due to spinning reserve for RSD (A-B)		Rs. In Crs.		325.49642

Generation details if above generators are under zero schedule

Sr. No.	Name of the Generating Unit	Variable Cost	Capacity	Availability	Per Day Generation	Variable Cost	Monthly Generation	Variable Cost	Annual Generation	Variable Cost
1	Mouda Stage I	3.5772	424	233	5.289	1.892	158.6693	56.7591748	1930.476	690.56996
2	Mouda Stage II	3.3206	285	157	3.555	1.181	106.6527	35.4150956	1297.608	430.88366
3	Parli Unit 06 and 07	3.274	500	275	6.237	2.042	187.11	61.259814	2276.505	745.32774
4	Bhusawal Unit 03	3.2321	210	116	2.620	0.847	78.5862	25.3998457	956.1321	309.03146
5	Parli Unit 08	3.1107	250	138	3.119	0.970	93.555	29.1021539	1138.253	354.07621
6	RattanIndia Unit 01 to 03	3.0712	750	413	9.356	2.873	280.665	86.1978348	3414.758	1048.7403
			2419	1330	30.175	9.804	905.2382	294.133919	11013.73	3578.6293

B. Generating Units from which power is not scheduled due to spinning reserve for zero schedule

Sr. No.	Name of the Generating Unit	Variable Cost	Capacity	Availability	Per Day Generation	per day Variable Cost	Monthly Generation	Variable Cost	Annual Generation	Variable Cost
1	MSEDCL Pool Power	2.80		1330	30.17	8.449	905.2382	253.46669	11013.73	3083.8447

Financial Burden on MSEDCL due to spinning reserve for Zero Schedule (A-B)					
	Financial Burden on MSEDCL due to spinning reserve for Zero Schedule (A-B)		Rs. In Crs.		494.78461

Note: Technical Minimum considered as 55% and Aux. Cons of 5.5%

CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI

No. L-1/219/2017-CERC

Coram:

Shri Gireesh B. Pradhan, Chairperson
Shri A.K. Singhal, Member
Shri A.S. Bakshi, Member
Dr. M.K. Iyer, Member

Date of Order : 5th May 2017

In the matter of

Approval of the detailed procedure for taking unit(s) under Reserve Shut Down and Mechanism for Compensation for Degradation of Heat Rate, Aux Compensation and Secondary Fuel Consumption, due to Part Load Operation and Multiple Start/Stop of Units

ORDER

The Central Electricity Regulatory Commission notified the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010 (Grid Code). The Grid Code was amended vide notifications dated 6.3.2012, 6.1.2014, 10.8.2015 and 6.4.2016. Regulation 6.3B.6 and 6.3B.7 introduced vide amendment dated 6.4.2016 entrusted certain responsibilities to NLDC and RPCs as under:-

> "6. NLDC shall prepare a Detailed Operating Procedure in consultation with the generators and beneficiaries at RPC forums within 2 months' time and submit to the Commission for approval. The Detailed Operating Procedure shall contain the role of different agencies, data requirements, procedure for taking the units under reserve shut down and the methodology for identifying the generating stations or units thereof to be backed down upto the technical minimum in specific Grid conditions such as low system demand, Regulation of Power Supply and incidence of high renewables etc., based on merit order stacking
>
> 7. The RPCs shall work out a mechanism for compensation for station heat rate and auxiliary energy consumption for low unit loading on monthly basis in terms of energy charges and compensation for secondary fuel oil consumption over and above the norm of 0.5 ml/kWh for additional start-ups in excess of 7 start-ups, in consultation with generators and beneficiaries at RPC forum and its sharing by the beneficiaries."

2. POSOCO has submitted the "Detailed Operating Procedure for taking units under Reserve Shut Down" (Detailed Operating Procedure) vide its letter dated 12.8.2016 and 4.11.2016. RPCs have also finalised the "Mechanism for Compensation for Degradation of Heat Rate, Aux Energy Compensation and Secondary Fuel oil Consumption, due to Part Load Operation and Multiple Start/Stop of Unit" (Compensation Mechanism) after discussions with stakeholders.

3. The Detailed Operating Procedure submitted by POSOCO and the Compensation Mechanism submitted by RPCs have been examined. A meeting with all the RPCs, NLDC and CEA was held in the Commission on 27.10.2016 to further discuss and finalise the above said Detailed Operating Procedure and Compensation Mechanism. The Detailed Operating Procedure and the Compensation Mechanism have been finalized in consultation with NLDC, RLDCs, CEA and RPCs.

