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संदर्भ: GRID-INDIA/NLDC/CERC/

दिनांक: 17th Oct 2023

सेवा में,

सचिव,

केन्द्रीय विद्युत विनियामक आयोग

3rd एवं 4th फ्लोर, चंद्रलोक बिल्डिंग

36, जनपथ, नयी दिल्ली, 110001

विषय: CERC staff paper on Market Coupling

महोदय/महोदया,

The suggestions on behalf of Regional Load Despatch Centres (RLDCs) and National Load Despatch Centre (NLDC) on the CERC staff paper on Market Coupling are enclosed herewith for your kind perusal.

सधन्यवाद,

भवदीय,



(एस. सी. सक्सेना)

कार्यपालक-निदेशक-रा.भा.प्रे.के.

Encl: As above

Copy for kind information:

1. CMD, Grid-India
2. Director (MO)/Director (SO), Grid-India
3. Heads of All RLDCs



**Grid Controller of India Limited
(A Govt. of India Enterprise)
(Formerly Power System Operation Corporation Limited)
National Load Despatch Centre**

दिनांक: 17-10-2023

Sub: Inputs on CERC Staff paper on Market Coupling

1. De-constructing the term "Market Coupling"

The proposed market coupling is distinct from coupling arrangement in Europe wherein Price Coupling of Regions – PCR exists which is a common price coupling algorithm used in the Single Day-Ahead Coupling to calculate power prices across Europe, while implicitly allocating auction-based cross-border capacity. Therefore, the proposal in staff paper is not market coupling in strictest sense but merger of bids received through various power exchange platforms.

In Europe, before implementation of the coupling arrangements, EU Regulation 2015/1222 was published which established a guideline on Capacity Allocation and Congestion Management (CACM) (link - <https://eur-lex.europa.eu/eli/reg/2015/1222/oj>) and also served as a key piece of legislation for the single market in electricity. It sets out minimum harmonised rules for the ultimate single day-ahead and intra-day market coupling among various Nominated Electricity Market Operators (NEMOs) (power exchanges in Europe in various countries). As per the CACM regulation the NEMOs were directed to give a plan that sets out how NEMOs will jointly set up and perform the Market Coupling Operator (MCO) Functions (the "MCO Plan") (link - https://www.nemo-committee.eu/assets/files/nemo_committee_files/MCO_plan.pdf).

In Europe, development of a single price coupling algorithm, commonly known as EUPHEMIA (acronym for Pan-European Hybrid Electricity Market Integration Algorithm) took place. Since February 2014, Euphemia is progressively used to calculate energy allocation and electricity prices across Europe, maximizing the overall welfare and increasing the transparency of the computation of prices and flows.

In the Indian context, Market Coupling Operator (MCO) would play the role of merging of bids and clearing of market transactions. It would, in essence, translate into a single platform, single physical delivery market. However, there is a need for extensive work on features of market coupling and roadmap for implementation.

2. Introduction of MCO and competition in power market

The introduction of separate MCO may disincentivise the existing Power Exchanges for the investment already done on the infrastructure. The Power Exchange shall be obtaining bids from its clients and forwarding the same to MCO and communicating the result of price discovered and transactions cleared by MCO. There will be little incentive for the power exchanges to introduce new and innovative products in the market. On the other hand, the MCO being the monopoly entity not having any interface with the customers will not have any incentive to introduce innovative products. For instance, new technologies like Battery Energy Storage Systems (BESS), Pump Storage Hydro may require more complex bid structure. On the other side with introduction of MCO uniform and standardised bid format needs to be operationalised across all the power exchanges.

3. Market/Exchange Coupling and optimisation of economic surplus

Considering that about 90% transaction volume is through contracts and more than 99% trade in power exchange is taking place in one exchange, optimization from a common price discovery by MCO and maximizing overall economic surplus will be of little significance. On the other hand, it will result in introduction of one more player in the chain of operations through power exchange and flow of information from power exchanges to the MCO and vice versa.

Time available in RTM for obtaining bids and processing after gate closure is already quite less and introduction of one more agency (MCO) will make it tighter and add to cost with insignificant gain.

4. Issue of Transmission Corridor Allocation among Power Exchanges for Collective Transactions

At present, three Power Exchanges are in operation in India, namely, the Indian Energy Exchange Limited (IEX), the Power Exchange India Limited (PXIL), Hindustan Power Exchange Limited (HPX).

