MINUTES OF EIGHT MEETING OF "TECHNICAL COMMITTEE FOR IMPLEMENTATION OF FRAMEWORK ON RENEWABLES AT THE STATE LEVEL"

Venue	:	Upper Ground Floor, Conference Hall CERC
Date	:	02-12-2016
List of Participants	:	At **Annexure - I (Enclosed)**

1. The Eighth meeting of Technical Committee on Implementation of Framework for Renewables at the State level was held under the Chairmanship of Shri A. S Bakshi, Member, CERC on 2nd December 2016. ShriBakshi welcomed all the members and participants of the meeting.

2. Dr. S.K. Chatterjee, JCRA, CERC, welcomed all and briefed that in the last technical committee, there was consensus on most of the design issues of Model Deviation Settlement Mechanism (DSM) regulation except Price Vector and Volume Limit. He informed that these two aspects would be covered in the present meeting. Dr. Chatterjee also briefed about developing Pan India web tool for RPO compliance. USAID has developed a web tool for Rajasthan which can be replicated for other states also with the support of FOR technical committee.

Discussion

Presentation on Model DSM Regulation:

3. Shri Ajit Pandit from Idam Infra presented the Model DSM Regulation for States (attached as Annexure – II). On Volume Limits, he highlighted the example of six states namely, Maharashtra, Gujarat, Rajasthan, Tamil Nadu, Karnataka and West Bengal. The concept of Zero crossing (change of sign of deviation for schedule) aimed at controlling gaming by buyer or seller, was also discussed.

4. The issue of deviation limit and Volume Cap was also discussed in detail. The consultant proposed to keep the limit as 150MW / 200MW / 250MW or 12%, whichever is lower, as per CERC regulations. Shri Soonee underscored the need for introduction of the concept of Area Control Error (ACE) which is given by the formula $\Delta P + k\Delta f$ and suggested that going forward this formula should be used to set the Volume Cap for deviation

5. The structure of Model DSM was discussed. Shri Soonee proposed to move all the tables and numbers to the Annexure. He also proposed to include provision of audit of Accounts.

6. Dr. Chatterjee proposed that while the overall principles of DSM at the Intra-State Level should be in sync with the framework at the Inter-State Level, wherever required,

flexibility should be provided to the states to adjust keeping in view the number of entities, magnitude of generation and load in the State, etc.

Presentation on Development of Generic Renewable Purchase Obligation Compliance Web-tool

7. Shri Balawant Joshi, Managing Director – Idam Infra presented on Development of Generic Renewable Purchase Obligation Compliance Web-tool which is being developed under MNRE USAID PACE-D TA Program (attached as Annexure – III).

8. The issues regarding development of this web tool for all the states were discussed. Different states have different regulations, for example, Maharashtra exempt 1-5 MW OA consumers from RPO Obligation. Shri Shirish Garud, Director – TERI informed that they are developing a similar tool for MNRE but at a National level and not at State Level.

9. It was decided that the consultant will compile data in respect of six RE rich states and develop the model for them. It was also proposed that TERI should work in coordination with the Idam Infra in this regard. .

Decisions

Draft Model DSM Regulations are framed by FOR in order to develop model framework at state level that would facilitate scheduling, energy accounting and deviation settlement while ensuring Intra-state Grid discipline. Draft DSM Regulations was discussed during Technical Committee's meetings.

After detailed discussion the model DSM regulations were agreed in principle with the following design parameters:-

1. Objective of model DSM Regulations is to maintain grid discipline and grid security as envisaged under state Grid Code through commercial mechanism for Deviation Settlement through drawal and injection of electricity by users of the grid.

2. Applicable to all Buyers and Sellers which includes Generating Stations – Thermal, Hydel, Renewables, Distribution Licensees, Deemed Distribution Licensees (SEZs, Railways) and Exempt Licensees (RESCOsOpen Access Users,Captive Users .

3. Definition of Deviation and %Error is aligned with CERC DSM Regulations for ensuring compatibility of State DSM Regulations with regional/national level.

4. Limits of Deviation in the model DSM Regulations are as proposed below;

   a. No over-drawal/under-injection when Frequency below 49.9 Hz

   b. No under-drawal / over-injection when frequency is above 50.05 Hz

   c. Volume Cap for Intra-state Entities proposed as under:

      i. For Generators /Sellers : 10 MW or 12% of Schedule, whichever lower

      ii. For DISCOMs/Buyers: X Limit or 12% of Schedule, whichever lower

iii. In case of schedule is less than 40 MW, Volume cap of 5 MW or 12% of schedule, whichever higher.

iv. Additional Charges at rate of 20%, 40%, 100% of Applicable Deviation Charges in steps of deviation 12%-15%, 15%-20%, >20% or X+10 .MW, X+ 20 MW, > X+ 20 MW

5. Provisions of State Grid Code and State OA Regulations shall be applicable for Declaration, Scheduling and ensuring elimination of gaming.

6. Pricing Framework for State Entity is proposed as below:-

i. Charges payable (over-drawal/under-injection) and receivable (under-drawal/over-injection) for each time-block with slope of 50 paise/unit per 0.01 Hz

ii. Linked to average frequency for each time block (15 min duration) in steps of 0.01 Hz over range from 49.9 Hz to 50.05 Hz

iii. Change in sign of deviation once every 6 time blocks- violation attracts additional charges @10% of deviation charges applicable for the continuance of violation

iv. Capping of Deviation Charges for Generating Stations regulated by SERC

v. Cap Rate of Paise 303.04/ unit (indicated- to be linked through imported coal power plant)

vi. Charges for deviation for buyer/seller in a time block in excess of 12% of the schedule or 10 MW shall be zero.

vii. If schedule of Buyer /Seller in any time block is less than or equal to 40 MW-charges for deviation in excess of 5 MW shall be zero.

7. State Deviation Pool Account will be operated by SLDC and Surplus will be transferred to 'State Power System Development Fund' at the end of month.

8. State Power Committee shall prepare Statement for Deviation Charges on Weekly basis and State Load Despatch Centres shall operate & maintain 'State Deviation Pool Account Fund.

9. It was decided that the next Technical Committee meeting will be held on **23rd December 2016 at Chennai.**

The meeting ended with a vote of thanks to the Chair.

Annexure-I

LIST OF PARTICIPANTS ATTENDED THE EIGHT MEETING OF THE TECHNICAL COMMITTEE FOR "IMPLEMENTATION OF FRAMEWORK ON RENEWABLES AT THE STATE LEVEL" HELD ON 04.11.2016 AT THE CERC, NEW DELHI

1	Shri. A. S.Bakshi, Member	CERC
2	Shri. S. K.Soonee,	POSOCO
3	Shri KVS Baba, CEO	POSOCO
4	Shri S. R.Narasimhan	POSOCO
5	Shri. S.Akshaya Kumar, Chairman	TNERC
6	Shri P. Rama Mohan, Member	APERC
7	Shri. Deepak Lad, Member	MERC
8	Shri P. J. Thakkar, Member	GERC
9	Shri S.C. Shrivastava, Chief (Engg.)	CERC
10	Shri Sushanta K. Chatterjee, JC(RA)	CERC
11	Smt.Rashmi Nair, DC (RA)	CERC
12	Smt.ShilpaAgarwal, DC(Engg.)	CERC
13	Shri ShirishGarud	TERI
14	Smt.Snekalatha A.K.	TERI
15	Shri A.K Saxena	TERI
16	Shri AjitPandit	IDAM INFRA
17	Shri AnantSant	IDAM INFRA

18	Shri Balawant Joshi	IDAM INFRA
19	Shri Anurag Mishra	USAID
20	Shri SidhharthArora	CERC
21	Shri Ankit Gupta	CERC

MODEL DSM REGULATIONS AT STATE LEVEL (DRAFT)
_____*(STATE)*ELECTRICITY REGULATORY COMMISSION

__November, 2016

NOTIFICATION

No.__/___/2016/SERC.- In exercise of the powers conferred under Section 181ofthe Electricity Act, 2003 (36 of 2003), and all other powers enabling it in this behalf, and after previous publication, the _____*[State]*Electricity Regulatory Commission hereby makes the following regulations, namely:

1. Short title and commencement

(1) These regulations may be called the _____*[State]*Electricity Regulatory Commission (Deviation Settlement Mechanism and related matters) Regulations, 2016.

(2) These regulations shall come into force from the date of notification in the official Gazette*[_____ , 2016]*.

2. Definitions and Interpretation

(1) In these regulations, unless the context otherwise requires -

(a) **Act'** means the Electricity Act, 2003 (36 of2003);

(aa) 'Absolute Error' shall mean the absolute value of the error in the actual generation of wind or solar generators which are regional entities or state entities with reference to the scheduled generation and the 'Available Capacity' (AvC), as calculated using the following formula for each 15 minute time block:

Error (%) = 100 X [Actual Generation– Scheduled Generation] / (AvC)

(b) **'Actual drawal'** in a time-block means electricity drawn by a buyer, as the case maybe, measured by the interface meters;

(c) **'Actual injection'** in a time-block means electricity generated or supplied by theseller, as the case may be, measured by the Interface meters;

(d) **'Beneficiary**" means a person purchasing electricity generated from a generating station;

(e) **'Buyer'** means a person, including beneficiary, purchasing electricity through atransaction scheduled in accordance with the regulations applicable for short-term open access, medium-term open access and long-term access;

(f) **'Connectivity Regulations'** means the _____*[State]*Electricity RegulatoryCommission (Grant

of Connectivity, Long Term Access and Medium Term Access in inter-State Transmission) Regulations as amended from time to time and shall include any subsequent amendment thereof.

(g) **'Commission'** means the _____*[State]*Electricity Regulatory Commission referred to insub-section (1) of section 82of the Act;

(h) **'Deviation'** in a time-block for a seller means its total actual injection minus its totalscheduled generation and for a buyer means its total actual drawal minus its total scheduled drawal.

Provided that deviation shall be calculated for the Regional Entities by the concerned RLDC/RPC which shall be attributed to various entities embedded within the State by SLDC.

(i) **'Gaming'** in relation to these regulations, shall mean an intentional mis-declarationof declared capacity by any seller in order to make an undue commercial gain through Charge for Deviations;

(j) **'Grid Code'** means the Grid Code specified by the Commission under clause (h) ofsub-section (1) of Section 86of the Act.

(k) **'Interface meters'** means interface meters as defined by the Central ElectricityAuthority under the Central Electricity Authority (Installation and Operation of Meters) Regulations, 2006, as amended from time to time.

(l) **'Load Despatch Centre'** means National Load Despatch Centre, Regional LoadDespatch 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;

(m) '**Open Access Regulations**' means the ____*[State]*Electricity Regulatory Commission (Open Access in intra-State Transmission) Regulations as amended from time to time and shall include any subsequent amendment thereof.

(n) '**Scheduled Generation'** at any time or for a time block or any period means schedule of generation in MW or MWh ex-bus given by the concerned Load Despatch Centre;

(o) '**Scheduled Drawal'** at any time or for a time block or any period time block means schedule of despatch in MW or MWh ex-bus given by the concerned Load Despatch Centre;

(p) **'Seller'** means a person, including a generating station, supplying electricitythrough a transaction scheduled in accordance with the regulations applicable for short-term open access, medium-term open access and long-term access;

(q) '**Time-Block'** means a time block of 15 minutes, for which specified electrical parameters and quantities are recorded by special energy meter, with first time block starting at 00.00 hrs;

(r) **'Available Capacity (AvC)**' for wind or solar generators which are regional entities or state entities, as the case may be, is the cumulative capacity rating of the wind turbines or solar inverters that are capable of generating power in a given time-block.