4. The Commission through this order approves the Detailed Operating Procedure and the Compensation Mechanism in terms of sub-clause 6 of the Regulation 6.3B of Grid Code. The approved Detailed Operating Procedure is annexed at Appendix I to this order. The approved Compensation Mechanism is annexed at Appendix II to this order.

5. The RPCs are directed to provide feedback, after consultation with the stakeholders, on the operation of the Compensation Mechanism within six months from the date of issue of this order for assessment of the efficacy of the Compensation Mechanism. It is clarified that review of the Compensation Mechanism will be undertaken only if it is considered necessary based on operational experience.

6. There is already a procedure for RSD for a station in WRPC in vogue based on principle of removal of costliest stations and also provide for adjustment of allocation of power to other generating stations in the consent of beneficiaries. NLDC is of the view that same needs deliberation. NLDC is advised to deliberate the WRPC procedure in the other RPC's and submit its feasibility in 6 months from the date of issue of the procedure.

7. Based on the feedback about the operation of the DOP on RSD and Compensation Mechanism shall be reviewed by the Commission after six months.

8. The Detailed Operating Procedure and the Compensation Mechanism specified in this order shall come into force from 15.5.2017.

sd/-	**sd/-**	**sd/-**	**sd/-**
(Dr. M.K. Iyer)	**(A.S. Bakshi)**	**(A.K. Singhal)**	**(Gireesh B. Pradhan)**
Member	**Member**	**Member**	**Chairperson**

Appendix-I

Detailed Operating Procedure for Backing Down of Coal/Lignite/Gas unit(s) of the Central Generating Stations, Inter-State Generating Stations and other Generating Stations and for taking such units under Reserve Shut Down on scheduling below Technical Minimum Schedule

1. **General**

1.1 Central Electricity Regulatory Commission notified the Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010 (referred to as "Grid Code") on 28.4.2010 and came into force from 3.5.2010. The Grid Code was subsequently amended through first, second and third amendments which came into force from 2.4.2012, 17.2.2014 and 1.11.2015. The Commission further amended the Grid Code vide Central Electricity Regulatory Commission (Indian Electricity Grid Code)(Fourth Amendment) Regulations, 2016, which was notified on 6.4.2016 (hereinafter referred to as "Amendment Regulations"). The Amendment Regulations provide to the Central Generating Stations, Inter-State Generating Stations and other Generating Stations which are Regional Entities an option to go for Reserve Shut Down (RSD) when the scheduled generation falls below Technical Minimum Schedule (TMS). As per Regulation 6.3B.6 of the Amendment Regulations, National Load Despatch Centre (NLDC) shall prepare a Detailed Operating Procedure in consultation with the generators and beneficiaries.

1.2 NLDC has submitted a draft on The "Detailed Operating Procedure for Backing Down of Coal/Lignite/Gas unit(s) of the Central Generating Stations, Inter-State Generating Stations and other Generating Stations and for taking such units under Reserve Shut Down on scheduling below Technical Minimum Schedule" (hereinafter "Detailed Operating Procedure" or "DOP"). Central Electricity Authority (Technical Standards for Construction of Electrical Plants and Electric Lines) Regulations, 2010 (CEA Regulations) provide for regular load cycling and two shift operation by thermal power plants. Further, these power plants are also required to be designed for a minimum of 4000 hot starts, 1000 warm starts and 150 cold starts. After due consideration of the draft DOP in the light of the comments received from the stakeholders and the provisions of the CEA Regulations, the DOP has been approved as per the provisions delineated hereinafter.

1.3 The DOP shall come into force with effect from the date notified by the Commission in the Official Gazette.

2. **Objective**

The objective of this DOP is to lay down (i) the methodology for identifying the generating stations or units thereof to be backed down in specific grid conditions

entitlements given by the concerned RLDC in accordance with the Grid Code, as amended from time to time.

5.4. Ex-Power Plant (Ex-PP) dispatch schedule of a generating station for each time block shall be computed by the respective RLDC by taking algebraic sum of requisitions of all beneficiaries of that generating station by 1800 hours and same shall be uploaded on website as revision R0 for next day (D) by 1900 hours of current day (D-1). The Ex-PP schedule shall be restricted to On Bar DC.

5.5. If the net EX-PP injection schedule for a generating station is less than technical minimum, the beneficiaries shall be required to review their requisition(s) and submit a revised requisition(s), by 2000 hours of current day (D-1) to the concerned RLDC.

