

## **Framework for Real-Time Market for Electricity**

### ***STATEMENT OF REASONS***

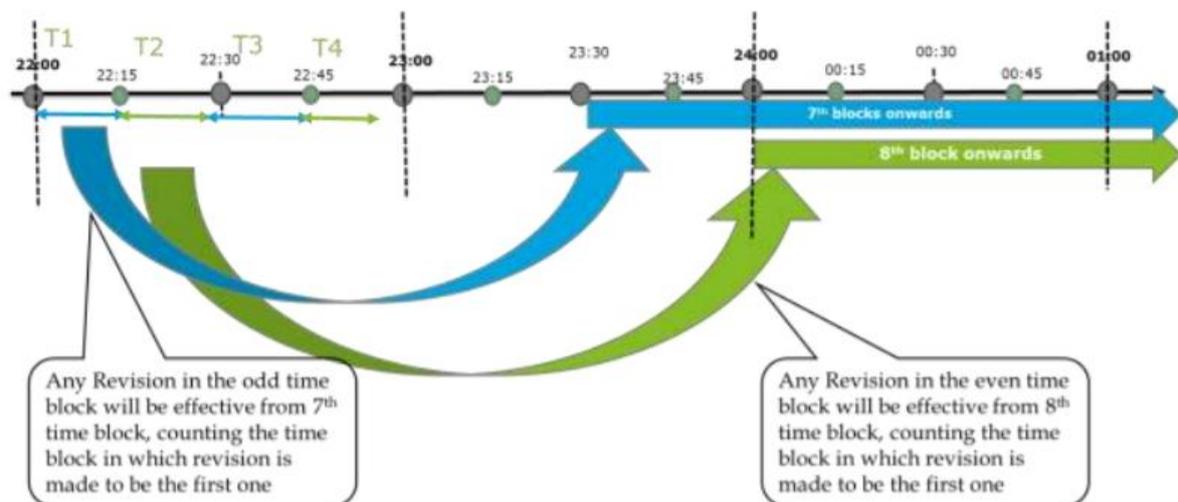
The Commission, with a view to providing the buyers and sellers an organized platform for energy trade closer to real time had proposed a regulatory framework for real-time market. The Commission issued the Explanatory memorandum and draft amendments to the Indian Electricity Grid Code, Power Market Regulation and Open Access in Inter-state Transmission Regulations on 06.08.2019 and invited comments/ suggestions/ objections thereon. Last date for submission of comments / suggestions /objections was 05.09.2019. In response to the same, 32 stakeholders submitted their written comments /suggestions. Subsequently, public hearing was held by the Commission on 14.10.2019 to hear views of all the stakeholders. The list of stakeholders who submitted written comments or made oral presentations in the public hearing is enclosed at Annexure-I.

1.2 From the comments/ suggestions received, it is observed that stakeholders have in principle agreed to the introduction of Real Time Market as an organised platform closer to delivery of power, however have sought clarification on operational aspect and implementation aspect of Real Time Market. In accordance with the provisions of section 178(3) of the Electricity Act, 2003 (the Act) read with Electricity (Procedure for Previous Publication) Rules, 2005, the Commission has considered the objections and suggestions received on the draft regulations which are dealt in the succeeding paragraphs.

## 2. Right to revision of schedule

### Proposed provision

2.1. It was proposed that any revision in schedule made in odd time blocks shall become effective from 7th time block onwards, and any revision in schedule made in even time blocks shall become effective from 8th time block onwards, counting the time block in which the request for revision has been received to be the first one. A schematic representation of the proposed changes to the right to revision of schedule is given below:-



2.2. Accordingly, the draft amendment to the Indian Electricity Grid Code Regulations, 2010 provided inter alia, as under:-

*“18. Revision of declared capability by the ISGS(s) having two part tariff with capacity charge and energy charge and requisition by beneficiary (ies) for the remaining period of the day shall also be permitted with advance notice. Any revision in schedule made in odd time blocks shall become effective from 7<sup>th</sup> time block and any revision in schedule made in even time blocks shall become effective from 8th time block, counting*

*the time block in which the request for revision has been received by the RLDCs to be the first one. “*

### **Comments Received**

2.3. Some stakeholders (viz., MSEDCL / BSPHCL /Telengana Transco etc) have stated that it is possible that due to extending the time for right to recall, the discom may purchase power from own contracted generator in real time. On the one hand, it will pay fixed cost and on the other there is a possibility that it may buy costlier power through the real time market. This is in violation of the existing PPA. This would increase the risk profile for the Discoms both in terms of pricing as well as availability. Moreover, discoms tend to overdraw due to gamut of reasons viz. forecast errors, weather changes, generation outages, RE variability etc. which are not controllable on their part.

2.4. POSOCO highlighted that once the window for revision of schedules closes at, say, 22:45 hours of Day D for delivery from 00:00 to 00:30 hours of day D+1, the RLDCs shall be working out the injection and drawl schedules which take 2-3 minutes. In the proposed scheme of things, there is no time allowed for running and finalizing the schedules prior to opening the RTM bidding/auction window and there can be information gaps. In this context, it could be better if one more block of 15 minutes may be provided so that participants have sufficient time to place their bids.

2.5. SRPC has suggested that one more window after RTM market clearing to revise the schedules may be retained at 4 time blocks before delivery of power. This is because since clearing in RTM is not certain, 7/8 time blocks ahead does not give enough time to beneficiaries to

modify their schedules and is against the available flexibility as on today. The objective of coming closer to real time is not met. TPDDL / FICCI also suggested that, in a case where generator's bid and discom's bid are not cleared in RTM and both of them have a PPA, right to recall such power may be restored for concerned discoms only. UPPCL also suggested not to disturb the present right to recall before 4 time blocks.

2.6. Some stakeholders (viz., RPTCL / NHPC / Adani / Udipi Power / NTPC / Sembcorp etc) also highlighted that in case of forced outages, the existing regulations for revision in schedule by a generator with 4 time blocks should be retained, else DSM exposure for generators will increase from 4-time blocks to 7 or 8 time blocks. Since, unit tripping / forced outage is an unforeseen event (may be 10 to 12 times a year), it has huge financial implication (almost 2 times) on generators.

2.7. UPPCL also highlighted that the proposed framework for power rescheduling has been proposed to be 7th / 8th time blocks before delivery whereas DSM 5th amendment has implemented sign change penalty from 6th time block post April, 2020. Hence, both provisions need to be reconciled.

