

**CENTRAL ELECTRICITY REGULATORY COMMISSION
NEW DELHI**

New Delhi, 17th September, 2015

**Framework on Ancillary Services Operations Regulations 2015:
Statement of Reasons**

Introduction

Central Electricity Regulatory Commission notified Draft Central Electricity Regulatory Commission (Ancillary Services Operations) Regulations, 2015 vide public notice No. 18/1/2013 on 1st May, 2015. Comments were invited from all stakeholders till 1st June, 2015. Written comments as received from individual stakeholders are available on CERC's website, and their list can be perused in Annexure I. Subsequently, public hearing was held on 12th June, 2015, where oral presentations were made by 8 stakeholders.

The important issues raised by the stakeholders, and Commission's analysis and decisions thereon are presented in the subsequent sections.

1 Definition, Applicability and Scope of Services

1.1 Commission's Proposal on Definitions and Scope as in Draft Regulations:

1. Short title and commencement

1.1. *These regulations may be called the Central Electricity Regulatory Commission (Ancillary Services Operations) Regulations, 2015.*

2. Definitions and Interpretation

2.1. *In these regulations, unless the context otherwise requires,*

l. "Reserves Regulation Ancillary Services" means an Ancillary Services that consists of either Regulation Down Service or Regulation Up Service;

m. "Reserves Regulation Ancillary Services Provider" means the inter-State Generating Stations (ISGSs) having un-requisitioned surplus and eligible to participate in the Reserves Regulation Ancillary Services.

n. "Regulation Down Service" means an Ancillary Service that provides capacity that can respond to signals or instruction of the Nodal Agency for decrease in generation, within the technical limit and time limit, to respond to changes in system frequency or congestion in the system.

- p. “regional entity” means a person whose metering and energy accounting is done at the regional level;

1.2 Comments received

- a. IL&FS Energy Development Company Ltd (IEDCL) has commented that all other forms of Ancillary Services (such as Network Control and System Restart) need to be specified in these Draft Regulations, else the Objective and Scope of these Draft Regulations has been restricted to Frequency Control Ancillary Services/ Reserves Regulation Ancillary Services. It is proposed that the Commission may consider re-designating these Regulations as Central Electricity Regulatory Commission (Frequency Control Ancillary Services Operations) Regulations, 2015.
- b. IEDCL has also suggested that ‘Ancillary Service Provider’ may be defined in line with CERC staff paper on ancillary services by including all the sellers and regional entities which are part of the scheduling and deviation settlement mechanism for real and reactive power with voice and data telemetry facilities in accordance with the regulations framed by the Central Commission and Central Electricity Authority and eligible to participate in the ancillary market.
- c. POSOCO has recommended that the definition of the Reserve Regulation Ancillary Services Provider may be modified after taking into account the fact that Regulation down services is also envisaged:
- “...m. Reserves Regulation Ancillary Services Provider” means the Regional Entity Generating Stations~~inter State Generating Stations (ISGSs) having un-requisitioned surplus and~~ eligible to participate in the Reserves Regulation Ancillary Services.”*
- d. Several stakeholders such as Statkraft, NTPC, Shanti Prasad and IEDCL have implored that Ancillary Services Regulation may be expanded to include additional services such as Black Start, Voltage Regulation and Reactive Power Compensation. Shri Shanti Prasad, GIZ, IEDCL and Wartsila have commented that Regulations should cater to the needs of primary, secondary and tertiary reserves. It is being suggested that simulation study should also explain monetary benefit for system having secondary control as compared to using the tertiary control for improving the system. Dedicated secondary generation plants have been suggested to ensure balancing.
- e. IEDCL has in addition highlighted that fast-responding grid storage technologies have several advantages over fossil fuel generation assets, such as gas turbines or coal generation plants. Network storage has also been suggested by Alstom. Demand response by large customers has been advocated by Statkraft and Independent Power Producers Association of India (IPPAI). IPPAI has also opined that smart grid may offer a unique opportunity to leapfrog into a vastly improved electricity environment, deploying grid modernization and load reduction technologies. Smart Grids can potentially revolutionize the electric grid by enabling (i) retail consumers to offer

ancillary services such as demand response and (ii) distributed generators to offer ancillary services such as Frequency Control Ancillary Services.

- f. Inox has proposed that these regulations may be treated as umbrella regulations to the recently proposed RRF mechanism, thereby allowing costs incurred by wind generators towards availing forecasting services as part of capex or O&M while deciding generic tariff.
- g. IPPAI has recommended that CERC may provide an investment framework for private/public investment in facilities (such as capacitor banks) that can provide static/mobile reactive power support in the system. Shri A. Velayutham has also opined that issues concerning reactive power scheduling and reactive power pricing need to be deliberated for possible adoption in grid system to improve voltage profile.

1.3 Analysis and Commission Decision:

The comments of stakeholders have been noted. Several stakeholders have proposed to expand the scope of services by including other components such as voltage control, black start, reactive power and primary/secondary frequency control. Comments on network storage, demand response and smart grids are also taken cognizance of.

While appreciating the need for specifying other forms of ancillary services, the Commission would like to reiterate that the scope of the present regulations as articulated in the Explanatory Memorandum is limited to tertiary frequency control through utilization of surplus capacity available in generating stations at the inter-state level or through Down service instructions on participating entities. The Commission would like to move in a calibrated manner in so far as introduction of ancillary services is concerned. As such to start with, only the Inter-State Generating Stations which are regional entities are being covered in the framework. Based on the experience of implementation of the present framework, it would be scaled up to cover other forms of ancillary services and other generating stations and reserves available in the country. National Smart Grid Mission has been launched under Ministry of Power, in association with MNRE, MoUD and MoHI. The Commission is working closely with MoP on this mission. Demand response is being tested in various states by respective DISCOMs as well as the Bureau of Energy Efficiency. The Commission's vision is to incorporate these components for Ancillary Services at the right time.

In the light of the above, the scope of ancillary services has been retained as proposed in the draft. However, for the sake of clarity, the definition of Reserve Regulation Ancillary Services Provider has been modified as under:

“...m. Reserves Regulation Ancillary Services Provider means the Regional Entity Generating Stations eligible to participate in the Reserves Regulation Ancillary Services, for providing Regulation Up or Regulation Down service.”

1.4 Comments on Applicability and Incentives for Down Regulation

- a. Shri Arup Kumar Datta and Association of Power Producers (APP) have requested that all generators can be made entitled for Regulation Down service, specially generators with full load are effective in this case. This is echoed by other stakeholders such as Essar and West Bengal State Electricity Transmission Company Ltd, who have stated that all ISGS who have full requisitioned power may also be allowed to provide Regulation Down service.
- b. GIZ has highlighted the need to address positive (up) and negative (down) reserve separately and the market to be distinguished in one part for positive and another part for negative reserve. For instance, in a negative reserve market also plants running on full load can participate or demand response of industrial customers can be stimulated. In a positive reserve market also stand-by generators like larger industrial backup systems could be involved.
- c. Stakeholders such as TPCIL, NTPC and IEX feel that treatment of back down generation and its commercial evaluation should be provided in detail, and that the generator will have no incentive to provide Regulation down services. Draft Regulation does not provide any markup in case of Regulation down services. Further, variable charges to the extent of reduction in quantum of schedule shall be paid to Regional Deviation Pool Account by generator. However, generator while reducing the load will incur higher O&M cost in addition to incurring cost due to support of oil for unit stabilization, deteriorating heat rate and other parameters on account of low loading factor etc. A commercial mechanism may be devised to compensate the generator for its losses.
- d. NTPC has recommended that Regulation down service should consider technical minimum of gas & coal units as per prevailing practice.

1.5 Analysis and Commission Decision:

Several stakeholders have argued that the generating stations running at full load can also provide Regulation Down service. Hence, the Regulation should allow them to participate as well. However, the generator might incur a higher O&M expenditure and thus needs some incentive to provide this service. It has been pointed out that incentive for providing Regulation Down service is not clear in the Draft Regulation.

- i. The Commission acknowledges comments on this topic and has decided that the eligible generating stations running at full capacity shall also be allowed to provide Down service. In such a case, while they will have to return the variable cost proportionate to the quantum regulated downward, they shall be allowed to retain 25% of this amount as an incentive. Suitable amendment has been made in the final regulations to this extent.
- ii. The Commission has already placed for public comments a draft amendment to the IEGC specifying a technical minimum. Technical minimum requirements of thermal units in line with the amendments shall be considered while providing instructions for Regulation Down service and the same shall be addressed in the Detailed Procedure.

