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दिनांक: 18 April 2023

सेवा में,

All the Stakeholders

विषय: Detailed Procedure for Tertiary Reserve Ancillary Services (TRAS)

संदर्भ: Central Electricity Regulatory Commission (CERC) (Ancillary Services) Regulations, 2022

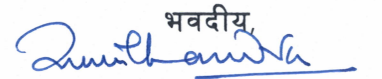
महोदय/महोदया,

CERC (Ancillary Services) Regulations, 2022 were notified on 31st January, 2022. The operation of the aforesaid regulations, except certain provisions pertaining to Tertiary Reserve Ancillary Services (TRAS), has been done w.e.f 05th December, 2022. Subsequently, vide order dated 27 March, 2023, Central Commission has notified that provisions pertaining to TRAS shall come into force w.e.f 01 May, 2023.

As per the above regulations, National Load Despatch Centre (NLDC), Grid-India has been designated as the Nodal Agency. In compliance to Regulation 23 of the aforesaid regulations, a draft detailed procedure for Tertiary Reserve Ancillary Services (TRAS) was circulated by the Nodal Agency for stakeholder consultations on 20 February, 2023. Suggestions received during the stakeholder consultation process have been considered and suitably incorporated.

The final detailed procedure is hereby attached as **Annexure** and also placed on the Grid-India website at <https://grid-india.in/spinning-reserves/>

सधन्यवाद,



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संलग्न – Detailed Procedure for TRAS in compliance with regulation 23 of the CERC (Ancillary Services), Regulations, 2022

प्रतिलिपि - सचिव, केंद्रीय विद्युत विनियामक आयोग, नई दिल्ली-110001



Grid Controller of India Ltd.

(Formerly POSOCO)

Detailed Procedure for Tertiary Reserve Ancillary Service (TRAS)

*Prepared in Compliance to
Central Electricity Regulatory Commission (Ancillary Services)
Regulations, 2022*

National Load Despatch Centre (NLDC), New Delhi

April 2023

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Annexure – 1	Reserve Requirement Information Dissemination
Annexure – 2	Sample Bid Format and Illustrations
Annexure – 3	High level algorithm for TRAS Bid Clearing

1.0 Preamble

- 1.1 Maintaining frequency stability is critical for the integrated operation of a large interconnected power system like India. Generally, frequency response of any power system can be characterized by different time window-based responses, such as, inertial, primary frequency, secondary frequency, and tertiary frequency response.
- 1.2 Tertiary reserves would act as replenishment for secondary reserves as secondary reserves are to be restored back to their original level for preparation towards next contingency. Tertiary reserve need to be greater or equal to secondary reserves to take care of contingencies. The tertiary reserves have to be maintained at both regional entity level as well as state control area in a distributed manner.
- 1.3 Tertiary control through Reserve Regulation Ancillary Services (RRAS) has already been implemented pan India since April 2016. Over 65 power plants with an installed capacity of around 68,000 MW are available for despatch under RRAS on day to day basis.
- 1.4 Central Electricity Regulatory Commission (CERC) has notified (Ancillary Services) Regulations, 2022, hereinafter referred to as the "AS Regulations". It has provided for Ancillary Services in the form of Secondary Reserve Ancillary Services (SRAS) and Tertiary Reserve Ancillary Services (TRAS).
- 1.5 Vide Order No. RA-14026(11)/3/2019-CERC dated 15 February 2023 and Order No. RA-14026(11)/3/2019-CERC dated 27 March 2023, Central Commission has notified that the following provisions of the AS Regulations shall come into force from 01 May 2023:
 - 1.5.1 Provisions pertaining to TRAS under Regulation 6;
 - 1.5.2 Regulations 14 to 19;
 - 1.5.3 Provisions pertaining to TRAS in Regulations 20 to 22
 - 1.5.4 Regulations 26.
- 1.6 It has been further notified in the aforesaid order dated 27 March 2023 that, with the coming into force of Regulations 26, the Detailed Procedures issued under CERC (Ancillary Services) Regulations, 2015 shall cease to be in operation from 01 May 2023.
- 1.7 "Tertiary Reserve Ancillary Service" or "TRAS" means the Ancillary Service comprising TRAS-Up and TRAS-Down and consists of spinning reserve or non-

spinning reserve, which responds to despatch instructions from the Nodal Agency.

- 1.8 As per the regulations, NLDC has been designated as the Nodal Agency. Further, it has been provided that detailed procedure on the operational aspects of Tertiary Reserve Ancillary Services (TRAS) are to be submitted by the Nodal Agency (Regulation 23(1)) for the information of the Hon'ble Commission.
- 1.9 National Load Despatch Centre i.e. the Nodal Agency, in coordination with RLDCs and SLDCs, shall estimate the quantum of requirement of TRAS, for such period and based on such methodology as specified in the Grid Code. Nodal Agency has proposed an interim methodology, till notification of revised Grid Code, for estimation of reserves which has been approved by the Central Commission on 02 December 2022. The procedure is available at following web-link: <https://grid-india.in/detailed-procedure-for-estimation-of-the-requirement-of-secondary-reserve-ancillary-service-sras-and-tertiary-reserve-ancillary-service-tras-at-regional-level/>

2.0 Scope

- 2.1 This procedure lays down the roles and methodology to be followed for the operational aspects of procurement, deployment and payment of TRAS in accordance with the CERC (Ancillary Services) Regulations, 2022 to be followed by the Nodal Agency (NLDC), RLDCs, SLDCs, RPCs, Power Exchange(s) and TRAS Providers.

3.0 Definitions

- 3.1 All the words and expressions used in the Procedure shall have the same definition as assigned to them in the Electricity Act, 2003 and various CERC Regulations.

4.0 Roles

4.1 Nodal Agency (NLDC)

- 4.1.1 Nodal Agency would, in coordination with RLDCs and SLDCs, estimate the quantum of requirement of TRAS, for such period and based on such methodology as specified in the Grid Code.
- 4.1.2 The exchange of information regarding TRAS between the Nodal Agency and the Power Exchange(s) shall be through National Open Access

Registry (NOAR) and/or appropriate software applications.. TRAS Providers shall be provided relevant information through NOAR, scheduling system and other software applications.

- 4.1.3 Nodal Agency shall communicate to the Power Exchange(s), the range of requirement of TRAS-Up and TRAS-Down in the Day Ahead AS Market and Real Time AS Market, considering the reserves likely to be available in real-time basis. The reserve requirement would be updated as and when required.
- 4.1.4 Nodal Agency shall perform price discovery based on the bids for TRAS-Up & TRAS-Down collected and provided by the Power Exchange(s), and TRAS requirement in the Day Ahead AS Market and Real Time AS Market.
- 4.1.5 Nodal Agency would activate and give TRAS despatch instructions to TRAS Providers based on triggering criteria laid down in this procedure.
- 4.1.6 In case of shortfall, all generating stations, whose tariff is determined by the Commission under Section 62 of the Act (including for inter-state generating stations whose tariff has been determined for full or part capacity) including those having URS power after declaration of the RTM results, shall be deemed to be available for use by the Nodal Agency for TRAS subject to technical constraints (like technical minimum, ramp rate etc.) of such generating stations.
- 4.1.7 In order to meet the emergency conditions for reasons of grid security as per the provisions of the Grid Code, Nodal Agency may require any generating station to provide Ancillary Services.
- 4.1.8 Nodal Agency would provide data (cleared volume, despatched volumes, energy charge/compensation charge, market clearing price, commitment charge) to respective RPCs, through RLDCs, for accounting and settlement through Regional Deviation and Ancillary Service Pool Account in respect of the regional entity TRAS providers on a weekly basis as per timelines specified in the Grid Code.
- 4.1.9 Nodal Agency would provide data (cleared volume, despatched volumes, energy charge/compensation charge) to respective SLDCs, through RLDCs, for the accounting and settlement through Regional Deviation and

Ancillary Service Pool Account in respect of the intra-state TRAS providers on a weekly basis.