Commission in its order in Petition No. 6/SM/2022, which dealt with the issue of issue of transmission corridor allocation among power exchanges for collective transactions has directed following –

"15.1. (c) In the event of the combined volume exceeding the ATC for DAM in any transmission corridor, the allocation of available corridor margin among the Power Exchanges shall be in the ratio of the initial unconstrained market clearing volume of DAM in the respective Power Exchanges, and accordingly, this shall be communicated to the Power Exchanges."

Commission has extended similar methodology for transmission corridor allocation among power exchanges for real time market.

The existing formula linked to volume handled in each exchange seems to be fair.

However, with the introduction of Connectivity and GNA Regulation-2022, state wise bid area concept has emerged. This will bring out more localized and granular congestion at national level. In addition to that it may be noted that the both "Guidelines for Resource Adequacy Planning Framework for India" as notified on 28th June 2023 by MoP and Indian Electricity Grid Code-2023 resource adequacy planning chapter mandates for ensuring tying up of sufficient capacity to reliably serve expected demand of the consumers in the DISCOMs license area in a cost-effective manner. This is expected to increase power market liquidity as well as potential congestion across network in future. In such a situation to ensure optimal utilization of network and congestion management establishment of single point market clearing operator may be desirable.

5. System operator as Market Clearing Operator (MCO)

System and market operation in power system are two specialised functions with their mutual dependence on reliable, secure, and efficient operation of power system as well as markets. However, for the sake of functional specialisation and fostering efficient working of both, distinct and independent functioning of both the activities needs to be recognised. The staff paper as an alternate method proposes the system operator to take up the role of Market Clearing Operator (MCO). It may be noted that while system operator plays the crucial role of calculating capacity margins, market operator does capacity allocation based on security and economic principles. Further, market operator administers mechanism for Price discovery adopting the principle of maximisation of economic surplus (sum of buyer surplus and seller surplus) while taking into account all bid types. This role of price discovery of MCO necessitate functional separation (arm's length distancing) from System Operator. Thus, for the sake of independent and specialised functioning, a ring fenced or de-mutualized Market Clearing Operator (MCO) may be considered.

6. Clearing and Settlement:

Clearing and settlement are the key components of a well-functioning market. If Market Clearing Operator (MCO) takes up the role of running the market clearing engine, it will become highly desirable to set up an independent and neutral clearing and settlement body.

In 2010, the Commission notified 'CERC (Power Market) Regulations 2010. Regulation 29 of the PMR 2010 made it optional for the Power Exchanges to hive off the clearing and settlement function to a separate Clearing Corporation. Relevant extract of Regulation 29 of the PMR 2010 has been provided as below:

"29. Power Exchanges may hive off the clearing and settlement function to a separate Clearing Corporation in case deemed fit."

The Power Market Regulation-2010 defined Clearing Corporation as –

"Clearing Corporation means an organization which undertake clearing and financial settlement of all contracts transacted on an Exchange with which it is affiliated or any contracts transacted outside the Exchange in accordance with these regulations as amended from time to time;"

The Commission notified the CERC (Power Market) Regulations 2021 on 15.08.2021 repealing the PMR 2010. Regulation 12(5) of the PMR 2021 provided that the Power Exchanges granted registration before the date of notification of these regulations are required to realign their Bye laws, Rules and Business Rules in accordance with the PMR 2021 and to seek approval of the same within six months of enforcement of these regulations. The Commission approved these documents which had a provision for in-house clearing and settlement procedure in the Power Exchanges for the transactions taking place at the respective Exchanges.

PMR 2021 also provided that the Power Exchanges which have been granted registration by the Commission prior to the date of coming into force of these regulations shall be required to carry out the Clearing and Settlement in accordance with the Payment and Settlement Systems Act, 2007 (PSSA 2007) within a period of one year from the date of coming into force of these regulations (i.e. 15.08.2021) or such other period as may be approved by the Commission. The relevant provision of Regulation 27 of PMR 2021 has been extracted below:

"27. Clearing and Settlement (1) The Power Exchange shall carry out the Clearing and Settlement of any transaction of electricity undertaken on the Power Exchange in accordance with the provisions of the Payment and Settlement Systems Act, 2007:

Provided that Power Exchanges which have been granted registration by the Commission prior to the date of coming into force of these regulations shall be required to carry out the Clearing and Settlement of any transaction of electricity undertaken on the Power Exchange in accordance with the provisions of the Payment and Settlement Systems Act, 2007, within a period of one year from the date of coming into force of these regulations or such other period as may be approved by the Commission"

PSSA 2007, inter-alia, provides that the payment and settlement related activities of Exchanges (excluding stock exchanges) would be under the purview of the Reserve Bank of India (RBI). The relevant extract from the PSSA 2007 is quoted below:

"3. Designated authority (1) The Reserve Bank shall be the designated authority for the regulation and supervision of payment systems under this Act.