5.6. Based on the revised requisitions received up to 2000 hours of current day (D-1), RLDC shall prepare revised injection schedule for the concerned generating station. If the scheduled injection is still less than technical minimum, RLDC shall review the anticipated demand pattern based on the demand forecast and grid conditions to decide on the requirement of providing technical minimum schedule to the generating station.

5.7. RLDC shall suo-moto revise the schedule of any generating station as per clauses 6.5.14 and 6.5.20 of the Grid Code to operate at or above technical minimum in the ratio of under-requisitioned quantum (with respect to technical minimum) in the interest of smooth system operation under the following conditions:

i. Extreme variation in Weather Conditions
ii. High Load Forecast
iii. To maintain reserves on regional or all India basis
iv. Network Congestion
v. Any other event which in the opinion of RLDC/NLDC shall affect the grid security.

While doing so, it is possible that the requisition of some beneficiaries may go up to ensure technical minimum. In this case, SLDCs may surrender power from some other inter-State generating station(s) or intra-State generating station(s) based on merit order. The concerned RLDC shall issue R-1 schedule accordingly and this shall be intimated to the concerned generating station, through the scheduling process.

5.8. If the grid conditions do not demand for providing technical minimum to a generating station, the concerned RLDC shall issue R-1 schedule based on the requisitions received. Under such situation, the generating station shall have the option to go for RSD with intimation to RLDC latest by 2100 hrs.

6.2.1 RLDC may provide technical minimum schedule considering the system conditions in accordance with Regulations 6.5.14 and 6.5.20 of the Grid Code.

6.2.2 In case the system condition does not require, RLDC shall direct the generating station to take any unit or the generating station under RSD. In such a scenario, RLDC shall display the station likely to go under RSD on its website. In case, the schedule is still less than the technical minimum and generating station decides to take a unit(s) under RSD, it shall inform the same to concerned RLDC.

6.2.3 In order to meet peak load and to maintain reserves, the generating station should endeavour to plan as far as possible the RSD in such a manner that maximum number of units are kept on bar keeping in view economy and efficiency of the units of the generating station.

7. Methodology for revival of generating station or unit(s) from RSD

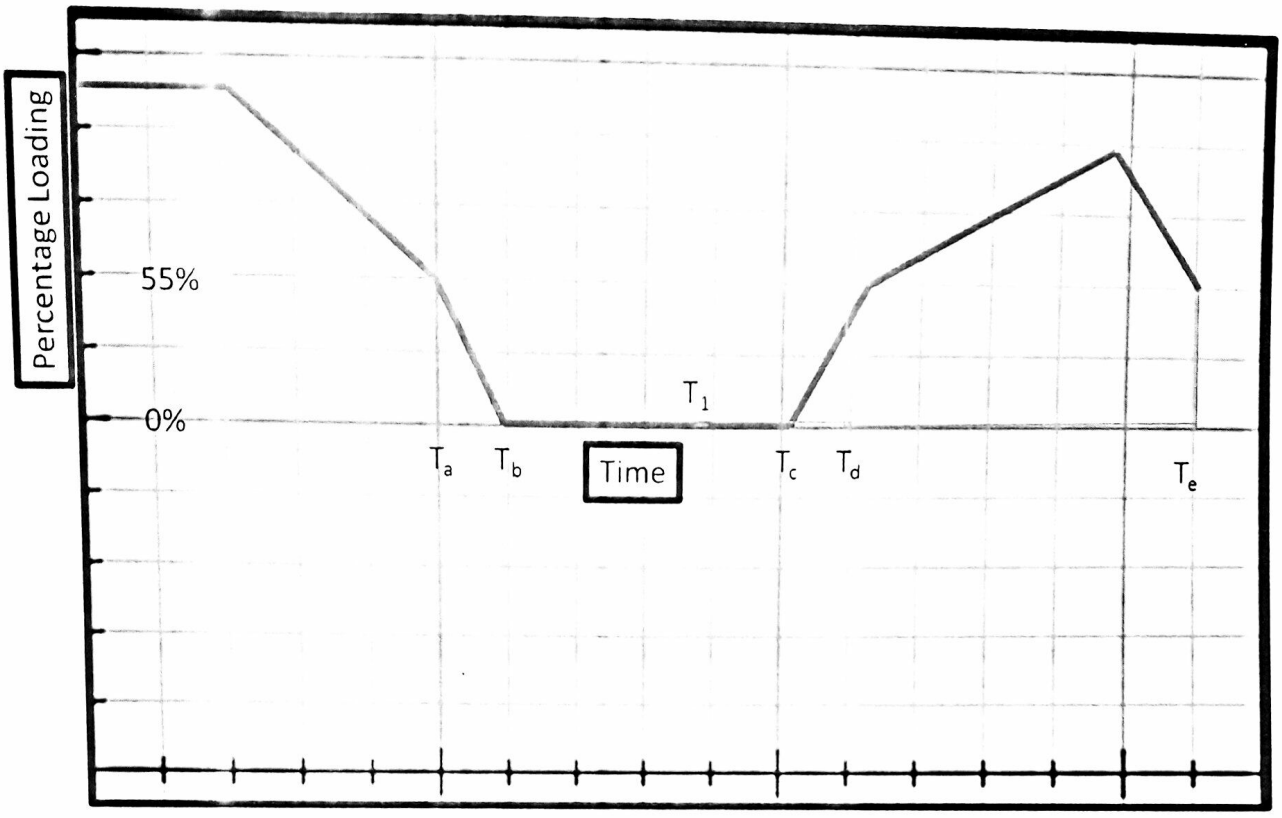
7.1 Once a unit is taken out under RSD, the generating station shall notify the period for which the unit will remain under RSD and the unit can be recalled anytime after 8 hours. In case of system requirements, the generating unit can be revived before 8 hrs as well. The time to start a machine under different conditions such as HOT, WARM and COLD shall be as per the declaration given by the generating station under the Detailed Procedure for Ancillary Services Operations (Format AS-1 and AS-3 of the said Procedure).