2.8. Some stakeholders (viz., Renew Power/APP/Tata Power etc) highlighted that wind and solar based projects should also be treated at similar footing like at present revision of wind and solar based generators need more time blocks. They also suggested that there would be a need to reduce the proposed timeline for implementation/revision of schedule in the future to make the market further closer to real time and facilitate grid management.

2.9. Torrent Power mentioned that the state grid code / scheduling process may not be in sync with the IEGC and hence the proposed RTM framework is to be implemented after making gate closure concept uniform across central and state level.

### **Decision of the Commission**

2.10. The Commission has considered inputs of the stakeholders on the issue of right to revision of schedule. The Commission appreciates the concerns arising out of extension of the right to revision of schedule from 4 to 7/8 time blocks before delivery. Conscious of this fact, the Commission proposed half hourly market as against the proposition of hourly market in the discussion paper, which would have further extended the right to revision to 10 time blocks. The Commission is in consonance with the need for reducing the time between RTM auction and delivery of power, but is constrained by the operational difficulties highlighted by the system operator and other stakeholders. Automation is a pre-requisite to shortening the time between RTM auction and delivery of power. The process of implementation of National Open Access Registry (NOAR) has already been initiated and once the automation is in place, the Commission would definitely like to bring Real Time Market further close to actual time of delivery.

2.11. However, the Commission would like to reiterate that the proposed Real Time Market would not only provide discoms an alternate mechanism to access larger market at competitive price but would also allow the generators to participate in the RTM with their un-requisitioned capacity. As explained in the Explanatory Memorandum, 'Right to revision of schedule' is nothing but a product in the electricity market continuum. When the application window for one product expires,

window for another product opens. The provision would still be available to the discom and the generator, and could be exercised by them until the real time market for specified half an hour commences. Any requirement of power after the end of right to revision of schedule should be met through the Real-Time Market at the real-time price. With Real Time Market in place, the discom would have a revolving reserve available in the form of half hourly trading opportunity.

2.12. On the issue of forced outage of the generators, the Commission is of the view that multiple provisions for right to revision would create avoidable confusion in scheduling and accounting practice and could shift the risk /financial impact to discoms. As discoms are expected to do better load forecast closer to the delivery period before the commencement of real time market, so are the generators also expected to bring discipline in managing their generation to avoid unforeseen event such as unit tripping/ forced outage. Further, under the existing regulatory framework also, revision of schedule is not permitted in case of collective transactions. Accordingly, a generator having participated in collective transaction in Day Ahead Market and Real Time Market cannot revise its schedule in case of forced outage for the time blocks for which it has been cleared. Accordingly, the Commission has decided that in order to maintain the equity between discoms and generators, the right to revision will remain at 7<sup>th</sup> or 8<sup>th</sup> time blocks in case of forced outage under long term, medium term and short term bilateral transactions (excluding collective transactions in day-ahead market and real time market).

2.13. The Commission is of the view that the proposed timeline of 15 minutes for RTM auction would be adequate for participants to place

their bids after considering any revision of schedules before the timeline for the same ends. It is also felt that extending the RTM auction by another 15 minutes will lead to extending the proposed right to revision from 7/8 to 8/9 time-blocks from delivery which will cause further discomfort to the utilities. Hence, the right to revision will remain 7/8 time blocks for the ISGS entitlement of the beneficiaries. The Commission has decided to implement RTM from 1st April, 2020. It is felt that during this period of more than three months, operational issues will be sorted out in the mock exercise to be coordinated by POSOCO with the assistance of Power exchanges, buyers, sellers and other concerned stakeholders. POSOCO is directed to coordinate the same accordingly.

2.14. Regarding the issue of allowing one more time block for re-scheduling of power after RTM clearing, as suggested by SRPC, the Commission is of the view that multiple provisions for revision of schedule, one for RTM (7-8 time-blocks) and another as per the existing practice (4 time blocks) would create avoidable complications in the scheduling processes. This could lead to overlap of schedules and also constrain ramping capabilities of generators for participation in the subsequent RTM window. As far as the issue of unmet demand and unsold URS power is concerned, the CERC regulated generators would have an option of getting scheduled through the SCED in the transition and the load serving entities are expected to do better load forecasting and estimate reserves requirement adequately to address this issue. Further, as highlighted above, the Commission is committed to bringing RTM further closer to the actual time of delivery, once the requisite level of automation (like NOAR) is put in place.

2.15. As far as the issue of DSM sign change penalty from 6th time block is concerned, it is to be noted that the sign change penalty is applicable only if there is a continuous deviation in one direction for 6 time blocks and the entity does not remain in the range of +/- 20 MW latest by 7<sup>th</sup> time block. The dispensation of +/- 20 MW has already been extended to enable the grid-connected entities to overcome operational constraints, and ensure change of sign at least once during the specified number of time blocks. This issue is, therefore, beyond the scope of the present regulatory intervention on revision of schedule in the context of RTM.

2.16. On the issue of treating wind and solar projects at similar footing, the Commission may take an appropriate view in due course of time, after reviewing the scheme of Forecasting and Scheduling of RE based on operational experience in this regard.

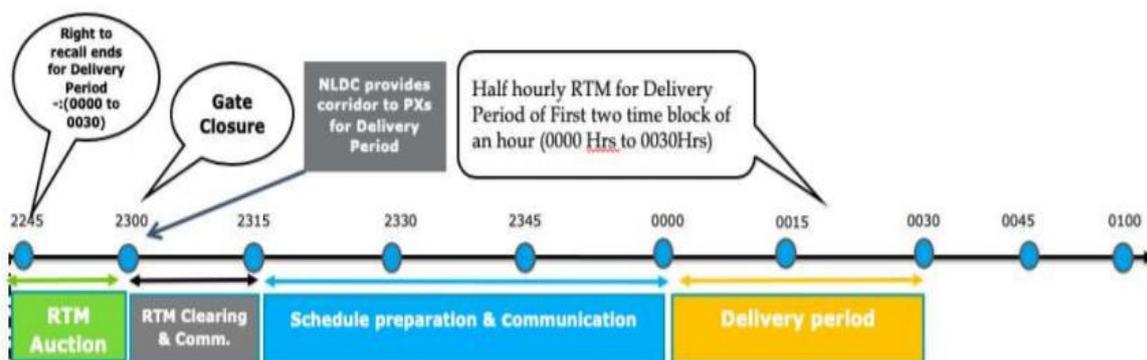
2.17. Regarding the issue of violation of PPAs, the Commission would like to reiterate that the provision of right to revision of schedule in most of the PPAs in respect of the generating stations whose tariff is determined by the Commission, owes its genesis to the provision in IEGC. Such PPAs generally make references to relevant provisions of CERC regulations in respect of scheduling, etc. As such, any amendment of the relevant regulations of CERC automatically gets incorporated in such PPAs. It would also be pertinent to mention that, as per the current legal position (as established by judicial pronouncements), regulations made by the Commission get inroads into the PPAs.