(2) Save as aforesaid and unless repugnant to the context or the subject-matter otherwise requires, words and expressions used in these regulations and not defined, but defined in the Act, or the Grid Code or any other regulations of this Commission shall have the meaning assigned to them respectively in the Act or the Grid Code or any other regulation.

3. Objective

The objective of these regulations is to maintain grid discipline and grid security as envisaged under the Grid Code through the commercial mechanism for Deviation Settlement through drawal and injection of electricity by the users of the grid.

4 Scope

These regulations shall be applicable to sellers and buyers involved in the transactions facilitated through short-term open access or medium-term open access or long-term access in intra-State or inter-state transmission of electricity, as the case may be.

5. Charges for Deviations:

(1) The charges for the Deviations for all the time-blocks shall be payable for over drawal by the buyer and under-injection by the seller and receivable for under-drawal by the buyer and over-injection by the seller, except for wind and solar generators which are regional entities or state entities, and shall be worked out on the average frequency of a time-block at the rates specified in the table below as per the methodology specified in clause (2) of this regulation:

Average Frequency of the time Block (Hz)		Charges for Deviation
Below	**Not Below**	**Paise/kWh**
	50.05	0
50.05	50.04	50
50.04	50.03	150
50.03	50.02	200
50.02	50.01	250
50.01	50.00	300
50.00	49.99	350
49.99	49.98	400
49.98	49.97	450
49.97	49.96	500
49.96	49.95	550

Average Frequency of the time Block (Hz)		Charges for Deviation
Below	Not Below	Paise/kWh
49.95	49.94	600
49.94	49.93	650
49.93	49.92	700
49.92	49.91	750
49.91	49.9	800

(Charges for deviation for each 0.01 Hz step is equivalent to 50 Paise/kWh in the frequency range of 50.05-49.9 Hz)

A change in sign of the deviation should be made once every 6 time blocks. A violation of this provision should attract additional charges @10% of the deviation charges applicable for the duration of continuance of violation.

Provided that–

(i) The charges for the Deviation for the generating stations regulated by Commission using coal or lignite or gas supplied under Administered Price Mechanism (APM) as fuel, when actual injection is higher or lower than the scheduled generation, shall not exceed the Cap Rate of 303.04 Paise/kWh as per the methodology specified in clause (3) of this regulation:

(ii) Provided that no cap rate shall be applicable with effect from [the date of revision of price of APM gas by the Government of India] on the charges for the Deviation for the generating stations regulated by [the CentralCommission] using gas supplied under Administered Price Mechanism (APM) as the fuel.

(iii) The charges for the Deviation for the under drawals by the buyer in a time block in excess of 12% of the schedule or 10 MW, whichever is less, shall be zero;

Provided that in case schedule of a buyer in a time block is lessthan or equal to 40 MW, the charges for the deviation for the under-drawal in excess of 5MW shall be zero;

(iv) The charges for the deviation for the over-injection by the seller in a time block in excess of 12% of the schedule or 10 MW, whichever is less, shall be zero, except in case of injection of infirm power, which shall be governed by clause (5) of this regulation:

Provided that in case schedule of a seller in a time block is less than or equal to 40 MW, the charges for the deviation for the over-injection in excess of 5MW shall be zero:

Provided also that charges for deviation for wind and solar generators which are regional entities or state entities undertaking inter-state transactions, shall be governed by sub-clauses (v) to (vii) of this regulation.

(v) The wind or solar generators which are regional entities or state entities undertaking inter-state transactionsshall be paid as per schedule. In the event of actual generation being less than the scheduled generation, the deviation charges for shortfall in generation shall be payable by such wind or solar generator which are regional entities to the Regional DSM Pool and by wind or solar generator which are state entities into State DSM Poolas given in Table – 1 below:

Table – I: Deviation Charges in case of under injection

S. No.	Absolute Error in the 15-minute time block	Deviation Charges payable to Regional DSM Poolor State DSM Pool (as applicable)
1	<= 15%	At the Fixed Rate for the shortfall energy for absolute error upto 15%
2	>15% but <=25%	(At the Fixed Rate for the shortfall energy for absolute error upto 15%) + (110% of the Fixed Rate for balance energy beyond 15% and upto 25%)
3	>25% but <=35%	(At the Fixed Rate for the shortfall energy for absolute error upto 15%) + (110% of the Fixed Rate for balance energy beyond 15% and upto 25%) + (120% of the Fixed Rate for balance energy beyond 25% and upto 35%)
4	>35%	(At the Fixed Rate for the shortfall energy for absolute error upto 15%) + (110% of the Fixed Rate for balance energy beyond 15% and upto 25%) + (120% of the Fixed Rate for balance energy beyond 25% and upto 35%) + (130% of the Fixed Rate for balance energy beyond 35%)

Where the Fixed Rate is the PPA rate as determined by the Commission under section 62 of the Act or adopted by the Commission under section 63 of the Act. In case of multiple PPAs, the weighted average of the PPA rates shall be taken as the Fixed Rate. The wind and solar generators shall furnish the PPA rates on affidavit for the purpose of Deviation charge account preparation to concerned SLDCsupported by copy of the PPA.

Fixed Rate for Open Access participants selling power which is not accounted for RPO compliance of the buyer, and the captive wind or solar plants shall be the Average Power Purchase Cost (APPC) rate at the National level, as may be determined by the Commission from time to time through a separate order. A copy of the order shall be endorsed to all RPCs.

(vi) The wind or solar generators which are regional entities or state entities undertaking inter-state transactionsshall be paid as per schedule. In the event of the actual generation being more than the scheduled generation, the Deviation Charges for excess generation

shall be payable to the wind or solar generators which are regional entities from the Regional DSM Pool and for state entities undertaking inter-state transactions from State DSM Poolas given in Table – II below:

Table – II: Deviation Charges in case of over injection

S. No.	Absolute Error in the 15-minute time block	Deviation Charges payable fromRegional DSM Poolor State DSM Pool (as applicable)
1	<= 15%	At the Fixed Rate for the excess energy upto 15%
2	>15% but <=25%	(At the Fixed Rate for the excess energy upto 15%) + (110% of the Fixed Rate for excess energy beyond 15% and upto 25%)
3	>25% but <=35%	(At the Fixed Rate for the excess energy upto 15%) + (110% of the Fixed Rate for excess energy beyond 15% and upto 25%) + (120% of the Fixed Rate for excess energy beyond 25% and upto 35%)
4	>35%	(At the Fixed Rate for the excess energy upto 15%) + (110% of the Fixed Rate for excess energy beyond 15% and upto 25%) + (120% of the Fixed Rate for excess energy beyond 25% and upto 35%) + (130% of the Fixed Rate for excess energy beyond 35%)

Where the Fixed Rate is the PPA rate as determined by the Commission under section 62 of the Act or adopted by the Commission under section 63 of the Act. In case of multiple PPAs, the weighted average of the PPA rates shall be taken as the Fixed Rate. The wind and solar generators shall furnish the PPA rates on affidavit for the purpose of Deviation charge account preparation to concerned SLDCsupported by copy of the PPA.

Fixed Rate for Open access participants selling power which is not accounted for RPO compliance of the buyer, and the captive wind or solar plants shall be the Average Power Purchase Cost (APPC) rate at the National level, as may be determined by the Central Commission from time to time through a separate order. A copy of the order shall be endorsed to all RPCs.

(vii) In reference to clauses (v) and (vi) of this Regulation, for balancing of deemed renewable purchase obligation (RPO) compliance of buyers with respect to schedule, deviations by all wind and solar generators which are regional entities shall first be netted off for the entire pool on a monthly basis and any remaining shortfall in renewable energy generation must be balanced through purchase of equivalent solar and non-solar Renewable Energy Certificates (RECs), as the case may be, by NLDC by utilising funds from the Pool Account. For positive balance of renewable energy generation, equivalent notional

RECs shall be credited to the DSM Pool and carried forward for settlement in future."

(2) The Charge for Deviation, except for wind and solar generators which are stateentities, shall be determined in accordance with the following methodology:

(a) The Charge for Deviation shall be zero at grid frequency of 50.05 Hz and above.

(b) The Charge for Deviation corresponding to grid frequency interval of 'below 50.01 Hz and not below 50.0 Hz'shall be based on the median value of the average energy charge of coal/lignite based generating stations regulated by the CentralCommission for any six month period preferably from July to December of previous year or from January to June for the year or any other six month period if deemed necessary and suitably adjusted upward to coincide with the Deviation Price Vector.

(c) The Deviation Price Vectors shall accordingly, be in steps for a frequency interval of 0.01 Hz between grid frequency of (i) 50.05 Hz and 'below 50.01 Hz and not below 50.0 Hz'and (ii) 'below 50.01 Hz and not below 50.0 Hz'and below 49.90 Hz.

(d) The Charge for Deviation at grid frequency "below 49.90 Hz" shall be based on the highest of the average energy charges of generating stations regulated by CentralCommission on RLNG for any six month period preferably from July to December of previous year or from January to June for the year or any other six month period if deemed necessary and suitably adjusted upward to coincide with the Deviation Price Vector.

(3) The Cap rate for the charges for the Deviation for the generating stations regulated by CentralCommissionusing coal/lignite or gas supplied under Administered Price Mechanism (APM) as the fuel, shall be the value coinciding with the energy charges on imported coal on Deviation Price Vector.

(4) The Charges for Deviation may be reviewed by the Commission from time to time and as and when Deviation Price Vector is revised by Central Commissionand shall be re-notified accordingly.

(5) The infirm power injected into the grid by a generating unit of a generating station during the testing, prior to COD of the unit shall be paid at Charges for Deviation for infirm power injected into the grid, consequent to testing, for a period not exceeding 6 months or the extended time allowed by the Commission in the ____*[State]*Electricity Regulatory Commission (Grant of Connectivity, Long-term Access and Medium-term Open Access and related matters) Regulations, as amended from time to time, subject to ceiling of Cap rates corresponding to the main fuel used for such injection as specified below:

Domestic coal/ Lignite/Hydro	- 1.78 / kWh sent out
APM gas as fuel	- 2.82/ kWh sent out *up to thedate of*

	revision of price of APM gas by Government of India and thereafter, at the rate to be notified by the Commission separately
Imported Coal	- 3.03 / kWh sent out
RLNG	- 8.24 / kWh sent out

6. Declaration, scheduling and elimination of gaming

(1) The provisions of the StateGrid Code and the _____*[State)*Electricity Regulatory Commission (Open Access in inter-State Transmission) Regulations, as amended from time to time, shall be applicable for declaration of capacity, scheduling and elimination of gaming.

(2) The generating station, as far as possible, shall generate electricity as per the day-ahead generation schedule finalized by the StateLoad Despatch Centre in accordance with the StateGrid Code.

Provided that the revision in generation schedule on the day of operation shall be permitted, in accordance with the procedure specified under the Grid Code and _____*[State]*Electricity Regulatory Commission (Open Access in inter-State Transmission) Regulations, as the case may be.

(3) The Commission, either suomotu or on a petition made by SLDC, or any affected party, may initiate proceedings against any generating company or seller on charges of gaming and if required, may order an inquiry in such manner as decided by the Commission. When the charge of gaming is established in the above inquiry, the Commission may, without prejudice to any other action under the Act or regulations thereunder, disallow any Charges for Deviation received by such generating company or the seller during the period of such gaming."