4.1.10 For the intra-state generators, the settlement of payments towards TRAS-Up/TRAS-Down along with the applicable commitment charges would be done by the Nodal Agency/RLDCs with the respective Regional Deviation and Ancillary Service Pool Account as per the weekly TRAS statement of accounts issued by respective RPCs.

4.1.11 Nodal Agency would publish information on its website about TRAS procured, scheduled and dispatched on weekly basis and submit monthly feedback reports to the Central Commission.

4.2 Regional Load Despatch Centres (RLDCs)

4.2.1 Any Entity, who satisfies the conditions for scheduling, metering & energy accounting by RLDCs, as per extant Grid Code provisions, and is intending to participate in the Day Ahead AS Market and Real Time AS Market as a Regional Entity shall obtain "Standing Clearance" by applying through NOAR from the respective RLDCs. The standing clearance already issued for short term market would be valid for participation in the TRAS market subject to registration in NOAR as per this procedure.

4.2.2 The respective RLDCs would maintain record of cleared and despatched TRAS quantum for regional entity TRAS Providers.

4.2.3 In the case of intra-state TRAS Provider, RLDC shall forward the weekly TRAS 15-minute MW despatched quantum to the respective SLDC.

4.2.4 RLDCs shall incorporate the despatched quantum of intra-state TRAS Providers to the respective state's net schedule in real time via WBES.

4.3 State Load Despatch Centres (SLDCs)

4.3.1 State Utilities and intra State entities proposing to participate in the Day Ahead AS Market and Real Time AS Market shall obtain "Standing Clearance" from the respective SLDCs. The standing clearance already issued for short term market would be valid for participation in the TRAS market subject to registration in NOAR.

4.3.2 The respective SLDCs would maintain record of cleared and despatched TRAS quantum for intra-state entity TRAS Providers. The SLDCs shall

ensure that cleared TRAS quantum of intra-state TRAS Provider shall not be scheduled by the intra-state beneficiaries/procurers.

- 4.3.3 SLDCs shall use the despatched quantum of TRAS for intra-state TRAS Provider and incorporate it in the state's net schedule (with appropriate sign) for the purpose of monitoring deviations at state periphery and at intra-state TRAS Provider periphery.
- 4.3.4 SLDCs shall include the 15-minute TRAS MW despatched quantum data in the schedules of TRAS Providers as received from RLDC for deviation settlement.
- 4.3.5 As per Clause 5.3 of the interim methodology for estimation of reserves for SRAS and TRAS as approved by the Central Commission, the SLDC shall maintain reserves as estimated by Nodal Agency or as per the estimation carried out by the SLDC in accordance with the IEGC or State Grid Code, as the case may be.

4.4 TRAS Providers

- 4.4.1 TRAS Providers shall get registered on NOAR portal for participation in the TRAS mechanism. The registration details would have both technical and commercial parameters as per **Format TRAS – I**. Those participants who are already registered on the NOAR for STOA shall provide additional details through the NOAR for participation in TRAS.
- 4.4.2 TRAS Providers shall submit "Energy-Up" bids and "Energy-Down" bids in the Power Exchange(s) in the Day Ahead AS Market and Real Time AS Market.
- 4.4.3 TRAS Providers shall have information exchange with power exchange(s) in respect of the TRAS-Up and TRAS-Down cleared for the Day Ahead AS Market and Real Time AS Market.
- 4.4.4 TRAS Providers, at inter-state level, would get TRAS Up/Down despatch instruction by Nodal Agency primarily through a web-based Application Programming Interface (API) and/or through respective RLDCs Web Based Energy Scheduling (WBES) Software. In addition, the communication alerts would also be sent through e-mail and SMS. It shall be the responsibility of TRAS Provider to continuously monitor the communications through the modes mentioned above for TRAS related information.

- 4.4.5 TRAS Providers, at intra-state level, would get TRAS Up/Down despatch instruction by Nodal Agency primarily through a web-based Application Programming Interface (API). In addition, the communication alerts would also be sent through e-mail and SMS with copy to respective SLDCs. It shall be the responsibility of TRAS Provider to continuously monitor the communications through the modes mentioned above for TRAS related information.
- 4.4.6 All TRAS Providers participating in the Day Ahead AS Market and Real Time AS Market shall be identifiable with a Unique Code on the basis of Bid Area, sub Bid Area (if any), Regional Entity, Intra state Entity as in vogue in NOAR. Power Exchange(s) shall use the same codes for the entities as have been specified for the collective transactions through Day Ahead Market and Real Time Market by NLDC.

4.5 Power Exchange(s)

- 4.5.1 The exchange of information regarding TRAS between the Nodal Agency and the Power Exchange(s) shall be through National Open Access Registry (NOAR) and/or appropriate software applications.
- 4.5.2 Power Exchange(s) would design a separate market segment for TRAS in terms of CERC (Power Market) Regulations, 2021.
- 4.5.3 Power Exchange(s) would collect and provide the bids by the TRAS Providers to Nodal Agency which in turn would perform price discovery based on the bids for TRAS-Up & TRAS-Down.

4.6 Regional Power Committees (RPCs)

- 4.6.1 The respective RPCs shall prepare weekly TRAS statement of accounts along with the weekly deviation account based on the data provided to them by the Nodal Agency/RLDCs for all inter-state and intra-state TRAS Providers.

5.0 Eligibility of TRAS Provider

- 5.1 A generating station or an entity having energy storage resource or an entity capable of providing demand response, on standalone or aggregated basis, connected to inter-State transmission system or intra-State transmission system shall be eligible for participation as TRAS Provider, if

- 5.1.1 it is capable of varying its active power output or drawl or consumption, as the case may be, on receipt of despatch instructions from the Nodal Agency; and
- 5.1.2 it is capable of providing TRAS within 15 minutes and sustaining the service for at least next 60 minutes; and
- 5.1.3 has obtained standing clearance from RLDC or SLDC, as the case may be; and
- 5.1.4 has taken necessary steps for participation in TRAS market through concerned Power Exchange;

6.0 Standing Clearance

- 6.1 The “Standing Clearance” submitted by the Regional Entity/ State Utilities/intra state entity to the Power Exchange through NOAR, as per the extant Procedure, for the Day Ahead market and Real Time market shall be considered valid for participation in the Day Ahead AS Market and Real Time AS Market.
- 6.2 It shall be the responsibility of the concerned TRAS Provider to ensure that there is no violation of the standing clearance issued by RLDC/SLDC.
- 6.3 The minimum quantum of standing clearance shall be 1 MW.

7.0 Triggering Criteria for Activation and Deployment of TRAS

- 7.1 TRAS shall be activated and deployed by the Nodal Agency on account of the following events:
 - 7.1.1 In case the secondary reserve through SRAS has been deployed continuously in one direction for fifteen (15) minutes for more than 100 MW, in order to replenish the secondary reserve;
 - 7.1.2 Balancing requirements arising due to forecast errors, contingencies (generation/transmission system outages), extreme weather conditions, load and net-load variations, renewable generation variation, ramp mismatches, congestion, system frequency profile and/or any other anticipated conditions affecting grid security.
 - 7.1.3 Such other events as specified in the prevailing Grid Code.

