

# Comments and suggestions on the Draft Central Electricity Regulatory Commission (Ancillary Services) Regulations, 2021

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## Submissions from the Council on Energy, Environment and Water (CEEW)

The Draft Central Electricity Regulatory Commission (Ancillary Services) Regulations, 2021 seek to establish a market-based mechanism for procurement of ancillary services (AS), essential for maintenance of reliability of the power system. While the Regulations are a logical move towards a market-based power procurement regime, we believe that there are some preconditions that are essential for an efficient market-based AS mechanism. These preconditions lie within as well as outside the scope of the Draft CERC AS Regulations.

The suggestions and clarifications requested on the Draft Regulations are set out below. This submission also captures and elaborates on a few preconditions to achieve an efficient AS market.

### Section 1: Suggestions and clarifications on the Draft Regulations

- 1. CERC should clarify the timeline for identifying Secondary Reserve Ancillary Services (SRAS) with respect to the gate closure of the Real-Time Market (RTM), and whether this will override the right to recall of original beneficiaries.**

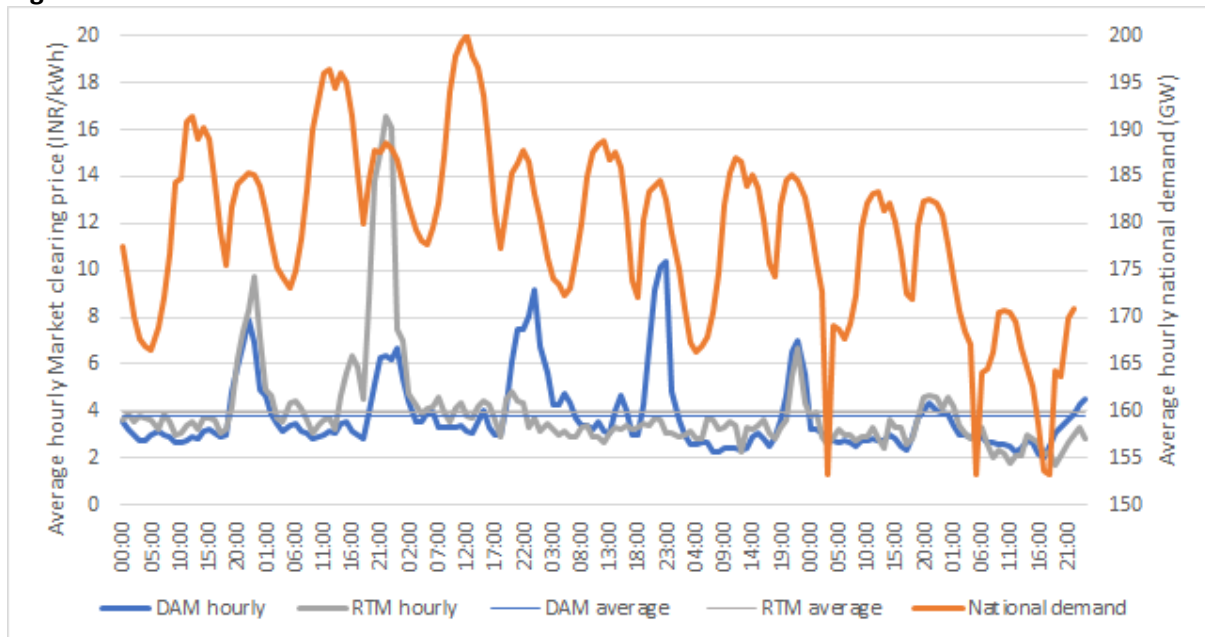
The CERC's discussion paper on redesigning the AS market (CERC 2018) highlighted that beneficiaries' 'right to recall' power from its contracted generators and an absence of gate closure leads to inadequacy of reserves. Gate closure was introduced in June 2020 with the implementation of the RTM at one hour before the time of delivery. As per the Draft Regulations, the Nodal Agency will identify generators for SRAS provision "before the gate closure".