7.2 One or more beneficiaries of the generating station as well as the generating station may decide for revival of unit(s) under RSD with commitment for technical minimum schedule with minimum run time of 8 hrs for Coal based generating stations and 3 hrs for Gas based generating stations post revival. In such situations, the generating station shall revise the On Bar and Off Bar DC (with due consideration to ramp up/down capability).

7.3 RLDC may also advise the generating stations to revive unit(s) under RSD for better system operation (IEGC 6.5.20). In such cases, RLDC shall ensure technical minimum schedule by increasing schedule of all the beneficiaries in the ratio of under-requisition.

7.4 In case the machine is not revived as per the revival time declared by the generating station under different types of start, the machine shall be treated under outage for the duration starting from the likely revival time and the actual revival time. RLDC shall ensure that intimation is sent to the generating station sufficiently in advance keeping in view its start-up time.

Annexure–I



T_a= Time at Which Generator unit(s) ramps down for Reserve Shut down.

T_b= Time at which Generator unit(s) reaches Reserve Shut down.

$T_b - T_a$ = Based on Ramp down rates as per AS1 Form submitted under RRAS.

T_1 = Time at which Generator should start its activity to synchronize its unit(s) at T_c to achieve 55% loading for Td.

T_d-T_a = Based on the Condition of the unit(s) (Cold, Warm, Hot) and as specified by AS1 Form submitted under RRAS but less than 8 Hours.

T_C = Time at which Generator unit(s) synchronize.

T_d= Time at which Generator unit(s) reaches schedule above 55% after RSD as per the instruction given to the generator by RLDC. The instruction is given before T_1

$T_d - T_c$ = Based on Ramp up rates as per AS1 Form submitted under RRAS.

T_e = Time at which Generator unit(s) can be given schedule below 55%.

Te-Td>8 hours

Fwd: Reg: withdrawal of NTPC Solapur unit from 14:30 hrs due to less schedule and low WR demand

From: scheduling SLDC (importantschedules@gmail.com)

To: selmkalwa@gmail.com

Date: Thursday, 26 July, 2018, 1:52 PM IST

---------- Forwarded message ----------
From: **WRLDC Control Room** <wrldccr@posoco.in>
Date: Thu, Jul 26, 2018 at 1:49 PM
Subject: Reg: withdrawal of NTPC Solapur unit from 14:30 hrs due to less schedule and low WR demand
To: NRLDC POSOCO <nrldcso@gmail.com>, "NRLDC Control Room (एन.आर.एल.डी.सी. कंट्रोल रूम)" <nrldccr@posoco.in>, SRLDC Control Room <srldccr@posoco.in>, "SRLDC Bangalore (srldccroom@gmail.com)" <srldccroom@gmail.com>, NTPC WR <ntpcwr@gmail.com>, "NTPC (ntpcwr@outlook.com)" <ntpcwr@outlook.com>, DNH Control Room <sldc.dnh@gmail.com>, SLDC CSEB Gmail-1 <sldccseb@gmail.com>, SLDC CSEB Gmail-2 <csebsldc@gmail.com>, SLDC GEB <sldc.getco@gmail.com>, SLDC MPSEB Gmail <sldcmpjbp@gmail.com>, DD Control Room <magarwada@jbsepl.com>, "ed-aesldc-dd@nic.in" <ed-aesldc-dd@nic.in>, MSLDC Outage <msldcoutage@gmail.com>, MSLDC Outages <msldc_outage@mahasldc.in>, msldc schedule <scheduling@mahasldc.in>, SLDC Chattisgarh <csebsldc@sldccg.com>, SLDC Goa <goamainsldc@gmail.com>, SLDC MSEB <cesldc@mahasldc.in>
Cc: NLDC Control Room Gmail-1 <nldcposoco@gmail.com>, "NLDC Control Room (एन.एल.डी.सी. कंट्रोल रूम)" <nldccr@posoco.in>, WRLDC Reliability <wrldcreliability@posoco.in>, WRLDC Reliability Coordinators <wrreliabilitycoordinator@posoco.in>, "V K Shrivastava (वी के श्रीवास्तव)" <vks@posoco.in>

