

**Subject: Comments on Draft Central Electricity Regulatory Commission (Ancillary Services Operations) Regulations, 2015.**

Reference is invited to CERC Public Notice No. 18/1/2013 /Reg. Aff. (AS Reg.) dated 1<sup>st</sup> May,2015 seeking comments of stakeholder on proposed draft Regulation on Ancillary Service operations.

For reliable operation of the grid it is necessary that Ancillary services are introduced in Indian Power system operation. This is required since after integration of All India Grid the size of Indian Grid has increased and it is handling about 136000 MW. Further to this there is emerging need of Integration of Renewable Energy in Grid operation.

The initiative of CERC in introducing Ancillary service is a welcome step. However the draft proposed Regulation need to be reviewed on certain Regulatory, technical and commercial aspects. Earlier also in April, 2013 a CERC staff paper on Ancillary power was published . For the purpose of transparency, it is requested that comments received on staff paper may please be made public. Also it need to be elaborated that how the proposed draft regulation, relates to staff paper. It will give clear idea that on which issue consensus emerged and what were the points on which there was difference in opinion. How proposed draft Regulation is dealing with these issues. On this, the rationale behind “ calibrated way “ mentioned in para 2.3.5 of explanatory memorandum need to be explained with pro and cons.

First point wise comments on proposed draft Regulation are given and then important issues are highlighted.

#### Definitions

( b) & 2.1(c) Actual Injection/ Actual Drawl: In these two definition word buyer and seller is used.

In accordance with CERC Deviation Settlement Regulation, 2014 buyer and seller includes all entities selling and buying electricity through a transaction scheduled in accordance with the regulations applicable for short term open access, medium term open access and long term access.

As proposed draft Regulation is applicable on a subset of seller i.e Generating station for which tariff is determined or approved by Central Commission so in Actual injection , only these entities are to be included.

On buyer side it need to be clarifies that proposed Regulation would be applicable to all or only to beneficiary of generation stations covered under draft Regulation.

This is necessary as although it is proposed that at present payment for Ancillary power will be made from pool Account , in future it may be a situation that there is no 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 responsible for payment as System operator , on its own cannot make payment for this service.

## 2. Definition of scope :

Under Scope the entities to whom it shall be applicable is contradictory to the definition of Regional entities.

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.

Grid code definition: Regional Entity” means: such persons who are in the RLDC control area and whose metering and energy accounting is done at the regional level;

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.

Regulation 6.1: It is not clear when nodal agency will prepare merit order stack and whether it will be displayed on web site or not.

Similarly as Un-requisitioned power belongs to beneficiary, what will happen if after preparation of merit order some beneficiary schedules it? This will require continues updating of merit order .Further again beneficiary reschedule and make its requisition nil or downward. So how frequent this merit order will be prepared and displayed. In accordance with Grid code schedule revision is allowed after 4 time block and different entities may reschedule at different time blocks.

So the quantity available under this service may not be certain unless a minimum period of “No requisition or no revision” is defined.

Regulation 6.2: It is mentioned that merit order will be prepared on variable cost. However it is mentioned in Regulation 13.3 that payment will be made on Fixed charges and Variable charge. So while decision to avail ancillary service will be taken on variable charges, payment will be made on total charges. This will distort the merit order . As initially station A with variable charge of say Rs 1.40 will be dispatched against Generating station B with variable charge of Rs. 1.5 , while at payment stage total payment to be made to A may be higher than B if its fixed charge of A ( Rs. 2) is more than B ( Rs. 1.70) . As per total charges B ( Rs 3.20) is cheaper than A ( Rs 3.40)

Regulation 6.5 : It is mentioned that Nodal agency shall **direct** the selected Regulation Ancillary service provider .

- In accordance with section 28(3) of Electricity Act, 2003 Nodal agency RLDC or NLDC cannot direct a dispatch, they can only dispatch according to contract:  
(a) *The Regional Load Despatch Centre shall -  
(a) be responsible for optimum scheduling and despatch of electricity within the region, **in accordance with the contracts entered into with the licensees or the generating companies operating in the region;***

As dispatch is to be in accordance with the contracts without any contract the power cannot be scheduled. There exist a contract between Generating station and its beneficiary and it is to be governed by their PPA. Through a “schedule “this contract is implemented between generating station and beneficiary . For power scheduled under Ancillary service who are the contracting parties. As this power is to be scheduled to “Pool” and “Pool” is to be managed by RLDC/NLDC, are RLDC /NLDC are underwriting this contract. As per proposed scheme, on behalf of pool RLDC /NLDC are giving schedule so in a way these entities are entering into contract. This cannot be done without this function is assigned to NLDC /RLDC as per Electricity Act.