2 Applicability of Reserves Regulation Ancillary Services

2.1 Proposal in Draft Regulations

4. Scope

- 4.1. *These regulations shall be applicable to Reserves Regulation Ancillary Services Provider and Regional Entities involved in the transactions facilitated through short-term open access or medium-term open access or long-term access in inter-State transmission of electricity.*

5. Eligibility for participation for Reserves Regulation Ancillary Services

- 5.1. *All Inter-State Generating Stations whose tariff is determined or adopted by the Commission and are operating on part load and which have not received full requisition shall be eligible to participate for providing the Reserves Regulation Ancillary Services.*

2.2 Comments received on: Eligibility for participation for Reserves Regulation Ancillary Services

- a. POSOCO has suggested that it needs to be clearly specified that plants which have a mix of regulated and merchant capacity shall not be eligible to participate in the Reserve Regulation Ancillary Services mechanism. It is proposed that only those regional entity generating stations whose tariff is determined or adopted by CERC for their full capacity are mandated to participate in the Reserves Regulation Ancillary Services Mechanism. The clause may be amended as follows:

~~“...5.1. All Inter State Generating Stations~~Regional Entity Generating Stations whose tariff is determined or adopted by the Commission ~~and are operating on part load and which have not received full requisition shall be eligible to participate for providing~~for their full capacity shall provide the Reserves Regulation Ancillary Services...”

- b. Shri Vijay Menghani has stated that providing ancillary services through URS power of Central sector generating station and UMPP is an in-efficient and uneconomic way of providing Ancillary services. He feels this is against the spirit of competition and economic efficiency.
- c. Thermal Powertech Corporation India Ltd (TPCIL) has commented that all Inter-State Generating Stations (CGS, IPPs and CPPs) whose capacity is united and willing to participate for the day and are operating on part load should be eligible to participate for providing the Reserves Regulation Ancillary Services.
- d. Industry stakeholders such as IEDCL, Tata Power & NLC, industry associations such as APP & IPPAI, and state agencies such as Gujarat SLDC & Kerala State Electricity Board (KSEB) have commented that the Regulations should not restrict the eligibility of generators to participate for providing the Reserves Regulation Ancillary Services (RRAS) to only identified ISGS that are operating on part load and which have not received full requisition. The suggestion is to include all inter-state and intra-state generating stations to provide these services. Brookings has also supported this.

IPPAI has clarified that State level plants should also be made part of supply side bidding through SERC level regulations to that effect.

KSEB has also stated that the tariff of such generating stations may also be approved by CERC / SERC and the scheduling of such stations may be brought under the purview of the RLDCs for the limited purpose of ancillary services.

- e. IEDCL further feels that regulations should consider allowing all the generators (conventional and non conventional) and other new emerging energy storage technologies having faster ramp up and ramp down capabilities (and also the capability to provide multiple AS & other supports to the grid) to be eligible to participate as Ancillary Services providers.
- f. KSEB has commented that in addition to the Generating Stations, Distribution utilities may be included as an eligible participant considering the following:
 - Electricity Act-2003 permits DISCOMS to own and operate generating stations.
 - The DISCOMS can very well able to provide 'up or down services' by varying the energy dispatch from its own stations. Hence intra state generating stations of DISCOMs who have spinning reserve capacity may be allowed to participate in the 'ancillary service mechanism'.
 - The variable charge or compensation provided for the DISCOMs may be the highest cost of power scheduled by them.
 - Further, private generators may also have surplus capacity on account of under scheduling on merit order for already tied up quantum. It is also possible that some independent generation may opt for short term markets for part capacity and may

be idling on commercial considerations which can be offered at the cost of generation (VC + FC) if permitted for short duration. In order to bring such situation also within the ambit of RRAS, participation is to be facilitated to all utilities and generating stations irrespective of whether ISGS or not. This will ensure more power coming to grid under contingencies.

- g. Tata Power and APP have requested for clarity on whether concessional fuel (Linkages/APM/Allocation of mines) will be allowed to be used under this mechanism as the present policy only allows concessional fuel to be used for supply to Discoms under long term.
- h. In order to safeguard the interest of the Trading Companies and to promote more competition, Tata Power has suggested that the Trading Companies may also be allowed to participate in the Ancillary market. Power Trading Corporation and Stratkraft have supported this by commenting that generators having long term PPAs with traders and traders having unscheduled balance capacity available from the plant may also be allowed to participate in RRAS.
- i. Power exchanges PXIL and IEX have suggested that Ultra-Mega Power Projects (UMPPs) and Independent Power Producers (IPPs) should also be made eligible for providing the RRAS.
- j. Shri Shanti Prasad has commented that ISGS, IPP, CPP and Merchant power plants may have un-requisitioned capacity and they may also be included for providing RRAS.
- k. Inox has wondered that Regulations are silent on wind power generators who are connected to CTU and who are likely to be out-of-merit-order dispatch owing to their high cost.
- l. Shri Vijay Menghani has stated that there are intrastate entities which also do short term transaction in interstate transmission of Electricity but these are not Regional entities and their accounting is not done by RLDC. So draft Regulation cannot extend the definition of Regional entities given in another CERC Regulation i.e Grid code.
- m. NLC has mentioned that CERC Order (No. 134/2009, dated 11.1.2010) provides for change of schedule of unrequisioned power from one beneficiary to another beneficiary (from the same station). It has been requested to clarify whether URS considered for stacking would be net of URS available after such scheduling.
- n. GE has recommended that regulations should be made applicable for Intra-state wind farms. Often, wind farms are asked to back down, and an additional revenue stream through Ancillary Services would be most welcome by this sector. GE's experience regarding possible concerns:
 - Scheduling: Even though wind power is infirm, technologies available today are capable of forecasting with reasonable accuracy. GE has demonstrated a pilot project at one of its wind farms in India to schedule generation as required by

CERC's Renewable Regulatory Fund requirements. The 12 month long pilot project demonstrated 79% generation within CERC mandated error band of $\pm 30\%$

- Secondary Control: Wind farm control systems such as GE's WindCONTROL can offer such controls to grid operators. Wind farm operators can also curtail / regulate their generation output to required levels using Active Power Control feature, rather than turning off turbines completely in response to a Regulation Down Service signal
 - Likewise for Regulation Up Service, wind farms integrated with energy storage can be used to store energy during specific periods and release the stored energy in response to a Regulation Up Service signal
 - The ramp limits for response to such services can also be maintained with integrated energy storage and farm control systems
- o. Stratkraft has commented that the Commission may provide incentives to incorporate Hydro generation which has the least response time and ability to provide reactive power in the ancillary services.
- p. Shri A. Velayutham has stated that Regulation Reserve pool has to be broad based in the absence of UI and to accommodate more wind/solar power. Regulation reserve up/down with different ratings/ limits have to be kept in the reserve pool. ASOR may not be restricted to surplus power/un requisitioned power management, instead it should be treated as a technical tool to improve and strengthen Grid operation.

2.3 Analysis and Commission's Decision:

Many stakeholders have suggested that entities such as intra-state generators, trading companies, CPPs, merchant plants and DISCOMs should be allowed to provide RRAS. Furthermore, it is being suggested that renewable energy generators such as wind power plants should also be permitted to participate, as these are now capable of forecasting, curtailing or increasing output using storage solutions.

- i. **This is a first step towards setting up of Ancillary Services in the country. Hence, currently only those stations which are regulated by the Commission are considered. In addition, our analysis shows that the current requirement for tertiary frequency control services may be met with only the ISGS plants. These regulations will evolve as per needs of the national grid. Other entities may be allowed to participate at a later date.**

Slight modification is made as per POSOCO's suggestion:

“...5.1. All Generating Stations which are regional entities and whose tariff is determined or adopted by the Commission for their full capacity shall provide Reserves Regulation Ancillary Services...”

- ii. The Commission is happy to note that stakeholders feel that solar and wind generators/UMPPs shall be able to forecast with good accuracy and control output. The recently published Regulation on Scheduling, Forecasting and Deviation Settlement of Renewable Sources shall ensure all wind and solar ISTS start forecasting and scheduling. These plants could be included under RRAS once forecasting models in the country are more mature and have proven accuracy levels.
- iii. It is clarified that para 11 of CERC Order No. 134/2009 dated 11.01.2010 will continue to hold, unless ordered otherwise by the Commission. This regulation shall apply to the net URS available post cross-beneficiary open-access scheduling. In accordance, the Commission has clarified the definition of ‘un-requisitioned surplus’ in the regulation as under :
 - u. ***“un-requisitioned surplus” means the reserve capacity in a generating station that has not been requisitioned and is available for despatch, and is computed as the difference between the declared capacity of the generation station and its total schedule under long-term, medium-term and short-term transactions, as per the relevant regulations of the Commission.***
- iv. All ISGSs are covered under the regulation, including the hydro-generating stations.
- v. The Commission clarifies that the definition of Regional Entity as per IEGC is ***“such persons who are in the RLDC control area and whose metering and energy accounting is done at the regional level;”***
Thus, the proposed regulation in no way alters or conflicts with this definition.
- vi. As regards the comment of Tata Power & APP regarding concessional fuel, it should be noted that RRAS seeks to utilize URS for ensuring grid stability and cannot be compared to merchant sale. Accordingly, the Commission feels that usage of concessional fuel for providing RRAS should be allowed.

2.4 Comments received on whether participation is voluntary or mandatory:

- a. Several stakeholders such as Essar, Tata Power and Shri Vijay Menghani have expressed that further clarification is required on whether participation in RRAS is voluntary or not. Further, it needs to be clarified if gencos are required to take prior permission

from its original procurer to opt to become RRAS Provider or Regulation will supersede the PPA and no explicit approval of Procurer is required. Clarification is also required as to whether genco is required to opt for both Regulation Up & Regulation Down Services or it can choose either of it.

