एनटीपीसी लिमिटेड
(भारत सरकार का उद्यम)
NTPC Limited
(A Govt. of India Enterprise)

Date: 28.05.2026

The Secretary
Central Electricity Regulatory Commission,
7th floor, Tower-B, World Trade Centre
Nauroji Nagar, New Delhi-110029

Subject: NTPC Submissions on Staff Paper on "Shortening the scheduling Timeline for Real Time Markets in India"

Sir,

Hon'ble Commission has published Staff Paper on "Shortening the scheduling Timeline for Real Time Markets in India" on 06.05.2026 and has invited comments from the stakeholders on the staff paper.

In this regard, please find enclosed submissions of NTPC on the Staff Paper on "Shortening the scheduling Timeline for Real Time Markets in India."

Thanking you,

Yours sincerely

Ajay Dua

ED (Commercial)

Comments on Discussion Paper on shortening the scheduling Timeline for Real Time Markets in India

1. Issues in RTM bidding process:

Clause 4.2 of draft paper has proposed the following:

"4.2. Further, the existing framework provides a 15-minute window for bidding in the RTM market. It has been noted that the actual time needed for entities to bid in the RTM is much shorter when automated. Operational experience shows that the five-minute window is sufficient to place bids in the RTM. Accordingly, it is proposed to reduce the RTM bidding window from the existing 15 minutes to 5 minutes."

Comment:

While the reduction in timeline **between Revision of Schedule and delivery through** compression of the real-time market timeline is appreciated, the entities which are using automated software for offering untied power and URS power from PPA capacity in RTM will be put to difficulty if the proposal is implemented in current form. The issue is described in detail as below.

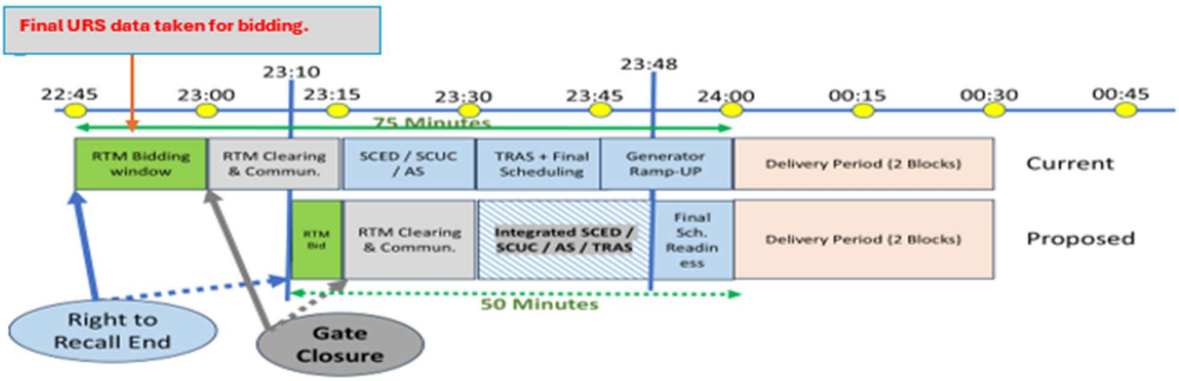
(i) Inadequacy of proposed 5 minutes RTM Bidding window:

It may please be noted that, after end of time to recall (Schedule revision timeline) by DISCOMs, the bids are to be prepared by assessing the quantum of URS to be offered for bidding, from final schedules and declared capability based on WBES data.

These data are automatically fetched through API interface with NLDC database, provided to generating entities like NTPC. Over the experience from almost 10 months of automatic bid preparation and submission, generators are facing following difficulties in accurately assessing URS quantum:

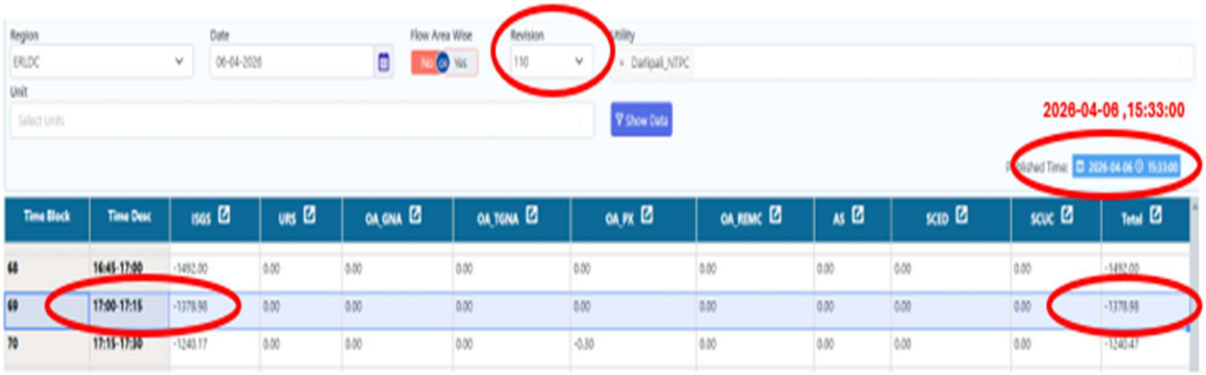
After expiry of schedule revision time (currently 75 min prior to delivery period), there is a time delay **3-min** for data updating at WBES and an additional **2-3 minutes** for API updating, resulting in idle period of **5-6 min**. Therefore, data can only be fetched after waiting for 6 minutes resulting in **6 minutes already being consumed from the existing 15 minutes RTM bidding window.**

Comparative timelines are illustrated below:

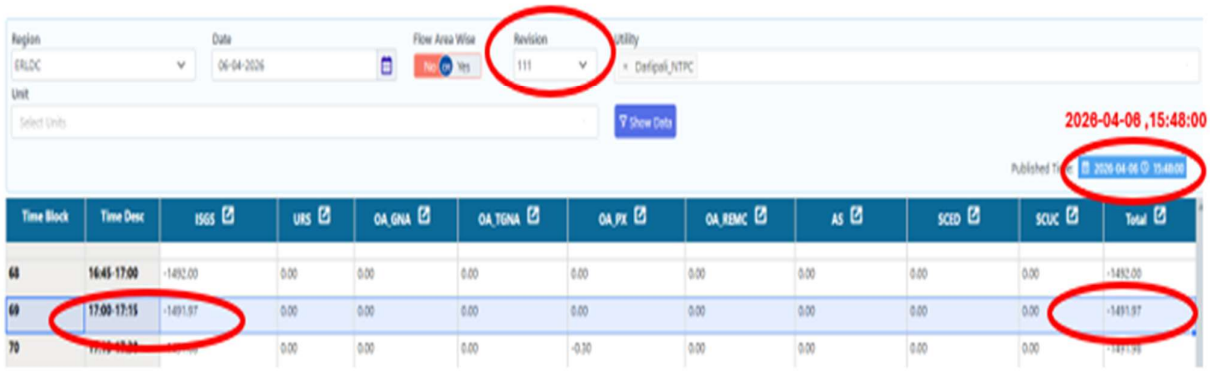


Example of 5-minutes trading window Inadequacy: Darlipalli station on 6th April

For delivery blocks 69-70 (17:00 hrs to 17:30 hrs) Delivery blocks, bidding starts from 15:45. However, it can be observed from the screenshot as placed in the following para that, final revision of Schedule was not published till 15:52 in API data & bidding done on previous revision resulted in Schedule > Declared Capacity.



Revision in SG was published 3 minutes after 15:45 and updated in API after 15:52 (>7 minutes).



Bid was placed as per Revision-110.



Thus, effectively, RTM bid process starts after 6-min start of RTM bidding window, after finalization of schedule and updation in API, as suggested by NLDC in meeting for LPSC rules Compliance.

In view of the above, shortening of RTM bidding window can be achieved only if the above-mentioned issue of the delay is addressed. Else, it will result in erratic bid quantum calculation based on earlier Schedule revisions and incorrect bid submission leading to bid rejection or DSM liability.