This is an legal issue, but being an engineer by professional, even without it under existing Acts and empowerment through Central Commission Regulation , if this function is performed by system operator , I am in favor of this initiative in national interest subject to RLDCs not taking any financial risk . Hence it will be better that in place of payment through Pool account, state entities which are

overdrawing are made to pay for this and for this they should made binding legal contracts with Nodal agency .

- **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.**

All the conditions given for ancillary service are subjective in nature and it is necessary that the time line and triggers are defined correctly.

(a) Extreme weather Forecast: If weather forecast are for day ahead then it is the responsibility of each SLDC to manage load generation balance in their control area as per “balancing Authority “ concept. Is Nodal agency is stepping in to take care of next day weather.

Nodal agency role should be limited to intra day weather event like sudden load throw off due to rain or other event.

( b) Multiple generating unit or transmission line outages: It can be found from RLDCs web site that on a particular day many generating units and transmission lines are under outage and daily schedule is prepared after considering all these . It may be possible that during a day a generating unit or transmission line outage happened. At that moment insistence on “ Multiple “ is incorrect as for safe operation even a single high capacity unit or line in important inter regional corridor is a contingency .

( c) Trend of load met: At present no trend of load met at Regional level or national level is available in public domain. So decision of Nodal agency can be checked. If from load trend it is found that during peak there is shortage of 3000 MW for 3 hours so whether everyday nodal agency try to meet this shortage by dispatching Ancillary services.

As at present RLDC/NLDCs are not doing any forecast of total Regional and National load , how a trend can be found. In all ancillary market , system operator based on forecast of load generation balance for the next day , made prior arrangement of Ancillary power , rather than waiting till last moment and depends on uncertain source of URS Power.

Using Ancillary service for Load –following will be counterproductive to Grid discipline and is explained in separate Para.

(d) Excessive Loop flow leading to congestion: In accordance with CERC Grid code and Real Time management of congestion, it is the responsibility of RLDC to do system study while allowing any schedule. If loop flows are possible leading to congestion, then particular transaction need not be allowed. Security constrained dispatch is duty of system operator and in present mechanism of de centralized dispatch, it need to be managed in advance by Security assessment tools .

For example due to STOA transaction between two private entities X and Y having value of say Rs 1 million , there is chance of congestion due to loop flow , then it will be better not to allow this rather than purchasing Ancillary service of Rs 2 million and paying from pool as proposed.

Regulation 6.6: It is not clear that how much time will be given for withdrawal of Ancillary service. Later it is mentioned that detailed procedure will be prepared by Nodal agency.

The Regulation of Ancillary Service operation has economic impact and it cannot be left to the procedure stage. 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 . In this performance of Nodal agency would play a pivotal role. Any delay in re-assessment of situation and giving withdrawal instruction would result in unnecessary payment to service provider. So this need to be defined in Regulation and all stakeholders must be aware about benchmarks.

Regulation 7.1:

In addition to commercial information, the most important information which is required from Ancillary service provider Generator is RAMP Rate both RAMP UP and RAMP DOWN rate. Without this it may not be possible to achieve desired benefit in required timeframe of different Ancillary service like contingency (Primary) or Reserve (Secondary and Tertiary) .

Regulation 8.1:

As variable charges for a month may be available after sometime, it is not clear what should be the data of submission of data by Ancillary service provider. For example for scheduling to be done for 1<sup>st</sup> June, 2015 whether variable charges for May,2015 would be used or April,2015 would be used if latest data is not available. Also in case of revision of variable charges due to some reasons in a month whether adjustment would be given or not. For

example if merit order was prepared based on variable charges of Rs 1.40 and Generator later claim Variable charges of Rs 1.60 whether it can be given.

#### Regulation 8.2

As payment for all scheduled energy is made as per Monthly Regional account ( REA) issued by RPCs, whether accounting for Ancillary service would be on monthly basis or on weekly basis as per deviation settlement mechanism.