Shri Menghani has also stated that this service will adversely affect PLF and incentive payment to Generator.

- b. Gujarat SLDC has commented that all ISGS should be covered under ancillary service by default. Concern has been expressed that ISGS may opt for Regulation Up services but they will not opt for Regulation Down services as they need to operate generator on part load.
- c. On the other hand, NTPC has opined that choice should be left to the generator as to what services it shall provide either Regulation up service or Regulation down service. NTPC has stated that there could be certain generating stations which are consistently getting low schedule and may not be willing to participate in the Regulation down services, or there could be certain station specific technical issues.

In addition, NTPC has suggested that the period for which consent/willingness given by a generator for offering RRAS would be considered valid should be clarified. After the end of the said period, the generator would need to give their further consent for another period.

2.5 Analysis and Commission's Decision:

Mixed feedback has been received on whether Ancillary Services should be voluntary or mandatory. While SLDC Gujarat has expressed support for default participation of ISGC, NTPC feels that choice should be given to the generator, especially for participation in Regulation Down service as the generator might already be getting low schedule and it will adversely affect PLF. Several other stakeholders have requested clarity on this matter. The Commission has decided as follows:

- i. **Instruction for Reserves Regulation Ancillary Services (Regulation Up) will ensue only if the beneficiaries (or cross-beneficiaries under open-access) do not requisition this capacity, and the generator is unable to sell this power in the day-ahead/intra-day market. However, once the generator has no contract for off-take of power, the system operator shall have the right to use it for Ancillary Services.**
- ii. **Regulation Down is expected to be triggered in cases of over-injection in the grid while the grid does not need this power and there is load-generation imbalance. For grid stability and reliability, generating units must take Regulation Down instructions from the nodal agency. As mentioned earlier, an incentive shall be provided for the same.**

3 Role of Nodal Agency

3.1 Proposal in Draft Regulation

6. Role of Nodal Agency

- 6.1. *Nodal Agency shall prepare merit order stack of un-requisitioned surplus capacities of Inter-State Generating Stations willing to participate in this mechanism based on the variable cost of generation, Declared Capacity and take despatch decision.*
- 6.2. *Nodal agency shall prepare stack of un-requisitioned surplus capacities available of Inter-State Generating Stations from lower variable cost to higher generation cost in each time block.*
- 6.3. *Nodal agency shall prepare region-wise merit order stack factoring inter-regional transmission constraints, if any.*
- 6.4. *Nodal Agency shall monitor the frequency during continuous low frequency or high frequency period, any system contingency, loading on tie line etc.*
- 6.5. *Nodal agency shall direct the selected Reserves Regulation Ancillary Services providers based on the merit order for economical despatch for Regulation Up and Regulation Down, as and when requirement arises in the system on account of any of the following events:*
 - i. *Extreme weather forecasts and/or special day;*
 - ii. *Multiple generating unit or transmission line outages;*
 - iii. *Trend of load met;*
 - iv. *Trends of frequency;*
 - v. *Intimation of any abnormal event such as outage of hydro generating; units due to silt, coal supply blockade etc.;*
 - vi. *Excessive loop flows leading to congestion; and*
 - vii. *Such other events.*
- 6.6. *Nodal agency shall direct the selected Reserves Regulation Ancillary Services providers to withdraw their services after the circumstances leading to triggering of Reserves Regulation Ancillary Services no longer exist.*

3.2 Comments received

- a. POSOCO has requested to clarify the responsibility of the NLDC/RLDC/SLDC for coordinating scheduling in accordance with the provisions of Grid Code and suggested that the clause may be amended as follows:

“Load Despatch Centre “ means National Load Despatch Centre, Regional Load Despatch Centre or State Load Despatch Centre, as the case may be, responsible for coordinating scheduling ~~of the buyers and the sellers~~ in accordance with the provisions of Grid Code;...”

In addition, they have commented that the national grid faces both inter-regional and intra-regional constraints. The nodal agency may prepare merit order stack also considering the likelihood of intra-regional constraints as well. The clause may be amended as follows:

“...6.3. Nodal agency shall prepare ~~region-wise~~ merit order stack factoring inter-regional and intra-regional transmission constraints, if any....”

- b. Shri A. Velayutham has stated that NLDC, as the apex controller, may have to closely monitor the system frequency to operate at 50 Hz./stipulated frequency in co-ordination with RLDC. Voltage control & line loading and congestion control may be taken care by RLDC and SLDC.
- c. West Bengal State Electricity Transmission Company Ltd (WBSETCL) has commented that the nodal agency should intimate instruction of starting of RRAS to RLDCs and the regional entities.
- d. Some stakeholders such as KSEB and Shri Vijay Menghani have commented that the conditions given for ancillary service are subjective in nature and it is necessary that the time line and triggers, including exact limits of over and under frequency and also the limits of voltage, are defined correctly.
- e. Shri Vijay Menghani has suggested that the time period given for withdrawal of Ancillary service would determine how much payment for a service need to be given when condition requiring initiation of the service get mitigated. Therefore, in this aspect role of nodal agency be specified.

Additionally, Shri Menghani has stated that as per section 28(3) of Electricity Act, 2003 Nodal agency RLDC or NLDC cannot direct a dispatch, they can only dispatch according to contract.

- f. FICCI has suggested that in clause 6.5, the phrases “Trend of load met” and “Trends of frequency” be replaced with “Anticipating difficulty to match trend of load” and “Trends of frequency outside the allowable boundary limits” respectively.
- g. IEX feels that real-time Curtailment of Power Exchanges should also qualify as an event for triggering ancillary services.

3.3 Analysis and Commission's Decision

The Commission has taken note of the assorted comments on the role of the nodal agency. The Commission has decided as under:

- i. Intra-regional transmission constraints shall be considered in addition to the inter-regional constraints by the respective nodal agency.
- ii. The grid can go through various contingencies of varying nature and intensity. NLDC, along with RLDCs, are empowered under the Electricity Act 2003 to give dispatch instructions in accordance with instantaneous needs of the grid, as well as to keep the grid stable through any contingency. It is neither feasible to enlist all possible scenarios nor is it desirable to strait-jacket all scenarios where ancillary services shall be called upon. The Commission entrusts the NLDC and RLDCs with decision-making on deployment of RRAS. The detailed procedure shall provide further clarification if required.
- iii. The Commission directs the staff to work with POSOCO to outline detailed procedure for operationalizing RRAS, which would address the questions about timeframe to deploy or withdraw services once instructed by the nodal agency, and how technical characteristics of generators will be accounted for, etc.
- iv. The Commission accepts the modifications as suggested by POSOCO. Thereby, the definition and the relevant regulation have been amended as follows:
“2.1(k) “Load Despatch Centre “ means National Load Despatch Centre, Regional Load Despatch Centre or State Load Despatch Centre, as the case may be, responsible for coordinating scheduling in accordance with the provisions of Grid Code;...”
“6.3. Nodal agency shall prepare merit order stack factoring inter-regional and intra-regional transmission constraints, if any....”
- v. Real-time curtailment of both collective and bilateral transactions is likely to occur as a result of one of the circumstances enlisted above. It is expected that the nodal agency would trigger ancillary services accordingly.

3.4 Comments received on merit order dispatch principles

- a. Several stakeholders- Shri Vijay Menghani, Shri Arup Kumar Datta, WBSETCL, Essar, APP and Tata Power- have commented that as RRAS providers have to be paid both fixed and variable charges, merit order stacking should be done on total cost, as the cost to supply for the pool would be the total cost.
- b. NLC has supported Commission's proposal stating that it is only appropriate that merit order ranking is based on variable cost (energy cost), and hence “higher generating

cost” as specified in Clause 6.2 be replaced with “higher variable cost”. NLC has also added that beneficiaries are making transmission charges payment pertaining to generators in proportion to their allocation. Inclusion of fixed charges in regulation up services is likely to complicate payment of regional transmission charges. Therefore, in regulation up and regulation down services only variable charges may be accounted for economic operation.