.....

*34. Act not to apply to stock exchanges or clearing corporations of stock exchanges.
– Nothing contained in this Act shall apply to stock exchanges or the clearing corporations of the stock exchanges."*

The Commission vide its order in Petition No. 11/SM/2022 (suo-motu) accorded approval to extension of time for the Power Exchanges to align their Clearing and Settlement system to the provisions of the PSSA 2007, for one more year w.e.f 15.08.2022. While directing the staff to the Commission to examine the issues involved in carrying out the Clearing and Settlement in accordance with the PSSA 2007, in consultation with the Ministry of Finance and RBI, and draw a roadmap for implementation of the same in accordance with Regulation 27 of PMR 2021.

Further, Hon'ble Commission vide Petition No. 8/SM/2023 (suo-motu), has accorded approval for a one-year extension w.e.f. 15.08.2023 in terms of the provisions of Regulation 27(1) of the PMR 2021, to the Power Exchanges to align their Clearing and Settlement systems to the provisions of the PSSA 2007. The Commission directed the staff of the Commission to resolve the matter expeditiously in consultation with the RBI and take the required steps in a time-bound manner.

As the clearing and settlement function of Power Exchanges would also become increasingly more complex with increase in physical and financial products portfolio, an

independent and neutral clearing and settlement body under the institutional mechanism as laid in accordance with Payment and Settlement Systems Act, 2007 and RBI oversight would ensure trust, reliability and accountability amongst the market players. In the future, such clearing facilities can also be utilized for settlement of POC charges, Payment Security Mechanisms etc.

7. Regulatory Oversight:

As MCO will perform critical function of capacity allocation and price discovery, proper regulatory oversight, periodic audit of market clearing functions is very much necessary for ensuring transparency and building confidence among market participants. A single agency such as MCO would need tighter regulatory monitoring and controls. Earlier in 2008, while introducing Power Exchanges, CERC chose to opt light handed regulation to allow competition between Power Exchanges.

Way forward –

Indian power market model is closer to European model of decentralised despatch where multiple power exchange platforms thrive. To begin with the European model, where different Nominated Electricity Market Operator (NEMO) are currently in charge of performing the role of MCO based on the rotational scheme, may be adopted in Indian context. Three exchanges in India can clear the DAM and RTM on round robin manner. The Power Exchanges would need to use same algorithm and same software. While one exchange will perform the market clearing function on a particular day any alternate exchange may perform result cross-validation. This will ensure continued usage of algorithms, resources and infrastructure already developed across different exchanges for market clearing purpose. Further this model will avoid creation of any new MCO and its market clearing algorithm and software.

As market coupling is a complex concept, there is a need for detailed study on various aspects such as formulation of Market Clearing Engine, Algorithm, Objective Function, Intertemporal constraints, resource level constraints and system-wide constraints. Validation and testing of the engine and algorithm, Information Technology, Hardware and Data Interfacing, Operational Flexibility Provisions and host of other requirements.

In this regard, it is suggested that after finalization of the regulations, an expert group comprising of Staff of the Commission, System Operator, Power Exchanges and other independent electricity market experts may be formed to deliberate various alternatives

and recommend the way forward and roadmap for the market coupling in Indian electricity market.

Power sector in India is currently passing through big-bang regulatory changes such as Connectivity and General Network Access Regulation-2022, Deviation Settlement Mechanism Regulation-2022, Indian Electricity Grid Code (IEGC) Regulations-2023. Such paradigm changes need time to be stabilized. Feedbacks obtained through various international experts reveal that before initiation of large-scale changes such as market coupling minimum three months of parallel/ trial operation needs to be done. Such pilot operation is sine-qua-non for ascertaining the operational, market and regulatory impacts on an existing system.