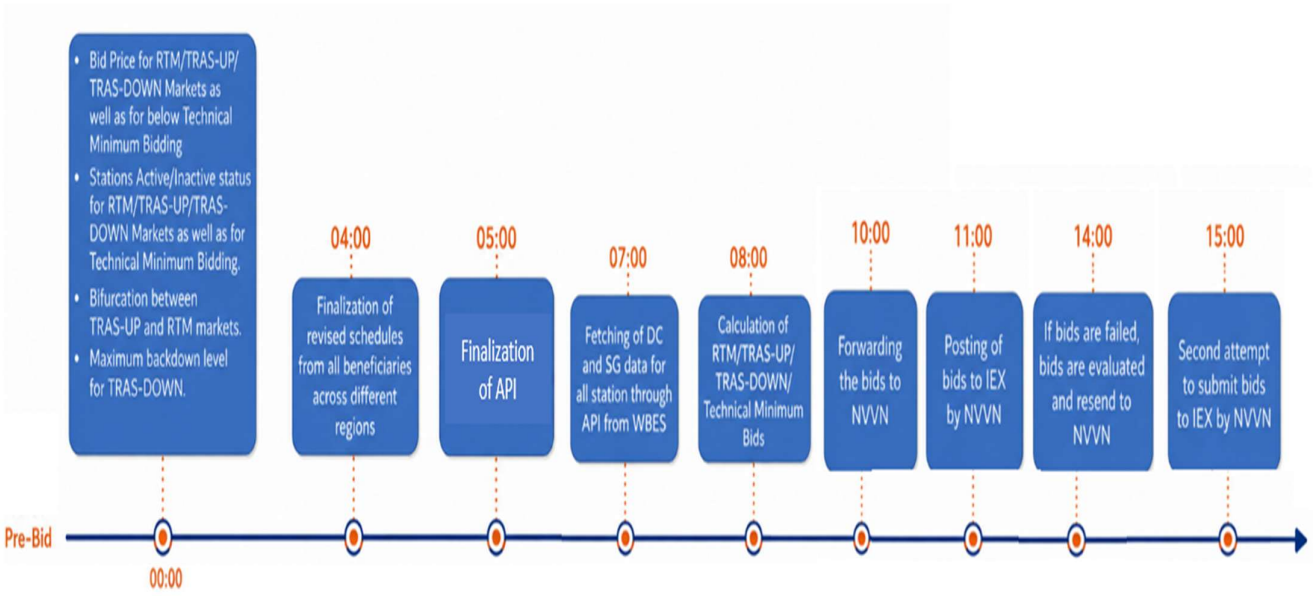
(ii) Bid Rejection issue due to NOAR injection NOC Limit violations:

It may please be noted that, Generators are bidding based on the information fetched by the API provided by the NLDC. **However, the Generators are not provided with NOAR injection NOC Limit data in the API provided by NLDC**. Notably the NOC-Limit is DC minus Schedule, and schedule considered for the computation of the NoC limit is the schedule after incorporation of schedule under GNA/T-GNA exigency/URS availed by other beneficiaries.

In the absence of such injection NOC limit data, the bid quantum based on WBES data at the time of submission of bids may sometimes exceed the injection NOC limit at the time of verification by the Power Exchange.

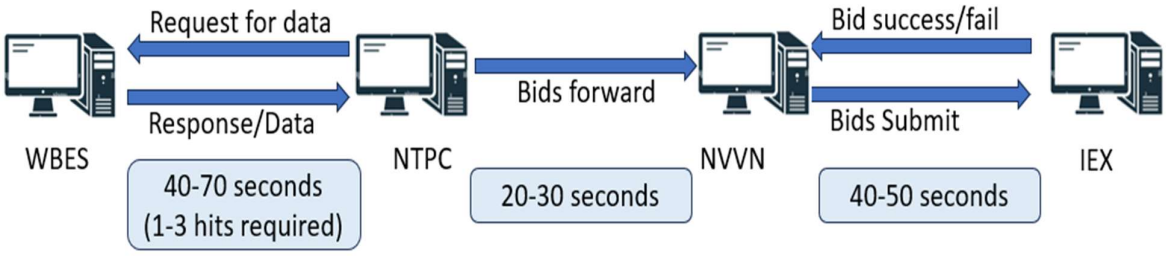
This mismatch arises due to subsequent revisions in WBES which occurs after the submission of the bid, incorporating schedules under GNA/T-GNA exigencies or URS availed by other beneficiaries. This result in NoC limit lesser than the NoC limit considered by the generator and results in rejection of total bid quantum.

Further, any bid rejection due to mismatch with injection NOC limit, cannot be reattempted in 5-minutes as shown below.