2.18. To sum up, the provision in the proposed amendment for revision of schedule in 7/8 time blocks is being retained in the final amendment (i.e. in Regulations No. 6.5.18, 6.5.18(a) and 6.5.19) subject to exceptions that revision of schedule in 4 time blocks would still be available (i) to Wind and Solar generators; and (ii) to the System Operator, in the event of bottleneck in evacuation of power or in the interest of better system operations, as per the existing provisions specified under Regulation 6.5.23(iii), 6.5.16 and 6.5.20 of IEGC.

### 3. Timelines and Gate Closure for RTM

#### Proposed provision

3.1. It has been proposed that the Real-Time Market would commence with the end of the right to revision of schedule or declared capability and would end with gate closure. Gate Closure refers to the time after which bids submitted to the Power exchange cannot be modified. Also, the real time market would be conducted every half an hour for the delivery of power for the duration of 30 minutes in two time blocks of 15 minutes each. A schematic representation of the proposed Real time market framework as illustrated in the Explanatory Memorandum is shown below:-



3.2. For this purpose, the proposal for amendment to relevant regulation of Central Electricity Regulatory Commission (Open Access in inter-State Transmission) Regulations, was as under:-

*“13(B) Procedure for scheduling of transaction in Real-time market All the entities participating in the real-time market for a specified duration may place their bids and offers on the Power Exchanges for purchase and sale of power. The window for trade in real-time market for day (Do) shall open from 22.45 hrs to 23.00 hrs of (D-1) for the delivery of power for the first two time blocks of 1st hour of (Do) i.e., 00.00 hrs to 00.30 hrs, and will be repeated every half an hour thereafter. The bidding mechanism for the real-time market shall be double-side closed bid auction for delivery of power in each time block of that hour. The Nodal Agency shall indicate to the Power Exchange(s) the available margin on each of the transmission corridors before the gate closure, i.e. before the window for trade closes for specified duration. The power exchanges shall clear the real-time market from 23.00 hrs till 23.15 hrs based on the available transmission corridor and the buy and sell bids for the RTM for the specified duration. Then the cleared bids shall be submitted by the Power Exchanges to the Nodal Agency for scheduling. The Nodal agency in accordance with the detailed procedure shall announce the final schedule by 23.45 hrs of (D-1) and communicate to the RLDCs to prepare the schedule for dispatch.*

The complete timeline for scheduling of the real-time collective transaction is shown in the table below:-

RTM Auction Start Time	RTM Auction End Time	RTM Clearing Interval and publication in the website	Communication of Schedule to NLDC/RLDCs/ SLDCs	Final Schedule Preparation	Preparation time for despatch	Delivery Period
<b>Illustration - A</b>						
22:45 Hrs (of the previous day)	23:00 Hrs (of the previous day)	23:00 Hrs – 23:15 Hrs (of the previous day)	23:15 Hrs – 23:30 Hrs (of the previous day)	23:30 Hrs – 23:45 Hrs (of the previous day)	23:45 Hrs – 24:00 Hrs (of the previous day)	00:00:00 – 00:30:00
23:15 Hrs (of the previous day)	23:30 Hrs (of the previous day)	23:30 Hrs - 23:45 Hrs of the previous day	23:45 Hrs – 00:00 Hrs (of the previous day)	00:00 Hrs – 00:15 Hrs	00:15 Hrs – 00:30 Hrs	00:30:00 – 01:00:00
<b>Illustration - B</b>						
07:45 Hrs	08:00 Hrs	08:00 Hrs - 08:15 Hrs)	08:15 Hrs – 08:30 Hrs	08:30 Hrs – 08:45 Hrs	08:45 Hrs – 09:00 Hrs	09:00:00 – 09:30:00
<b>Illustration - C</b>						
20:45Hrs	21:00Hrs	21:00 Hrs – 21:15 Hrs	21:15 Hrs – 21:30 Hrs	21:30 Hrs – 21:45 Hrs	21:45 Hrs - 22:00 Hrs	22:00:00 – 22:30:00

## Comments Received

3.3. TPDDL has appreciated the proposed framework given by the Commission. Gujarat SLDC /GETCO has requested for clarity on timelines of RRAS, SCED & RTM.

3.4. Various stakeholders have suggested to reduce the total RTM timelines further. Sembcorp suggested to shorten the time between the commencement of RTM and the start of actual delivery of power from proposed 5 time blocks to 3 time blocks by reducing the schedule preparation and communication to 1 time block. APP and Tata Power have suggested that schedule communication should be issued latest by 2330 for delivery of 0000-0030 hours, i.e. 2 time blocks ahead. Tata Power and BSPHCL also suggested to move RTM closer to delivery. NTPC highlighted that timeline for schedule preparation and communication should be 2 time blocks and there must be one clear time block for preparatory works / ramping activities of generator.

3.5. RPTCL has also highlighted that 15 mins window is less in the case of multiple bids by the traders from multiple parties. It has also argued that it is very difficult for small consumers to plan demand/drawal for every two time blocks. It is more viable for Open access customers to plan their demand / drawal pattern for 4 time blocks instead as they have a stable load factor. NHPC requested clarification on whether bidding for a particular time block can be done simultaneously at Intra Day and RTM.

3.6. NVVN has highlighted that presently they participate in bidding in the power exchanges by creating bid files and uploading the same onto the exchange platform. Due to such a mechanism, the proposed timeframe of 15 mins may not be adequate for a trader member to do the same for so many clients. Power Exchange could provide such a platform to trader member who can extend the same to clients who can submit real time bids directly.