7. Limits on Deviation volume and consequences of crossing limits

(1) The over-drawals / under drawals of electricity by any buyer during a time block shall not exceed 12% of its scheduled drawalor X MW, whichever is lower, when grid frequency is '49.90 Hz and above and below 50.05 Hz.'

Where, Volume Limit of X MW for Intra-State DISCOMs / Buyers shall be determined as under:
(a) Min (12% of schedule , (Peak Demand / ∑NCPD) x State Volume Limit)
(b) State Volume Limit shall be linked to Volume Limit (L) applicable to the State as per CERC DSM Regulations and its amendments thereof

Provided that no over drawal of electricity by any buyer shall be permissible when grid frequency is "below 49.90 Hz" and no under drawal of electricity by any buyer shall be permissible when grid frequency is "50.05 Hz and above".

(2) The under-injection / over-injection of electricity shall not exceed following when grid frequency is "49.90 Hz or above and below 50.05 Hz":

a) 12% of the scheduled injection or 10 MW, whichever is lower for a seller

Provided that:

a. In case schedule of a seller, in a time block, is less than or equal to 40 MW, under-injection / over-injection in a time-block shall not exceed 5 MW, when grid frequency is "49.90 Hz or above and below 50.05 Hz".
b. Provided that the limits on deviation volume and consequences for crossing these limits (including the additional charges for deviation) as stipulated under Regulation 7 shall not apply to wind and solar generators which are regional entitiesor state entities.

c. No under injection of electricity by a seller shall be permissible when grid frequency is "below 49.90 Hz" and no over injection of electricity by a seller shall be permissible when grid frequency is "50.05 Hz and above.

d. Any infirm injection of power by a generating station prior to COD of a unit during testing and commissioning activities shall be exempted from the volume limit specified above for a period not exceeding 6 months or the extended time allowed by the Commission in accordance with Connectivity Regulations.

e. Any drawal of power by a generating station prior to COD of a unit for the start up activities shall be exempted from the volume limit specified above when grid frequency is "49.90 Hz and above".

(3) In addition to Charges for Deviation as stipulated under Regulation 5 of these regulations, Additional Charge for Deviation shall be applicable for over-drawal as well as under-injection of electricity for each time block in excess of the volume limit specified in Clause (1) and (2) of this regulation when average grid frequency of the time block is "49.90 Hz and above" at the rates specified in the Table I and Table III as the case may be below in accordance with the methodology specified in clause (7) of this regulation:

Provided that –
(i) Additional Charge for Deviation for under-injection of electricity, during a time-block in excess of the volume limitspecified in clause (1) and (2) of this regulation when grid frequency is "49.90 Hz and above", by the generating stations regulated by the

Commissionusing coal or lignite or gas supplied under Administered Price Mechanism (APM) as the fuel shall be at the rates specified in Table II below in accordance with the methodology specified in clause (9) of this regulation;

(ii) Any drawal of power by a generating station prior to COD of a unit for the start-up activities shall be exempted from the levy of additional Charges of Deviation.

TABLE –I (for Seller/Buyer)

(A) When 12% of the Schedule is less than or equal to 10 MW		
1	For over drawal of electricity by any buyer in excess of 12% and upto 15% of the schedule in a time block	Equivalent to 20% of Charge for Deviation corresponding to average grid Frequency of the time-block
2	For over drawal of electricity by any buyer in excess of 15% and upto 20% of the schedule in a time block	Equivalent to 40% of Charge for Deviation corresponding to average grid Frequency of the time-block
3	For over drawal of electricity by any buyer in excess of 20% of the schedule in a time block	Equivalent to 100% of Charge for Deviation corresponding to average grid Frequency of the time-block
4	For under injection of electricity by any sellerin excess of 12% and upto 15% of the schedule in a time block	Equivalent to 20% of Charge for Deviation corresponding to average grid Frequency of the time-block
5	For under injection of electricity by any sellerin excess of 15% and upto 20% of the schedule in a time block	Equivalent to 40% of Charge for Deviation corresponding to average grid Frequency of the time-block
6	For under injection of electricity by any sellerin excess of 20% of the schedule in a time block	Equivalent to 100% of Charge for Deviation corresponding to average grid Frequency of the time-block
(B) When 12% of the Schedule is more than 10 MW		
1	For over drawal of electricity by any buyer is above X MW and uptoX+10 MW in a time block	Equivalent to 20% of Charge for Deviation corresponding to average grid Frequency of the time-block
2	For over drawal of electricity by any buyer is above X+10 MW and uptoX + 20 MW in a time block	Equivalent to 40% of Charge for Deviation corresponding to average grid Frequency of the time-block
3	For over drawal of electricity by any buyer is above X + 20 MW in a time block	Equivalent to 100% of Charge for Deviation corresponding to average grid Frequency of the time-block

(A) When 12% of the Schedule is less than or equal to 10 MW		
4	For under injection of electricity by any selleris above 10 MW and upto20 MW in a time block	Equivalent to 20% of Charge for Deviation corresponding to average grid Frequency of the time-block
5	For under injection of electricity by any selleris above 20 MW and upto25 MW in a time block	Equivalent to 40% of Charge for Deviation corresponding to average grid Frequency of the time-block
6	For under injection of electricity by any buyer is above 25 MW in a time block	Equivalent to 100% of Charge for Deviation corresponding to average grid Frequency of the time-block

TABLE – II

(A) When 12% of the Schedule is less than or equal to 10 MW		
1	For over drawal of electricity by any buyer in excess of 12% and upto 15% of the schedule in a time block	Equivalent to 20% of Charge for Deviation corresponding to average grid Frequency of the time-block
2	For over drawal of electricity by any buyer in excess of 15% and upto 20% of the schedule in a time block	Equivalent to 40% of Charge for Deviation corresponding to average grid Frequency of the time-block
3	For over drawal of electricity by any buyer in excess of 20% of the schedule in a time block	Equivalent to 100% of Charge for Deviation corresponding to average grid Frequency of the time-block
(A) When 12% of the Schedule is more than 10 MW		
1	For over drawal of electricity by any buyer is above X MW and uptoX+10 MW in a time block	Equivalent to 20% of Charge for Deviation corresponding to average grid Frequency of the time-block
2	For over drawal of electricity by any buyer is above X+10 MW and uptoX + 20 MW in a time block	Equivalent to 40% of Charge for Deviation corresponding to average grid Frequency of the time-block
3	For over drawal of electricity by any buyer is above X + 20 MW in a time block	Equivalent to 100% of Charge for Deviation corresponding to average grid Frequency of the time-block

Provided that when the schedule is less than or equal to 40 MW, the additional charges for deviation shall be based on percentage of deviation worked out with reference to schedule of 40 MW as per Table-I and Table-II above.

(4) In addition to Charges for Deviation as stipulated under Regulation 5 of these regulations,

Additional Charge for Deviation shall be applicable for over-injection/under drawal of electricity for each time block by a seller/buyer as the case may be when grid frequency is "50.05 Hz and above" at the rates equivalent to charges of deviation corresponding to the grid frequency of "below 50.01 Hz but not below 50.0 Hz".

(5) Methodologies for the computation of Charges for Deviation and Additional Charges for deviation for each regional entity or state entity as the case may be for crossing the volume limits specified for the under-drawal /over-injection and for over-drawal and under-injection in clause (3) of this regulation shall be as per Annexure I, Annexure I-A and Annexure-II, Annexure-II-A of these Regulations respectively.

(6) In addition to Charges for Deviation as stipulated under Regulation 5 of these Regulations, Additional Charge for Deviation shall be applicable for over-drawal or under-injection of electricity when grid frequency is "below 49.90 Hz" in accordance with the methodology specified in clause (8) of this regulation and the same shall be equivalent to 100% of the Charge for Deviation of 800Paise/kWh corresponding to the grid frequency of "below 49.90 Hz".

Provided further that Additional Charge for Deviation for under-injection of electricity by a seller, during the time-block when grid frequency is "below 49.90 Hz", by the generating stations regulated by CERC using coal or lignite or gas supplied under Administered Price Mechanism (APM) as the fuel in accordance with the methodology specified in clause 8 of this regulation shall be equivalent to 100% of the Cap Rate for Deviations of 303.04 Paise/kWh*(indicative, to be linked to variable cost for imported coal price)*.

(7) The Additional Charge for Deviation for over-drawal and under-injection of electricity for each time block in excess of the volume limit specified in clause (1) and(2) of this Regulation when grid frequency is "49.90 Hz and above" shall be as specified by the Commission as a percentage of thecharges for the Deviation corresponding toaverage grid frequency of the time block with due consideration to thebehavior of the buyers and sellers towardsgrid discipline:

Provided that the Commission may specify different rates for additional Charges for Deviation for over drawalsand under injectionsdepending upon different % deviation from the schedule in excess of the volume limit specified in clause (1) and(2) of this Regulation.

(8) The additional Charge for Deviation for over-drawals and under-injection ofelectricity for each time block when grid frequency is "below 49.90 Hz" shall be as specified by the Commission as a percentage of the charges for the Deviation corresponding to average grid frequency of the time block with due consideration to the behavior of the buyers and sellers towards grid discipline:

Provided that the Commission may specify different rates for Additional Charges for Deviation for over drawls and under injections and for different ranges of frequencies "below 49.90 Hz".

(9) The Additional Charge for Deviation for under-injection of electricity during the time-block

in excess of the volume limit specified in Clause (2) of this regulation when grid frequency is '49.90 Hz and above", by the generating stations regulated by SERCusing coal/ lignite or gas supplied under Administered Price Mechanism (APM) as the fuel shall be as specified by the Commission as a percentage of the Cap Rate or the Charges for Deviation corresponding to the grid frequency of the time block, or both with due consideration to the behavior of the generating stations regulated by SERCtowards grid discipline:

(10) In the event of sustained deviation from schedule in one direction (positive or negative) by any regional entity or state entity, such regional entity or state entity(buyer or seller) shall have to make sign of their deviation from schedule changed, at least once, after every 6 time blocks. To illustrate, if a regional entity has positive deviation from schedule from 07.30 hrs to 9.00 hrs, sign of its deviation from schedule shall be changed in the 7thtime block i.e. 9.00 to 9.45 hrs from positive to negative or negative to positive as the case may be.

(11) Payment of Charges for Deviation under Regulation 5 and the Additional Charges for Deviation under Clauses (3) and (4) of this regulation, shall be levied without prejudice to any action that may be considered appropriate by the Commission under Section 142 of the Act for contravention of the limits of over-drawal/ under drawal or under-injection /over-injection as specified in these regulations, for each time block or violation of provision of clause 10 of these regulations.

(12) The charges for over-drawal/ under-injection and under-drawal/ over-injection of electricity shall be computed by the respective StatePower Committee in accordance with the methodology used for preparation of 'StateEnergy Accounts".

(13) The StateLoad Despatch Centre shall, on monthly basis, prepare and publish on its website therecords of the Deviation Accounts, specifying the quantum of over-drawal/ under-injection and corresponding amount of Charges for Deviation payable/receivable for each buyerand seller for all the time-blocks when grid frequency was "49.90Hz and above" and "below 49.90" Hz separately.

8. Compliance with instructions of Load Despatch Centre

Notwithstanding anything specified in these Regulations, the sellers and the buyers shall strictly follow the instructions of the StateLoad Despatch Centre on injection and drawal in the interest of grid security and grid discipline.