8.0 Protocol for exchange of information between Nodal Agency and Power Exchange

- 8.1 All data between Nodal Agency and Power Exchange(s) shall be exchanged electronically through National Open Access Registry (NOAR) with redundant dedicated communication channel for better reliability.
- 8.2 At the end of each Day-Ahead AS market bidding session and Real-time AS market bidding session, the Power Exchanges shall collect and submit the TRAS Up and Down bids on their platform to the Nodal Agency.
- 8.3 Nodal Agency shall aggregate the TRAS Up and TRAS Down bids received from the Power Exchange(s).

9.0 TRAS Requirement

- 9.1 The assessment of TRAS Day-Ahead and TRAS Real Time requirement would be done as per Approved Procedure for Assessment of Reserves dated 02 December, 2022 and subsequent revisions, as applicable.
- 9.2 Nodal Agency shall communicate to the power exchange(s), the requirement of TRAS-Up and TRAS-Down as per **Annexure - 1**, considering the reserves likely to be available in real-time basis, for both Day-Ahead AS market and Real Time AS market. It would be updated as and when required.

10.0 Bids for TRAS Up and TRAS Down

- 10.1 TRAS Providers may participate in Day Ahead AS and/or Real Time AS market.
- 10.2 The TRAS Up and Down bid would be in the form of Single bid. Single bid would specify multiple sequences of price and quantity pairs in a portfolio manner. The quantity shall be assumed to vary linearly between two price pairs.
 - 10.2.1 In case of TRAS Up, monotonically increasing bid shall be considered.
 - 10.2.2 In case of TRAS Down, monotonically decreasing bid shall be considered.
- 10.3 The minimum quantity bid shall be 1 MW with a minimum step-size of 0.1 MW.
- 10.4 The minimum quotation step or price tick would be ₹ 1 per MWh.

10.5 The TRAS Providers shall submit bids in the following manner:

10.5.1 Time-block wise bids for TRAS-Up and TRAS-Down shall be submitted in the Day Ahead AS Market and Real Time AS market.

10.5.2 For TRAS-Up, Energy-Up bid in ₹/MWh shall be submitted for the offer volume in MW.

10.5.3 For TRAS-Down, Energy-Down bid in ₹/MWh shall be submitted for the offer volume in MW.

10.6 TRAS provider shall ensure that the capacity offered, as a sell bid for energy in the Power Exchange and for TRAS from a resource in the same time-block, shall be separate and non-overlapping.

10.7 After clearing of the Integrated Day-Ahead Energy Market (I-DAM), the uncleared bids of eligible I-DAM participants who have opted to carry over their bids, would be carried forward to Day Ahead AS market. There shall be no order carry forward for TRAS Down bids in Day Ahead AS market. There shall be no order carry forward for both TRAS Up and TRAS Down bids in Real Time AS market.

10.8 There shall also be a provision for 'Ancillary Service (AS) only' bid in Day Ahead AS market and Real Time AS market.

11.0 Protocol for transmission of Bids by Power Exchanges

11.1 The uncleared bids from the IDAM of those TRAS Providers who have opted to carry forward their bids to the Day-Ahead AS market would be known as Order Carried Forward bid(s).

11.2 In case power exchanges receive both Ancillary only bids and Order Carried Forward bid(s) from the same TRAS provider, then power exchange shall form and transmit combined bid(s) to the Nodal Agency for price discovery.

11.3 The power exchanges shall transmit the bids through the API/web interface of NOAR. The bid data shall consist of the NOAR id of the TRAS Provider, time block, bid submission time stamp of the TRAS Provider on power exchange platform, price and quantity pairs in the specified format. The bid data format along with illustrations for combining bid(s) by the power exchanges is attached at **Annexure – 2**.

11.4 The power exchanges shall provide daily and weekly reports (in machine readable format) containing details on total unsold bid quantum and the associated price ticks along with total carried forward bid quantum and the associated price ticks for each of the individual TRAS Provider bids as per formats indicated by Nodal Agency from time to time.

12.0 Price Caps

12.1 Price caps, as notified by CERC from time to time, shall be applicable for DAM-AS and RTM-AS for the TRAS Up bid(s).

12.2 Central Commission, vide Record of Proceedings dated 25 March, 2023, directed that the price cap for AS market needs be harmonized with DAM and HP-DAM. Accordingly, NLDC and the Power Exchanges have to make suitable provisions in their respective procedures and software towards the same. In order to avoid arbitrage opportunities, similar bid/price cap needs be provided for RTM-AS as well.

12.3 Central Commission vide order in Petition No. 04/SM/2023 (Suo-Motu) dated 31 March, 2023 directed all the Power Exchanges to re-design their bidding software for the period from 04 April 2023 until further orders, in such a way that the members can quote the price in the range of (a) ₹ 0/kWh to ₹ 10/kWh for all contracts, viz., DAM (including GDAM), RTM, Intra-day, Day Ahead Contingency and Term-Ahead (including GTAM); and (b) ₹ 0/kWh to ₹ 20/kWh in the HP-DAM segment.

12.4 Eligible high price TRAS Providers (having HP-DAM tag available in NOAR) shall be allowed to place bids for TRAS-Up in the range of ₹ 0/kWh to ₹ 20/kWh. All other TRAS Providers shall be allowed to place bids for TRAS-Up in the range of ₹ 0/kWh to ₹ 10/kWh.

12.5 The price caps are subject to change as per circulars issued by Nodal Agency in accordance with the Central Commission directions on price caps in terms of Power Market Regulations, 2021 from time to time.

13.0 Price Discovery of TRAS

13.1 Price Discovery for TRAS-Up

13.1.1 The price discovery for TRAS-Up shall be based on the principle of Uniform Market Clearing Price subject to market splitting in case of congestion.

13.1.2 The highest Energy-Up bid corresponding to the requirement for TRAS-Up, shall be the Market Clearing price for Energy-Up in the Day Ahead Ancillary Service Market (MCP-Energy-Up-AS-DAM) or in the Real Time Ancillary Service Market (MCP-Energy-Up-AS-RTM), as the case may be. Provided that, the applicable Market Clearing Price for TRAS Up providers shall be capped at their respective price caps as specified in the subsequent sections.

13.2 Price Discovery for TRAS-Down

13.2.1 The price discovery for TRAS-Down shall be based on the principle of Pay-as-bid.

13.2.2 The Energy-Down bids shall be stacked in a descending order from the highest Energy Down bid to the lowest Energy-Down bid and the Nodal Agency shall select the TRAS-Down Providers to meet the estimated TRAS Down requirement in that order.

13.3 The TRAS-Up Bids from High Price tagged TRAS Providers (HP-TRAS Providers) and other TRAS Providers shall be collected and cleared together. Market Clearing Price (MCP) shall be derived from the single clearing solution,.

13.4 In case MCP discovered is less than or equal to ₹ 10/kWh, the applicable MCP for both HP-TRAS providers and other TRAS providers would be equal to the MCP discovered.

13.5 In case MCP discovered is greater than ₹10/kWh, the applicable MCP for HP-TRAS providers would be equal to MCP discovered, and the applicable MCP for other TRAS providers would be capped at ₹ 10/kWh.

13.6 The high level algorithm of bid clearing is given as **Annexure – 3**.

14.0 Procurement of TRAS

14.1 Bidding Timelines

14.1.1 Procurement of TRAS through Day Ahead AS Market and Real Time AS Market shall be undertaken in accordance with the prevailing bidding timelines as specified from time to time by CERC..

14.1.2 In the interim, till the notification of revised Grid Code, the bidding timelines for Day Ahead AS Market and Real Time AS Market shall be the same as those prevailing for the Day Ahead Market for energy and Real Time Market for energy respectively.