- c. CEA has brought attention to Regulation 6.2 where it is mentioned that merit order will be prepared on variable cost while Regulation 13.3 says that payment will be made on fixed charge and variable charge. In CEA’s view, evaluation and payment should be made only on variable charge to encourage efficient generation from the economics point of view, and so also payment. The mark-up rate as determined by the Commission may be shared between the generator and the procurer surrendering the share.
- d. Shri Shanti Prasad and Shri Vijay Menghani have suggested that in addition to commercial information, other important factor for Ancillary service provider generator is RAMP rate both RAMP UP and RAMP DOWN rate. Ramp rate of the plant determines the availability of such plant in the stages of short-time, dynamic and steady-state. Shri Prasad has stated that, therefore, stacking should be done also taking the other factors such as hot or cold reserve, ramp rate, starting time (for cold reserve), hydrological limitations etc.
- e. Shri Shanti Prasad and NTPC has highlighted that there is a need to identify generators with regard to Regulation up services and Regulation down services separately. As per NTPC, Regulation up services and Regulation down services would be provided by different set of generators as per merit order dispatch principle. Regulation down services can be provided economically by high variable charges generators running on imported coal/RLNG/Gas etc. Similarly, Regulation up services would be provided by low variable charges generators such as pit head coal stations.
- f. Essar has sought clarification that Nodal agency shall prepare stack of un-requisitioned surplus capacities available of Inter-State Generating Stations from lower total Charges (comprising fixed charge, variable charge & any other statutory charges as per the CERC regulations) to higher Total Charge in each time block. Essar has also commented that the Commission may define variable cost of generation, Declared Capacity based on actual figures (for PPA u/s 62) / as per PPA tariff (for PPA u/s 63).
- g. Shri Vijay Menghani has commented that it is not clear when nodal agency will prepare merit order stack and whether it will be displayed on web site or not.
- h. TPCIL has stated that considering all the generating stations (IPPs, CGS and CPPs whose scheduling is done by RLDCs) eligible for participation, merit order dispatch may be stacked as per each entity quote of the Price and Quantum to power to RLDC/RPC. Thus, service providers shall submit the single tariff per unit on monthly basis to RPC, instead of its Fixed charges and variable charges for IPPs/CGS/CPPs.

3.5 Analysis and Commission's Decision

Mixed feedback has been received on the proposed methodology of merit order preparation. Several stakeholders feel that merit order should be prepared based on the actual outflow from the pool (fixed cost + variable cost). However, some stakeholders have supported merit order on the basis of variable cost only. One particular stakeholder feels it should be based on the price quote of the generator. Further, it has been recommended that other factors such as ramp up or ramp down rate, response time etc should also be considered while deciding the dispatch order. It has also been suggested that generators for providing Regulation Up and Regulation Down service should be identified separately. The Commission has decided as under:

- i. For merit order, variable cost is considered as per existing procedures for economical dispatch of power by respective load dispatch centres. Same principle will be extended for RRAS as well to prioritize efficient generators.
- ii. The Commission acknowledges the need for taking into consideration other characteristics such as ramp rate, response time and transmission constraints in preparation of the stack for dispatch. These factors shall be stipulated in the detailed operationalization procedure, and shall be accounted for in the final stack besides the variable cost based merit order.
- iii. Refunding fixed charges to the beneficiary(ies) and providing a mark-up over and above fixed cost to the generator would provide incentive to both the parties.
- iv. Separate merit order stacking shall be done for Regulation Up service and Regulation Down service.

Thus, the regulations stand modified as follows:

6.1. Nodal Agency shall prepare merit order stack of Inter-State Generating Stations as stipulated in Regulation 6.2 and take despatch decision.

6.2. For Regulation-Up, Nodal agency shall prepare stack of un-requisitioned surplus capacities available in respect of Inter-State Generating Stations from lowest variable cost to higher variable cost in each time block, and taking into account ramp up or ramp down rate, response time, transmission congestion and such other parameters as stipulated in the Detailed Procedure. For Regulation-Down, a separate merit order stack from highest variable cost to

lowest variable cost incorporating technical parameters as above shall be prepared.

6.3. *Nodal agency shall prepare merit order stack factoring inter-regional and intra-regional transmission constraints, if any.*

6.6. *Nodal agency shall direct the selected Reserves Regulation Ancillary Services providers to withdraw their services after the circumstances leading to triggering of Reserves Regulation Ancillary Services no longer exist. The time-frame for withdrawal of service shall be determined as per the Detailed Procedure.*

4 Role of Regional Power Committees

4.1 Proposal in the Draft Regulation

8. Role of Regional Power Committees

8.1. The Regional Power Committees shall intimate on monthly basis the details of fixed charge, variable charge and any other statutory charges applicable on the Reserves Regulation Ancillary Services Providers to the Nodal Agency for merit order dispatch.

8.2. The Regional Power Committee shall use the details of fixed charge, variable charge and any other statutory charges applicable on the Reserves Regulation Ancillary Services Providers for preparation of their energy/ Deviation Accounts.

4.2 Comments received

- a. Shri Vijay Menghani has stated that as payment for all scheduled energy is made as per Monthly Regional account (REA) issued by RPCs, it is not clear whether accounting for Ancillary service would be on monthly basis or on weekly basis as per deviation settlement mechanism.
- b. PTC has suggested that through regulations, the RPCs may be directed to place information relating to the charges (fixed, variable, statutory charges etc.) in the public domain.

4.3 Analysis and Commission's Decision

The Commission has noted the suggestions and would like to clarify that as the settlement is through the DSM Pool Account, the accounting will follow the same weekly

cycle. This has been stated in regulation 12.1 of the Draft Regulations. It is a welcome suggestion to share the information in the public domain. The same shall be specified under the Detailed Procedure.

5 Dispatch of Reserves Regulation Ancillary Services

5.1 Proposal in the Draft Regulations

9. Dispatch of Reserves Regulation Ancillary Services

- 9.1. Generation under the Reserves Regulation Ancillary Services shall be scheduled to the Regional Deviation Pool in each Regional Grid.*
- 9.2. Once the time period as specified by the Nodal Agency in the scheduled procedure starts, Reserves Regulation Ancillary service shall be deemed to have been triggered.*
- 9.3. The schedules of the Reserves Regulation Ancillary Services Providers shall be considered as revised by the quantum scheduled by the Nodal Agency under Reserves Regulation Ancillary Services.*
- 9.4. Any deviations in schedule of Reserves Regulation Ancillary Services Providers beyond the revised schedule shall be treated in accordance with the Central Electricity Regulatory Commission (Deviation Settlement Mechanism and related matters) Regulations, 2014.*

10. Withdrawal of Reserves Regulation Ancillary Services

- 10.1. The Nodal Agency, having been satisfied that the circumstances leading to triggering of Reserves Regulation Ancillary Services no longer exist, shall direct the Reserves Regulation Ancillary Services Provider to withdraw from the time block specified in detailed procedure.*

5.2 Comments Received

- a. Some stakeholders such as Tata Power, NTPC and APP have emphasized that as per provision of the PPA between ISGS and the beneficiaries, the beneficiary can restore the un-requisitioned power within a short notice period of one and half hours (6 time blocks). This could lead to a situation where the un-requisitioned surplus of ISGS gets cleared in Ancillary Market and the beneficiary of the same ISGS wants to restore the un-requisitioned power in real time, which is ready to despatch in the Ancillary Market. This needs to be addressed.

- b. Tata Power and APP have also stated that the above scenario for un-requisition power can also be created in case of IPPs selling power on a long term basis to the DISCOM/State Utility.
- c. Gujarat SLDC has commented that even after triggering the Regulation Up services, right of original beneficiary should remain first. i.e. whenever, original beneficiary requisites URS back, it is to be scheduled. In such a case, nodal agency may instruct another generator (as per merit order) to fulfill requirement under ancillary services.
- d. Essar has requested the Commission to specify priority of scheduling of power to Original Procurer vis-a-vis Ancillary Services. Currently, the SBD/ MBD provides for the Procurer to recall the un-dispatched power within 3 hours. Essar suggests that the regulation should over-ride this provision to provide for recall of power no earlier than 2 days. PTC has also requested for clarity on whether beneficiary can recall the un-requisitioned power if the plant is under regulation up service.
- e. Few stakeholders have underlined the issue of trigger time for RRAS. KSEB has stated that the time allowed (number of time blocks) to put the RRAS into service needs to be clarified. NTPC has also commented the Draft Regulation does not provide the trigger time for start of RRAS service. It is suggested that trigger time should be from 4th time block from the time block in which the revision is intimated. In addition, Shri Shanti Prasad has commented that scheduling of regulation up / regulation down service should be made effective from the “triggering in” to “triggering out” time.
- f. CEA has underlined that the Regulations do not give the details of the lead time given to the generator to ramp up or ramp down generation, the ramp rates for ramp-up or ramp-down, etc. However, it is assumed that these generating stations would be capable of meeting the required criteria.
- g. NTPC has stated that to bring unit under reserve shut down on bar, sufficient start up time may be provided to commensurate with hot / warm / cold conditions of units. Thermal units cannot be started & stopped for short duration to avoid thermal stresses which can damage the machines. It is suggested that as per prevailing practice Coal units, once started, must be allowed to run at least for 72 hours & Gas units for at least 24 hours. APP has also supported this issue of Nodal agency should take into consideration the technical limitation/specifications of the machines of the RRAS providers.
- h. FICCI has recommended that upon issue of direction by nodal agency to withdraw the services, the RRAS provider may be allowed a minimum 30 mins of time to withdraw the service.
- i. POSOCO has commented that in the draft regulations, it appears that Reserves Regulation Ancillary Services shall be scheduled only to the Regional Deviation Pool of the respective Region. However, in case of major contingency (Generation station outage, Load crash etc.) in any one of the regions, Nodal Agency may give Regulation Up/Down instructions to Reserves Regulation Ancillary Services Provider located in

other regions and the same may be scheduled to the Regional Deviation Pool of the region under contingency. The clause may be amended as follows:

“...9.1. Generation under the Reserves Regulation Ancillary Services shall be scheduled to the Regional Deviation Pool in ~~each Regional Grid~~ in any one or more Regional Grids as decided by the Nodal Agency ...”