### **Decision of the Commission**

3.7. The commission has considered the comments received regarding the timelines of RTM market. Some stakeholders have suggested to move the RTM closer to delivery and some have suggested to further increase the timeline for communication to market participants.

3.8. The Commission has undertaken extensive discussions with various stakeholders and arrived at the proposed framework. Any further increase in the timeline would mean that the right to revise the schedule will need to be further increased which could cause further discomfort to buying entities especially discoms. Further, any decrease

in timeline without full automation would cause operational difficulties at this stage. The Commission is of the view that the proposed timeline is adequate and the market participants would gradually adapt to the timeline.

3.9. Some stakeholders have suggested that provision for placing bids for all hours / more than two time blocks of the upcoming day should be enabled. The Commission expects that the Power exchange will develop the requisite market engine and rules so that participants can place bids for all the time blocks of the upcoming day in advance. However, the market engine will consider only the respective bids for clearing as per the proposed timeline. The Power Exchange is expected to frame suitable rules and bye-laws in this regard and obtain approval of the Commission.

3.10. On the issue of whether bidding for a particular time block can be done simultaneously at Intra Day and RTM, it is to be noted that the draft amendment proposed (Regulation 2.1 of (Open Access in inter-State Transmission) (Sixth Amendment) Regulations, 2019), has made it clear that bidding for a particular block cannot be simultaneously done at Intra Day and RTM.

3.11. It is expected that power exchanges will create suitable infrastructure and procedures to enable effective implementation of bidding and clearing mechanism as per the timeframe.

## **4. Transmission capacity / curtailment**

### **Proposed provision**

4.1. The Explanatory memorandum to the proposed RTM framework provides as under:-

*The allocation of transmission corridor between the power exchanges for real time transactions could be in the ratio of their shares in the cleared volumes in the day ahead market subject to a minimum of 10% of the available capacity to the power exchange having smaller share; or based on such methodology to be decided by the Commission by way of an Order.*

### **Comments received**

4.2. POSOCO highlighted that there is a need for specifying the modalities for the transmission Congestion Management post operation of the RTM. There could be a situation when a large number of participants may get affected due to real time curtailment and with the proposed timeline for real time market, communicating the information to all such affected parties would be a challenge.

4.3. Gujarat SLDC/ GETCO has requested for clarification on the curtailment priority of transactions under RTM. IEX has suggested that there should be no curtailment on RTM transactions.

4.4. PXIL has highlighted that since participation in existing DAM is skewed, the allocation criteria based on cleared volumes in DAM would deprive market participants of their choice as well as benefit the users of a particular exchange and leave no choice to consumers but to transact only through one exchange. This in turn would negate the competition

between power exchanges. Hence, PXIL requested to allocate the transmission capacity equally among both exchanges. EMA Solutions has also suggested for neutral and equity based transmission allocation mechanism.

4.5. EMA Solutions and BSPHCL have suggested that if transmission availability for the respective trading time blocks is not known, this may result in improper bidding and create uncertainty in selection. It has been suggested that it should be made mandatory for NLDC to declare corridor and time-block wise net ATC (post consideration of all transaction till the declaration time) to the market.

4.6. Renew Power has also requested for publishing the real time corridor availability data to enable the buyer/seller to make better decision before participating in RTM.

### **Decision of the Commission**

4.7. The Commission has considered the comments in the context. Considering the limited time to communicate curtailment information to participants in Real Time Markets, the Commission has decided that in the extreme event of curtailment of collective transactions, the day ahead collective transactions would be curtailed first following which the Real time collective transactions would be curtailed. Suitable amendments have accordingly been made in the Regulation 15 of the CERC Open Access Regulations.

4.8. Regarding the issue of transmission capacity allocation between the exchange, the Commission has stated in the Explanatory Memorandum that the allocation of transmission corridor between the

power exchanges for real time transactions could be in the ratio of their shares in the cleared volumes in the day ahead market subject to a minimum of 10% of the available capacity to the power exchange having smaller share; or based on such methodology to be decided by the Commission by way of an Order. The Commission has decided to continue with this principle as the same is also in line with the existing practice in the day-ahead collective transactions through the power exchanges.

4.9. As far as the issue of publishing corridor availability prior to RTM bidding is concerned, the Commission is of the view that the process of providing the transmission corridor margins in advance could affect the bidding behaviour of the market participants. However, NLDC will provide corridor availability just at the end of the bidding window for RTM. Bids received in the Real time market will be cleared by the Power Exchanges based on this corridor availability.

## **5. Profit sharing**

### **Proposed provision**

5.1. The Explanatory Memorandum provided as under:-

*Buyers/sellers would have the option of placing buy/sell bids for each fifteen minute time block in the half hourly real time market. The generators having long-term contract and participating in this market will be required to share the net gains (after accounting for the energy charge) with the discoms in the ratio of 50:50 as per the stipulation of the Tariff Policy, 2016.*

5.2. Further, as per the draft Central Electricity Regulatory Commission (Indian Electricity Grid Code) (Sixth Amendment) Regulations, 2019:-

*“(c) An ISGS may sell power from the share of its original beneficiaries in the day-ahead Market with the consent of such beneficiaries; and in the real-time market without the requirement of consent from the beneficiaries, before the trading for the real time market for a specified duration commences. In both the cases, the realized gains shall be shared between the ISGS and the concerned beneficiary in the ratio of 50:50 or as mutually agreed between the ISGS and concerned beneficiary in the billing of the following month. This gain shall be calculated as the difference between selling price of such power and fuel charge including incidental expenses.”*

*“Provided that such sale of power by ISGS shall not result in any adverse impact on the original beneficiary (ies) including in the form of higher average energy charge vis-à-vis the energy charge payable without such sale”*

*“Provided further that there shall be no sharing of loss between the ISGS and the beneficiary (ies)”*

### **Comments received**

5.3. GRIDCO suggested that instead of sharing gains from URS sale in the ratio of 50:50, generators should be given applicable trading margins as the generator in this case is acting like a trader and selling the beneficiary's power to another buyer in the market. GRIDCO highlighted that the original beneficiary is paying the fixed cost for such un-requisitioned power and it can sell the same either directly or through a trader / generator. Hence, in such a case, sharing of profit margin in the ratio of 50:50 seems to be unreasonable and unfair. GRIDCO also highlighted that the proposed mechanism of 50:50 sharing may also

prevent the beneficiaries from giving first preference to sell such power through the generator. On the other hand, if the gains to the generator are limited to prevailing trading margin, then the beneficiaries will prefer a generator over a trader for such sale and thus enable a mechanism for generators to earn additional revenues through the market.