14.2 Trading Days

14.2.1 Nodal Agency shall operate on all days of the year including Sundays, public and bank holidays.

14.3 Bidding in Day Ahead AS Market

14.3.1 The bid-call session for TRAS-Up and TRAS-Down in the Power Exchange(s) shall be open from 1000 – 1200 hours or as specified from time to time, on day-ahead basis, for the TRAS Providers to submit separate TRAS Up & TRAS Down bids.

14.3.2 The power exchange(s) shall collect the bids for TRAS-Up and TRAS-Down and share the same with the Nodal agency for clearing and price discovery by 1530 hrs.

14.3.3 Nodal Agency would calculate the Day-Ahead AS Market Clearing Price and Market Clearing Volume for each time-block for TRAS Up & TRAS Down separately

14.3.4 Nodal Agency would send the cleared TRAS Up & TRAS Down information to Power Exchange(s) through National Open Access Registry (NOAR) by 1700 hrs.

14.3.5 Nodal Agency would send the information of cleared trades to respective RLDCs, SLDCs and TRAS Providers by 1700 hrs.

14.4 Bidding in Real Time AS Market

14.4.1 The bid call sessions for Real Time AS market for delivery in the specified two consecutive time-blocks shall be open concurrently with the bid call session for Real Time Energy market in the Power Exchanges.

14.4.2 The Power Exchanges shall collect the bids received and share the same with the Nodal Agency immediately at the end of the bid-call session.

14.4.3 Nodal Agency would calculate the Real-Time AS Market Clearing Price and Market Clearing Volume for each time-block for both TRAS Up & TRAS Down in next 15 minutes following the bid call session from Power Exchange(s).

14.4.4 Nodal Agency would send the cleared TRAS Up & TRAS Down information to Power Exchange(s) and also, send the information to respective RLDCs, SLDCs and TRAS Providers.

15.0 Scheduling and Despatch of TRAS

15.1 Scheduling and despatch of TRAS shall be according to the provisions of the prevailing Grid Code.

15.2 The schedule for TRAS shall become effective from the time block starting 15 minutes after issue of the despatch instruction by the Nodal Agency.

15.3 Nodal Agency may issue despatch instruction from any time block after the above-mentioned time block, if required, based on the anticipated system conditions.

15.4 A virtual regional entity called "Virtual Ancillary Entity (VAE)" shall be created for each of the five regional grids by the respective RLDCs for the purpose of scheduling counterparty.

15.5 The quantum of TRAS dispatched by the Nodal Agency shall be incorporated in the schedule of respective TRAS provider by the concerned RLDC at inter-state level and concerned SLDC at intra-state level.

15.6 MCP-Energy-Up-AS-DAM and MCP-Energy-Up-AS-RTM would be computed for all TRAS Providers for scheduling and despatch as follows -

15.6.1 In case MCP discovered is less than or equal to ₹ 10/kWh, the MCP-Energy-Up-AS-DAM for both HP-TRAS providers and other TRAS providers would be equal to MCP discovered.

15.6.2 In case MCP discovered is greater than ₹ 10/kWh, the MCP-Energy-Up-AS-DAM for HP-TRAS providers would be equal to MCP discovered. The MCP-Energy-Up-AS-DAM for other TRAS providers would be capped at ₹ 10/kWh.

15.6.3 Similar methodology would be followed for MCP-Energy-Up-AS-RTM

15.7 The Nodal Agency shall deploy the cleared TRAS-Up as under:

15.7.1 In case the actual requirement for deployment of TRAS-Up is more than or equal to the total TRAS Up cleared in the AS market (both Day-ahead AS market & Real Time AS market), the Nodal Agency shall issue despatch instructions to all the cleared TRAS-Up Providers.

15.7.2 In case the actual requirement for deployment of TRAS-Up is less than the total TRAS Up cleared in the AS market (both Day-ahead AS market & Real Time AS market), the TRAS-Up Providers with lower MCP-Energy-Up-AS shall be despatched first, followed by the TRAS-Up Providers with higher MCP-Energy-Up-AS, till the actual requirement quantum is dispatched.

15.7.2.1 In cases where MCP-Energy-Up-AS-DAM and MCP-Energy-Up-AS-RTM of the TRAS-Up Providers is equal, and dispatching only some of the TRAS-Up Providers is enough to meet the actual requirement quantum, then all those TRAS-Up Providers shall be despatched on pro-rata basis of their cleared volume.

15.8 The Nodal Agency shall deploy the cleared TRAS-Down as under:

15.8.1 In case the actual requirement for deployment of TRAS-Down is equal to the total TRAS-Down cleared in the AS market, the Nodal Agency shall issue despatch instructions to all such TRAS-Down Providers.

15.8.2 In case the actual requirement for deployment of TRAS-Down is less than the total TRAS-Down cleared in the AS market, the Nodal Agency shall issue despatch instructions to the TRAS-Down Providers in the descending order of their Energy-Down bids, so that the selected TRAS-Down Provider with the highest Energy-Down bid shall be despatched first, followed by the TRAS-Down Provider with the next highest Energy-Down bid and so on.

15.9 The Nodal agency would consider inter-regional and intra-regional congestion, if any, while dispatching the TRAS and, segregate the TRAS Providers stack on a region-wise basis as per the anticipated congestion.

15.10 In case of forced outage of the cleared TRAS provider, the TRAS Provider shall inform the Nodal Agency, vide e-mail and through NOAR Portal, within 15 minutes of the tripping. Upon receipt of this information, such quantum shall be excluded from TRAS cleared quantum by Nodal Agency. Such TRAS Provider shall receive no commitment charges in case of forced outage for the quantum not available for despatch under TRAS;

15.11 The final TRAS Up and TRAS Down implemented schedule issued by the Nodal Agency/RLDCs shall be considered final for the settlement.

16.0 Transmission Charges and Losses

16.1 No inter-state transmission charges, transmission losses and transmission deviation charges shall be applicable for the TRAS Up and TRAS Down delivery.

17.0 Shortfall in Procurement of TRAS

17.1 In case of shortfall, all generating stations, whose tariff is determined by the Central Commission under Section 62 of the Act (including for inter-state generating stations whose tariff has been determined for full or part capacity) including those having URS power after declaration of the RTM results, shall be deemed to be available for use by the Nodal Agency for TRAS subject to technical constraints (like technical minimum, ramp rate etc.) of such generating stations.

17.2 The generating stations whose tariff is determined under section 62 of the Act, shall declare their energy charges upfront on monthly basis by 12th of every month through NOAR which shall be used for TRAS despatch under shortfall/emergency conditions from the 16th of the current month to the 15th of the next month. The energy charges declared shall be the same as being declared for SRAS despatch.

17.3 Section 62 generating stations, whose URS is despatched for TRAS-Up, in the event of short-fall in procurement of TRAS-Up through the AS Day Ahead Market and AS Real Time Market, shall be paid at the rate of 110% of their energy charges for the quantum of TRAS-Up despatched.

17.4 Section 62 generating stations, if despatched for TRAS-Down, in the event of short-fall in procurement of TRAS-Down through the AS Day Ahead Market and AS Real Time Market, shall pay back at the rate of 90% of their energy charges, corresponding to the quantum of TRAS-Down despatched.

18.0 TRAS Despatch in case of Emergency Conditions

18.1 In case the Nodal Agency requires any generating station to provide Ancillary Services to meet the emergency conditions for reasons of grid security as per the provisions of the Grid Code, such generating station shall be compensated at the rate of the energy charge as determined under Section 62 of the Act or adopted under Section 63 of the Act, or at the rate of the compensation charge declared by the AS provider, as the case may be.