Sir,

Due to rain and cloudy weather there is less demand in WR region which has resulted in power surrender in various central sector generators by WR constituents.

The technical support has been given in various central sector station. However in view of continuous under drawal by Maharastra and other constituent the technical minimum support being given to run NTPC Solapur unit is being withdrawn from 14:30 hrs.

All constituent are requested to analyse own power demand pattern and give proper requisition in NTPC Solapur otherwise the unit may be withdrawn after 14:30 hrs.

regards

--
--
Regards,

Operations Section,
MSLDC, Kalwa.
Maharashtra State.

^_Solapur^_ Unit-1 ^_RSD^_

From: NTPC WR (ntpcwr@gmail.com)

To: control.room@mppmcl.com; csebsldc@sldccg.com; ed-aesldc-dd@nic.in; magarwada@jbsepl.com; sldc.dnh@gmail.com; sldc.getco@gmail.com; schedulesldc@gmail.com; goamainsldc@gmail.com; sldcmpjbp@gmail.com; controlroom.tradeco@gmail.com; selmkalwa@gmail.com; wrldccr@posoco.in

Cc: sceccrsolapur@gmail.com

Date: Thursday, 26 July, 2018, 5:02 PM IST

Dear Sir,

Solapur: Unit-1 withdrawn at 16:58 hrs due to low Schedule & kept under RSD.

धन्यवाद / Regards,
पाली प्रभारी /Shift In charge
पश्चिम क्षेत्र-1 मुख्यालय एन टी पी सी / WRHQ-1, NTPC
मुंबई / Mumbai
Tel: 022-28310217/022-40225700

Format AS1: Generator Details by RRAS Provider

From: Korba - I&II / NTPC LTD

To: WRPC

Validity of the Information **From: 16/10/2018** **To: 15/11/2018**

Date: 09/10/2018

S.No	Title/Parameters	Values/Data
a)	Number of Generating Units	3x200 MW + 3x500 MW
b)	Total Installed Capacity (MW)	2100 MW
c)	Maximum possible Ex-bus injection (MW) (including overload if any)	1960MW from till21.10.2018 1778MW from21.10.18-15.11.18
d)	Technical Minimum (MW)	1066MW from till21.10.18 978MW from21.10.18-15.11.18
e)	Type of fuel	Coal
f)	Region	WR
g)	Bid area	W3
h)	Fixed Cost (paise / kwh upto one decimal place)	68.9
I)	Variable Cost (Paise / kWh upto one decimal place)	133.7
j)	Ramp-Up Rate (MW/Min) for each unit	1 MW / Min 200 MW & 2 MW / Min 500 MW
k)	Ramp-Down Rate (MW/Min) for each unit	1 MW / Min 200 MW & 2 MW / Min 500 MW
l)	Start- up Time from Cold Start (in Min) & Warm Start of each unit	Cold Start- up: 360 min Warm Start - up:240 min
m)	Any other information	Unit#3 AOH from 21.10.18 for 25 days

Signature of Authorized Signatory (with Stamp)
Name: P A Pande
Designation:GM(COMML)