5.3 Analysis and Commission’s Decision

Stakeholders have requested for clarity on recall of un-requisitioned power by the beneficiary. A conflict might happen if the URS was scheduled for Ancillary Services in the day-ahead schedule while the beneficiary recalls it intra-day. In this regard, the Commission would like to provide the following clarifications:

- i. Original Procurer will have priority of scheduling of power from the generating station. Currently, the process shall follow the existing provisions of the Indian Electricity Grid Code (IEGC) Regulation 6.5.18“Scheduling and Despatch procedure for long-term access, Medium-term and short-term open access”:

Revision of declared capability by the ISGS(s) having two part tariff with capacity charge and energy charge (except hydro stations) and requisition by beneficiary(ies) for the remaining period of the day shall also be permitted with advance notice. Revised schedules/declared capability in such cases shall become effective from the 4th time block, counting the time block in which the request for revision has been received in the RLDC to be the first one.

The Commission, however, appreciates the need for certainty of capacity for use under Ancillary Services, and directs the staff to examine this issue in light of various provisions of National Electricity Policy and Tariff Policy, and come up with suggestions on suitable amendments in relevant regulations, if required.

- ii. Stakeholders have underscored the need for clarity on timeframe or trigger time to deploy or withdraw the ancillary service. The number of time blocks to put the RRAS into service as well as withdraw the service shall be specified in the Detailed Procedure, keeping in view the provision of the IEGC, and other requirements of the Ancillary Services. The issue of minimum run-time in case units are cold started shall also be addressed.
- iii. POSOCO has pointed out the need for inter-regional deployment in cases of contingency. For enabling inter-regional exchange, as warranted by the situation, the Commission has decided to modify regulation 9.1 as below:

"9.1. Generation under the RRAS shall be scheduled to the Virtual Ancillary Entity in any one or more Regional Grids as decided by the Nodal Agency."

(The new term 'Virtual Ancillary Entity' is discussed in the next section)

6 Scheduling of Reserves Regulation Ancillary Services

6.1 Proposal as in Draft Regulations

11. Scheduling of Reserves Regulation Ancillary Services

- 11.1. *The quantum of generation dispatched shall be directly incorporated in the schedule of respective RRAS providers.*
- 11.2. *For Regulation Up Service, power shall be scheduled from the generating station to the pseudo-entity "pool" by the concerned RLDC.*
- 11.3. *For Regulation Down Service, power shall be scheduled from the "pool" to the generating station, so that effective scheduled injection of the generating station comes down.*
- 11.4. *Separate statement shall be maintained alongwith Regional Deviation Settlement Account for Reserves Regulation Ancillary Services.*
- 11.5. *The energy despatched under Reserves Regulation Ancillary Services would be deemed as delivered at the Regional periphery.*

6.2 Comments received

- a. IEDCL has commented that the Draft Regulations do not define "pseudo entity pool", whether it is an existing "pool" or a new pool shall be created by the Commission is not clear. Hence, it is requested to provide clarity in this regard and definition of "Pseudo entity pool" may be included in the final regulations.
- b. Gujarat SLDC has stated that the proposed methodology considers power to be scheduled to or from pseudo-entity 'pool'. However, in case of consistent DSM violation by any beneficiary, power may be scheduled to directly to that beneficiary (instead of pseudo-entity).
- c. NTPC has brought up the issue of module capacity while scheduling units for Regulation Up services. For example, in case of Dadri-Gas, if running module is already fully requisitioned & additional 1GT+ST is required to be run for meeting additional requirement, then a minimum schedule of 170 MW would be required.

- d. POSOCO has stated that the schedule of the Reserves Regulation Ancillary Services provider will be at ex-bus periphery, and therefore, the injection loss/withdrawal loss shall be applied as per existing regulations so that the losses will be adjusted in kind. The clause may be amended as follows:

“...11.5. The energy despatched under Reserves Regulation Ancillary Services would be deemed as delivered ~~at the Regional periphery~~ ex-bus ...”

6.3 Analysis and Commission’s Decision

Stakeholders have requested for clarity on the pseudo-entity pool. Gujarat SLDC has commented that specific beneficiaries that are responsible for consistent DSM violation should be held liable to pay for ancillary services that are called upon. NTPC has brought up the issue of module capacity in the context of Regulation Up service, while POSOCO has underlined that schedule of RRAS provider will be at ex-bus periphery. The Commission has considered these suggestions and decided as follows:

- i. The scheduling of power would be done to the regional DSM pool, which is the existing commercial pool. There is a requirement to define a virtual entity that can participate in pool transactions. Accordingly, this pseudo-entity shall also be billed for this power thence scheduled to it. For more clarity, the Commission has decided to term it as a ‘Virtual Ancillary Entity’, and define it as follows in the Regulation:
- “Virtual Ancillary Entity” means a virtual entity participating in the Regional Deviation Pool, as operationalized under Central Electricity Regulatory Commission (Deviation Settlement Mechanism and related matters) Regulations, 2014, which shall act as the counterparty for the schedule prepared for despatch of Reserves Regulation Ancillary Services Providers.*
- ii. As a consequent change, regulations 11.2 and 11.3 are amended as under:
- “11.2. For Regulation Up Service, power shall be scheduled from the generating station to the Virtual Ancillary Entity by the concerned Nodal Agency, until such time the Nodal Agency gives instruction for withdrawal of service.*
- 11.3 For Regulation Down Service, power shall be scheduled from the Virtual Ancillary Entity to the generating station, so that effective scheduled injection of the generating station comes down, until such time the Nodal Agency gives instruction for withdrawal of service.”*
- iii. The Commission takes note of the suggestion for the specific case of consistent DSM violation, and would like to clarify that as provided in regulation 13.5 of the Draft Regulations, penalties shall be levied in such cases.

- iv. **Module capacity and other technical parameters considered at the time of scheduling for Regulation Up services shall be addressed in the Detailed Procedure.**
- v. **The regulation regarding delivery of power is amended as per the suggestion of POSOCO as below:**
“11.5. The energy despatched under Reserves Regulation Ancillary Services would be deemed as delivered ex-bus.”

7 Accounting and Commercial Settlement

7.1 Proposal in the Draft Regulations

12. Energy Accounting

- 12.1. *Energy Accounting shall be done by the respective Regional Power Committee on weekly basis along with Deviation Settlement Account based on interface meters data and schedule.*
- 12.2. *The Regional Power Committees shall issue an Ancillary Services statement along with the Deviation Settlement Mechanism Account.*

13. Reserves Regulation Ancillary Services Settlement

- 13.1. *The settlement shall be done by the Nodal Agency under the Deviation Settlement Account under separate account head of Reserves Regulation Ancillary Services.*
- 13.2. *The payment to Reserves Regulation Ancillary Services provider shall be from the Regional Deviation Pool Account Fund.*
- 13.3. *The Reserves Regulation Ancillary Services provider shall be paid at their fixed and variable charges, with markup as decided by the Commission through a separate order from time to time in case of Regulation Up services for the quantum of Reserves Regulation Ancillary Services scheduled from the Regional Deviation Pool Account Fund.*
- 13.4. *Any deviation from the schedule given under Reserves Regulation Ancillary Services shall be in accordance with the Central Electricity Regulatory Commission (Deviation Settlement Mechanism and related matters) Regulations, 2014.*
- 13.5. *Sustained failure to provide the Regulation Reserves Services Provider (barring unit tripping) shall attract penalties on account of gaming. Violation of directions of RLDC for ancillary services shall also involve penalties in terms of section 29 of the Act.*

- 13.6. *The Reserves Regulation Ancillary Services provider shall adjust the fixed charges to the original beneficiaries in proportion to the quantum scheduled from generating station.*
- 13.7. *The Reserves Regulation Ancillary Services provider shall pay variable charges to Regional Deviation Pool Account Fund in case of Regulation Down services for the quantum of Reserves Regulation Ancillary Services scheduled.*
- 13.8. *No commitment charges shall be payable to the Reserves Regulation Ancillary Services providers for making themselves available for the Reserves Regulation Ancillary Services.*