#### Regulation 11.3

Regulation Down services: It is not clear whether participation in Regulation Down Service is optional or compulsory. As it will adversely affect PLF and incentive payment to Generator, they may not be agreeable to participate in Regulation Down services. It also affects technical parameter like Heat Rate so variable charges of all beneficiaries would increase so this service must be optional.

#### Regulation 13.3

The payment from Regional Deviation Pool account is not correct. First existing Deviation Settlement account does not have any provision for it. Payment from Deviation pool account will not only promote grid indiscipline but also affect power market operation .Only in case of Ancillary service requisition by RLDC to take care of contingency like Central sector Generating Unit outage it may be form Deviation pool account.

If for load following or frequency management Ancillary services are used, it will detrimental to grid discipline. If due to indiscipline by one or two state frequency is falling and Nodal agency tried to chase frequency and requisitioned Ancillary service to maintain frequency , entity not following grid discipline would be benefitted as it has to pay less rate for same amount of energy overdrawn from the grid. The entity which are helping the grid by positive deviation within limit as permissible under existing Regulation ( deviation which help in restoring frequency i.e over injection/under drawl at low frequency) would be penalized as they would received less amount . The example or case study given in explanatory memorandum substantiates this.

State utilities , in place of proper forecasting and making arrangement for power procurement in advance or in day ahead basis form power market would depend on Ancillary service and wait till system operator come to their rescue by initiating ancillary service.

**Rather, utilities, indiscipline of which resulted in deterioration of system parameters and need of ancillary service occurs at first place, should be made to pay for ancillary service in proportion to their deviation from the schedule.** A simulation exercise with this option would show that this is more justified and rational way of doing this. Otherwise it will be a loop in which they keep on overdrawing and system operator keep on arranging Ancillary power for maintaining system parameter.

It must be clear 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 market interacted at financial settlement level. These two are entirely separate markets. The notion that pool account would be always surplus is also incorrect and assume that large deviation from schedule would continue to trigger levy of Additional Deviation charges through which pool account would remain surplus is in a way accepting grid indiscipline.

#### Regulation 13.8

With the design of Ancillary service market it is clear that only generator having un requisitioned surplus power and having schedule less than their declared availability are to participate in this , there is obviously no need to pay any commitment charges..

#### Regulation 14:

Many operational issue affecting performance and effectiveness of Ancillary service is left to detailed procedure which is not correct. To comments on Regulation in a prudent manner operational parameter or range of that must be included in the Regulation. These critical parameters like trigger points or events, minimum time blocks to start and stop ancillary service, frequency of operation of Ancillary service in a day and validation of requisition etc cannot be left to Nodal agency . The Regulation must clearly specify responsibility of Nodal agency on forecasting of demand and forecasting of quantum of

anticipated Ancillary service , information sharing on all India unit and transmission line outage consolidated basis for all regions . Also mechanism for performance evaluation of Nodal agency on the parameter of economic operation of Ancillary service need to be given .

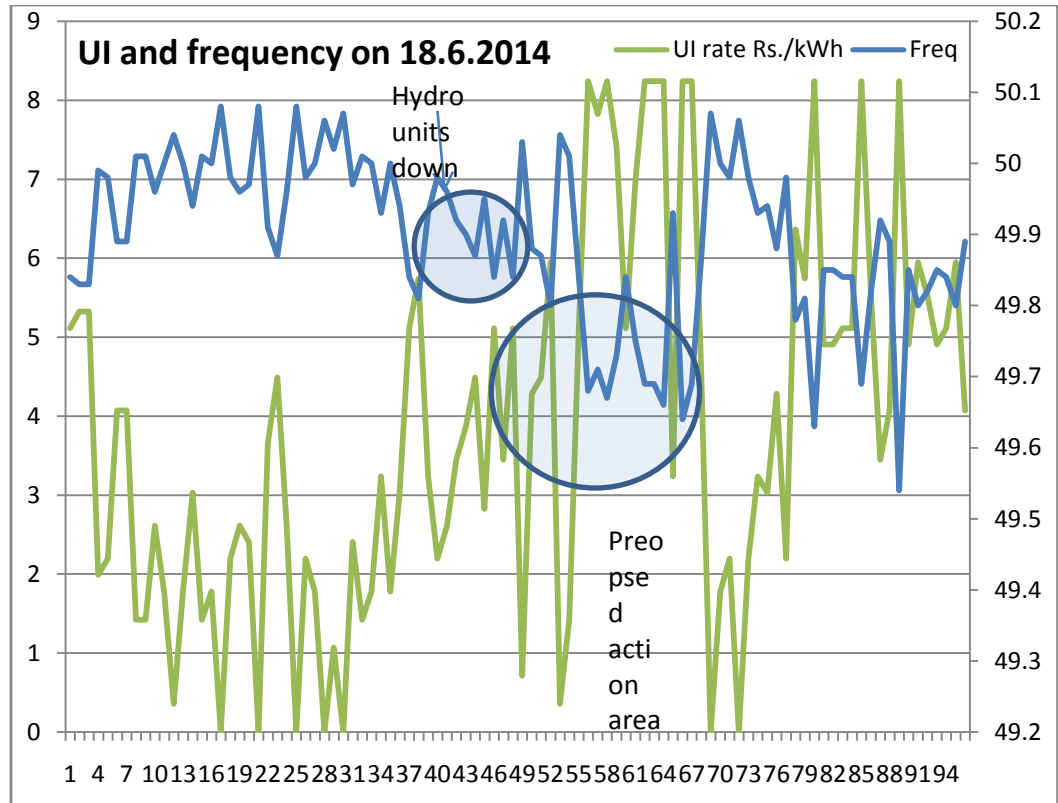
Comments on Case study given in Explanatory memorandum:

1. The case study described in Explanatory memorandum does not correctly mimic the proposed Regulations and hence is not correctly bring out the implication of Regulation.
2. It is not giving price of Ancillary power in merit order to clearly show how decision to schedule gas based power station was taken. Whether power from other coal based stations was not available or it was technically not feasible.
3. Rescheduling of Hydro station was done during 1030 AM to 1200 noon, what was the behavior of state utilities during the period, whether they continue to overdraw or ignore RLDC instruction. Whether an issue of grid indiscipline is attempted to be corrected through Ancillary service.
4. As gas generation is being used it is appeared to be treated as contingency measures, but action in contingency cannot await 45 minutes (service initiated at 1245 PM while event occurs between 1030 AM to 1200). Again it is accepting the fact that primary response in accordance to Grid code is not provided by Generators. It I would give a wrong signal that violation of Grid code will be tolerated and the generators would be economically rewarded by scheduling their power in Ancillary what they should have provided at first place under primary response . Only at tertiary response level, there is need to compensate but first they should provide Primary response and only when secondary and tertiary response are activated by system operator, these generators will be given schedule of Ancillary service.
5. As before scheduling power from gas based generation , power from coal generating stations which are operating at part load ( load less than their capability declaration) would be scheduled under Ancillary , the unscheduled generation by these generators which is considered in original deviation scheduled mechanism would be replaced by other generators or IPP. It would be relative price of deviation vs variable cost of generation which would decide where profit is moving.
6. The data given for un-requisitioned power are underestimated. Much more capacity is available to be used as reserves. Similarly lot of underutilized capacity is available in State sector and operating at partial load. State must use first this capacity as per concept of balancing area wherein each



entity is responsible for managing load generation balance within its control area.

- The graphical view of frequency and UI prices on 18.6.2014 is indicating that taking signal from prevailing deviation prices as proxy of Real time Energy price, power system is trying to balance itself and entities are also trying to balance their drawl accordingly. If proposed system of payment of Ancillary power from Pool account is implemented then self correction form State within its own control area would reduce as it will keep waiting action from Regional load dispatcher.
- It is important to note that wherever Ancillary power services are started in decentralized dispatch system , first Regulatory standards for Reliability were implemented. Then adherence to these standards is measured ( Control Performance standards called CPS 1 and CPS2) and each control area is responsible for maintain its own balance as measured by Area Control error and only for residual balance requirement Ancillary services are procured. Then the rate of this balancing services are continuously displayed on website so that entity can decide whether Real time energy balance is cheaper or balancing service is cheaper as in advance it knew how much percentage of this balancing cost it need to share. If it is to paid by some pool , then there is no incentive for self correction.