NTPC LTD,WR-I HQ,Mumbai-93

Format AS1: Generator Details by RRAS Provider

From: Korba - III / NTPC LTD

To: WRPC

Validity of the Information **From: 16/10/2018** **To: 15/11/2018**

Date: 09/10/2018

S.No	Title/Parameters	Values/Data
a)	Number of Generating Units	1x500 MW
b)	Total Installed Capacity (MW)	500 MW
c)	Maximum possible Ex-bus injection (MW) (including overload if any)	471.25 MW
d)	Technical Minimum (MW)	256.4MW Ex bus
e)	Type of fuel	Coal
f)	Region	WR
h)	Fixed Cost (paise / kwh upto one decimal place)	139.6
I)	Variable Cost (Paise / kWh upto one decimal place)	131.4
j)	Ramp-Up Rate (MW/Min) for each unit	2 MW / MIN
k)	Ramp-Down Rate (MW/Min) for each unit	2 MW / MIN
l)	Start- up Time from Cold Start (in Min) & Warm Start of each unit	Cold Start- up: 360 min Warm Start - up:240 min
m)	Any other information	

Signature of Authorized Signatory (with Stamp)

Name: P A Pande

Designation:GM(COMML)

NTPC Ltd. W.R-1 HQ.Mumbai-93

Format AS1: Generator Details by RRAS Provider

From: Vindhyachal I / NTPC LTD

To: WRPC

Validity of the Information **From: 16/10/2018** **To: 15/11/2018**

Date: 09/10/2018

S.No	Title/Parameters	Values/Data
a)	Number of Generating Units	6 x 210 MW
b)	Total Installed Capacity (MW)	1260 MW
c)	Maximum possible Ex-bus injection (MW) (including overload if any)	1160 MW
d)	Technical Minimum (MW)	630.6 MW
e)	Type of fuel	COAL
f)	Region	WR
g)	Bid area	
h)	Fixed Cost (paise / kwh upto one decimal place)	86.4
I)	Variable Cost (Paise / kWh upto one decimal place)	156.5
j)	Ramp-Up Rate (MW/Min) for each unit	15 MW / Block / Unit
k)	Ramp-Down Rate (MW/Min) for each unit	15 MW / Block / Unit
l)	Start- up Time from Cold Start (in Min) & Warm Start of each unit	Cold: 300 min Warm:180 Min
m)	Any other information	

Signature of Authorized Signatory (with Stamp)
Name: P A Pande
Designation:GM(COMML)

NTPC - WRHQ,WR-I HQ,Mumbai-93

Format AS1: Generator Details by RRAS Provider

From: Vindhyachal II / NTPC LTD

To: WRPC

Validity of the Information From: 16/10/2018 To: 15/11/2018

Date: 09/10/2018

S.No	Title/Parameters	Values/Data
a)	Number of Generating Units	2 x 500
b)	Total Installed Capacity (MW)	1000
c)	Maximum possible Ex-bus Injection (MW) (including overload if any)	950
d)	Technical Minimum (MW)	518.4 MW
e)	Type of fuel	COAL
f)	Region	WR
g)	Bid area	
h)	Fixed Cost (paise / kwh upto one decimal place)	70.1
I)	Variable Cost (Paise / kWh upto one decimal place)	146.2
j)	Ramp-Up Rate (MW/Min) for each unit	35 MW / Block / Unit
k)	Ramp-Down Rate (MW/Min) for each unit	35 MW / Block / Unit
l)	Start- up Time from Cold Start (in Min) & Warm Start of each unit	Cold: 300 min Warm:180 Min
m)	Any other information	

Signature of Authorized Signatory (with Stamp)
Name: P A Pande
Designation:GM(COMML)

मुंबई-93
Mumbai-93

Format AS1: Generator Details by RRAS Provider

From: Vindhyachal III / NTPC LTD

To: WRPC

Validity of the Information **From: 16/10/2018** **To: 15/11/2018**

Date: 09/10/2018

S.No	Title/Parameters	Values/Data
a)	Number of Generating Units	2 x 500
b)	Total Installed Capacity (MW)	1000
c)	Maximum possible Ex-bus injection (MW) (including overload if any)	960
d)	Technical Minimum (MW)	518.4 MW
e)	Type of fuel	COAL
f)	Region	WR
g)	Bid area	W1
h)	Fixed Cost (paise / kwh upto one decimal place)	105.5
I)	Variable Cost (Paise / kWh upto one decimal place)	146.9
j)	Ramp-Up Rate (MW/Min) for each unit	35 MW / Block / Unit
k)	Ramp-Down Rate (MW/Min) for each unit	35 MW / Block / Unit
l)	Start- up Time from Cold Start (in Min) & Warm Start of each unit	Cold: 300 min Warm:180 Min
m)	Any other information	

Signature of Authorized Signatory (with Stamp)
Name: P A Pande
Designation:GM(COMML)