18.2 The TRAS Providers, other than those covered under section 62 and 63 of the Act, shall declare the compensation charges upfront on monthly basis by 12th of every month for 16th of current month to 15th of next month. In case of non-declaration of the compensation charges/energy charges, the last available compensation / energy charges would be considered for emergency despatch.

19.0 Energy Accounting of TRAS

19.1 The respective RPCs shall prepare weekly TRAS accounts based on the TRAS despatched quantum, prices and schedules provided to them by the Nodal Agency/RLDCs.

19.2 For the intra-state generators, the settlement of payments towards TRAS-Up/TRAS-Down along with the applicable commitment charges would be done by the Nodal Agency/RLDCs through the respective Regional Deviation and Ancillary Service Pool Account.

19.3 Deviation of AS Provider in every 15 minutes time block shall be calculated as under and settled as per the DSM Regulations:

$$\text{MWh Deviation for AS Provider} = (\text{Actual MWh of AS Provider}) - (\text{Scheduled MWh of AS Provider including TRAS MWh despatched}) - (\text{SRAS MWh of AS Provider despatched})$$

19.4 Any shortage or excess delivery of electricity from the total schedule, including TRAS despatch quantum of the grid connected entity will be settled by them under Deviation Settlement mechanism as per the procedure laid down by the CERC at inter-state level or any other settlement system as prescribed by concerned SERC at intra-state level.

19.5 In case of TRAS-Up,

19.5.1 The concerned RPC, based on the details provided by concerned RLDC, shall compute and furnish the following details along with the DSM Account under separate account head of TRAS-Up.

19.5.1.1 Total Energy cleared in TRAS-Up (DAM/RTM) of each TRAS-Provider.

19.5.1.2 Total Energy scheduled under TRAS-Up (DAM/RTM) of each TRAS-Provider.

19.5.1.3 Total charges payable as per MCP-AS-Up, as discovered in the TRAS-Up (DAM/RTM) as per their energy schedule under TRAS-Up (DAM/RTM).

19.5.1.4 Total commitment charges to TRAS-Up provider at the rate of ten percent of the MCP -Energy-Up-AS-DAM or the MCP-Energy--Up-AS-RTM, subject to the ceiling of 20 paise/kWh for the quantum of TRAS-Up cleared in the Day Ahead Market or the Real Time Market as the case may be, but not instructed to be despatched by the Nodal Agency.

19.6 In case of TRAS-Down, the concerned RPC, using the detail provided by concerned RLDC, of the TRAS-Down Providers shall prepare TRAS-Down statement as per the rate of AS-Down bid by TRAS-Down provider in the Day Ahead AS Market or the Real Time AS Market, as the case may be, for the capacity instructed to be despatched by the Nodal Agency.

19.7 In case of despatch of TRAS under shortfall or Emergency Conditions, Nodal Agency shall furnish despatched schedule of selected TRAS Providers on weekly basis to respective RPCs through concerned RLDCs.

19.8 No separate bills shall be raised for this purpose.

19.9 Any post facto revision of variable charge or compensation charge, as the case may be, shall not be permitted.

20.0 Settlement of TRAS

20.1 The payment to the TRAS Provider(s) shall be from the surplus available in Deviation and Ancillary Service Pool Account of the concerned Region where the TRAS Provider(s) is located as per **Format TRAS-II** and **Format TRAS-III**.

20.2 The payments related to the TRAS shall be settled from the concerned RLDC's "Regional Deviation and Ancillary Service Pool Account" before transfer of any residual amount to the PSDF.

20.3 The Deviation and Ancillary Service Pool Account shall be charged towards:

20.3.1 Full cost towards TRAS-Up including the charges for the quantum cleared and despatched and the commitment charge for the quantum cleared but not despatched.

20.3.2 For the full cost of TRAS Up charges despatched due to shortfall in procurement of TRAS-Up or despatch under emergency condition.

20.4 The Deviation and Ancillary Service Pool Account shall receive credits for:

20.4.1 Payments made by TRAS Provider for the TRAS-Down despatched.

20.4.2 Payment made by TRAS Down provider despatched due to shortfall in procurement of TRAS-Down or despatch under emergency condition.

20.5 The Payment to TRAS Provider(s) shall be made on net basis i.e. net of TRAS up and TRAS down.

20.6 Any surplus accumulated in Deviation and Ancillary Service Pool Account due despatch of SRAS/TRAS-Down after adjusting the payment liability of TRAS-Up provider(s) or interest accumulated due to delay in payment received from TRAS-Down provider (s) shall not be treated as monthly surplus accumulated in Deviation and Ancillary Service Pool Account and shall be retained in Deviation and Ancillary Service Pool Account for onwards settlement of Ancillary Service.

20.7 The payments by the TRAS Provider for TRAS-Down shall be made within seven (07) days from the date of issue of the statement by the RPC. If payments by the TRAS Provider for TRAS-Down are delayed beyond seven (07) days from the date of issue of the statement by the RPC, the TRAS Provider shall pay simple interest @ 0.04% for each day of delay from 08th day.

Liability to pay interest for the delay in payments to the "Deviation and Ancillary Services Pool Account" shall remain till interest is not paid; irrespective of the fact that TRAS-Up Providers who have to receive payments have been paid from the "Regional DAS Pool Account Fund" in part or full.

- 20.8 The payments to the TRAS Provider for TRAS-Up shall be made within twelve (12) days from the date of issue of the statement by the RPC. If payments to the TRAS Provider for TRAS-Up are delayed beyond twelve (12) days from the date of issue of the statement by the RPC, the TRAS Provider shall be paid simple interest @ 0.04% for each day of delay from 13th day.
- 20.9 The details of interest statement shall be prepared by Nodal Agency / RLDCs.
- 20.10 In case of continued payment default by TRAS Provider, beyond 19 days of date of issuance of statement by RPCs, Nodal Agency may debar such TRAS Provider from further participation in TRAS till such default is cured. However, interest, as specified above for delayed payments, shall continue to be applicable till the payment is made.
- 20.11 Compensation due to Part Load Operation or any other charges not specified in the CERC (Ancillary Services) Regulations, 2022, shall not be payable to the TRAS providers for providing TRAS.
- 20.12 The quantum of schedule under TRAS Up and TRAS Down shall not be considered for the purposes of incentive calculation for the TRAS Provider by the concerned RPC.
- 20.13 Quarterly reconciliation of the TRAS Account shall be done by the respective RLDCs with the TRAS Providers.
- 20.14 Deficit, if any, in the "Deviation and Ancillary Service Pool Account" maintained by an RLDC due to despatch of SRAS/TRAS, shall be made up proportionately by Regional Deviation and Ancillary Service Pool Account maintained by other RLDCs on a monthly basis.
- 20.15 In case of shortfall in payment to SRAS/TRAS providers due to net shortfall after considering the surplus available in all "Regional Deviation and Ancillary Service Pool Account" then TRAS providers and SRAS provider shall be settled proportionately for that particular week.

21.0 Data and Voice Communication

- 21.1 Data and voice communication facilities, including interfacing with NOAR/WBES of concerned RLDCs shall be ensured by the regional entity TRAS Providers to facilitate information exchange and real time monitoring.

21.2 Data and voice communication facilities, including interfacing with NOAR/energy scheduling software of concerned SLDCs shall be ensured by the intra-state TRAS Providers to facilitate information exchange and real time monitoring.

21.3 Nodal Agency, RLDCs and SLDCs shall provide information related to cleared quantum and dispatch of Ancillary Services on their respective websites.