5.4. MSEDCL highlighted that selling power without consent is violation of terms and conditions of PPA. Moreover, commercial arrangement for profit sharing needs to be worked out mutually between seller and buyer. The proposed 50:50 basis of profit sharing will give undue advantage to generators in a cost plus regime since generators are already recovering their investments.

5.5. UPPCL suggested that gains from URS sale should be done in the ratio of 80:20 between utility and generator. The rationale for the same is that since fixed charges are borne by original beneficiaries, the utility, in present conditions, can recall the surrendered power but the proposed real time framework will prohibit the same. In such a condition, the beneficiary will need to arrange the power from the market which could be at a higher cost. Profit sharing on the basis of 80:20 formula will ensure adequate compensation for the beneficiary to balance out higher cost of power through RTM, if the case is so.

5.6. Nabha Power and L&T requested for clarity on profit sharing mechanism for all types of power plants like 62 and 63. APP / Tata Power have suggested that for Sec 62 projects and for untied capacities, sale proceeds shall be 50:50 of net revenue after factoring in the actual fuel costs (instead of the quoted costs in the bids) and the associated power sale costs incurred by GENCO to facilitate such sale.

For Sec-63 projects, there should not be any ratio of sharing and the generator shall be allowed to retain the entire revenue earned from such sales as the actual fuel costs cannot be determined for such projects as against the quoted variable charge. This would encourage the cost efficient generators to participate in such real time market with their less costly power.

### **Decision of the Commission**

5.7. The Commission has noted the concerns raised by various stakeholders in this regard. The Commission understands that currently the beneficiaries bear the fixed cost of URS power. Under the existing URS availed mechanism, the original beneficiary receives refund of fixed cost proportional to its URS availed if any, by other beneficiary. As such the arguments of the Discoms in terms of equity on sharing of benefits with due regards inter alia also to the fact the generators already have the comfort of recovery of their fixed cost may need to be considered by the Commission. The Commission has considered the existing practice in this context, suggestions received and decided that adequate balance needs to be maintained to safeguard Discoms interest while at the same time incentivising the generators to participate in the Real Time Market.

5.8. Accordingly, with a view to balancing the interests of the distribution companies and the generators, the Commission has decided that the generators whose tariffs are determined by the Commission under section 62 of the Act and participating in this market will be required to share the net gains (after accounting for the energy charge) with the discoms in the ratio of 50:50 subject to a ceiling of share of 7 paise / kWh to the generator and the balance to the beneficiary. This

mechanism will provide adequate compensation to both buyers and sellers in the market.

5.9. As per the current practice, the distribution companies, if they so choose, can also sell in the RTM, their share of capacity in a generating station. In such a case, the entire net gains shall be retained by such distribution company.

5.10. As regards the generators under section 63 of the Act, in order to give effect to the above gain sharing mechanism, there might be a need for a supplementary PPA based on mutual agreement between the generator and the buyer. The appropriate Commission needs to approve such supplementary PPA.

## **6. Capacity building / augmentation of infrastructure**

### **Comments received**

6.1. POSOCO has suggested that there is a need for significant resources in terms of automation, communication and financial settlement.

6.2. MSEDCL has highlighted that SLDCs presently lack online demand forecasting and decision support tools for optimum scheduling. NTPC highlighted that sufficient time for development of IT infrastructure, training and skill development at various levels should be given before the proposed mechanism is rolled out.

6.3. Tata Power highlighted that that the system operator would need some time for schedule preparation and communication. It would be

important to also focus on the infrastructure needs of LDCs to enable true market operations rather than shift the operations away from Real Time. BRPL has suggested that an integrated scheduling software between RLDC / SLDC / Utilities is a basic requirement.

### **Decision of the Commission**

6.4. The Commission appreciates the need for infrastructure augmentation and capacity building for successful roll out of RTM and has accordingly decided to implement RTM from 1<sup>st</sup> April, 2020. The Commission expects that, during the period of more than three months, the buyers, sellers, traders, system operator and power exchanges would invest efforts in creating the necessary infrastructure for the Real time markets.

6.5. The Commission also directs POSOCO to coordinate mock exercise during the transition with the assistance of Power exchanges, buyers, sellers and other concerned stakeholders.

## **7. Auction design / price discovery / market operations**

### **Proposed provision**

7.1. The Explanatory Memorandum stipulated as under:-

- Real Time Market will be a half hourly market (as against the proposal in the discussion paper for an hourly market)
- Price discovery mechanism will be double-sided closed auction with uniform price.
- The concept of gate closure is proposed to be introduced, with timeline in consonance with half hourly market.

- Buyers/sellers would have the option of placing buy/sell bids for each fifteen minute time block in the half hourly real time market.
- RTM would be financially and physically binding. If the utilities fail to follow the dispatch instruction post RTM, it will attract charges under Deviation Settlement Mechanism.

7.2. Following is the overall process as described in the explanatory memorandum:-

- All the entities participating in the Real-Time Market i.e. after the right to revision of schedule or declared capability ends for a specified half an hour may place their bids and offers in the Power Exchanges for purchase and sale of power.
- The window for trade in Real-Time Market for day (Do) shall open from 2245 hrs to 2300 hrs of (D-1) for the delivery of power for the first two time blocks of (Do) i.e. 0000 hrs to 0030 hrs, and will be repeated every half an hour thereafter.
- The NLDC shall assess and communicate the margin in each transmission corridor before the trading for RTM closes for a specified duration that will be available for delivery period in RTM transactions (say by end of 2300 hrs for delivery of power between 0000 hrs to 0030hrs). The allocation of transmission corridor between the power exchanges for real time transactions could be in the ratio of their shares in the cleared volumes in the day ahead market subject to a minimum of 10% of the available capacity to the power exchange having smaller share; or based on such methodology to be decided by the Commission by way of an Order.