As shown above, shortening of RTM bidding window can be achieved only if the issue of bid rejection is also get addressed by providing injection NOC-limit to the generators in the API provided by WBES.

(iii) Minimum Processing time: The whole process of RTM bidding requires communication across various nodes as shown in the figure below with approx. time taken in communication:



As shown above, the time available for communication and processing of data across different nodes after shortening is very less.

It is worth mentioning that a generater is laible to get penalised (fixed cost deduction) as per the provisions of LPS rules for the intances of bid failure in the RTM. Further, incorrect bid submission may lead to DSM liability on generators.

The shortening of RTM window to 5-minutes will lead to drastic increase in bid missing incidents, as major portion is consumed for schedule updating in API and data fetching. Therefore, the following is suggested:

Proposal-1:

Keep the RTM bid window at current duration of 15 min, schedule revision timeline can still be shortened to 60 min from current 75 min.

Proposal-2:

Shortening of RTM bidding window up to 5 minutes may be achieved only after incorporating the following measures:

If the following approach/measures are taken, Generators may bid from the commencement of Bid submission window for RTM. Power Exchange would not outrightly reject bids during cross-verification of NOAR injection NOC quantum at its end. Instead, the available NOAR injection NOC quantity fetched on a real-time basis or the quantum bid by the generator, whichever is lower, would be considered by Power Exchange, rather than rejecting the entire bid quantum as being done presently.

This approach would eliminate bid rejections at the Power Exchange end and reduce waiting time for generators. It would also ensure that, at maximum, the available NOAR injection NOC quantum is cleared, thereby mitigating instances of over-scheduling beyond declared capacity (DC). However, this mechanism would require appropriate regulatory approval, as it entails enabling Power Exchange to modify bids submitted by participants.

Further, NOAR injection NOC quantum may be included in NLDC API being given to NTPC on real time basis to reduce RTM Bid rejections. The present mechanism being followed for the cross checking of NOAR injection NOC quantum by Exchange is as follows:

Generator Bid quantum (MW) for the Block 00:00-00:15 Hrs (A)	NOAR injection NOC Quantum (MW) for the Block 00:00-00:15 Hrs (B)	Power Exchange cleared Quantum (MW) for the Block 00:00-00:15 Hrs to bid in the market	Remarks
100	99.5	0	As the bid have been placed for quantum higher than the NoC quantum the bid is being rejected presently.

Instead of the above method it is proposed that following proposed mechanism of cross checking for NOAR NOC Injection quantum by Exchange may be followed:

Generator Bid quantum (MW) for the Block 00:00-00:15 Hrs (A)	NOAR injection NoC Quantum (MW) for the Block 00:00-00:15 Hrs (B)	Power Exchange cleared Quantum (MW) for the Block 00:00-00:15 Hrs to bid in the market	Remarks
100	99.5	99.5	Suggested for MIN(A, B)
100	30	30	Suggested for MIN(A, B)

Implementation of above mechanism shall avoid the waiting time required by the generator for getting the updated information, which occurs only after some time and even if there is a mismatch then the bid shall not be rejected and an optimum bid shall be placed.

2. Real Time SCUC, SCED Optimisation Despatch Issues:

Presently SCUC, SCED is incorporated in WBES at T-27 Min before delivery starts without considering market cleared TRAS Dispatch quantum. The Draft Paper RTM Scheduling methodology also places scheduling of SCUC, SCED at (T-30) to (T-15) period without taking market cleared TRAS Dispatch quantum.

Extract of Fig-4 of Draft Paper is as below:

Block	(T-30) to (T-15)	SCUC and SCED optimization	•Scheduling of RTM trades in regional entity schedules •Discovery of MCV and MCP for RTM-AS market by NLDC •Real-time SCUC run followed by SCED run
X-2			•Scheduling of SCED and SCUC instructions in regional entity schedules •Finalization of TRAS dispatch requirement for block X •Sequential TRAS dispatch – Market followed by Shortfall, then Emergency, considering generator and system constraints

Comment:

The present and proposed RTM scheduling procedure does not take into account market cleared TRAS DOWN or UP, **which is causing schedule below technical minimum or ramp limit violation.**

The Clause 6.14.12 of Detailed Procedure for Security Constrained Unit Commitment (SCUC), Unit Shut Down (USD) and Security Constrained Economic Despatch (SCED) is quoted below.