22.0 Failure to deliver TRAS

22.1 The delivery by TRAS providers against the TRAS- Up and TRAS-Down dispatch instructions shall be monitored using the telemetered injection/drawal.

22.2 Sustained failure to deliver TRAS as per dispatch instructions, shall make the TRAS provider liable for disqualification from participation in TRAS for a week by the Nodal Agency.

22.3 Such sustained failure to deliver TRAS shall also be brought to the notice of the Central Commission.

23.0 Indemnification

23.1 All the TRAS providers shall keep each of the SLDCs/ RLDCs /Nodal agency indemnified at all times and shall undertake to indemnify, defend and save the SLDCs/RLDCs /Nodal Agency harmless from any and all damages, losses, claims and actions including those relating to injury to or death of any person or damage to property, demands, suits, recoveries, costs and expenses, court costs, attorney fees, and all other obligations by or to third parties, arising out of or resulting from the transactions.

24.0 Issuance of Circulars by Nodal Agency

24.1 In order to address day to day operational aspects regarding TRAS, Nodal Agency may issue circulars from time to time.

25.0 Revision of the procedures

25.1 The procedure may be reviewed and modified / amended as and when need arises after stakeholder consultations under intimation to Central Commission.

Format TRAS – I: Technical and Commercial Parameters of TRAS Providers
(to be provided in NOAR Interface)

Hydro Generator Details for Participation in Tertiary Reserve Ancillary Service Provider (TRAS)		
From: (Name of TRAS Provider Generating Station) / (Name of Owner Organization)		
To: Nodal Agency (NLDC)		
Validity of the Information From: xx/mm/yyyy To: xx/mm/yyyy		
Date: dd/mm/yyyy		
(Name of Hydro Electric Plant, Installed Capacity and Owner Organization)		
S.No	Title/Parameters	Values/Data/Information
1	Number of Generating Units (e.g. 1 x 100 MW + 2 x 250 MW)	
2	Auxiliary consumption (%)	
3	Type of Plant (RoR, Pondage or Reservoir)	
4	Installed Capacity of Unit (MW) - P	
5	Start time for each unit (Standstill to Synchronization of unit to grid) (in minutes)	
6	Which value (Cumecs/MW) is used for declaring MWh capability?	
7	Minimum load at which unit can stably run after synchronization - Unitwise (P1) (in MW)	
8	Forbidden zones or high cavitation zones - Unitwise (From MW to MW) - P2 to P3	
9	Maximum loading possible on unit (continuous) (P4)	
10	Unit-wise Cumecs/MW for P, P1,P2,P3 and P4 generation level as well as cumecs from standstill to synchronization.	
11	Maximum possible Ex-bus injection (MW) (including overload if any)	
12	Fixed Cost (paise / kWh upto one decimal place)	
13	Variable Cost (paise / kWh upto one decimal place)	
14	Ramp-Up Rate (MW/Min) for each unit	
15	Ramp-Down Rate (MW/Min) for each unit	
16	Requirement of Tandem Operation of the Plant (If Yes, with which plant and details and its Ratio)	
17	Present Governor Droop Setting (Unit-wise)	

18	Considering all the constraints, how much further droop setting can be improved and range thereof	
19	Blackstart Facility availability (Yes/No)	
20	Any Other Information including the constraints (Time-specific, Location-Specific, Event Specific, Unit-Specific, etc.)	
Thermal (Coal/Lignite/Gas) Generator Details for Participation in Tertiary Reserve Ancillary Service Provider (TRAS)		
From: (Name of TRAS Provider Generating Station) / (Name of Owner Organization)		
To: Nodal Agency (NLDC)		
Validity of the Information From: xx/mm/yyyy To: xx/mm/yyyy		
Date: dd/mm/yyyy		
S.No	Title/Parameters	Values/Data
.		
1	Number of Generating Units (e.g. 1 x 210 MW + 2 x 500 MW)	
2	Total Installed Capacity (MW)	
3	Auxiliary consumption (%)	
4	Maximum possible Ex-bus injection (MW) (including overload if any)	
5	Technical Minimum (MW)	
6	Type of Fuel	
7	Region	
8	Bid area	
9	Fixed Cost (paise / kWh upto one decimal place)	
10	Variable Cost (paise / kWh upto one decimal place)	
11	Ramp-Up Rate (MW/Min) for each unit	
12	Ramp-Down Rate (MW/Min) for each unit	
13	Start-up Time from Cold Start (in Min) & Warm Start of each unit	
14	Any other information	

Format TRAS-II: TRAS Settlement Account by RPC (Day Ahead and Real Time Market)

(To be issued by concerned RPC)

TRAS Account for Week:

Net Charges Payable/Receivable by the TRAS Provider(s) to/from the Regional Deviation and Ancillary Service Pool Account

S.No	TRAS Provider Name	TRAS-Up in Day Ahead AS Market				TRAS-Up Energy in Real Time AS Market				Total Charges/compensation charge for TRAS Up (Rs) (I)=(C)+(D)+(G)+(H)	TRAS-Down in Day Ahead AS Market		TRAS-Down in Real Time AS Market		Net Charges (Rs) (N)=(I)-(K)-(M) (+) Payable from Pool to TRAS Provider (-) Receivable by Pool from TRAS Provider
		TRAS-Up Cleared (MWh) (A)	TRAS-Up Energy Scheduled (MWh) (B)	TRAS-Up Energy Charges (Rs.) (C)	TRAS-Up Commitment Charges (Rs.) (D)	TRAS-Up Cleared (MWh) (E)	TRAS-Up Energy Scheduled (MWh) (F)	TRAS-Up Energy Charges (Rs) (G)	TRAS-Up Commitment Charges (Rs) (H)		TRAS-Down Energy Scheduled (MWh) (J)	TRAS-Down Charges to be paid back to Pool (Rs) (K)	TRAS-Down Energy Scheduled (MWh) (L)	TRAS-Down Charges to be paid back to Pool (Rs) (M)	
1															
2															
3															

(To be put up on the website of the respective RPC & transmitted to concerned RLDC electronically)

Format TRAS-III TRAS Settlement Account by RPC
(Shortfall/Emergency Condition)

(To be issued by concerned RPC)

TRAS Account for Week:

Net Charges Payable/Receivable by the TRAS Provider(s) to/from the Regional Deviation and Ancillary Service Pool Account in Shortfall/Emergency Condition

S. No.	TRAS Provider Name	Energy scheduled under Shortfall/Emergency TRAS-Up (MWh) (A)	Total Charges/ Compensation Charges for Shortfall/Emergency TRAS-Up (Rs) (B)	Energy scheduled under Shortfall/Emergency TRAS-Down (MWh) (C)	Total Charges/ Compensation Charges for Shortfall/Emergency TRAS-Down to be paid back to Pool (Rs) (D)	Net Charges (Rs) (E)=(B)-(D) (+) Payable from Pool to TRAS Provider (-) Receivable by Pool from TRAS Provider
1						
2						
3						
.						
.						

(To be put up on the website of the respective RPC& transmitted to concerned RLDC electronically)

Annexure – 1**Reserve Requirement Information Dissemination**

The range of reserve requirement for date..... is projected as follows:

TRAS Regulation Up: MW to MW

TRAS Regulation Down: MW to MW

- To be notified on day-ahead basis and would be updated as and when required.