7.2 Comments received on DSM Pool

- a. Some stakeholders have expressed concern over possible deficit in pool account if RRAS payments are made from the pool. Specifically, Power Exchange of India Ltd (PXIL) has stated that DSM is a zero sum account and addition of new components for drawl from the fund may lead to deficit in the account. As per DSM Regulations, surplus is to be deposited in PSDF and therefore, RRAS payment mechanism should be designed in such a way that it creates surplus. In this regard, Shri Vijay Menghani has commented that in future there may be a situation resulting in nil balance in pool account and if the payment is to be made to Ancillary service provider then all entities connected to and transacting on ISTS may be made responsible for payment.
- b. Other stakeholders have opposed the payment mechanism as proposed in the Draft, and have instead suggested that direct beneficiaries should share the cost. WBSETCL has commented that payment of RRAS charge from pool account is not justified as it is intended through EA 2003 to reduce cross subsidies. Cost of ancillary service should be shared between the entities as per the benefit derived by them. Also that we move away from UI mechanism, relying on UI pool account for payment to RRAS is a step backwards. Shri Vijay Menghani and IEX have supported this, especially underlining that indiscipline of utilities has resulted in deterioration of system parameters and therefore, they should be made to pay for ancillary service in proportion to their deviation from the schedule.
- c. Shri Vijay Menghani has further added that deviation settlement account is a real time balancing market and mixing of this with Ancillary service market is not correct. Nowhere in the world has these markets interacted at financial settlement level. These two are entirely separate markets.
- d. Brookings has commented that interaction and opportunity costs related to participation in the service as opposed to participating in the UI mechanism must be clarified.
- e. KSEB has asked for clarity on how the inter regional transactions are accounted, i.e. the Reserves Regulation Ancillary Service Provider' is located in one region and the affected areas / beneficiaries is located in another region. KSEB has also commented that the

regulation does not stipulate as how the payment is shared by the beneficiaries of the service provider and at what rates the beneficiary has to pay for the quantum scheduled from the Reserves Regulation Ancillary Service provider. The regulation does not stipulate the procedures for sharing of the cost of reserves regulation ancillary service by the intra state open access customers and embedded entities.

- f. Shri Shanti Prasad has suggested that a separate sub-head may be created under deviation settlement account of region and settlement may be done through this sub-head of that particular region.
- g. CEA has commented that as per clause No.11 of the Regulations, ramping up service power would be scheduled from the generating station to the “Pool”. In case this extra power is injected by the ancillary service provider, it would obviously be drawn by the States, since power generated would have to be consumed somewhere. Therefore, it is suggested that the schedule of each of the grid connected stakeholders may be increased on pro-rata basis during that 15 minute period and deviation calculated accordingly; otherwise, the states would be penalized unduly for the over-drawal related to this injection of power from ancillary service provider.
- h. In addition, CEA has commented on clause No.13.7, which says that the ancillary service provider shall pay variable charges to the Regional Deviation Pool Fund in case of Regulation down service. CEA has highlighted that it is mentioned in the Explanatory Memorandum (clause no.3.0) that the Regulation Down service is being made with the objective of facilitating pumping of the pumped storage plants and integration of renewable energy sources. This does not appear to be in order for a pumped storage plant since pumped storage plant is, in any case, only providing the service and should be paid for the service rather than the pumped storage plant paying the fuel charge. Moreover, there is no fuel charge for a pumped storage plant. This dispensation would hold in the case of a thermal generating station.

7.3 Analysis and Commission’s Decision

Some stakeholders have requested that interaction and opportunity costs related to participation in RRAS vs UI/DSM mechanism must be clarified. Others have expressed concern that payment from UI pool account might encourage further indiscipline by over-drawing entities. Accordingly, it has been suggested that responsible entities must pay for RRAS. It has been highlighted that payment from Regional pool might also result in a situation where DSM pool balance becomes nil or negative. It has been felt that further clarification is required on how inter-regional transactions are accounted for. CEA has commented that schedule of grid-connected entities will have to be revised at the time of deployment of Regulation Up/Down services. Secondly, pumped storage plants should not be asked to pay any variable charges as they don’t have any fuel costs.

- i. The Commission has noted all the inputs, and maintains that DSM mechanism is for minor frequency corrections only; and must not be used as a market to off-take power. Over-drawl/deviation from schedule will still need to be paid for, under the Central Electricity Regulatory Commission (Deviation Settlement Mechanism and related matters) Regulations, 2014. Though deployment of RRAS might result in a lower instantaneous UI and hence lower deviation charge, the objective of grid stability is paramount.
- ii. Tertiary frequency control is required for other contingencies such as loss of a generating unit or a transmission line, unexpected weather events or special load days, etc. In such situations, it is warranted that costs of ancillary services be socialized across the region.
- iii. DSM pool may be reviewed monthly by NLDC to ensure that imbalance in the regional DSM pool does not persist. If it does, the deficit may be made up from other regional pools. Accordingly, the following provision has been added to the Regulations:
“ 13.1 The payment to RRAS Provider(s) shall be from the Regional Deviation Pool Account Fund. Deficit, if any, in the Regional Deviation Pool Account Fund maintained by an RLDC due to despatch of Ancillary Services, shall be made up by Regional Deviation Pool Account Fund maintained by other RLDCs.”
- iv. NLDC may schedule RRAS to regional DSM pool of the region under contingency, which would then remunerate the providers.
- v. The schedule of RRAS providers shall be modified to the extent of Regulation Up or Down services provided, as stipulated in regulation 11.1. Schedule for other connected entities need not be modified.
- vi. As regards the pumped storage plants, it is clarified that the tariff regulations issued by the Commission for the period 2014-19 do provide for a framework of energy charge for such stations as well. Suitable provision shall be made to take care of the special requirement of compensation for such plants as and when such regional entity pumped storage plant gets commissioned and the same would be in line with the applicable CERC (Terms and Conditions of Tariff) Regulations.

7.4 Comments received on fixed charges, mark-up etc.

- a. POSOCO has requested that it may be clarified that *the Reserves Regulation Ancillary Services provider shall adjust the fixed charges to the original beneficiaries in proportion to the quantum surrendered from generating station.* The clause may be amended as follows:

“...13.6. The Reserves Regulation Ancillary Services provider shall adjust the fixed charges to the original beneficiaries in proportion to the quantum ~~scheduled~~surrendered from generating station....”

- b. NTPC has commented that the Regulation Up services would generally be required during the period of low frequency. During such time, the generator will have the option to generate higher than schedule and get payments under deviation settlement mechanism. Therefore, it is submitted that the mark up under the regulation up services should be sufficient to incentivize the generator to subscribe for Regulation up services.
- c. In addition, NTPC has also suggested that in case of revision of fixed charges or any other charges by CERC, it should clearly be provided in the Regulation that the liabilities on account of change in fixed charges or any other charges due to any subsequent tariff order by CERC/Appellate authority shall be with original beneficiaries only. Since, energy will be billed to Deviation Pool Account by generator, therefore, any further revision of energy charges shall be billed to Deviation Pool Account. NLC has supported this by stating that any changes / revisions in fixed and energy charges owing issue of tariff orders, arbitration, litigation, statutory levies etc. may be retrospectively adjusted along with interest from pool account.
- d. NLC has commented that DSM for deviation from revised schedule of RRAS providers to be restricted to the cap rates (applicable to lignite/coal power station) without any additional charges specified under DSM.
- e. IEDCL has recommended that performance of the ancillary service provider can be evaluated by the Nodal agency through a Performance Index that tracks how accurately a resource follows the dispatch signal. A penalty for not following the dispatch signal should be charged as per the Deviation Settlement Mechanism Regulations 2014.
- f. Shri Shanti Prasad and NTPC have suggested that payment of fixed charges to service provider by deviation pool account and service provider passing it on to beneficiary can be avoided and payment can be made directly to the beneficiaries.
- g. Some stakeholders such as WBSETCL and Shri Arup Kumar Datta have pointed out that it is not clear if “mark-up” is on fixed and variable charges, hence the principle needs to be defined and benefit due to mark-up should be passed on to the beneficiaries. Shri Datta has added that if it is applicable to both, then stacking cannot be done based on variable cost only.
- h. Several stakeholders have commented on how to determine the mark-up. PXIL has stated that mark-up should reflect key factors, viz. age of plant, frequency response characteristics, SHR etc. Similarly, IEDCL adds that service providers should be rewarded based on their value of services i.e. the higher the speed and accuracy of following the dispatch signal from the Nodal Agency, higher the compensation. GE has recommended that a significant markup should be set for the fixed and variable

charges payable for actual participation, especially for wind power where the variable cost of generation is very low given that wind is a free resource.

- i. CEA has highlighted that because of ramping up and ramping down of generation, may be a number of times a day, the efficiency and wear and tear of the power plant is likely to be affected adversely. These power plants may then have to be compensated for the same.

7.5 Analysis and Commission's Decision

NTPC has suggested that mark-up should be high enough compared to DSM payment that the generator can get by over-injecting in cases of low frequency. Some stakeholders have stated that more clarity is required on whether mark-up shall be on both fixed and variable costs or one of them. Several stakeholders have suggested that mark-up should be based on plant performance, which should be tracked. NTPC has also raised the question on how payment for RRAS shall be adjusted if fixed or/and variable charges are modified at a later date. The Commission has taken note of all comments and suggestions above, and would like to respond as follows:

- i. The Commission emphasizes that UI/DSM is not a trading mechanism and generators do not have the unbridled freedom to over-generate lured by high UI rate during low frequency regime. There are deterrents in IEGC and DSM Regulation against such perverse tendencies amounting to gaming.**
- ii. It is clarified that the mark-up shall be applied to fixed cost, through a separate order. The Commission shall decide the same based on factors such as age & ramp rate, loss of efficiency, additional wear & tear of the unit, etc. Mark-up shall be communicated from time to time through a separate order.**
- iii. The Commission appreciates the suggestion of IEDCI highlighting the need for tracking performance of RRAS providers. NLDC being the Nodal Agency is expected to undertake performance evaluations of such providers at regular intervals and submit report to the Commission.**
- iv. Existing billing arrangements are conducive to net settlement of fixed charges between the seller and the buyer. These need not be disturbed.**
- v. The fixed or variable charge that is adopted by the Commission (provisional or final) at the time of delivery of Ancillary Service shall be used to calculate the payment for this service. No retroactive settlement shall be undertaken even if the fixed or variable charge is modified at a later date.**

- vi. Penalty for non-compliance of dispatch instructions has already been clarified, and stated under regulation 13.7.