- Once the auction has ended, the power exchange shall run the optimization/engine and clear the market considering the available transmission margins (say by 23:15 Hrs.).
- The power exchange shall immediately communicate to the NLDC the cleared transaction/volume. The NLDC, using this information will communicate the schedule to the RLDCs/SLDCs to incorporate in the schedule. These schedules will be communicated to the respective RLDCs and SLDCs. The LDCs shall in turn incorporate the schedules and inform the respective generators and discoms.
- The bids cleared will be financially and physically binding for the delivery period

7.3. Accordingly, amendment to relevant provision of the IEGC was proposed as follows:-

*“(aa) Scheduling of Real-time collective transaction: NLDC shall indicate to Power Exchange(s), margin available in each of the transmission corridors before the gate closure, i.e. before the window for trade closes for a specified duration. Power Exchange(s) shall clear the buy and sell bids for the said duration under consideration on various interfaces or control areas or regional transmission systems as intimated by NLDC. The limit for scheduling of collective transaction during real time for respective Power Exchanges shall be worked out in accordance with the directives of the Commission. NLDC shall furnish the available transmission corridors to the Power Exchange(s) before the trading for real time market or a specified duration closes. Based on the information furnished by NLDC, Power Exchange shall clear the RTM bids and announce the Market Clearing price and volume. Based on the volume*

*cleared by the Power Exchanges, NLDC shall communicate the schedules to the respective RLDCs. After getting confirmation from RLDCs, NLDC shall convey the acceptance of scheduling of collective transaction to Power Exchange(s). RLDCs shall schedule the Collective Transaction at the respective periphery of the Regional Entities.”*

### **Comments received**

7.4. POSOCO commented that participation in both DAM and RTM segment is ‘voluntary’ and thus, liquidity is a concern in the RTM segment. In absence of a fairly liquid market to support a robust price discovery, uniform pricing or pay-as-bid needs to be debated thoroughly while considering auction design. POSOCO also suggested that in order to have utilities necessarily correct their position and balance their portfolio, it is suggested that mandatory participation for all regional entities may be considered. This would also bring liquidity and robustness of price in the RTM. POSOCO also commented that in future the RE generators may also participate in the RTM. It needs to be made clear that schedules for RE through the RTM cannot be revised and they shall be treated as firm and no revisions in RTM schedules can be done.

7.5. POSOCO also suggested that Ramping in the bids in sequential blocks be limited to 1% in bidding stage itself in line with the provisions of CERC (Indian Electricity Grid Code) Regulations, 2010. Gujarat SLDC /GETCO has highlighted that the scheduling methodology needs to be clarified in the case of a generator buying power during a forced outage (i.e. would it be a generator to generator dispatch or generator to beneficiary dispatch?).

7.6. Some stakeholders (viz. APP / Tata Power / IEX / FICCI etc.) have suggested that the provision for a generator to buy power in case of forced outage should not be restricted to only those generators who face forced outages. Instead, the same should be extended to all generators so that they may also get an opportunity to scout for cheaper power available in the market and replace their own expensive cost of generation.

7.7. FICCI highlighted that the proposed framework for Real Time Market does not address ramping limitations which would be important to create depth in the proposed intra-day market.

7.8. NTPC suggested that the NLDC should consider ramping constraints while clearing the RTM to ensure schedules are achievable. Another option is to consider a multipart bidding framework where generator can submit its ramp rate as well and the same may be considered while clearing the bids.

7.9. NHPC commented that suitable procedure be provided for generators who want to compensate the loss to its beneficiary / clients on account of Forced outage of its units in respect of Long Term / Medium Term / Short Term schedule of generator.

7.10. Statkraft requested for clarification on how the generators in a forced outage scenario will be able to buy power for the beneficiary and which regulatory provision enables the generators to execute this. Statkraft also wanted clarification as to whether trade results given by power exchanges will be assumed as the final schedule or whether the

intra-state entity has to wait for the same to be implemented at RLDCs/SLDCs portal.

7.11. Nabha Power and L&T wanted clarification on whether single exchange will operate or both and the detailed procedure if multiple exchanges are envisaged to operate.

7.12. APP / Tata Power also highlighted that the timelines should also be made strictly applicable at the Intrastate level as well, or else there would be a situation where intra state generating companies would continue to self-schedule based on earlier time line of 4 time blocks and Discoms will not be able to access RTM from ISGS and hence this anomaly would reflect in increased quantum of transactions being settled through DSM – which is clearly not the objective. Nabha Power and L&T also wanted to understand applicability on the State embedded Generators (within SLDC jurisdiction).

7.13. Some stakeholders (viz. EMA Solutions / RPTCL / BSPHCL / BRPL etc.) highlighted that since RTM is going to increase operational complexity for market participants, automation and digitization of Open Access process should be resolved before implementation of RTM and that NOAR should be in place before implementing RTM. EMA solutions also stated that Discoms take the risk of off-take, and pay capacity charges to the plant to the extent of their ownership and are thus the owners of power generated from the plants. Discoms should be given rights to sell un-scheduled power from contracted power plants on Power Exchanges by being the trading and clearing member of such plants on PX and place sell bids of such generators. The current provision of 50:50 sharing if generator sells at a profit may not serve the

Discoms well, as Generators are not the owners of the power and may not take effective calls to maximize profit from the market. It also mentioned that it is a practice in commerce of any commodity to give the right to buyer to re-sell from the point of delivery itself.

7.14. EMA solutions also highlighted the need to provide regulatory provisions to mandate Power Exchanges to provide API (Application Program Interface) access to their Trading Engines, so that technology firms can develop advanced and customized Trading/Bidding Terminals for use by Members and Clients.

7.15. RPTCL proposed that initially the control of RTM be assigned to the system operator (NLDC) to build trust initially then subsequently, activities like settlement, coordination and communication to/with market participants can be reassigned to power exchanges.

### **Decision of the Commission**

7.16. The Commission has considered the issues raised by the stakeholders. The Commission feels that in uniform pricing, auction participants receive the market clearing price so that the optimal strategy in competitive environments is to bid at marginal cost. In comparison, the pay-as-bid scheme used for continuous trading implies that market participants have to anticipate the clearing price and accordingly mark up their bids. Thus, the system of uniform pricing which helps in discovering the true system marginal cost has been preferred. Further, such an auction design followed in DAM has already gained acceptance with the market participants.

7.17. With regard to participation in real time market, the Commission has already highlighted that the real time market shall not be restricted to only merchant or renewable generators instead all the un-requisitioned capacity available in the long-term / medium-term contracts should be brought to the RTM platform to ensure that the real-time energy needs are met at least cost.