In addition to the above the major points to be considered are:

- Issue 1: Procuring Ancillary service only from Central sector generating station is discriminatory and economically inefficient:
  - Providing ancillary services through URS power of Central sector generating station and UMPP is an in-efficient and uneconomic way of providing Ancillary services. This is against the spirit of competition and economic efficiency.
  - Few countries which have implemented this, realized after few years that if equal opportunities were given to IPPs then based on market mechanism and marginal cost based procurement of Ancillary power, it could have saved millions of dollars of public money. If given an opportunity, the same can be proved for Indian Power system also.
  - Also this is against the non discriminatory open access principle as cheaper power from IPP under open access may be denied access to accommodate system operator requested Ancillary service as Regulation is silent about how request of open access in contingency market would be dealt.
- **Issue 2:** Payment of both fixed charges and variable charges with markup is against the principle of marginal cost basis economic procurement of services and commodity.

While power market transactions and deviation settlement market, transactions are either marginal price based bidding or participants are price taker, here additionally fixed cost are being reimbursed to Generators who shall further give it to beneficiaries. These provisions are appeared to be made for satisfying existing beneficiaries, but if they are not scheduling the power, what is their claim of reimbursement of fixed charges. They cannot be “rent seeker” if they are not using their allocated share. Also because they are retaining their right to reschedule, only in case they forego their right for scheduling the power they can be entitle to fixed charge reimbursement and that only if power is scheduled under Ancillary service. This principle is applied even in case of temporary surrender of share in central sector power.

- **Issue 3: Allocation of cost of Ancillary power:**

Huge international technical literature on design and cost allocation of Ancillary service is available and Prof William Hogan of Harvard Electricity Policy group published many papers on this and nowhere the design as proposed in the draft Regulations is mentioned. Most worrying is the financial interaction between Real Time energy market (proxy Deviation settlement) and Ancillary services operation. An imaginary entity” Pool” with uncertain inflows due to grid

indiscipline ( in Hollywood terms “blood money” ) is being relied upon as source for the payment .