NTPC LTD WR-1 HQ,Mumbai-93

Format AS1: Generator Details by RRAS Provider

From: Vindhyachal IV / NTPC LTD

To: WRPC

Validity of the Information **From:** 16/10/2018 **To:** 15/11/2018

Date: 09/10/2018

S.No	Title/Parameters	Values/Data
a)	Number of Generating Units	2 x 500
b)	Total Installed Capacity (MW)	1000
c)	Maximum possible Ex-bus injection (MW) (including overload if any)	960
d)	Technical Minimum (MW)	518.4 MW
e)	Type of fuel	COAL
f)	Region	WR
g)	Bid area	W1
h)	Fixed Cost (paise / kwh upto one decimal place)	158
I)	Variable Cost (Paise / kWh upto one decimal place)	146.3
j)	Ramp-Up Rate (MW/Min) for each unit	35 MW / Block / Unit
k)	Ramp-Down Rate (MW/Min) for each unit	35 MW / Block / Unit
l)	Start- up Time from Cold Start (in Min) & Warm Start of each unit	Cold: 300 min Warm:180 Min
m)	Any other information	

Signature of Authorized Signatory (with Stamp)
Name: P A Pande
Designation:GM(COMML)

एन.टी.पी.सी.लि., प.क्षे.1 मु.,मुंबई-93
NTPC LTD,WR-1 HQ,Mumbai-93

Format AS1: Generator Details by RRAS Provider

From: Vindhyachal V / NTPC LTD

To: WRPC

Validity of the Information **From: 16/10/2018** **To: 15/11/2018**

Date: 09/10/2018

S.No	Title/Parameters	Values/Data
a)	Number of Generating Units	1 x 500
b)	Total Installed Capacity (MW)	500
c)	Maximum possible Ex-bus injection (MW) (including overload if any)	480
d)	Technical Minimum (MW)	256.4
e)	Type of fuel	COAL
f)	Region	WR
g)	Bid area	
h)	Fixed Cost (paise / kwh upto one decimal place)	168.65
I)	Variable Cost (Paise / kWh upto one decimal place)	149.6
j)	Ramp-Up Rate (MW/Min) for each unit	35 MW / Block / Unit
k)	Ramp-Down Rate (MW/Min) for each unit	35 MW / Block / Unit
l)	Start- up Time from Cold Start (in Min) & Warm Start of each unit	Cold: 300 min Warm:180 Min
m)	Any other information	

Signature of Authorized Signatory (with Stamp)
Name: P A Pande
Designation:GM(COMML)

WR-1 HQ,Mumbai-93

Format AS1: Generator Details by RRAS Provider

From: Mouda I / NTPC LTD

To: WRPC

Validity of the Information From: 16/10/2018 To: 15/11/2018

Date: 09/10/2018

S.No	Title/Parameters	Values/Data
a)	Number of Generating Units	2 x 500 MW
b)	Total Installed Capacity (MW)	1000 MW
c)	Maximum possible Ex-bus injection (MW) (including overload if any)	967.5 MW
d)	Technical Minimum (MW)	259 MW per unit
e)	Type of fuel	Primary : Coal, Secondary: LDO
f)	Region	WR
g)	Bid area	
h)	Fixed Cost (paise / kwh upto one decimal place)	189.4
I)	Variable Cost (Paise / kWh upto one decimal place)	339.3
j)	Ramp-Up Rate (MW/Min) for each unit	2.33 MW
k)	Ramp-Down Rate (MW/Min) for each unit	2.33 MW
l)	Start- up Time from Cold Start (in Min) & Warm Start of each unit	Cold Start - up: 420 min* Warm Start - up : 245 min*
m)	Any other information	

* Time from Boiler light-up to Unit synchronization

Signature of Authorized Signatory (with Stamp)
Name: P A Pande
Designation:GM(COMML)

एन टी पी सी लि., प.क्षे.1 मु.,मुंबई-93
NTPC LTD.,WR-1 HQ,Mumbai-93

Format AS1: Generator Details by RRAS Provider

From: Mouda II/ NTPC LTD

To: WRPC

Validity of the Information From: 16/10/2018 To: 15/11/2018

Date: 09/10/2018

S.No	Title/Parameters	Values/Data
a)	Number of Generating Units	2 x 660 MW
b)	Total Installed Capacity (MW)	1320
c)	Maximum possible Ex-bus injection (MW) (including overload if any)	1277.1
d)	Technical Minimum (MW)	343 per Unit
e)	Type of fuel	Primary : Coal, Secondary: LDO
f)	Region	WR
g)	Bid area	
h)	Fixed Cost (paise / kwh upto one decimal place)	142.2
I)	Variable Cost (Paise / kWh upto one decimal place)	316.3
j)	Ramp-Up Rate (MW/Min) for each unit	2.33 MW
k)	Ramp-Down Rate (MW/Min) for each unit	2.33 MW
l)	Start- up Time from Cold Start (in Min) & Warm Start of each unit	Cold Start - up: 600 min* Warm Start - up : 540 min**
m)	Any other information	