Thus, the regulations are modified as below:

- 13.3.** *The RRAS Provider(s) shall be paid at their fixed and variable charges, with mark-up on fixed cost, as decided by the Commission through a separate order from time to time in case of Regulation Up services for the quantum of RRAS scheduled, from the Regional Deviation Pool Account Fund. Provided that, the fixed and variable charges allowed by the Commission and as applicable at the time of delivery of RRAS shall be used to calculate the payment for this service and no retrospective settlement shall be undertaken even if the fixed or variable charges are revised at a later date.*
- 13.4.** *The RRAS Provider(s) shall adjust the fixed charges to the original beneficiaries for the quantum of un-requisitioned surplus scheduled under Regulation Up service.*
- 13.5.** *For Regulation Down service, the RRAS Provider(s) shall pay back 75% of the variable charges corresponding to the quantum of Regulation Down services scheduled, to the Regional Deviation Pool Account Fund.*
- 13.7.** *Sustained failure to provide the RRAS (barring unit tripping) by RRAS Provider(s) shall attract penalties on account of gaming. Violation of directions of RLDC for RRAS shall also make the RRAS Provider(s) liable for penalties in terms of section 29 of the Act.*

7.6 Comments received on commitment charges and misc commercial issues

- a. Mixed feedback has been received on the issue of awarding commitment charges to generators. Some stakeholders such as GE, PTC and APP have stated given that Ancillary Services are just proposed to be introduced in India, and the utilization of un-requisitioned capacity for participation in Ancillary Services is dependent on a real-time need for the service (which leads to non-revenue capacity), we recommend offering a Commitment or Capacity Charge to encourage more participation. On the other hand, Shri Vijay Menghani has commented that there is no need to pay any commitment charges as only generator having un requisitioned surplus power and having schedule less than their declared availability are to participate in this.
- b. PTC has commented that there is no incentive for ISGS to back down generation and participate in RRAS unless they are protected with the lost PLF owing to RRAS participation.
- c. Shri Shanti Prasad has suggested that besides sustained failure, penalties may also be levied on account of mis-declaration of capacity, ramp rate, start time etc.

- d. Statkraft has brought attention to the fact that no specific details about sharing of transmission charges and losses are mentioned in the regulation. It is requested that this aspect may be clarified in the regulations.
- e. Shri A. Velayutham has commented that the pricing mechanism may be framed to attract more regulation reserve participating entities in ASOR. Power market apart from power business would strengthen grid operation.
- f. Essar has expressed concern that apart from unit tripping, Force Majeure Conditions beyond control should be included and in case of existence of such conditions, services provider should be allowed not to serve without any penalty.

7.7 Analysis and Commission's Decision

It is observed that there is mixed feedback on whether commitment charges should be paid to the generator or not. Industry stakeholders have suggested that commitment or capacity charge be paid to generators to encourage them for participating in these services.

- i. The Commission feels that this capacity is already declared as part of 'Total Available Capacity' by the generator, and not set aside for ancillary services specifically, until the generator is unable to sell this power even in the intra-day market. As the generating station is being paid fixed charges for deployment of its unutilized capacity also, no additional commitment charges are warranted.**

Thus the Commission decides to retain the proposed regulation.

- ii. Incentive for Regulation Down service has already been elaborated upon and stated in regulation 13.1.**
- iii. Force majeure conditions may be exempted for levying of penalties in case of non compliance of dispatch instructions, and the same may be clarified in the Detailed Procedure.**
- iv. As regards transmission charges, unless separate regulatory dispensation is provided at a later date, there would be no separate accounting for such charges for the purpose of ancillary services on lines of similar dispensation for DSM/UI transactions. Treatment of transmission losses may be suitably accounted for in the detailed procedure.**

8 Detailed Procedure

8.1 Proposal in the Draft Regulations

14. Detailed Procedure

14.1. *The Nodal Agency shall after obtaining prior approval of the Commission, issue the detailed procedure to operationalise Ancillary Services including scheduling and dispatch, at inter-State level and on any residual matter.*

8.2 Comments received

- a. TPCIL has commented that Nodal agency may provide detailed procedure for better operationalization of the RRAS. Additionally, TPCIL feels that for backing down instruction from the RLDC/NLDC, order of priority for selection of RRAS, payment for honouring the back down instruction were not covered in the present regulations unlike ramp up instructions.
- b. NLC and Shri Shanti Prasad have requested that the nodal agency should publish draft operating procedure and obtain views of stakeholders for incorporation and subsequent submission to the Commission. CEA has also supported this, by stating that Regulations do not give the details of the kick-in and kick-out frequency or stage of congestion (i.e. whether violating ATC or TTC and for how long) at which the ancillary services would get kicked in. The Detailed Procedure mentioned in the Regulations is expected to provide the modalities. States may object to continuing ancillary services when not needed. Therefore, it is suggested that the Detailed Procedure should also be put on the public domain for comments before finalization.
- c. Shri Vijay Menghani has added that many operational issues affecting performance and effectiveness of Ancillary service may not be left to be defined under detailed procedure but should be specified as part of the Regulations.

8.3 Commission's decision

- i. **The Commission has taken cognizance of stakeholder comments requesting for further detailing of operational aspects of RRAS. The Commission directs POSOCO to evolve Detailed Procedure, solicit public comments and seek necessary approval of the Commission, so as to ensure that the framework of RRAS could be implemented w.e.f such date as may be specified by the Commission through a separate order.**
- ii. **The relevant regulations are amended as follows:**

“

14.1. The Nodal Agency shall, after obtaining prior approval of the Commission, issue the Detailed Procedure within a period of 3 months of notification of these regulations.

14.2. The Detailed Procedure shall contain the guidelines regarding operational aspects of RRAS including scheduling and dispatch and any residual matter.”

9 Market for Ancillary Services

9.1 Comments received

- a. Stakeholders such as PXIL, IEDCL and Statkraft have recommended that Ancillary services should be a market based service allowing voluntary participants bid on exchanges, instead of merit order stocking based on variable cost. A transparent mechanism similar to spot market may be created for these services. A part of the price discovery should be towards commitment to be available for dispatch and respond within stipulated time under the reserves system/market.
- b. Gujarat SLDC has suggested that in line with ISGS, other generating stations having less schedule against DC should be able to participate through IEX/PXIL platform with real time transaction may be considered for future.
- c. GIZ has suggested that to create a liquid market and push technical innovations the eligibility should be extended and the reserve should be addressed as positive (up) and negative (down) reserve separately. It is suggested that the market for other required ancillary services viz. Primary Frequency Control, Secondary Frequency Control, Voltage Control Ancillary Service, Power Flow Control Service, System Re-Start Ancillary Service etc. should also be introduced in short to medium term.

9.2 Commission's Decision

Several stakeholders have recommended creation of a market for Ancillary Services. Market based price discovery is suggested as the way forward.

- i. **As already mentioned in the accompanying Explanatory Memorandum, the Commission is aware of market frameworks existing in other developed markets: "The Commission has noted these practices and feels that while the international experience calls for Ancillary Services to be purely market based instrument, it would be desirable to move in a calibrated way in so far as introduction of Ancillary Services in India is concerned."**
Additionally, as mentioned in the Explanatory Memorandum, several rounds of stakeholder discussions were organized by CERC where a number of issues pertaining to introduction of Ancillary Services Market were discussed. The market framework will be introduced at a later point when more providers are enabled to participate in providing these services. Indeed, the Commission's vision is to move towards a market based Ancillary Services framework.