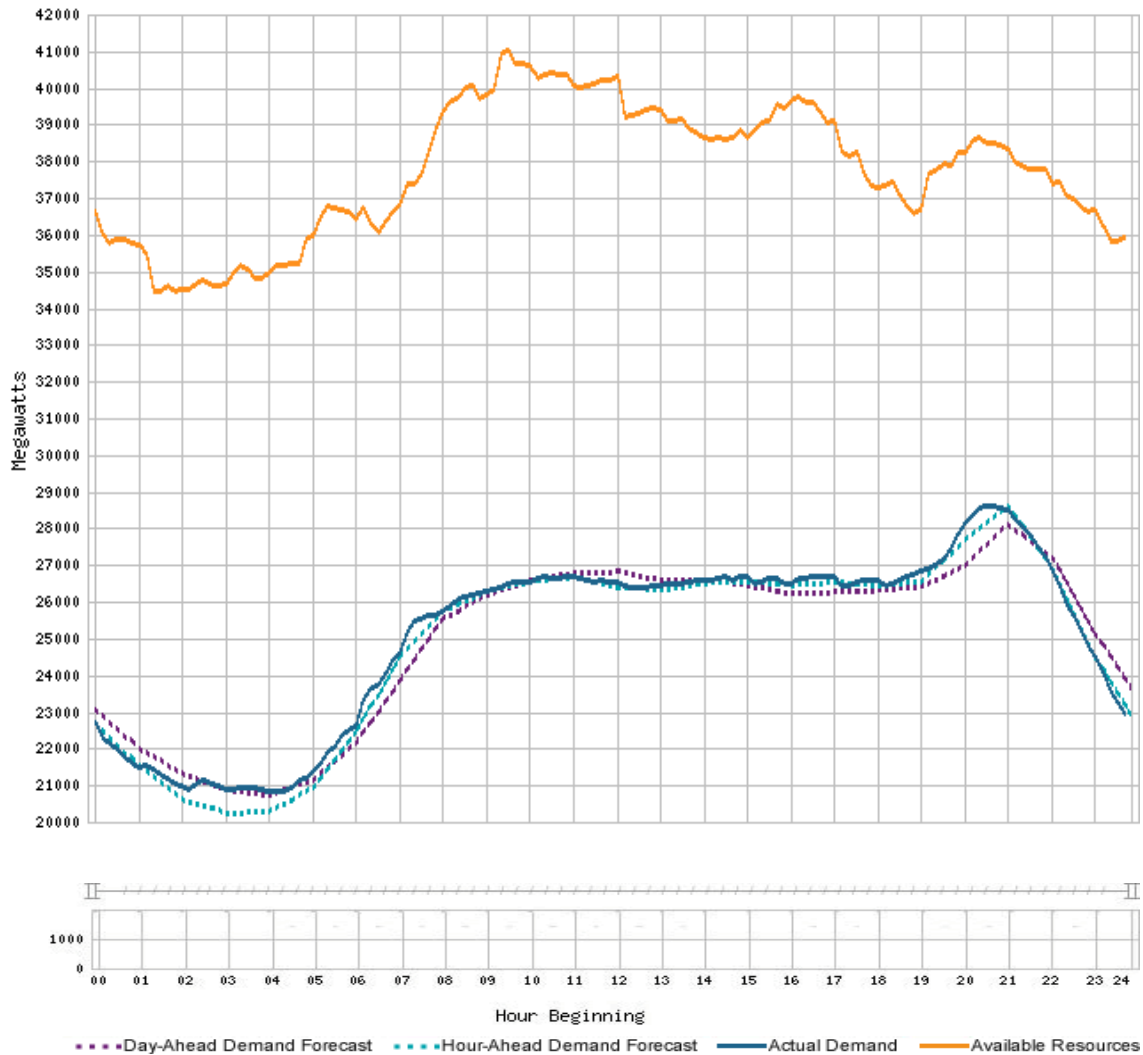
- a. Most important is the allocation of cost of Ancillary power. The proposal of payment of Ancillary power from deviation pool account is not a correct and fair design and its liking rewarding defaulting and undisciplined entity using public money.
- b. For this Ancillary power can be segmented into two usage first is for contingency measures for few time blocks ( say 4 to 6 blocks) for which payment can be made from pool and second for load frequency response services , where due to deviation of few entities these services were made operational, then these entities should pay for Ancillary services.
- c. Operation of Ancillary power cannot be designed to benefit the entities which are in first place responsible for initiation of ancillary power and as per the “ Causer pay” principle , instead of payment from deviation pool account , cost of Ancillary power should be allocated to overdrawing entity through a separate overlay account . As through the improvement of frequency their payment liability under deviation settlement mechanism decreases, they should pay for Ancillary services.
- d. It appears that design of payment mechanism is done with basis that these entities responsible for overdrawing would not pay for these ancillary services as these are already defaulting in payment of deviation charges, so payment form a “pool” is a safer option. Also the charges of Ancillary services cannot be socialized as it will be opposed by utilities which are disciplined and it may be seen as pushing costly power to unwilling customers. In actual this is a “social cost of operation like an “Ambulance service” , and its cost can be paid as System operation cost under relevant Regulation of Fee and charges of System operations. But a social service can be given when enteritis availing these services behaves in a socially responsible way. Then these services can be initialed and paid because in a broad way would benefit all the entities connected to the grid.
- e. If the design as proposed in the Regulation is implemented and payment is made by a “ Pool” which itself is generated when indiscipline goes beyond a bound of limits imposed by deviation settlement mechanism then it will not only affect Real time balancing market but it would adversely affect day ahead and long term capacity market. Entities in place of following due process of load forecasting and power procurement in advance through power market where there are issues like advance payment for procurement and uncertainty of transmission corridor are there, would wait for this last rescue from system operator where even payment would be made by “ Mr.