9. Accounting of Charges for Deviation

(1) A statement of Charges for Deviations including Additional Charges for Deviation levied under these regulations shall be prepared by the Secretariat of the StatePower Committee on weekly basis based on the data provided by SLDC by the Thursday of the weekand shall be

issued to all constituents by next Tuesday, for seven day period ending on the penultimate Sunday mid-night.

(2) All payments on account of Charges for Deviation including Additional Charges for Deviation levied under these regulations and interest, if any, received for late payment shall be credited to the funds called the "State Deviation Pool Account Fund", which shall be maintained and operated by the concerned StateLoad Despatch Centre in accordance with provisions of these regulations.

Provided that –

(i) the Commission may by order direct any other entity to operate and maintain the respective "StateDeviation Pool Account Fund":

(ii) separate books of accounts shall be maintained for the principal component and interest component of Charges for Deviation and Additional Charges for Deviation by the Secretariat of the respective StatePower Committee.

(3) All payments received in the "StateDeviation Pool Account Fund" shall be appropriated in the following sequence:

(a) First towards any cost or expense or other charges incurred on recovery of Charges for deviation.
(b) Next towards over dues or penal interest, if applicable.
(c) Next towards normal interest.
(d) Lastly, towards charges for deviation and additional charges for deviation.

10. Schedule of Payment of Charges for Deviation

(1) The payment of charges for Deviation shall have a high priority and the concernedconstituent shall pay the indicated amounts within 10 (ten) days of the issue of statement of Charges for Deviation including Additional Charges for Deviation by the Secretariat of the StatePower Committee into the "StateDeviation Pool Account Fund".

(2) If payments against the Charges for Deviation including Additional Charges for Deviation are delayed by more than two days, i.e., beyond twelve (12) days from the date of issue of the statement by the Secretariat of the State Power Committee, the defaulting constituent shall have to pay simple interest @ 0.04% for each day of delay.

(3) All payments to the entities entitled to receive any amount on account of charges for Deviation shall be made within 2 working days of receipt of the payments in the "StateDeviation Pool Account Fund".

Provided that –

(i) in case of delay in the Payment of charges for Deviations into the StateDeviation Pool Account Fund and interest there on if any, beyond 12 days from the date of issue of the

Statement of Charges for Deviations the Stateentities who have to receive payment for Deviation or interest thereon shall be paid from the balance available if any, in the StateDeviation Pool Account Fund. In case the balance available is not sufficient to meet the payment to the StateEntities, the payment from the StateDeviation Pool Accounts Fund shall be made on pro rata basis from the balance available in the Fund.

(ii) the liability to pay interest for the delay in payments to the "StateDeviation Pool Account Fund" shall remain till interest is not paid; irrespective of the fact that constituents who have to receive payments have been paid from the "StateDeviation Pool Account Fund" in part or full.

(4) All Stateentities which had at any time during the previous financial year failed to make payment of Charges for Deviation including Additional Charges for Deviation within the time specified in these regulations shall be required to open a Letter of Credit (LC) equal to 110% of its average payable weekly liability for Deviations in the previous financial year, in favour of the SLDCwithin a fortnight from the date these Regulations come into force.

Provided that –

(i) if any Stateentity fails to make payment of Charges for Deviation including Additional Charges for Deviation by the time specified in these regulations during the current financial year, it shall be required to open a Letter of Credit equal to 110% of weekly outstanding liability in favour of StateLoad Despatch Centre within a fortnight from the due date of payment.

(ii) LC amount shall be increased to 110% of the payable weekly liability for Deviation in any week during the year, if it exceeds the previous LC amount by more than 50%.

Illustration: If the average payable weekly liability for Deviation of a State entityduring 2015-16 is `2.0 crore, the Stateentity shall open LC for 2.2 crore in 2016-17. If the weekly payable liability during any week in 2016-17is `3.5 crore which is more than 50% of the previous financial year's average payable weekly liability of Rs 3.0 Crore, the concerned regional entity shall increase the LC amount to `3.85 Crore (1.1*3.50) by adding 1.65 Crore.

(5) In case of failure to pay into the "StateDeviation Pool Account Fund" within the specified time of 12 days from the date of issue of statement of charges for Deviations, the SLDCshall be entitled to encash the LC of the concerned constituent to the extent of the default and the concerned constituent shall recoup the LC amount within 3 days.

11. Application of fund collected through Deviations

The surplus amount, if any in the Deviation Pool Account Fund as on last day of the month, shall be transferred to a separate fund namely "Power SystemsDevelopment Fund" specified by the Commission in the first week of the next month and shall be utilized, for the purpose specified by the Commission.

12. Power to Relax.

The Commission may by general or special order, for reasons to be recorded in writing, and after giving an opportunity of hearing to the parties likely to be affected by grant of relaxation, may relax any of the provisions of these regulations on its own motion or on an application made before it by an interested person.

13. Power to issue directions:-

If any difficulty arises in giving effect to these regulations, the Commission may on its own motion or on an application filed by any affected party, issue such directions as may be considered necessary in furtherance of the objective and purpose of these regulations.

Annexure-I

Methodologies for the computation of Charges of Deviation and Additional Charges for deviation for each regional/state entity for crossing the volume limits specified for the over-drawal/under injection by Buyer/Seller

1. When the grid frequency is 49.9 Hz and above

A. When D_{tb} i.e. Deviation from schedule in a time block in MW is less than (+/-) 12% of the schedule in MW or 10 MW whichever is lower in each time block, D_{tb} to be payable by the regional entity at normal Charges for Deviation;

B. When D_{tb} i.e. Deviation from schedule in a time block in MW is more than (+/-) 12% of the schedule in MW or 10 MW whichever is lower in each time block

(1) $D_{tb} = D0 + D12/10$

Where

D_0 = (+/-) 12% of Scheduled Generation (SG) or 10 MW whichever is lower,

$D_{12/150}$ = Deviation in excess (+/-) 12% of the SG or 10 MW, whichever is lower in each time block

(2) $D_{12/10} = D_{tb} – D_0$

(3) The Charges of Deviation corresponding to D_{tb} shall be payable by the regional entity at normal Charges of Deviation; In addition, graded AdditionalCharges for the Deviation for $D_{12/10}$ shall be payable by the regional entity for over drawal/under injection for crossing the volume limit on the basis of percentage termor MW terms as the case may @ 20%, 40%, 100% of Charge of Deviation for the incremental deviation in each slab. The same is illustrated as under:

Illustrations "A" - When 12% of Schedule is less than or equal to 10 MW

Category	Additional Charges for Deviation
D_{tb} is above 12% and up to 15% of schedule in MW	50 x (D_{tb} - 12% of schedule) x Charge for Deviation corresponding to average grid frequency of the time block
D_{tb} is above 15% and up to 20% of schedule in MW	(100 x (D_{tb} - 15% of schedule) + 1.50 x schedule) x Charge for Deviation corresponding to average grid frequency of the time block
D_{tb} is above 20%	(250 x (D_{tb} - 20% of schedule) + 6.50 x schedule) x Charge for Deviation corresponding to average grid frequency of the time block

Provided that when the schedule is less than or equal to 40 MW, the additional charges for deviation shall be based on percentage of deviation worked out with reference to schedule of 40 MW.

Illustrations "B" - When 12% of Schedule is more than 10 MW

Category	Additional Charges for Deviation
D_{tb} is above X MW and up to X + 10 MW	50 x (D_{tb} - 10) x Charge for Deviation corresponding to average grid frequency of the time block
D_{tb} is above X+ 10 MW and up to X + 20 MW	(100 x (D_{tb} - 20) + 250) x Charge for Deviation corresponding to average grid frequency of the time block
D_{tb} is above X + 20 MW	(250 x (D_{tb} - 25) + 750) x Charge for Deviation corresponding to average grid frequency of the time block

Note: The Additional Charge for Deviation for under-injection of electricity, during thetime block in excess of the volume limit specified in clause 7 (1) and (2) of the Regulation when grid frequency is "49.90 Hz and above", by the generating stations regulated by the CERC using coal or lignite or gas supplied under Administered Price Mechanism (APM) as the fuel shall be calculated with the Cap Rate for Deviations of 303.04 Paise/kWh or the Charge for Deviation corresponding to average grid frequency of the time block, whichever is less.

2. When the grid frequency is below 49.9 Hz

The charges for deviation corresponding to D_{tb} shall be payable by the regional entity at 800 Paise/kWh. In addition, additional deviation charges for deviation for D_{tb} shall be payable by the regional entity at 800 Paise/kWh.

Note: The charges for Deviation and the additional charges for Deviation for underinjection, during the time block when grid frequency is below 49.90 Hz, by the generation station regulated by the Commission using coal or lignite or gas supplied under Administrative Price Mechanism (APM) as the fuel shall be calculated corresponding to the cap rate for deviations of 303.04 Paise/kWh.

Annexure-II

Methodologies for the computation of Charges of Deviation and Additional Charges for deviation for each regional entity for crossing the volume limits specified for the under drawal/ over-injection by buyer/Seller

A. When D_{tb} i.e. Deviation from schedule in a time block in MW is less than (+/-)12% of the schedule in MW or 10 MW, whichever is lower in each time block, D_{tb} to be receivableby the regional entity at normal Charges for Deviation;

B. When D_{tb} i.e. Deviation from schedule in a time block in MW is more than (+/-)12% of the schedule in MW or 10 MW,whichever is lowerin each time block

(1) $D_{tb} = D0 + D12/10$

Where

D_0 = (+/-) 12% of Scheduled Generation (SG) or 10 MW whichever is lower,

$D_{12/10}$ = Deviation in excess (+/-) 12% of the SG or 10 MW, whichever is lower in each time block

(2) $D_{12/10} = D_{tb} – D_0$

(3) The Charges for Deviation corresponding to D_0shall be receivable by the regional entity at normal Charges of Deviation or the ceiling rate whichever is lower; the regional entity shall not be entitled to any receivable for $D_{12/150.}$

Provided that when the schedule is less than or equal to 40 MW, 12% of schedule will be considered as 5 MW for the purpose of this clause.

C. Additional Charges for the Deviation D_{tb}shall be payable by the regional entity for under drawal/ over injection when grid frequency is 50.05 Hz or above in accordance with clause 7 (4) of this Regulation.