7.18. The Commission is of the opinion that any entity can participate in the Real time market and it should not be limited only to those participants who have participated in the day-ahead collective transactions since in such a case, the long term PPA holders who typically self-schedule their capacities on day-ahead cannot participate in RTM. The Commission expects that the SERCs would implement SAMAST in the states in order to have participation by intrastate entities in the RTM

7.19. On the issue of scheduling of RE generators in RTM, the Commission expects that with the proposed Real time market being close to actual period of delivery, the RE generators having un-tied capacities can participate in the Real time market for the same. The Commission also feels that in respect of the RE generators tied up under long term PPAs with discoms, the variability in such RE generation can be adequately managed by the discoms as portfolio managers, by participating in the real time market.

7.20. Some stakeholders have highlighted that ramping constraints should be factored in the bids. However, the Commission feels that the generators would submit their bids for the quantum of power to be injected considering ramping and other technical capabilities. It is also

important to understand that RTM would be an avenue for URS power of the generators. Ramping constraint is applicable for the entire plant and the generator has to consider the self-scheduled as well as RTM portion of capacity to check if the total of both is within the ramping constraint.

7.21. The Commission is of the view that the provision of allowing all generators to buy back and substitute their power with cheaper generation needs to be further studied in terms of its implications in the scheduling and market operations, and is therefore, not being suggested at the introductory stage of the real time market.

7.22. Some stakeholders have expressed concerns around liquidity in the RTM market. The Commission is of the view that although liquidity could be an issue in the initial stage, it is expected to increase as the market matures, participants gain confidence in the mechanism and more and more entities start participating.

7.23. Further, following decisions are taken by the Commission in response to other comments received from various stakeholders:-

- The existing practice of scheduling and communication to stakeholders will continue and appropriate measures to communicate the final schedules will be stipulated in the detailed procedure to be prepared by POSOCO for implementing the RTM.
- Both the power exchanges are expected to operate as per existing practices. Detailed rules and bye-laws to introduce RTM, including provisions relating to price discovery mechanism, timelines, bidding formats, enabling generators to buy back power in case of forced

outage, etc. will be prepared suitably by the Power exchanges after finalization of the regulations.

- As per the current practice, the distribution companies, if they so choose, can also sell, their share of capacity in a generating station in the RTM.
- As per Clause 3.2.2 of the explanatory memorandum, the Commission has already indicated that implementation of National Open Access Registry (NOAR) will lead to further streamlining of the real time markets. It is also envisaged that with the implementation of NOAR, the timelines for Real time markets can be further reduced.

## **8. NOC**

### **Comments received**

8.1. POSOCO has suggested that the total quantum allowed for long term, medium term and short term open access including quantum to be traded under RTM should be within the limit of the approved NOC quantum for the applied period.

8.2. IERS has also requested the Commission to allow Day Ahead NOC issued by the respective SLDCs be used for RTM.

8.3. SRPC has highlighted that since all SLDCs need to maintain secondary and tertiary reserves and reserves can only be utilised after all market products are cleared, only the quantum for which the generator has got NOC from SLDC can be bid into RTM.

8.4. IEX sought clarity on applicability of Standing Clearance /NOC for RTM, requested clarity on whether clause 2 and (2A) of Regulation 8 of Open Access Regulations is applicable for RTM. If it is applicable and an entity completely utilises it in DAM, it will not be able to participate in RTM to manage any imbalances. Variability in buy / sell requirement may arise on account of any change in long term or medium-term contracts whereas Standing Clearance/NOC is issued looking at the short-term open access requirement of an entity.

8.5. IEX suggested that for generators buying power, buy-side NOC is not required as there is no actual physical flow. However, PXIL commented that valid NOC from the LDC is required to place purchase bid by generator.

8.6. Renew Power has highlighted that NOC for collective should be self-sufficient so that unnecessary delay from SLDC for consent can be avoided. There is also a need to develop real time NOC issuance system at state and regional level for implementation of Real Time market. A central agency needs to be created for issuance of real time permission for transaction of power. Such agency should be linked to all SLDCs through a robust IT system.

8.7. Torrent Power has highlighted that regulations 8(2) and 8(3) provide for standing clearance of concerned SLDC for sale of power in exchange. Since due to varying real time quantum available for sale in each half hour, it is not practical to receive concerned NOC from SLDC, it requested to allow sale of power in exchange without such prior standing clearance.

8.8. RPTCL highlighted that there should be a mechanism to fast track the NOC process. Option for rendering NOC may be for one or two days is also required.

### **Decision of the Commission**

8.9. The Commission is of the view that single NOC for Long Term, Medium Term and Short Term Open Access including quantum to be traded under RTM should be within the limit of the approved NOC quantum for the applied period.

8.10. The Commission also believes that with the implementation of National Open Access Registry (NOAR) the process of granting NOC, approval of applications, transmission corridor checking, etc. is expected to be further streamlined.

## **9. Charges**

### **Comments received**

9.1. POSOCO highlighted that the applicability of transmission charges, operating charges and application fees on the transactions to be cleared through real time market needs to be suitably incorporated in regulations.

9.2. NPCL has suggested that component of operating and transmission charges is substantial which makes the landed cost abnormally high for power bought from exchange.

9.3. IEX highlighted that application fee and transmission charges may be waived off. Torrent Power has requested to review the existing PX fees and RLDC / SLDC operating charges in lieu of future increase in transactions.

9.4. Nabha Power and L&T have enquired as to what will be the point of scheduling of power for both generators and Discoms. In case its regional periphery who will bear the cost of transmission charges and losses (Generators or Discoms) incurring outside the purview of PPA for long term contracts.

9.5. FICCI suggested that the Commission should relax the obligation of transmission charges and the same may be kept as per original schedule to be paid for 24 hours instead of two days.

### **Decision of the Commission**

9.6. Some stakeholders have suggested that the application fees, operating charges, transmission charges, etc. need to be reviewed or waived of to begin with. This would also help in reducing the landed cost of power bought through the RTM. The Commission is of the view that this is beyond the scope of the current regulatory proposition and shall be reviewed separately.

9.7. The Commission directs the NLDC to prepare detailed procedures for collective transactions under RTM in line with the outline specified in the Regulations.