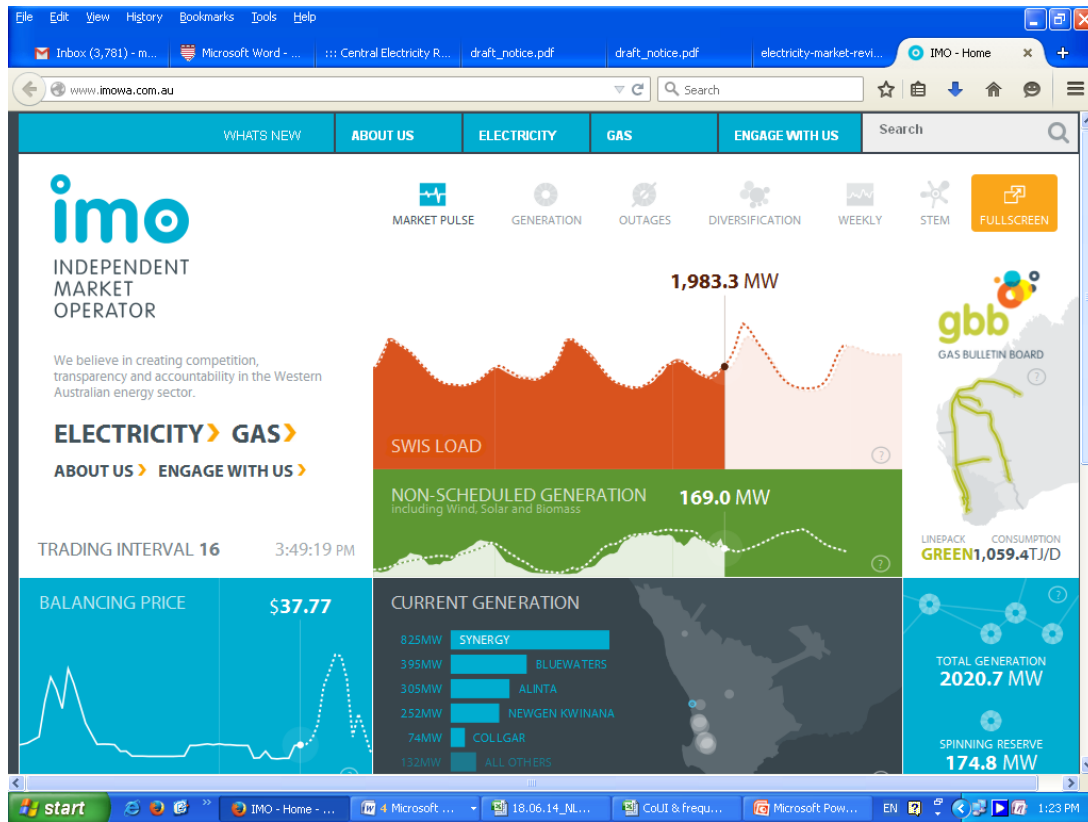
Pool” and not by these entities which fail to arrange adequacy power supply for their customers.

- Issue 4: Design of Deviation settlement mechanism:  
The Real time energy deviation mechanism based on frequency based deviation pricing is the most importance hindrance in the development of Ancillary service market. Basic structural change in price and volume structure of Deviation settlement mechanism is required as it is not giving correct economic signals for long term capacity market. Also the integration of Renewable into the grid is becoming difficult due to pricing of deviations as compare to cost of power from renewable. As ancillary power would be required for management of variability of Renewable, the review of deviation settlement mechanism requires urgent attention.
- The utility of energy can be measured by cost, price and value of energy. With deviation settlement pricing not reflecting the correct value of electricity, prices in day ahead market are also not reflecting the value of electricity for the consumer which ultimately had to bear power cut .Till Electricity in the country is valued properly, adequate resources cannot be created and Reserves cannot be maintained. Economically efficient usage of resources requires that all services like capacity, energy and Ancillary are procured from most efficient plants at marginal cost .
- Whole country is looking towards Central Commission for creation of an economically efficient and reliable power sector and in the past all Regulations of Central Commission were directed towards this goal. In an era of open market and competition, it is expected that Regulations making process is not calibrated and very cautious, taking into consideration only fragmented view based on ownership of plants but an bold market base mechanism should be evolved in which all generators should be given an equal opportunity to sell their unutilized power at competitive rate. For this on one hand Commission may like to strengthen its role in Grid discipline compliance as proposed in increased penalties in draft amendments in Electricity Act, on other hand Market oversight and monitoring can allay the fears of stakeholders that through Ancillary power costly power would be pushed to them.
- Commission may like to first initiate information dissipation by system operator wherein an All India picture of Demand, projected demand and Available resources to cater the demand and Reserves is available at one place, and then

only stakeholder may be assured that system operator is ready with resources to provide a reliable Grid operation. With the availability of information only correct price of service or commodity is ensured. Few examples of information provided by system operators in other countries are given below:

### CASIO system operation 11.5.2015





At the end I want to quote of poet laureate Rabindranath Tagore's lines from Gitanjali on our country : "Where the mind is without fear and the head is held high, where knowledge is free, where the world has not broken up into fragments. So , I hope above suggestion would be considered in true spirit and a holistic view would be taken with in the interest of all stakeholders.

These comments are being sent in individual capacity and do not in any way represents the views of the organization in which undersign is working.

Best wishes for successful implementation of a great initiative.

Sd/-

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