10 Integration of renewable sources and Ancillary Services

10.1 Comments received

- a. Several stakeholders have commented on the role of ancillary services in the grid-integration of renewable sources of energy. Shri Vijay Menghani has commented that it is the need of integration of Renewable which should be focus area for Ancillary service, nothing about this is mentioned in Regulation 6.5 . This should be included as top most priority in the listing given under Regulation 6.5. GIZ has stated that the highly ambitious targets of achieving 175 GW of RE installed capacity by 2022 necessitates introduction of other ancillary services. It is observed that the (Ancillary Services Operations) Regulations, 2015 aims to address only frequency control and transmission congestion. It is suggested that the market for other required ancillary services should also be introduced in short to medium term. CEA has echoed this while observing that Regulations may be in need for continuous revision because of the need for continuous availability of ancillary services with the growth of renewables. CEA adds that there is stranded private gas based generation capacity, amounting to about 14,000 MW available, which should be used, as such capacity is more flexible than coal based capacity. In that case, Market-based ancillary services would be required to enable a level playing field.
- b. Shri A. Velayutham has highlighted that it is possible to implement Secondary control/AGC /Semi EMS in a new (but purposeful) format. Grid friendly characteristics of wind /solar units in frequency/voltage control and grid security aspects may have to be utilised appropriately. The associated cost issues have to be addressed in time to accommodate more wind/solar power in to the grid.
- c. GETCO has recommended that in case of sudden drop in RE generation, schedule from on bar machine to be made to the needy state until it comes under normal DSM limit.
- d. Shri Shanti Prasad feels that wind / solar plants be considered as regulation down service providers of last resort.

10.2 Analysis and Commission's decision

- i. **Several stakeholders have recommended that RRAS should be designed keeping in mind the challenges posed by grid integration of renewables. The Commission acknowledges the unique challenges posed by variability and uncertainty of renewable power. The country has to take a multi-pronged approach towards successful integration of renewable power on the grid, Ancillary Services being one of them. The resultant grid operational challenges are likely to be covered by the scenarios enlisted for deployment of Ancillary Services in the draft. Additionally, primary and secondary frequency response is required for balancing of intermittent**

sources of energy. CERC staff is engaged in evolving a suitable regulatory framework in this regard.

- ii. **Shri Velayutham has opined that new wind and solar plants can be used for frequency/voltage control, while Shri Prasad has urged that their must-run status should not be compromised. The wind and solar plants are currently not envisaged for participation in ancillary services, and hence shall not be receiving Regulation Down instructions. Once the forecasting and scheduling processes are streamlined and forecasting accuracy improves, these might be considered for providing RRAS in future.**
- iii. **Regional entity gas based plants are eligible and should be used due to their flexibility and speed of ramping up/down. They will be dispatched based on security constrained merit order principles as discussed earlier in this document.**

11 Other issues/Miscellaneous

11.1 Comments received

- a. CEA has stated that the un-requisitioned surplus indicated is about 5,000 MW. From the Explanatory Memorandum, it is seen that the figure is arrived at by calculating the difference between the average availability for the year 2014-15 (upto Jan. 2015) and the average PLF during the same period. This therefore indicates that this is the average un-requisitioned surplus, which means that there could be less or more of it at various times of the year and also vary during the day.
- b. CEA has made an observation that most of this un-requisitioned surplus is from the gas based power stations of NTPC as well as of RGPPL, in addition to MAUDA and Jhajjar. If the gas based stations have to be used for ancillary services, variation of gas flow in the gas pipeline would be required, based on when the ancillary services are called for. The Commission may need to write to the Ministry of Power / Ministry of Petroleum & Natural Gas to facilitate the same, since the off-take of gas is based on normally constant flow of gas. In addition, payment is made for the gas on "Take or Pay basis" and not on "Take and Pay basis". Modification for this dispensation also may be required by the Petroleum & Natural Gas Regulatory Board (PNGRB).
- c. CEA has also commented that it is not clear whether gas plants would be running as combined cycle power plants or as open cycle power plants. In case, they run as open cycle power plants, the tariff of the power plants as determined by CERC may have to be revised. This has been supported by NTPC, which has stated that open cycle operation carried out during starting/stopping of gas based units would need to be compensated corresponding to open cycle heat rate/APC. Secondary Oil consumed at Coal Stations for starting a unit or oil support taken during extreme

back down condition for short duration needs to be accounted separately & compensated.

- d. Gujarat SLDC has observed that if generator selling power through collective transaction, trips and is not able to bring back on bar, there is no provision for revision in collective transaction. Hence, in such a case, power may be scheduled through ancillary services to compensate the energy loss. Additionally, in case of tripping of generator (capacity 100 MW and above) selling power through inter-state bilateral transaction, only one revision is allowed and schedule gets revive as per the restoration time declared by the generator. In case, generator fails to bring back machine on bar as per the commitment, the provision to schedule power from other on bar machine may please be made.
- e. Statkraft has suggested that a provision for transparently sharing historical data on demand at time block level transparently with all market participants may be incorporated.
- f. PTC has asked that the term sustained failure by the service provider may be defined in the regulations, i.e. number of failures etc.
- g. NTPC feels that non-availability of transmission line causing dynamic instability and deviated inter-state exchange in tie lines may be penalized in the same manner as done for power station in the form of UI charges.
- h. KSEB has objected that in the case of outage of a generating unit or a major transmission link, the beneficiaries of that generating unit are forced to avail the mandatory service of the costly Reserves Regulation Service Provider, without allowing the utilities to make an alternative decision of managing their load through shedding or other Demand Side Management measures. In order to avoid this, it is requested that the Reserves Regulation Service may be put into service only after the RLDC consults with the concerned SLDCs for their strategic plans before the Reserves Regulation Service is put into operation.
- i. KSEB has highlighted that one of the objectives of the regulation as stated is to reduce the transmission congestion. However, the regulation does not address the issue of reducing the transmission congestion, if there are no regulation reserves service provider in a region for meeting the requirement.

11.2 Analysis & Commission's Decision

The Commission has taken note of miscellaneous comments above. Responses are as under:

- i. **CEA has expressed concern on the availability of un-requisitioned surplus (URS) capacity as estimated in the Explanatory Memorandum, on a continuous basis through the year. The Commission acknowledges this point. In this regard, availability of URS**

- of regional entities over a financial year has been analyzed in Annexure II. For over 85% of the time, 3000 MW - 4000 MW of un-requisitioned surplus is available in ISGS.
- ii. CEA has brought attention to the issue of open-cycle operation of gas plants that may be required if they participate in RRAS. Accordingly, variable flow of gas will be necessary, and warrant modification for current dispensation by the Petroleum & Natural Gas Regulatory Board (PNGRB). Secondly, both CEA and NTPC have underscored that gas plants, if operated under open cycle mode, will need to be compensated accordingly. The Commission clarifies that gas plants preferably with dual fuel capability could provide RRAS, and if required, the Commission may give statutory advice to the Government on change of dispensation procedures (related to alteration of gas flows). The mark-up will account for revised costs due to open cycle operation.
 - iii. The suggestion regarding balancing in case of a generator tripping under an inter-state bilateral transaction or under a collective transaction is beyond the scope of this Regulation.
 - iv. KSEB has requested further elaboration on how transmission congestion may be reduced if there are no RRAS providers in a downstream region. Other methods of congestion alleviation such as kicking in of congestion charge might have to be resorted to in such cases.
 - v. 'Sustained failure', as requested by PTC, shall be defined in the Detailed Procedure.
 - vi. Sharing of historical demand data is a welcome suggestion but beyond the scope of the present regulatory dispensation.
 - vii. NTPC has suggested penalties for non-availability of transmission lines, which is an issue beyond the scope of the present regulation.
 - viii. The Act already requires the load dispatch centres to coordinate for smooth and secure operation of the grid. However, it is clarified that the RLDCs while kicking in the RRAS shall be governed by the factors provided for in the Regulation and the Detailed Procedure as approved by the Commission.

Other regulations are retained unless changes are specified above.

Sd/-
(A.S. Bakshi)
Member

Sd/-
(A.K. Singhal)
Member

Sd/-
(Gireesh B. Pradhan)
Chairperson

Annexure I

List of stakeholders who have submitted written comments:

- 1 Alstom
- 2 Essar
- 3 FICCI
- 4 GE
- 5 IL&FS
- 6 Inox Wind
- Independent Power Producers Association of India
- 7 (IPPAI)
- 8 Neyveli Lignite Corporation (NLC)
- 9 NTPC
- 10 Statkraft
- 11 Wartsila
- 12 Association of Power Producers (APP)
- 13 Central Electricity Authority (CEA)
- 14 Gujarat SLDC
- 15 Kerala State Electricity Board (KSEB)
- West Bengal State Electricity Transmission Co. Ltd
- 16 (WBSETCL)
- 17 Tata Power
- 18 POSOCO
- 19 Power Trading Corporation (PTC)
- 20 Power Exchange of India Ltd (PXIL)
- 21 Brookings-CMU
- 22 GIZ
- 23 Shri Shanti Prasad
- 24 Shri Velayuthum
- 25 Shri Vijay Menghani
- 26 Shri Arup Kumar Dutta

Annexure II

Underlying Data: URS capacity for every ISGS (thermal & gas stations), for every time-block, for 1/4/2014-31/03/2015

Time-Granularity	Average URS (MW)	Minimum (MW)	Maximum (MW)
Daily	5,430	1,348	15,314
Hourly	5,430	814	21,715
Time-block	5,430	766	21,750

All India URS is*

- >2000 MW for 97% of the time
- >2500 MW for 92% of the time.
- >3000 MW for 87% of the time
- >4000 MW for 71% of the time
- >5000 MW for 51% of the time
- >6000 MW for 32% of the time

* Reserve shutdown not deducted

Hourly average URS is plotted for the year 2014-15.