Model DSM Regulations at state level

For discussion during 8th Meeting of

FOR Technical Committee

2-Dec-2016

Salient features of CERC DSM Regulations – 1/2

Parameter	Description
Notification	• CERC (Deviation Settlement Mechanism and Related Matters) Regulations, 2014 *(includes third amendment, 30.05.2016)*
Objective	• To maintain grid discipline and grid security as envisaged under Grid Code through commercial mechanism for Deviation Settlement through drawal and injection of electricity by users of the grid.
Applicability	• Buyers and Sellers involved in transactions facilitated through short term / medium term / long term open access in inter-state transmission of electricity.
Deviation	• Total Actual Injection – Total Scheduled Generation (*for Seller*) • Total Actual Drawal – Total Scheduled Drawal (*for Buyer*)
Absolute Error	• Error (%) = 100 X [Actual Generation– Scheduled Generation] / (AvC) *(Applicable for Wind/Solar Regional Entities)*
Pricing Framework	• Charges payable (overdrawal/under-injection) and receivable (under-drawal/over-injection) for each time-block • Linked to average frequency for each time block (15 min duration) in steps of 0.01 Hz over range from 49.7 Hz to 50.05 Hz

Salient features of CERC DSM Regulations – 2/2

Parameter	Description
Other Conditions for Deviation Charges	• Capping of Deviation Charges for Generating Stations regulated by CERC • Cap Rate of Paise 303.04/ unit • Volume Cap of 150 MW or 12% of Schedule [Different volume caps for RE Rich States] • Additional Charges for exceeding Volume Cap
Infirm power injection	• Upto 6 months or as per time extension allowed by Commission • Priced at 178 Paise/unit (coal/lignite/hydro), 282 Paise/unit (APM Gas), 303 Paise/unit (imported coal), 824 Paise/unit (RLNG). • Subject to ceiling of Cap Rate for Main fuel
Limits for Deviation	• Volume Cap of 150 MW or 12% of Schedule [Different volume caps for RE Rich States] • No over-drawal/under-injection when Frequency below 49.7 Hz • Additional Charges at rate of 20%, 40%, 100% of Applicable Deviation Charges in steps of deviation 12%-15%, 15%-20%, > 20% or 150-200 MW, 200-250 MW, > 250 MW
DSM Pool	• Regional Deviation Pool Account to be operated by RLDC and Accounts by RPCs • Surplus to be transferred to 'Power System Development Fund' at the end of month.
Institutional Arrangement	• Regional Power Committee to prepare Statement for Deviation Charges on Weekly basis • Regional Load Despatch Centres to operate & maintain 'Regional Deviation Pool Account Fund'

State specific considerations for DSM framework – 1/2

- **State experiences**
  - Identification of Intra-State Entities, interface boundary limits (inter-utility and intra-utility, G<>T and T<>D) is cumbersome and evolving process.
  - Significant time (over 2 yrs), efforts and coordination necessary for implementation of metering and communication infrastructure.
  - Different Treatment of Open Access transactions (TOA, DOA/Embedded, Full/Partial OA) is necessary under DSM framework.
  - Centralised Despatch or De-centralised Despatch Model has close links to status of power market reforms at state level and power scenario (surplus/deficit) at state level.
  - Managing deviations of intra-State entities within volume cap of (12%, 150 MW to 250 MW), without flexible resources / demand response is challenge.

State specific considerations for DSM framework – 2/2

- **Payment mechanism for Generators**
  - Operation of Two part/ Multi-part for Generators is necessary.
  - Whether Energy Payment to Generators to be linked to (Actual v/s schedule)?
  - Modification to PPA (IPPs and SGS) and Amendments to Tariff Regulations may be necessary.
  - Hydro generation is used as balancing resource (single part payment operation in place)
- **Market developments in the country**
  - Power Supply scenario has improved significantly.
  - Regional and National power market operation are growing rapidly. With emergence of Multiple entities viz. traders, open access entities, volume of merchant transactions are expected to grow.
  - Reference market price discovery through market mechanism (thru Power Exchanges) is available.
  - With conducive policy and Grid Integration of RE, share of RE transactions (inter/intra-state) is expected to grow further.

With this background, Key Design Parameters for DSM framework at state level needs to be discussed.

Model DSM Regulations : Key Design issues – 1/2

1. Pre-condition for introduction of DSM – Applicability of Multi-part tariff design
2. Applicability and coverage of DSM at state level
3. Definition of DSM and Error
4. Principle for Pricing of Deviations
5. DSM Price Vector
6. Identification of State Entity
7. DSM Pool design
8. Governance structure and Institutional arrangement
9. State Energy Accounting and Settlement Accounting
10. Reactive Energy accounting

Model DSM Regulations : Key Design issues – 2/2

11. DSM Fund Operationalisation : Utilisation rules, Application of residual fund
12. Treatment for Gaming / Curtailment / Despatch
13. Treatment for infirm power
14. Metering & AMR infrastructure
15. Detailed Implementation procedures – Nodal Agency, Roles & responsibility of stakeholders

During 7th Meeting, it was decided to undertake further activities as under:

- Analysis of DSM pricing and Volume Limit at state level
- Develop Model DSM Regulations at State level

1. Pre-conditions for introduction of DSM at state level

- Pre-conditions for introduction of DSM at state level
  - Identification of State Entities
  - Identification of interface boundaries (G<>T and T<>D)
  - Ensuring Metering Infrastructure and Communication links covering interface points
- Summary of Discussions:

- STU, through the state level committees (say, Grid Coordination Committee) should evolve **Action Plan** with clear identification of milestones under each stage of Implementation **alongwith timelines for implementation of SAMAST at state level**.
- Such Action Plan could be approved by concerned SERC.
- SERCs to guide and monitor the implementation through coordination and support of state power committee or state advisory committee.

2. Applicability and Coverage of DSM at state level

- Applicability and Coverage
  - Generating Stations – Thermal, Hydel, Renewable
  - Distribution Licensees
  - Deemed Distribution Licensees (SEZs, Railways) and Exempt Licensees (RESCOs)
  - Open Access Users (TOAUs / DOAUs) and (Full OA Users and Partial OA Users)
  - Captive Users (Captive Wheeled, In-Situ)

Key Discussion Points	Provision in Draft Regulations
Distinction to be made between Existing v/s New Generating Stations	Applicable for all generating stations
Treatment of existing Banking and Wheeling arrangements	Provision of state specific OA Regulations to be made applicable
Minimum threshold Installed Capacity	Buyer and Seller are defined in the Draft. Threshold limit to be in line with respective State Grid Code and OA Regulations

2. Applicability and Coverage of DSM at state level

Discussion during 7th Meeting

- All the generators including Nuclear and Hydro stations should be covered. These generators could also be requested to provide the schedule of their generation even if they are exempt from any charges. It was also emphasized that the accounting settlement must be done on weekly basis.

Draft Model DSM Regulations at State level : (Scope and Application)

- These regulations shall be applicable to sellers and buyers involved in the transactions facilitated through short-term open access or medium-term open access or long-term access in intra-State or inter-state transmission of electricity, as the case may be.

- **'Buyer'** means a person, including beneficiary, purchasing electricity through a transaction scheduled in accordance with the regulations applicable for short-term open access, medium-term open access and long-term access;

- **'Seller'** means a person, including a generating station, supplying electricity through a transaction scheduled in accordance with the regulations applicable for short-term open access, medium-term open access and long-term access;

3. Definition of DSM and Error

- Deviation and Error
  - **Deviation** = Actual – Schedule (to be computed for Injection and Drawal)
  - Deviation to be computed for each state entity separately
  - **Error (%)** = Deviation / Av. Capacity x 100 (relevant only for Wind/Solar)

- Key considerations

Parameters	Provision in the draft Regulation
Compatibility of State DSM Regulations with regional/national level	Definition of Deviation and Error is aligned with CERC DSM Regulations

4. Volume Cap : key considerations – 1/2

- **Volume Cap for Time-block**:
  - Over-drawal limit for each intra-State Entity to be determined
  - For entire frequency range or only for the low frequency period

- **Daily Variation Cap**:
  - Limit for particular time-block or daily limit in MWh terms or both

- **Zero Crossing**:
  - Number of times deviation (over-drawal/under-drawal) or (over-injection/under-injection) changes sign from positive to negative and vice-versa over specified duration.

Volume Cap : key considerations – 2/2

- **Influencing Factors for defining Deviation Volume Limit for Intra-State Entities**
  - Number of Intra-State Entities
  - Deviation Volume Limit for State
  - Availability of Variable RE Generation and Flexible Generation (Hydel /Gas) within State
  - Contribution/Share of ISGS to State's Load Generation Balance
  - Diversity in Size/ Capacity of Intra-state Entities (Minimum and Maximum Capacity / Load)

Model DSM Regulations at state level – (draft provisions)

Parameter	Description

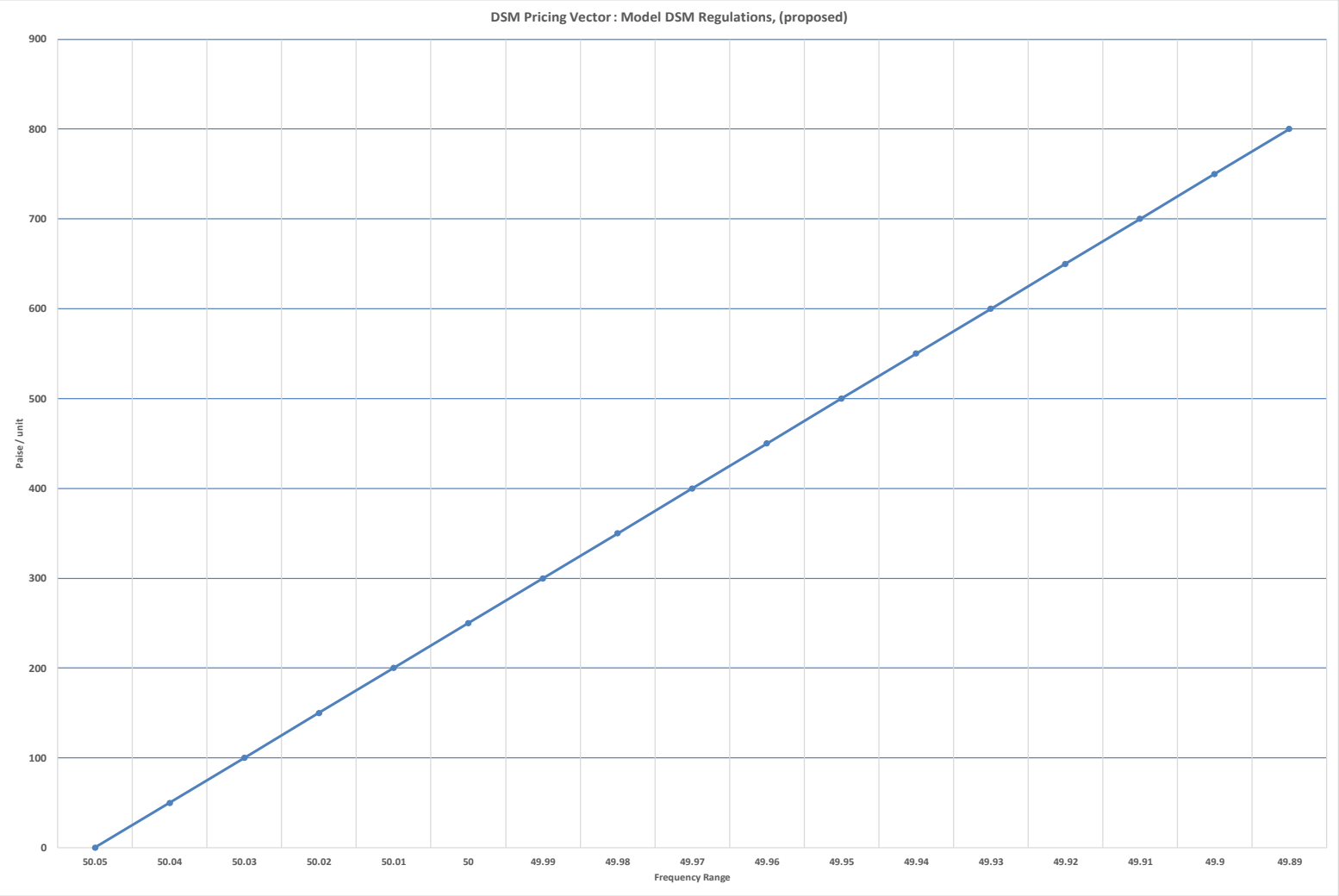
Limits for Deviation	• No over-drawal/under-injection when Frequency below 49.9 Hz
	• No under-drawal / over-injection when frequency is above 50.05 Hz
	• Volume Cap for Intra-state Entities proposed as under:
	  • For Generators /Sellers : 10 MW or 12% of Schedule, whichever lower
	  • For DISCOMs/Buyers: X Limit or 12% of Schedule, whichever lower
	  • In case of schedule is less than 40 MW, Volume cap of 5 MW or 12% of schedule, whichever higher.
	• Additional Charges at rate of 20%, 40%, 100% of Applicable Deviation Charges in steps of deviation 12%-15%, 15%-20%, > 20% or X+10 MW, X+ 20 MW, > X+ 20 MW