Annexure – 2

Sample Bid Format and Illustrations

Block ID	NOAR ID	Time Stamp	Bids					
			0.0 @ 0	0.0 @ 1999	25.0 @ 2000	25.0 @ 10000		
1	NORNA23518	10:45:00	0.0 @ 0	0.0 @ 1999	25.0 @ 2000	25.0 @ 10000		
1	SOSMI83515	10:44:00	0.0 @ 0	0.0 @ 3375	97.3 @ 3376	97.3 @ 20000		
1	NOSMI13512	10:43:00	0.0 @ 0	0.0 @ 3299	30.0 @ 3300	30.0 @ 3699	66.0 @ 3700	66.0 @ 10000
1	WORPA13509	10:43:00	0.0 @ 0	0.0 @ 2999	91.0 @ 3000	91.0 @ 10000		
1	EOSRF13505	10:45:00	0.0 @ 0	0.0 @ 8169	18.8 @ 8170	18.8 @ 20000		
1	EORSH13504	10:44:00	0.0 @ 0	0.0 @ 999	15.0 @ 1000	15.0 @ 20000		
1	EORIN13427	10:43:00	0.0 @ 0	0.0 @ 4999	93.0 @ 5000	93.0 @ 10000		
1	EORNI13470	10:43:00	0.0 @ 0	0.0 @ 4288	98.7 @ 4289	98.7 @ 20000		
1	NOSGR13485	10:45:00	0.0 @ 0	0.0 @ 999	5.4 @ 1000	5.4 @ 20000		
2	EORWU1S3441	10:44:00	0.0 @ 0	0.0 @ 49	2.5 @ 50	2.5 @ 499	2.5 @ 500	2.5 @ 20000
2	NORNA23518	10:43:00	0.0 @ 0	0.0 @ 999	24.4 @ 1000	24.4 @ 20000		
3	SOSMI83515	10:43:00	0.0 @ 0	0.0 @ 500	6.5 @ 501	6.5 @ 10000		

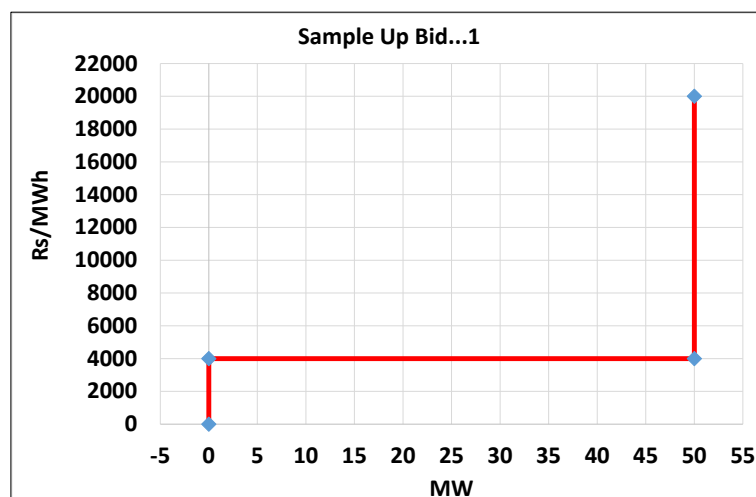
Q @ P → Quantity in MW @ Price in ₹/MWh

- Quantum at the ₹ 0/MWh price tick, at the capped price tick (₹ 10/MWh or ₹20/MWh, as the case may be), and any other price ticks may be provided, for enabling correct interpretation of the bids for market clearing by the Nodal Agency.