Under the proposed market mechanism, if the gate closure does not override the beneficiaries' right to recall, call-back of power by beneficiaries could hamper liquidity on the Tertiary Reserve Ancillary Services (TRAS) market, jacking up market prices of reserves.

- 2. For specified daily windows in seasons when the Nodal Agency anticipates higher reserve requirement, bilateral procurement of SRAS and TRAS via reverse auctions ahead of time may help mitigate price risk.**

Experience from the energy markets (Day-Ahead Market (DAM) and RTM) have shown that market clearing prices in high demand periods can be volatile around the average prices (Figure 1). This diminishes the economic case for discoms to procure energy from the exchanges in hours where the prices are high.

**Figure 1: Clearing prices on energy markets can be much higher than the average during periods of high demand**



Source: CEEW’s analysis based on IEX and MERIT

Note: The chart shows data for the period: 5th July 2021 00:00 to 12 July 2021 23:00.

As long as liquidity in the TRAS market remains low (in part due to the right to recall), it may face similar volatility during high-demand periods. During the transition phase to a liquid market, procurement of part of reserve requirement may be more economical if made before the day-ahead market, as seen from experiences in Germany (de Decker, De Keyser, and Kreutzkamp 2019) and the United Kingdom (Proffitt 2021), where such contracts facilitated integration of higher shares of variable renewable energy (VRE). However, in the longer term the market design and liquidity should allow for procurement of adequate reserves at optimal cost.

**3. The Draft Regulations should clarify on eligibility of VRE generators in the AS market.**

VRE sources, like solar and wind plants, can provide various AS, such as inertia support and reactive power support. The Draft Regulations must take a forward-looking view and create an enabling framework for VRE generators to provide AS, especially as their share in the power system grows. The Regulations must include relevant provisions to this end. For example, the settlement formula for MWh deviation for AS providers under the Draft Regulations is currently:

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

However, for wind and solar generators this formula would need to be modified as under, as in the Deviation Settlement Mechanism Regulations.

$$MWh\ Deviation\ for\ AS\ Provider = [(Actual\ MWh\ of\ AS\ Provider) - (Scheduled\ MWh\ of\ AS\ Provider\ including\ TRAS\ MWh) - (SRAS\ MWh\ of\ AS\ Provider)] / (Available\ Capacity\ of\ AS\ Provider)$$

**4. CERC should provide clarity on the basis for calculating incentives and penalties for AS providers.**

The basis for estimating the quantum of incentives for AS providers (Table 1) are currently not provided either within the Draft Regulations or the explanatory memorandum (CERC 2021).

**Table 1: Incentives for providers of SRAS**

Actual performance vis-à-vis secondary control signal for an SRAS Provider	Incentive Rate (paise/kWh)
Above 95%	(+) 40
70% - 95%	(+) 30
45% - 70%	(+) 20
20% - 45%	(+) 10
Below 20%	0

Source: Draft CERC (Ancillary Services) Regulations, 2021

**5. CERC should ensure that all information related to the new AS market is accurate and transparent, in order for the market to function efficiently.**

We suggest adding a provision for continued disclosure of following information via the Regional Power Committees (RPCs) in the Draft Regulations, in addition to information already collated by RPCs as per clause 6.1 of the detailed procedure for Reserve Regulation Ancillary Services (RRAS) (CERC 2016):

- a. Quantum tied under long-term contracts,
- b. Beneficiaries of long-term contracts,
- c. Scheduling limits,
- d. AGC enablement status,
- e. Outage status and reasons

Further, the CERC (2015) identified a static primary, secondary and tertiary reserve requirement of 4000 MW, 3623 MW and 5218 MW, respectively. However, as per the Draft Regulations the reserve requirement will now be dynamically defined on day-ahead and real-time bases. While the Draft Regulations state that the methodology for sizing of reserves will be contained in the detailed implementation procedure, it is requested that CERC explain in a transparent manner how the reserve requirement will be established, including but not limited to the following aspects:

- a. formulae/principles for calculation of reserves,
- b. frequency of updating these estimates,
- c. role of various institutions in disclosing the information required for such estimations in an accurate and transparent manner.