## **10. Deviations, Clearing and Settlement**

## Comments received

10.1. POSOCO has suggested that RTM has to be a liquid market so as to facilitate a robust price discovery and therefore, the price discovered in the RTM should not be considered for linking to the DSM prices till market stabilizes.

10.2. PXIL has highlighted that appropriate clearing and settlement rules need to be framed for function of trades post closure of banking hours.

10.3. BSPHCL suggested that separate energy accounting for Real Time Market is to be done by NOAR /RLDC.

## Decision of the Commission

10.4. The Commission directs POSOCO to frame the detailed procedures and the power exchanges to frame suitable market rules and bye-laws for the proper implementation and functioning of Real time market.

## 11 Editorial and consequential changes in relevant Regulations

### Comments received

11.1. POSOCO has suggested the following changes:-

- **Definition of Intra-Day Transaction / Contingency as per amendment to Open Access Regulations:** Intra-Day Transaction / Contingency Transaction” means the continuous transaction which occurs on day (T) after the closure of day ahead market window for delivery of power on the same day (T) except for the duration of the specified **period of delivery**

**(presently half an hour)** of the real-time market, or for the next day (T+1) and which are scheduled by Regional Load Despatch Centre or National Load Despatch Centre

- Definition of Intra-Day Transaction / Contingency Transaction as per amendment to Power Market Regulations: Intraday Contract / Contingency Contract means the contract where continuous transaction occurs on day (T) after the closure of day ahead transaction window for delivery of power is on the same day (T) **except for the duration of the specified period of delivery of real time market** or next day (T+1) and which is scheduled by Regional Load Despatch Centre or National Load Despatch Centre

#### 11.2. IEX has suggested the following changes

- Definition of Real time transaction: “Real-time transactions” means the collective transactions which occur on the day of **delivery(D)** or **(D-1)** after the right to revision of schedule ends for a specified duration of delivery during the day of operation **delivery (D)** and which are scheduled by Regional Load Despatch Centre or National Load Despatch Centre.”
- Definition of Gate Closure: “Gate Closure” refers to the time **upto** which the bids **can be** submitted to the Power Exchange for a specified delivery period.”
- Definition of Real-time Contract: IEX suggested to substitute the phrase “Day of operation” by the phrase “Day of Delivery” in the proposed definition.
- IEX also highlighted that the intraday and contingency transactions are carried out as bilateral transactions outside of the Exchange platform. Therefore, the modifications incorporating that that these

transactions will be on continuous basis may not be appropriate to insert

11.3. PXIL has suggested that they currently operate these contracts using a Batch auction trading methodology different from Continuous matching and hence request not to amend the existing definition by including the word “Continuous”.

11.4. POSOCO has highlighted that some of the clauses in the Principal regulations viz. Clause 6.5.16, 6.5.17, 6.5.20, 6.5.23(iii), Annexure-1: 4(ii) of IEGC, where there is a reference to revision from 4th time block need to be aligned & harmonized.

### **Decision of the Commission**

11.5. The Commission has noted the suggestions for editorial and consequential changes to relevant Regulations and has incorporated suitable modifications in the final amendments to relevant Regulations, namely, sub-clause (g-1) of clause (1), sub-clause (m) of clause (1) of Regulations 2 and Regulation 13 (B) of Open Access Regulations; sub-clause(o) of Clause (i) and sub-clause(cc) of Clause (i) of Regulation 2 of Power Market Regulations.

11.6. As regards to POSOCO’s suggestions for modifications in Regulations 6.5.18(a), 6.5.19, 6.5.23(iii), 6.5.16 and 6.5.20 of IEGC, it has already been mentioned earlier that as of now, the dispensation of 4 time block revision is being continued as a special case under two conditions viz. (i) to Wind and Solar generators; and (ii) to the System Operator, in the event of bottleneck in evacuation of power or in the interest of better system operations, as per the existing provisions specified under Regulation 6.5.23(iii), 6.5.16 and 6.5.20 of IEGC. This

would be reviewed at a later date. However, it is clarified that such dispensation of 4 time block revision will not be available in the event of the generators having participated in the Day-ahead market and Real-time market.

## **12. Others issues and comments**

### **Comments received**

12.1. POSOCO has highlighted that there is a need for robust and pro-active market monitoring and surveillance mechanisms to be put in place for analysing bidding patterns, price discovery, market power, gaming etc. for smooth and dispute-free implementation and introduction of RTM is a paradigm shift for the Indian Electricity Market and a significant effort is required in terms of information dissemination, workshops and training by all stakeholders'

### **Decision of the Commission**

12.2. The Commission has noted the suggestions on the need for robust and pro-active market monitoring and surveillance mechanisms. The Commission is already working on strengthening this aspect.

## **13. Accordingly suitable provisions have been made in the final amendments to the IEGC, Open Access and Power Market Regulations.**

Sd/-  
(I.S.Jha)  
Member

Sd/-  
(Dr. M.K.Iyer)  
Member

Sd/-  
(P.K.Pujari)  
Chairperson

Date: 12-12-2019

## **ANNEXURE I:**

### **List of Stakeholders / individuals that have submitted comments on draft Amendments in written**

1. Tata Power Delhi Distribution Ltd.
2. GRIDCO Ltd
3. Sembcorp
4. Statkraft
5. PCKL
6. Adani Power Ltd.
7. Noida Power Company Ltd,
8. NTPC Vidyut Vyapar Nigam Ltd.
9. MSEDCL
10. Renew Power
11. Indian Energy Regulatory Services
12. Uttar Pradesh Power Corporation Limited
13. Power Exchange India Ltd.
14. Kreate Energy
15. Udipi Power
16. Telangana State Transco
17. Torrent Power Ltd.
18. National Thermal Power Corporation
19. The Energy & Resources Institute
20. Nabha Power
21. Association of Power Producers
22. India Energy Exchange
23. EMA Solutions Pvt. Ltd
24. Tata Power
25. Federation of Indian Chambers of Commerce and Industry
26. RPTCL

27. Southern Regional Power Committee
28. Power System Operation Corporation Ltd.
29. Central Electricity Authority
30. National Hydroelectric Power Corporation
31. Bihar State Power Holding Company Ltd.
32. Gujarat SLDC

**List of Organizations /individual that have submitted comments during Public Hearing**

1. Tata Power.
2. PXIL, Delhi
3. NTPC Ltd.
4. POSOCO
5. GMR Energy
6. IEX
7. Individual – Vijay Menghani