" 6.14.12 A 96 time block multi-period day-ahead optimization shall be run at NLDC starting 1500 hrs of D-1 for day "D". Where SCUC stations have to be scheduled SCUC-Up, the commensurate reduction shall be done in generation from some of the other generating station(s) as SCUC-Down, subject to technical constraints, following merit order. This is a continuous time-blockwise exercise which shall incorporate changing schedules of sellers and buyers in the software and would help to assess the situation of the grid with such SCUC-UP."

The above Regulation talks about operation of SCUC, SCED meeting Technical Constraints while duly taking into consideration of Realtime buyers and sellers changing schedules due to real time market operation or ancillary services despatch.

The below example of NTPC Talcher-2 for block 09:45 -10:00 hrs on 14th May 2026 shows schedule going below technical minimum level of 1034 MW as SCUC scheduling did not consider quantum of 282 MW TRAS Down cleared in RTM AS.

Time Block	Time Desc	ISGS	URS	OA_GNA	OA_TGNA	OA_PX	OA_REMC	AS	SCED	SCUC	Total
39	09:30-09:45	-1828.79	-28.75	0.00	0.00	-22.40	0.00	0.00	0.00	845.94	-1034.00
40	09:45-10:00	-1851.20	-26.00	0.00	0.00	-2.80	0.00	282.00	0.00	846.00	-752.00

In view of the above, SCUC and SCED despatch quantum may be incorporated after taking in to account the TRAS despatch quantum.

3. Timeline of communication of final schedule for preparing & ramping up of generators:

Clause 51.4 (iv) provides as under:

"Block X-1 (T-15to T)- Preparation Time:

From 23:45, another 15 min will be utilised for the incorporation of TRAS dispatch in WBES and preparing & ramping up of generators. And from 00:00hrs of D, final delivery of power will be processed for 2-time blocks of 15 minutes each."

Comment:

As per Clause (1)(q)(iii) of Regulation 49 of IEGC 2023, NLDC is required to finalise schedules under RTM, SCED and Ancillary Services by 23:30 hrs of 'D-1' day, and RLDC is required to publish the final schedules for dispatch by 23:35 hrs of 'D-1' day.

The intent of the above provision is to ensure that generating stations receive the final dispatch schedules sufficiently in advance and have adequate time for prepare for ramping. However, in the present scheduling framework (including the proposed scheduling timeline), the TRAS schedule is being published only by T-12 minutes, thereby leaving merely 12 minutes for generators to prepare for ramping requirements. Sometimes such limited preparation time is operationally inadequate, particularly for thermal generating stations.

It is pertinent to note that **ramping involves several critical operational activities, including cut-in/cut-out of mills, stabilization of combustion conditions and boiler-turbine parameters etc.** These processes require a reasonable lead time for safe and efficient execution.

Further, **it is observed that in most instances, ramping instructions under TRAS continue consecutively for 2–3-time blocks**. Under such conditions, the effective time available for operational preparedness and implementation of sustained ramping becomes inadequate, thereby increasing operational complexity and the risk of inefficient or unstable unit operation.

In view of the above, **TRAS schedule may be published at least one time block before delivery** to ensure availability of adequate preparation time to generating stations for ramping in a safe, reliable and technically feasible manner.

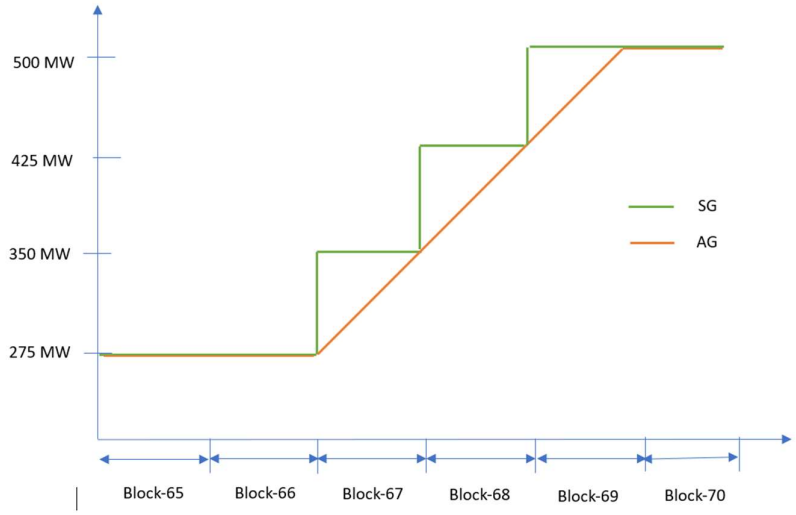
Therefore, it may be ensure the SCUC, SCED, TRAS DISPATCH quantum incorporated in schedule at (T-30) to (T-15) period, so that at least 15 min may be available to generators for preparation and ramping.