* Time from Boiler light-up to Unit synchronization

Signature of Authorized Signatory (with Stamp)
Name: P A Pande
Designation:GM(COMML)
NTPC LTD.,WR-1 HQ,Mumbai-93

Format AS1: Generator Details by RRAS Provider

From: Sipat I / NTPC LTD

To: WRPC

Validity of the Information From: 16/10/2018 To: 15/11/2018

Date: 09/10/2018

S.No	Title/Parameters	Values/Data
a)	Number of Generating Units	3 x 660 MW
b)	Total Installed Capacity (MW)	1980 MW
c)	Maximum possible Ex-bus injection (MW) (including overload if any)	1866 MW
d)	Technical Minimum (MW)	1026.4 MW
e)	Type of fuel	COAL
f)	Region	WR
g)	Bid area	W3
h)	Fixed Cost (paise / kwh upto one decimal place)	131.54
I)	Variable Cost (Paise / kWh upto one decimal place)	130
j)	Ramp-Up Rate (MW/Min) for each unit	2 MW / Unit
k)	Ramp-Down Rate (MW/Min) for each unit	2 MW / Unit
l)	Start- up Time from Cold Start (in Min) & Warm Start of each unit	Cold: 600 Min Warm : 480 Min
m)	Any other information	NIL

Signature of Authorized Signatory (with Stamp)
Name: P.A Pande
Designation:GM(COMML)

लि., प.क्षे.1 मु.,मुंबई-93
NTPC LTD.,WR-1 HQ,Mumbai-93

Format AS1: Generator Details by RRAS Provider

From: Sipat II / NTPC LTD

To: WRPC

Validity of the Information **From: 16/10/2018** **To: 15/11/2018**

Date: 09/10/2018

S.No	Title/Parameters	Values/Data
a)	Number of Generating Units	2 x 500 MW
b)	Total Installed Capacity (MW)	1000 MW
c)	Maximum possible Ex-bus injection (MW) (including overload if any)	943 MW
d)	Technical Minimum (MW)	518.4 MW
e)	Type of fuel	COAL
f)	Region	WR
g)	Bid area	W3
h)	Fixed Cost (paise / kwh upto one decimal place)	124.87
I)	Variable Cost (Paise / kWh upto one decimal place)	133.8
j)	Ramp-Up Rate (MW/Min) for each unit	2.3 MW / Unit
k)	Ramp-Down Rate (MW/Min) for each unit	2.3 MW / Unit
l)	Start- up Time from Cold Start (in Min) & Warm Start of each unit	Cold: 420 Min Warm : 330 Min
m)	Any other information	NIL

Signature of Authorized Signatory (with Stamp)
Name: P A Pande
Designation:GM(COMML)

[illegible], प क्षे 1 मु.,मुंबई-93
[illegible] W.R-I HQ,Mumbai-93

Format AS1: Generator Details by RRAS Provider

From: Solapur Super Thermal Power Project / NTPC LTD

To: WRPC

Validity of the Information From: 16/10/2018 To: 15/11/2018

Date: 09/10/2018

S.No	Title/Parameters	Values/Data
a)	Number of Generating Units	2 x 660 MW
b)	Total Installed Capacity (MW)	660 MW
c)	Maximum possible Ex-bus injection (MW) (including overload if any)	653 MW
d)	Technical Minimum (MW)	343 MW
e)	Type of fuel	COAL
f)	Region	WR
g)	Bid area	W3
h)	Fixed Cost (paise / kwh upto one decimal place)	215.6
I)	Variable Cost (Paise / kWh upto one decimal place)	482.4
j)	Ramp-Up Rate (MW/Min) for each unit	2.0 MW / Unit
k)	Ramp-Down Rate (MW/Min) for each unit	2.0 MW / Unit
l)	Start- up Time from Cold Start (in Min) & Warm Start of each unit	Cold: 600 Min Warm:480 Min
m)	Any other information	NIL

Signature of Authorized Signatory (with Stamp)

Name: P A Pande

Designation :AGM(Comml)

General Manager (Comml.)

एन टी पी सी लि., प.क्षे.1 मु., मुंबई-93

NTPC LTD ,WR-1 HQ,Mumbai-93