Declaration, Scheduling and elimination of gaming	• Provisions of State Grid Code and State OA Regulations shall be applicable

DSM Pricing Vector : Proposed (Model DSM Regulations)

Charges of Deviation (proposed):

- Linked to frequency range of 49.9 Hz to 50.05 Hz in steps of 0.01 Hz
- Slope of 50 Paise/unit for each 0.01 Hz
- Additional Deviation Charges for exceeding volume limits
- at rate of 20%, 40%, 100% of Applicable Deviation Charges in steps of deviation 12%-15%, 15%-20%, > 20% or X+10 MW, X+20MW, > X+20 MW
- Change in sign of deviation once every 6 time blocks- violation attracts additional charges @10% of deviation charges applicable for the continuance of violation



Model DSM Regulations at state level – (draft provisions)

Parameter	Description
Pricing Framework for State Entity	• Charges payable (over-drawal/under-injection) and receivable (under-drawal/over-injection) for each time-block with slope of 50 paise/unit per 0.01 Hz • Linked to average frequency for each time block (15 min duration) in steps of 0.01 Hz over range from 49.9 Hz to 50.05 Hz • Change in sign of deviation once every 6 time blocks- violation attracts additional charges @10% of deviation charges applicable for the continuance of violation • Capping of Deviation Charges for Generating Stations regulated by SERC • Cap Rate of Paise 303.04/ unit (indicated- to be linked through imported coal power plant) • Charges for deviation for buyer/seller in a time block in excess of 12% of the schedule or 10 MW shall be zero. • If schedule of Buyer /Seller in any time block is less than or equal to 40 MW-charges for deviation in excess of 5 MW shall be zero.

6. Identification of state entities

- State Entities to be Imbalance Pool Participants
  - Identifying a State Entity to be an entity under SLDC control area and whose metering and energy accounting is done at the State level.
  - Generating Stations (Thermal, Hydel, RE thru QCAs), DISCOMs, CPPs/Captive Users, OA Users (TOAUs/DOAUs, Full/Partial OA Users)
- Key Considerations
  - Identification as State Entity to be distinct from being a Pool Participant.
  - Rules for Membership of Imbalance Pool to be devised by SLDC/State Power Committee
  - To be guided by State Grid Code, State DSM Regulations and TOA/DOA Regulations to be aligned.

Suggestion:

- Procedure for Mapping/Accreditation/Registration of State Entities to be approved.
- Rules/principles for Membership of Pool Participation to be devised.
- Imbalance handling of State Entities who are not Pool Participant to be addressed through OA Regulations.

Model DSM Regulations at state level – (draft provisions)

Parameter	Description
DSM Pool	• State Deviation Pool Account to be operated by SLDC and Accounts by SPCs • Surplus to be transferred to 'State Power System Development Fund' at the end of month.
Institutional Arrangement	• State Power Committee to prepare Statement for Deviation Charges on Weekly basis • State Load Despatch Centres to operate & maintain 'State Deviation Pool Account Fund'

Thank You

PARTNERSHIP TO ADVANCE CLEAN ENERGY-DEPLOYMENT TECHNICAL ASSISTANCE PROGRAM

Development of Generic Renewable Purchase Obligation Compliance Web-tool

Presented to: Forum of Regulators

Date: December 02, 2016

Contents

- RPO Compliance Monitoring Framework
- Approach & Scope of Developing Generic RPO Web-Tool
- Generic RPO Web Tool: Features, Functionalities & Process Flow
- Key Learnings from Rajasthan Case
- Way Forward: Next Steps & Timelines

RPO Compliance Monitoring Framework (CMR)

Need for RPO CMR
Background
Compliance Status of Different States
Key Issues to be Addressed in RPO CMR

USAID
FROM THE AMERICAN PEOPLE

Need for RPO Compliance Monitoring Framework

29 States/UTs have specified Obligation for Purchase of Renewable Energy by Obligated Entities

- RPO compliance monitoring is crucial to ensure:
  - RPO targets are met
  - Non-compliance is brought to the notice of regulators
- RPO compliance monitoring for DISCOM through Annual Performance Review, but no such monitoring mechanism for other obligated entities.
- Suo-Motu proceedings in few states to review the RPO compliance status by OA and captive consumers.
- RPO compliance review process is undertaken with significant time lag.

Need for an innovative, process-driven and technology-based solution to address these challenges

RPO Regulations: Background…1/2

Parameters	FY	MH		RJ		GUJ		TN		AP		KAR	
		NS	S	NS	S	NS	S	NS	S	NS	S	NS	S
RPO Regulations (%)	2016-17	10.00	1.00	8.75	2.75	8.25	1.75	9.00	2.50	RE- At least 5%, including a min. 0.25% from solar		11.00	0.75
	2017-18	10.50	2.00	9.50	4.75			9.00	5.00			12.00	1.25
	2018-19	11.00	2.75	10.25	6.75							13.00	1.75
Applicability		Discom, OA (Cont. Demand < 5MW) & CPP (Inst. Capa <5MW)		Discom, OA & CPP (Inst. Capa <=1MW)		Discom, OA, CPP (Inst. Capa<=5MW) &Third party sale		Discom, OA & CPP		Discom, OA & CPP (Inst. Capa 1MW)		Discom, OA (Demand<5MW) & CPP (Capa <5MW)	
State Nodal Agency (SNA)		MEDA		RRECL		GEDA		SLDC		SLDC		SLDC	

RPO Regulations: Background…2/2

Parameters	MH	RJ	GUJ	TN	AP	KAR
Role of SNA	•Collect Information •Compute the compliance •Submit quarterly status •Suggest measures on RPO Compliance	•Collect Information •Compute the compliance •Submit quarterly status •Suggest measures on RPO Compliance	•Submit quarterly status •Suggest measures on RPO Compliance	•Submit quarterly status •Suggest measures on RPO Compliance	•Submit quarterly status •Suggest measures on RPO Compliance	•Notify, formulate procedures within 3 months from the date of notification •Submit quarterly reports
Forms/Formats/ Procedures	Specified	Not Specified	Specified	Not Specified	Not Specified	Not Specified

RPO Compliance Status…1/2

State		Non Solar RPO achieved as against 8.48%(MUs)	Non Solar RPO Shortfall/Excess(MUs)	Solar RPO achieved as against 0.50%(MUs)	Solar RPO Shortfall/Excess(MUs)
Maharashtra (DISCOM RPO Report for FY 2015-16 - 15.10.2016)	Best-D	422.47	6.61	31.5	-6.2
	TPC-D	509.19	-0.28	74.14	-44.14
	R-Infra-D	779.678	-2.944	67.72	-21.93
	MSEDCL	8764.94	1345.58	386.44	210.47
		Non Solar RPO achieved as against 7.50%(MUs)	Non Solar RPO Shortfall/Excess(MUs)	Solar RPO achieved as against 1.50%(MUs)	Solar RPO Shortfall/Excess(MUs)
Gujarat	GUVNL	5.79	1283	1.92	-303
	TPL	7.29	22.51	1.72	-23.61
	Torrent Energy	7.78	-0.606	1.55	-0.101
	MPSEZ	7.59	-0.18	1.52	-0.04

RPO Compliance Status…2/2

State		Non Solar RPO achieved as against 7.308%(MUs)	Non Solar RPO Shortfall/Excess(MUs)	Solar RPO achieved as against 2.00%(MUs)	Solar RPO Shortfall/Excess(MUs)
Rajasthan (Data received from CAO, RUVNL, Jaipur vide letter)		**7.07**	**264**	**0.96**	**700**
		Non Solar RPO achieved (%)	**Non Solar RPO Shortfall/Excess**	**Solar RPO achieved as against (%)**	**Solar RPO Shortfall/Excess**
Karnataka (Data Received from the recent Tariff Orders of the respective DISCOMs)	**BESCOM**	**11.78**	**-1.78%**	**0.35**	**-0.10%**
	GESCOM	**4.6**	**178.44 MUs**	**0.39**	**-10.90 MUs**
	HESCOM	**6.86**	**0.06%**	**0.34**	**10.09 MUs**
	MESCOM	**14.80**	**-4.80%**	**0.88**	**-0.63%**
	CESC	**11.51**	**-87.81 MUs**	**0.23**	**0.02%**

RPO Compliance Framework : Work Done so Far…

- **MNRE-USAID PACE-D TA Program** is supporting Rajasthan SNA (RRECL) in the development of RPO Compliance Monitoring and Reporting Framework and Web Tool development.
  - ✓ Assisted RRECL in the formation of RPO compliance reporting cell and designed the data collection forms.
  - ✓ Developed Manuals: *Accreditation Guidebook, URS Document, Web-Hosting Requirements, Training Manuals, etc.* for obligated entities (OA).
  - ✓ Designed framework for RPO Compliance Reporting.
  - ✓ Developed a Web based tool (under final stage) for RPO Compliance Reporting.

- The Program presented "RPO Compliance Framework for Captive/OA Transactions at State Level" with a focus on RPO framework prepared for RRECL in 51st Meeting of FOR.
- The Program also demonstrated key functionalities of RPO Compliance Web Tool in 56th Meeting of FOR.
- FOR suggested to prepare a roadmap for replication of RPO Compliance Web-Tool in other States.
- The Program proposes to provide Technical Assistance to Forum of Regulators in development of generic RPO Web Tool for replication in other States.

Key Issues to be Addressed in RPO Compliance Monitoring and Reporting

- Identification of Obligated Entities (OE)
- Verification of data submission by CPP and OA consumers
- Practical difficulties in monthly data submission
- Lack of Standard Data Formats
- No standard methodology for energy accounting for computing RPO compliance
- Lack of check on double accounting
- Lack of streamlined RPO-related data flow between OEs and RRECL
- Lack of awareness among OEs

WEB-BASED TOOL

Monitor, Record & Report

RPO Compliance Status of OEs to SERCs

— Approach for RPO Compliance Monitoring Framework

Approach for RPO CMR

Scope of Developing Generic RPO Compliance Web-Tool

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Approach for RPO Compliance Reporting Framework Development

1 RPO Reporting Cell

Cell Structure, Role and Responsibilities of Stakeholders, etc.

2 Forms & Format Design

Formats for RPO compliance data collection from OEs

3 Manual for OEs

RPO information manual for OEs, Accreditation Guidebook, URS Document, Web Hosting Requirements, etc.

4 Reporting Framework Design

5 Development of a Web Tool

Protocol for data collection and M&V, Process for OE (CPP/OA) Accreditation, List of OE & Updating OE List

6 Compliance Reporting to SERC

Quarterly/Annual Reporting to SERC as per the SERC Regulations

Scope of Developing Generic RPO Compliance Web Tool

- Constitution of Working Group / Technical Committee at FOR
- Selection of five to six States in consultation with Working Group / Technical Committee
- Analysis of regulatory framework and processes adopted by selected states for RPO compliance monitoring and reporting;
- Development of Key Functionalities of Generic RPO Tool and finalization of the same in consultation with Technical Committee/ Working Group;
- Development of Standard Forms and Formats for filing information of Obligated Entities;
- Development of a standard methodology and protocol for the data collection from OEs;
- Development of Standard URS/SRS and Webhosting Requirement Documents;
- Development of Generic RPO Compliance Web Tool;
- Preparation of Training Manuals
- Outreach and Demonstration of Key Functionalities of the Web Tool to FOR and Selected States.