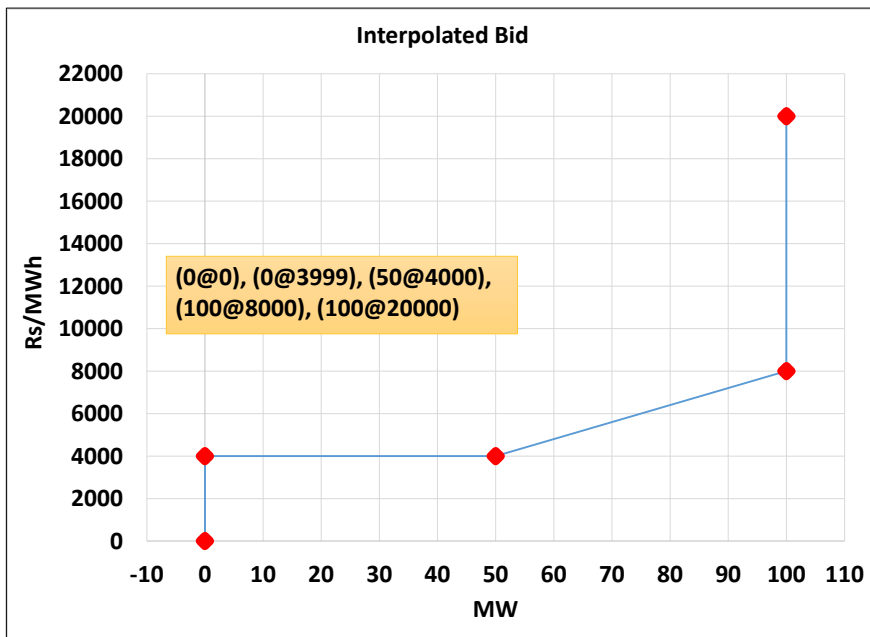
TRAS-Up

Sample Up Bid...1

Raw bids	0@0	0@3999	50@4000	50@20000
₹/MWh	0	3999	4000	20000
MW	0	0	50	50



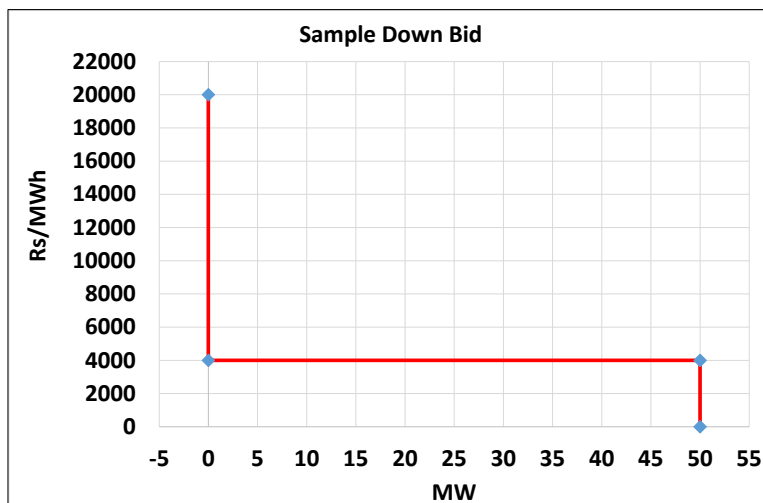
Sample Up Bid ...2



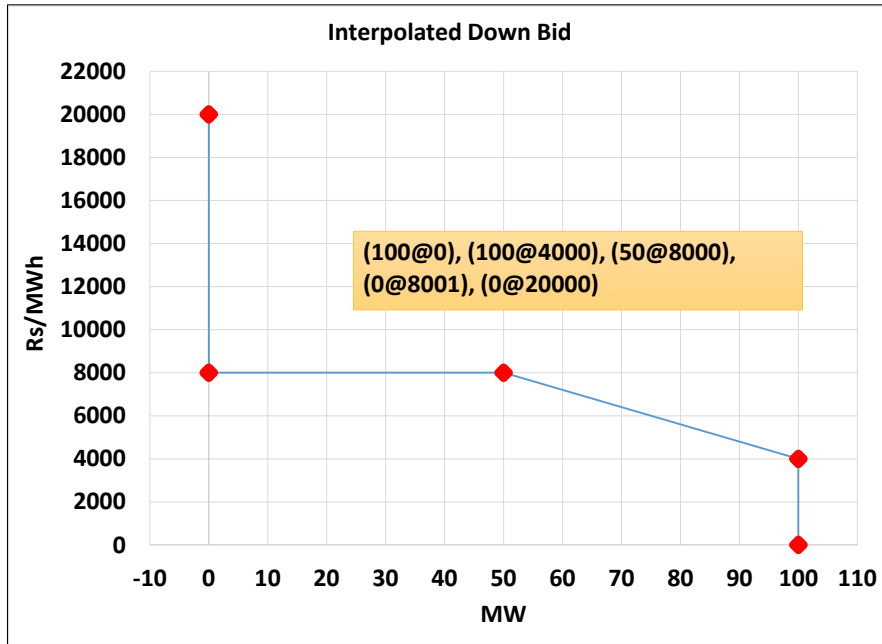
TRAS-Down

Sample Down Bids...1

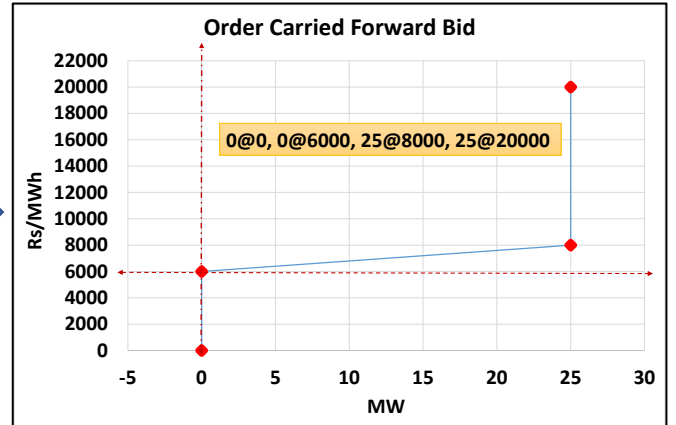
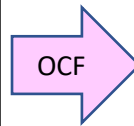
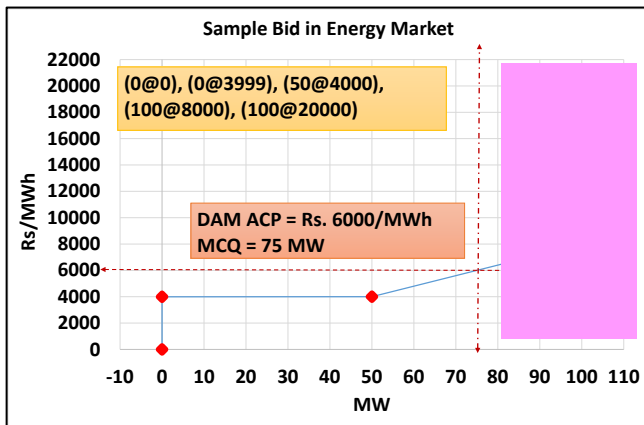
Raw bids	50@0	50@3999	0@4000	0@20000
Rs/MWh	0	3999	4000	20000
MW	50	50	0	0



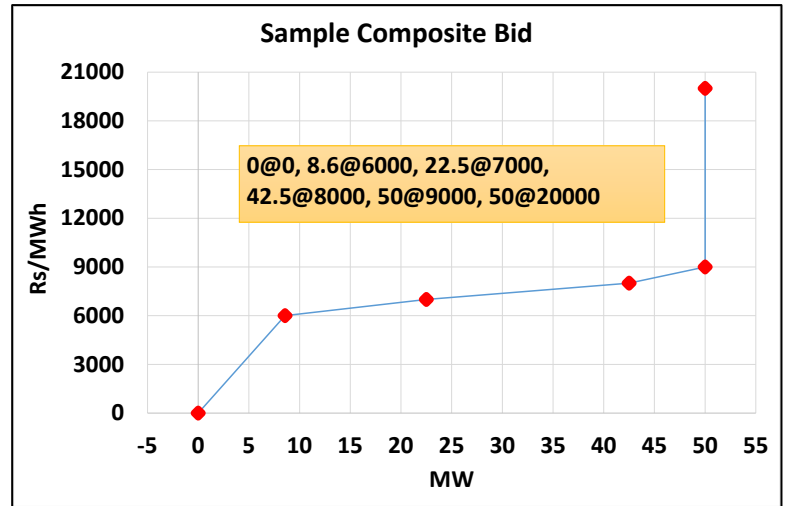
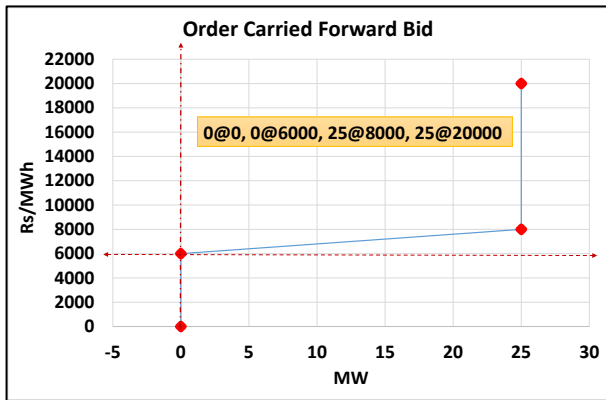
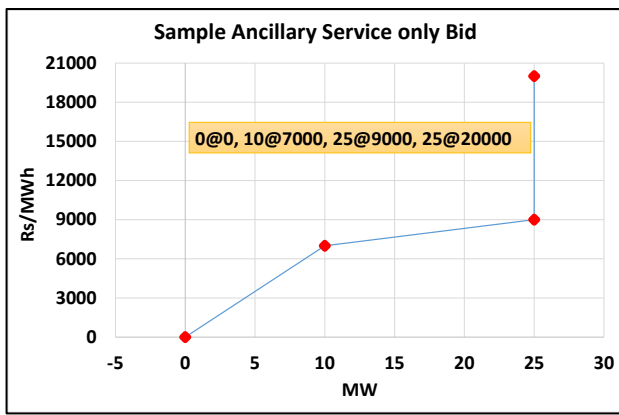
Sample Down Bid...2



Sample Illustration for forming Order Carried Forward Bid(s)



Sample illustration for Combined Bid(s)



Annexure – 3

High level algorithm for TRAS Bid Clearing

TRAS Up:

- Objective Function:
 - Minimize the energy charge of Up reserves
- Constraints
 - Total Sum of Bids equals Punched Value
 - Individual cleared quantum \leq Individual Bid
- Solved through Linear Programming (LP)

TRAS Down:

- Objective Function:
 - Optimize energy charge of down reserves
- Constraints
 - Total Sum of Bids equals Punched Value
 - Pay as bid: Allot only one price tick per bid
 - Pay as bid: Allow partial clearing when needed
- Solved through Mixed Integer Linear Programming (MILP)

Market Clearing Price of Ancillary Services (MCP-AS)

Market Clearing Price (MCP) is the market clearing price discovered in either Day Ahead AS market or Real Time AS market considering the bids of both HP-TRAS Providers and other TRAS Providers for TRAS-Up.

If $MCP \leq ₹ 10/kWh$, then

- MCP applicable for HP-TRAS providers = MCP discovered
- MCP applicable for other TRAS providers = MCP discovered

If $MCP > ₹ 10/kWh$, then

- MCP applicable for HP-TRAS providers = MCP discovered
- MCP applicable for other TRAS providers = ₹ 10/kWh

Version Release History

Version	Date	Changes
V1.0	20 February 2023	Issuance of Draft Detailed Procedure in Public Domain for Stakeholder Consultation
V2.0	18 April 2023	Issuance of Detailed Procedure in Public Domain post Stakeholder Consultation