Transparency on methodology of reserve sizing will help market participants design efficient bidding strategies and manage plant utilisation.

## Section 2: Other preconditions for an efficient AS market

- 6. Load shedding as a measure to manage over drawal or grid frequency needs to be disincentivised. State Grid Codes need to be amended to mandate all users/discoms to publish information around load shedding instances, including contingency faced, quantum shed, duration, and options exhausted before load shedding was resorted to.**

While disconnection of demand/rotational load shedding may be the easiest way to maintain grid frequency within prescribed limits of 49.95 to 50.05 Hz (Nath et al. 2020), it leads to a number of inefficiencies:

- a. Unmet service obligation to consumers,
- b. Inadequate compensation for consumers whose load is shed, who are effectively providing a Regulation UP service,
- c. Inadequate compensation for service providers willing to provide AS.

Recording reasons and duration of load shedding across seasons and years can allow State Electricity Regulatory Commissions (SERCs) to devise appropriate review, monitoring and penalty mechanisms. For example, the existing Deviation Settlement Mechanism (DSM) regulations may be modified to disincentivise occurrence of such events. In addition, reserve requirement (or likely demand for AS) at state and/or regional level may be assessed by computing the total value of unserved energy (at a certain penalty rate as proxy) in case of various supply- and demand-side contingencies.

### **7. The Draft Regulations may favour inefficient thermal plants for provision of AS.**

As per the Draft Regulations, SRAS providers will be identified based on the Custom Participation Factor, which takes into account both the ramping capability and the variable cost (VC) of the AS provider. TRAS will be cleared based on discovered prices, and in an efficient market, bids would be based on the VC. The average VC of centrally-owned gas-based thermal generators over the past year was INR 5.08/kWh, while that of centrally-owned coal power plants was less than half of this, at INR 2.26/kWh. Among the latter, plants likely to have un-requisitioned supply based on their average plant load factors had VCs of INR 2.77-2.94/kWh, with 25–40-year-old plants at the lower end of the spectrum. Thus, SRAS and TRAS are likely to open up an alternative revenue stream for inefficient plants with access to cheaper fuel (primarily coal).

### **8. The Draft Regulations should solve for the regionally skewed provision of AS under the RRAS mechanism.**

As per CERC (2015), a part of the tertiary reserves should be maintained in a decentralised fashion by each state control area, highlighting the importance of local reserves. As per the Draft Regulations, a shortfall in market-based procurement of AS would imply that the procurement mechanism essentially reverts to the extant system, which may lead to skewed provision of reserves at local and regional levels (Athawale 2021).

**9. There is a need to analyse requirement for allocation of transmission capacity for AS providers.**

The Draft Regulations do not specify any mechanism for allocation/reservation of transmission capacity for providers of AS that are located in remote locations. Transmission capacity reservation for reliability services is seen as an essential feature in developed markets, and may become more important as aggregators or battery storage operators, and not just power generators, seek to participate in the AS market. Intuitively, use of such AS providers would decongest the grid, and hence, should be considered for improving reliability. However, reserving capacities for reliability may be further analysed.

**10. The costs and benefits of transitioning to a 5-minute scheduling and despatch system need to be assessed.**

POSOCO's review of the RRAS mechanism (POSOCO 2016) as well as the Forum of Regulators (2016) have recommended transitioning to a 5-minute scheduling and despatch system from the existing 15-minute scheduling and despatch system. This would reduce the need for AS, as schedules can be drawn up more frequently, reducing the uncertainty in the demand-supply gap. However, this may impose substantial costs on the system in terms of communication and coordination between the various entities involved in operating the grid, both at the state and the national level, and the transition may be part of the longer-term strategy.

We share the above inputs with the objective to inform strategies for improvement of the performance and efficiency of the sector as a whole. We would be happy to further clarify/explain our submission, if needed, before CERC.

## References

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