Role of Working Group/Technical Committee

1. Develop mechanism for listing and accreditation of CPP & OA consumers
2. Develop mechanism for establishing data flow and information exchange between various entities involved including data verification of CPP & OA Consumers
3. Address various potential issues faced in monitoring, verification and compliance of RPO of all the obligated entities including CPP and OA consumers
4. Provide Inputs for Functional Design of Generic RPO Webtool
5. Meet on monthly basis to review and, modify the mechanism, if necessary

FOR shall act as convenor of the Working Group

Working Group to constitute members/ representatives from SERCs & SNAs

Working Group shall submit its report to their respective Commissions on monthly basis regarding the ongoing developments of the web-tool

Generic RPO Web-Tool:

Key Features
Functionalities
Process Flow

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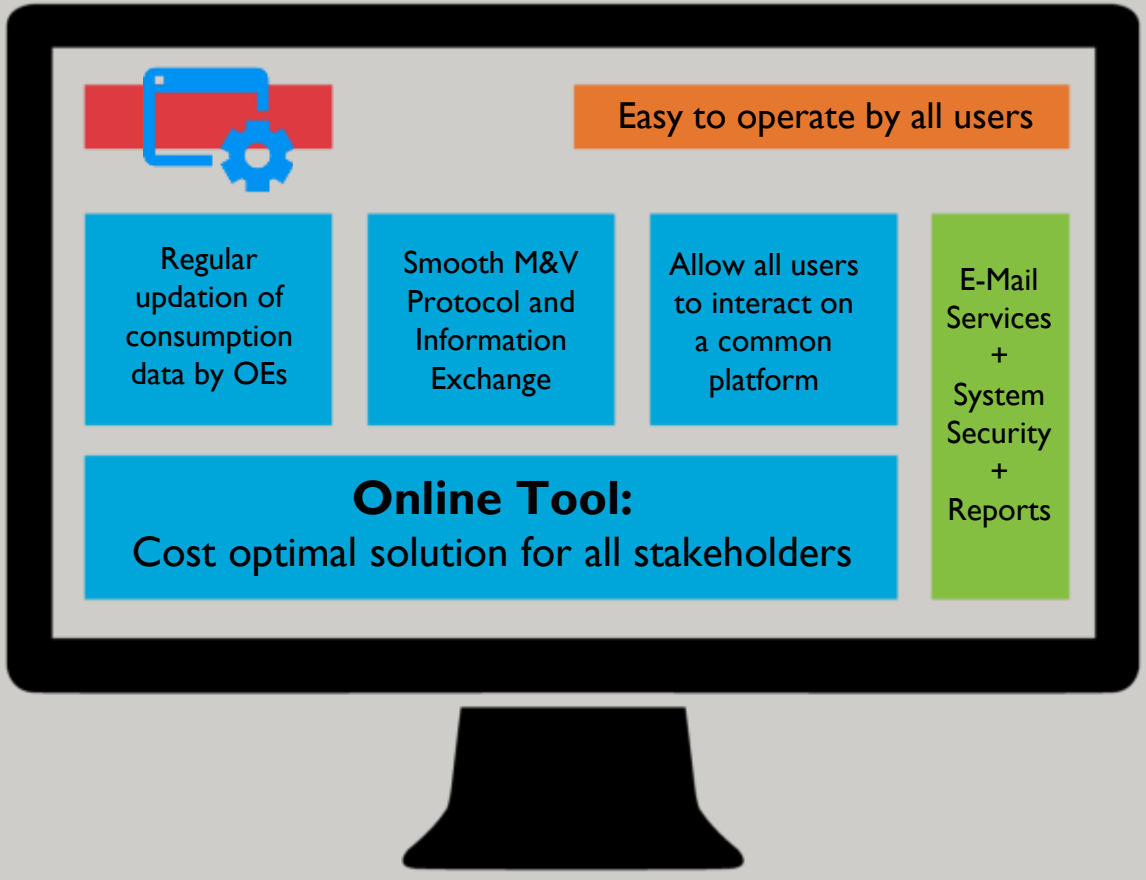
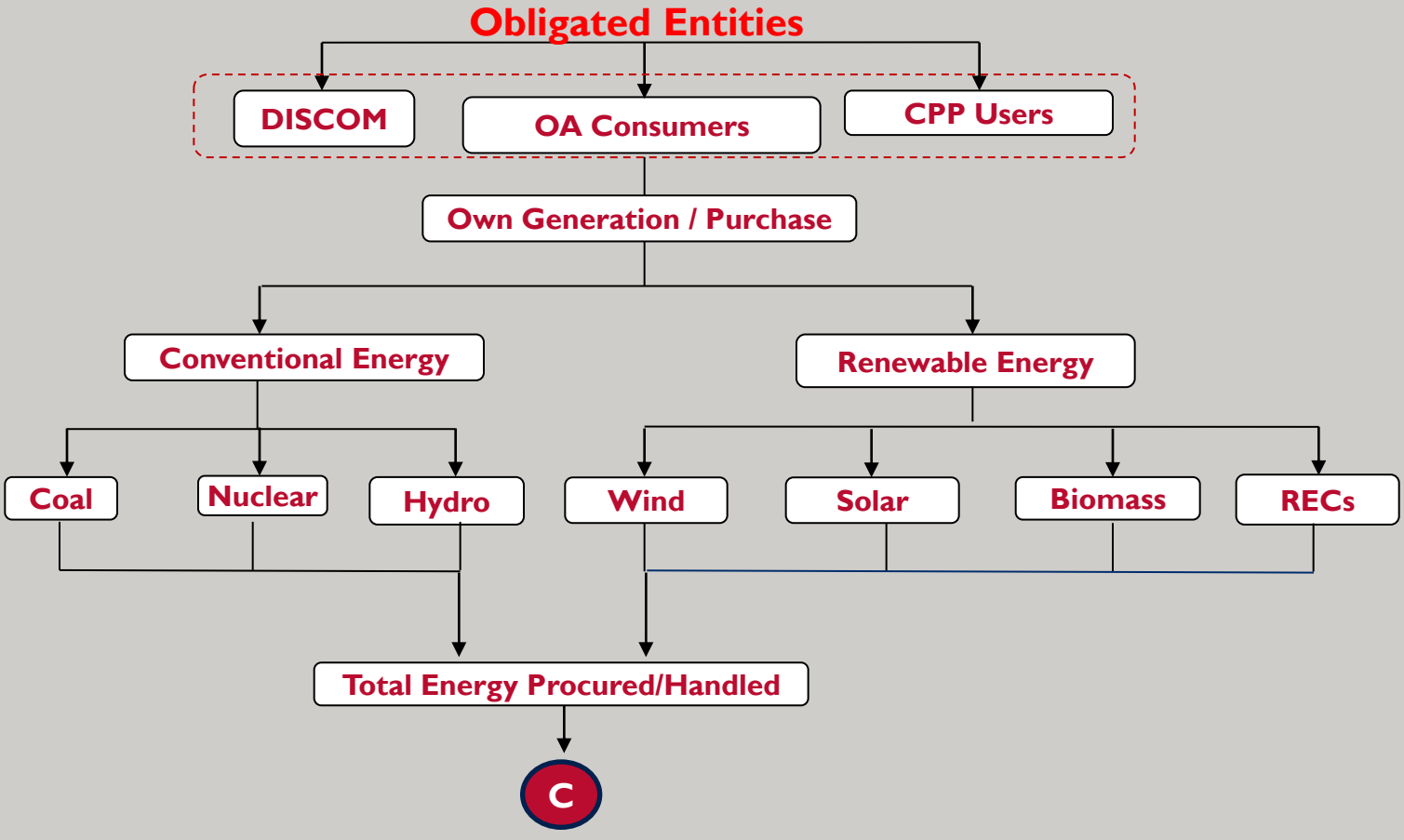
Generic RPO Web Tool: Key Features



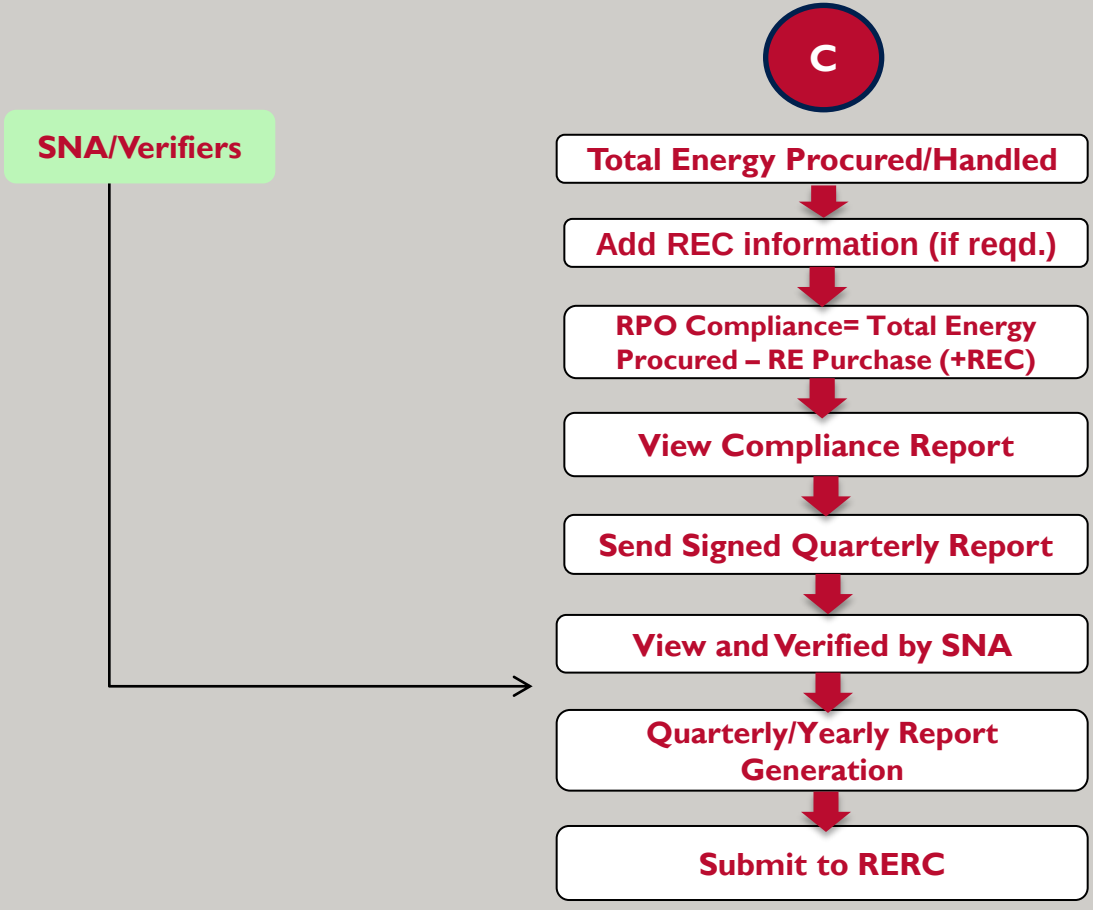
Generic RPO Web Tool: Functionalities

1. Defining System Users, their categories and access rights (Registration Process)
2. Regular Data Updation- Vendors, Contracts, Consumption, etc. (Standard Formats)
3. Representation of data to web based online user interface
4. Presentation of Data in user friendly format (PDF)
5. Classification of data based on Obligated Entity/Type/DISCOM/ location
6. Confirmation Mails, Report Generation, etc.
7. Monitoring, Verification and Validation Protocol and Information Exchange
8. Scalable system to incorporate future obligated entities
9. E-Mail reminders, System security, Compliance Report Generation, etc.
10. Admin Interface for Incorporating new parameters, changes, modifications, etc.