Additional comment

1. **Issue of deviation between Actual Generation (AG) and Scheduled Generation (SG) during ramping (55% to 100% and 100% to 55%) of thermal stations leading to DSM charges:**

NTPC Coal based thermal stations generally declare a Ramp rate of 1% per min in accordance with IEGC-2023. It has been observed that AG (block average) changes only by 0.5% per min despite actual ramping at 1% per min and the **station is not able to achieve average AG equal to the schedule leading to deviation in 1st ramp time block and also in subsequent time blocks as illustrated below**:

- Capacity: 500 MW
- 1% per min ramp = 75 MW per Time-Block

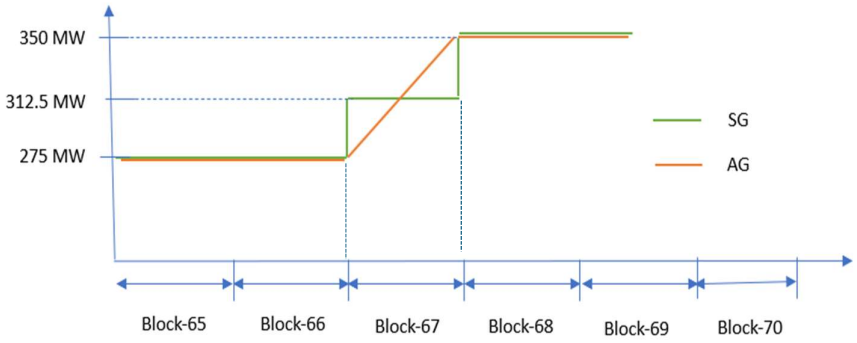


Block No.	SG (MW)	Scheduled ramp rate per min w.r.t. preceding time block	15-min Avg. AG (MW)	Achieved Avg. Ramp rate per min w.r.t preceding time block	Ramp assessment as per procedure	Deviation (AG-SG) (MW)
65	275		275			0
66	275	0%	275	0%		0
67	350	1%	312.5	0.5%	Passed	-37.5
68	425	1%	387.5	1%	Passed	-37.5
69	500	1%	462.5	1%	Passed	-37.5
70	500	0%	500	0.5%		0

Though detailed guidelines for assessment of ramping capability of thermal Interstate generating stations (ISGS) **dated 30.12.2020 recognised the fact that** AG (block average) changes only by 0.5% per min despite actual ramping at 1% per min and considers such ramp performance as 1% per min for the purpose of CERC Tariff Regulations-2024, the same is required to be incorporated in final schedule given to the generators.

To avoid DSM charges due to deviation between AG and SG during ramping, SG during 1st ramp and last ramp may be limited 0.5% per min as illustrated below under different ramp conditions of two, three and four ramps:

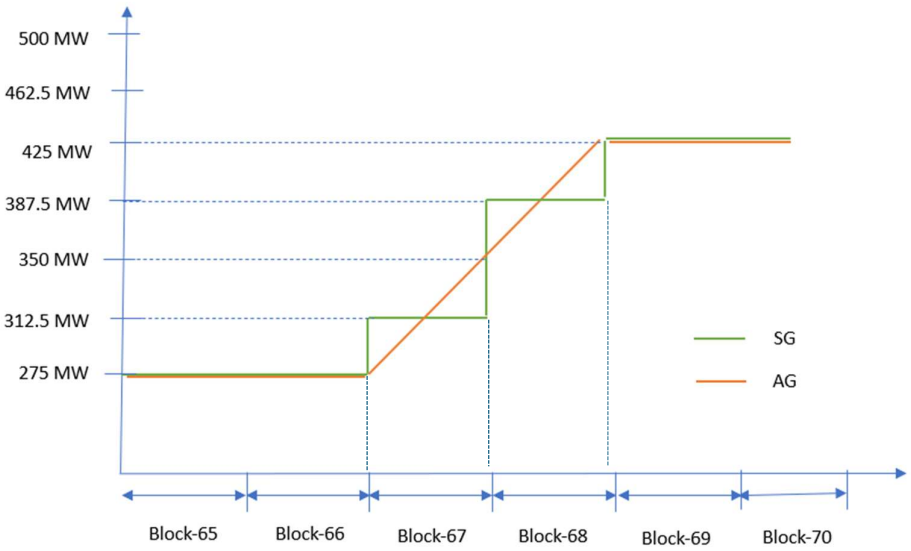
a) **2 Ramps: 1st and 2nd ramp of 0.5%** per min as shown below:



In this type of scheduling, Block wise AG, SG & Deviation data shall be as follows:

Block No.	SG (MW)	Scheduled ramp rate per min w.r.t. preceding time block	15-min Avg. AG (MW)	Achieved Avg. Ramp rate per min w.r.t preceding time block	Ramp assessment as per procedure	Deviation (AG-SG) (MW)
65	275		275			0
66	275	0%	275	0%		0
67	312.5	0.5%	312.5	0.5%	Passed	0
68	350	0.5%	350	0.5%	Passed	0
69	350	0%	350	0%		0
70	350	0%	350	0%		0

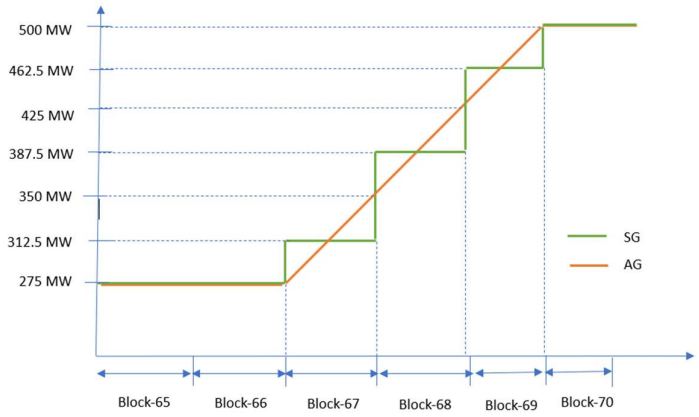
b) **3 ramps:** 1st, 2nd & 3rd ramp are of **0.5% per min, 1% per min & 0.5%** per min respectively as shown below:



In this type of scheduling, Block wise AG, SG & Deviation data shall be as follows:

Block No.	SG (MW)	Scheduled ramp rate per min w.r.t. preceding time block	15-min Avg. AG (MW)	Achieved Avg. Ramp rate per min w.r.t preceding time block	Ramp assessment as per procedure	Deviation (AG-SG) (MW)
65	275		275			0
66	275	0%	275	0%		0
67	312.5	0.5%	312.5	0.5%	Passed	0
68	387.5	1%	387.5	1%	Passed	0
69	425	0.5%	425	0.5%	Passed	0
70	425	0%	425	0%		0

c) **4 ramps: 1st, 2nd, 3rd & 4th ramps are of 0.5% per min, 1% per min, 1% per min & 0.5% per min** respectively as shown below:



In this type of scheduling, Block wise AG, SG & Deviation data shall be as follows:

Block No.	SG (MW)	Scheduled ramp rate per min w.r.t. preceding time block	15-min Avg. AG (MW)	Achieved Avg. Ramp rate per min w.r.t preceding time block	Ramp assessment as per procedure	Deviation (AG-SG) (MW)
65	275		275			0
66	275	0%	275	0%		0
67	312.5	0.5%	312.5	0.5%	Passed	0
68	387.5	1%	387.5	1%	Passed	0
69	462.5	1%	462.5	1%	Passed	0
70	500	0.5%	500	0.5%	Passed	0

In view of the above, to avoid deviation between AG and SG and DSM charges during ramping, SG during 1st ramp and last ramp may be limited 0.5% per min as illustrated above under different ramp conditions of two, three and four ramps.

XXXXX