Generic RPO Web Tool: Process Flow…1/2



Generic RPO Web Tool: Process Flow…2/2



Note:

- All records maintained as per quarter/ financial year.
- No information to be saved without uploading a relevant document as a proof.
- Predefined grace period for data entry as per RRECL directions.

— Key Learnings from Rajasthan Case

Issues and Potential Solutions in RPO Compliance Framework Implementation Challenges in Hosting Web-Tool

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Issues & Potential Solutions in RPO Compliance Framework

Practical Difficulties in Data Submission,Verification or Compliance Reporting:

Continued engagement with all stakeholders through Working Group Committee

Lack of Standard Data Formats:

PACE-D Program has formulated standard formats in consultation with RRECL

Defining Roles & Responsibilities of Each Stakeholder:

SLDC, DISCOMs, EI, RRECL, etc.

Lack of Awareness among OEs:

- RRECL initiated periodic consultation process by sending letters to CPP & OA consumers
- USAID PACE-D TA Program in consultation with RRECL prepared a Draft Manual for OEs
- DISCOMS should sensitize OA consumers about RPO compliance requirement at the time of grant of Open Access permission
- EI should sensitize CPP consumers about RPO compliance requirement at the time of registration of CPP

Implementation Challenges in Hosting Web Tool

- **Web Hosting Requirements** (both hardware and software) to be agreed and arranged by the SNA for Web Tool integration.
- Responsibility of **migrating** Web Tool from Test server to RRECL server. **Involvement of multiple agencies** makes the process length & time consuming. In case of Rajasthan, RRECL>RISL>DoIT>Energy Portal Team of Rajasthan.
- **Pilot testing and Launch of Web Tool**: Involvement of IT Resources and dedicated team for pilot testing & preparatory work for hand-over/take-over.
- **Hand over of the tool and** testing the real time data: Expected Launch date?
- Requirement of **security audit** of the web-tool?
- **Ownership and maintenance** of the tool post handover by the Program?
- Planning for **AMC support** for post hand-over for update of Web Tool?

— Way Forward

Next Steps & Timelines

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Way Forward (Support Required from FOR)

- Support in **creation of Working Group / Technical Committee** to provide necessary guidance/suggestions to the Program for development of Generic RPO Web Tool;
- Support in **selection of five to six representative states** for development of Generic RPO Web Tool;
- Support in **reaching out to selected five to six states for sharing data and information** related to processes adopted for RPO compliance monitoring and reporting;
- **Inputs/suggestions on the proposed approach/scope of work of Generic RPO Web Tool, its functionalities and its time frame;**
- Clarity on **ownership of the Generic Web Tool** post handover by the Program;
- Requirement of **hosting of the Generic Web Tool and Security Audit** of Tool;
- **Functionalities of integration of Generic Web Tool with Web Tool of various other States**;
- Support requirement for **implementation of Generic Web Tool in selected five/six States by doing necessary state specific customization** as per requirement under Regulatory Provision.

Next Steps & Timelines

S.No.	Activities	Deliverables	Due Date
1	Review and analysis of RPO Regulations and Processes of Selected five/six states	Note on Analysis of RPO Regulations & Processes	December 2016
2	Meeting/ Presentation toTechnical Committee	Presentation/Minutes of Meetings	December 2016
3	Development of Standard Forms and Formats for Filing Information for Obligated Entities	Standard Accreditation Process Guidebook	January 2017
4	Development of Standard URS/SRS and Webhosting Requirement Document	Standard URS/SRS and Webhosting Requirement Document	January 2017
5	Development of Generic RPO Web Tool	Source Code or URL of Generic Web Tool	March 2017
6	Preparation of Training Manual	Standard Training Manual	March 2017
7	Meeting/Presentation to Technical Committee of FOR	Presentation/Minutes of Meetings	April 2017
8	Outreach and Demonstration of Key Functionalities of Webtool to FOR and selected States	Presentation / Minutes of Meetings	April/May 2017

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RPO Compliance Formats: Maharashtra…1/2

CPP/OA Annexure IV

FINAL RPO ACHIVEMENT DATA REPORTING FOR FINANCIAL YEAR 20--- to 20---

Name of the Company/Organization: ----------

Obligated Entities [Tick (√) the appropriate option]: Captive User (CPP): ( ) or Open Access Consumer: ( )

Name of the Distribution Licensee's Area: ----------

For CPP: Plant Installed Capacity (in MW): Captive Use from power plant in MW: ------ Sale outside/third party (in MW) ------)

For OA Consumer: Contract Demand (in MVA) :----------(Source: ---------- Consumption location ----------)

Fiscal Year (_____)	Total Energy Consumption (from captive source in case of Captive user) / (from open access source in case of OA consumer	Solar RPO			Non-Solar RPO			Total energy to be procured as per RPO E= (A)+(C)	Total RE procurement (Solar + Non-Solar) F= (B+D)	Shortfall if any (E)-(F)
		Solar RPO Target for respective years (A)	Energy actually procured against target (B)		Non-Solar RPO Target for respective years (C)	Energy actually procured against target (D)				
	MU	MU	MU		MU	MU		MU	MU	MU
			Solar RE	Solar REC		Non-Solar RE	Non-Solar REC			
April										
May										
June										
July										
August										
September										
October										
November										
December										
January										
February										
March										
Total										

Sign and Seal of authorized signatory of Company

Sign and Seal of C.A.

Note: 1) Detailed information about RE generators from whom RE purchased along with proof of REC purchased if any shall be submitted along with report for confirmation purpose.
2) In case of OA consumer copy of open access permission for concerned period shall be submitted.
3) In case of CPP copy of grid connectivity permission shall be submitted.

RPO Compliance Formats: Maharashtra…2/2

Quarterly updated details of Registered Self Use/CPPs above 1MW to be submitted by DISCOM / PWD (Electrical) to MEDA

Quarter: --------- to --------- of 20

Sr. No	Name of CPP unit (Self Use)	Address / Location of Self Use / CPP unit	Email-id / Contact details	Self Use CPP installed & generation capacity (in MW)	Registration No.	Registration date (DD/MM/YYYY)	Date of Commissioning (DD/MM/YYYY)	Source of generation (specify fuel type / technology)	Voltage level of grid connection (in KV)	Grid connection status **(whether synchronised for parallel operation or not)**	Gross Energy Consumption from own generation (from CPP unit) (in MWh)	Host DISCOM (not necessary if location of CPP specified)	Consumer number	Meter location and meter type (marked on the Single Line Diagram to be provided)
1														
2														
.														
.														
N														

Note: DISCOMs / PWD (Electrical) needs to submit above updated details for the quarter by first week of next quarter to MEDA.

Say: for April- June quarter-First week of July

for July- September quarter-First week of October

for October- December quarter-First week of January

for January- March quarter-First week of April

RPO Compliance Formats: Gujarat…1/3

FORM-A

ANNEXURE-I

LIST OF OBLIGATED ENTITIES for the duration of [1/04/2016 TO 31/03/2017]					
Sr. No	Name of the Obligated Entity	Category of the Obligated Entity			Remarks
		DISCOM	CPP	Open Access	
1	GUVNL	DGVCL			
2		MGVCL			
3		PGVCL			
4		UGVCL			
5	Torrent Power Ltd.	DISCOM			
6	Torrent Energy Ltd.	DISCOM			
7	MPSEZ Utilities Pvt. Ltd.	DISCOM			
.					
.					
n					

Name: Obligated Entity (Put Licensee name, Captive /OA consumer as the case may be)

Form IA: RPO Statement – (Yearly Estimate)

Obligated Entities	Compliance Year and RPO in percentage 2016-17	Consumption (Estimated)	Total RPO Obligation for the year (MUs)		Estimated Purchase of Electricity from RE resources		Estimated Purchase of RECs from PX		Estimated Total RE Power Procurement	
			Non-Solar	Solar	Non-Solar	Solar	Non-Solar	Solar	Non-Solar	Solar
		A	B	C	D	E	F	G	D+F	E+G
		MUs	MUs	MUs	MUs	MUs	MUs	MUs	MUs	MUs
GUVNL	10.00%									
TPL-D	10.00%									
TEL	10.00%									
MPSEZ	10.00%									

RPO Compliance Formats: Gujarat…2/3

ANNEXURE-III

Name: Obligated Entity (Put Licensee name, Captive /OA consumer as the case may be)

Form IIA: RPO Compliance (Quarterly)

Compliance FY 2016-17	Consumption (Actual)	Total Non Solar RPO obligation required for the present Quarter	Non Solar RPO obligation required Upto Previous Quarter	Non Solar RPO obligation Cumulative required Upto the present Quarter	Non- solar REC Purchase for the present Quarter		Total Purchase of Non- Solar of the present Quarter	Non solar RE purchase upto previous Quarter	Total Non solar RE purchase upto the present Quarter	Shortfall/ (Excess) if Any
					Non-Solar REC at Pref. tariff	Non-Solar REC				
			(3)	(4)	(5)	(6)	(5)+(6) = (7)	(8)	(7) + (8) = (9)	(4)-(9) = (10)
Quarter (I) April to June	MUs	MUs	MUs	MUs	MUs	MUs	MUs	MUs	Mus	MUs
GUVNL										
TPL-D										
TEL										
MPSEZ										

ANNEXURE-IV

Form IIA: RPO Compliance (MUs) – (Yearly Actual)

Compliance Year 2016-17	Consumption (Actual)	Total RPO Obligation for the year		Actual Purchase of Electricity from RE resources		Actual Purchase of RECs from PX		Actual Total RE Procurement	
		Non-Solar	Solar	Non-Solar	Solar	Non-Solar	Solar	Non-Solar	Solar
	A	B	C	D	E	F	G	D+F	E+G
	MUs	MUs	MUs	MUs	MUs	MUs	MUs	MUs	MUs
GUVNL									
TPL-D									
TEL									
MPSEZ									

RPO Compliance Formats: Gujarat…3/3

ANNEXURE – V

Form IVA: RPO Compliance (%) – Renewable Energy Sources (Yearly Estimate)

Compliance Year 2016-17 (Upto first Quarter)	Total RPO Obligation as per the RPO Regulations for the year (%)		Actual Purchase of Electricity from Renewable resources at Preferential Tariff for the year (%)		Actual Purchase of RECs from PX for the year (%)		Actual Total Non Solar RPO fulfilled for the year (%)	
	Non-Solar (A)	Solar (B)	Non-Solar (C)	Solar (D)	Non-Solar (E)	Solar (F)	Non-Solar (C) + (E)	Solar (D) + (F)
	(%)	(%)	(%)	(%)	(%)	(%)	(%)	(%)
GUVNL	8.25	1.75						
TPL-D	8.25	1.75						
TEL	8.25	1.75						
MPSEZ	8.25	1.75						