MINUTES
OF
180th OCC MEETING

Date: 22.06.2021

Eastern Regional Power Committee
14, Golf Club Road, Tollygunge
Kolkata: 700033

EASTERN REGIONAL POWER COMMITTEE

MINUTES FOR 180th OCC MEETING HELD ON 22.06.2021(TUESDAY) AT 10:30 HRS

Member Secretary, ERPC chaired the 180th OCC Meeting. Welcoming all the participants to the meeting, he outlined the performance of ER Grid during May-2021 in brief and specially mentioned the following points:

- During the month of May-21, growth in energy consumption of ER was 22.5% compared tothe same month of previous year, however was lower by 3% compared to that of 2019.
- During the year 2021-22, the Peak Demand Met of ER was 24,445 MW in the month of May- 21 which is 21.2 % and 7.3% more than year May-20 and May-19 respectively..
- Eastern Region registered average PLF of 69.5% in May-21. Moreover, during the month of May-21, 4 nos. of thermal plants have achieved more than 90%.
- During May-2021, net energy export by ER was 4162 MU which is 10% lower than May-2020.
- During May-2021, 74.5 % of time, grid frequency was within IEGC Band (49.90Hz-50.05Hz). In May-2020, the same was 76.24%.

He further mentioned that annual maintenance of the Thermal plants which are long due and could not be undertaken due to severe Covid-19 situation may be carried out during the monsoon season to the extent possible.

PART – A

ITEM NO. A.1: Confirmation of Minutes of 179th OCC Meeting held on 21st May 2021 through MS Teams online platform.

The minutes of 179th Operation Coordination sub-Committee meeting held on 21.05.2021 was circulated vide letter dated 02.06.2021

Members may confirm the minutes of 179th OCC meeting.

Deliberation in the meeting:

Members confirmed the minutes of 179th OCC meeting.

PART B: ITEMS FOR DISCUSSION

ITEM NO. B.1: Availability of 24x7 uninterrupted SCADA Data in view of implementation of Ancillary Service Regulation.

CERC has published draft CERC (Ancillary Services), Regulations, 2021 where mainly two types of ancillary services – Secondary Reserve Ancillary service (SRAS) & Tertiary Reserve Ancillary service (TRAS) have been dealt with.

The deployment of SRAS will be depending upon Area Control Error (ACE). For each region ACE would be auto-calculated at the control center of the Nodal Agency based on Telemetered values (SCADA Data)

For payment of variable charge or compensation charge, average of SRAS-Up and SRAS-Down MW data shall be calculated for every 15 minutes time block in MWh for every SRAS Provider by the Nodal Agency using the archived SCADA data at the Nodal Agency and reconciled with the data received at control centre of the SRAS Provider and shall be used for payment of variable charge or compensation charge

For payment of incentive average of SRAS-Up and SRAS-Down MW data shall be calculated by the Nodal Agency for every 5 minutes in absolute terms using archived SCADA data at the Nodal Agency and reconciled with the data received at the control centre of the SRAS Provider and shall be used for payment of incentive

As per the regulation accounting of SRAS shall be done by the Regional Power Committee on a weekly basis, based on SCADA data.

Thus, deployment, performance assessment & payment settlement of Secondary Reserve Ancillary service (SRAS) depends upon quality and uninterrupted SCADA data emphasis as there will be commercial implication now with this implementation.

Utilities are requested to take necessary steps to set right the telemetry, ensuing quality and uninterrupted SCADA data availability as there will be commercial implications once the Ancillary Service Regulation gets implemented.

Members may note.

Deliberation in the meeting:

ERLDC gave a brief presentation on Draft Ancillary Services Regulations highlighting the need of un-interrupted SCADA data availability for implementation.

OCC advised all the stakeholders/beneficiaries to check their respective SCADA data at their end so that the error can be minimized and once the regulation gets finalized we can implement it with minimum possible error.

OCC advised all the utilities to go through the draft CERC (Ancillary Services), Regulations, 2021 and submit their views/observations, if any, latest by 30th June'21 to CERC. Further OCC opined that, if required, a separate workshop on the Draft Ancillary Services Regulations can be organized.

ITEM NO. B.2: Reliable Power Supply to Lalmatia/Godda/Dumka areas of JUSNL

The 220 kV Farakka-Lalmatia S/C was out of service since April 2021due to tower collapse. The 220/132/33 kV Lalmatia substation is relying on only 132 kV lines. At present the local load at 220 kV Dumka and Godda S/S were being radially fed from 400/220 kV Maithon S/S through 220 kV Maithon-Dumka D/C and 220 kV Dumka-Godda D/C.

In 179th CC meeting, ERLDC representative stressed over the fact that commissioning of 220kVTenughat-Govindpur line would increase the system reliability and the said line may be commissioned at the earliest.

In 103rd PCC meeting, during discussion of tripping of 220 kV Maithon-Dumka line-2 on 15/05/21, it was informed that the auto-recloser in the said line is not in operation due to some issues in PLCC. It was also come to notice that there was no formal agreement between JUSNL &Powergrid for O & M of the bay equipment at Maithon end. As a result bay equipment at Maithon end for 220 kV Maithon-Dumka D/C lines are not being maintained properly.

In view of above, the following issues need to be discussed:

1. Restoration of 220 kV Farakka-Lalmatia S/C line
2. Commissioning of 220 kV Tenughat-Govindpur lines
3. Status of O & M agreement with Powergrid for bay equipments at Maithon end and resolution of autorecloser issues in the 220 kV Maithon-Dumka Lines.

JUSNL may respond.

Deliberation in the meeting:

1. Restoration of 220kV Farraka-Lalmatia S/C line

JUSNL representative submitted that for the restoration of the said line field survey has already been carried out. He informed that cost estimation for the same has been prepared and submitted to HQ for approval so that it can be forwarded to NTPC Farakka for fund requisition.

On query, he further submitted that they would restore the line first and thereafter the necessary arrangement of handing over would be made.

MS ERPC, in regard to this raised serious concern about this line and directed JUSNL to get the work done without further delay and to co-ordinate with ECL regarding handing over of the assets.

2. Commissioning of 220kV Tenughat-Govindpur line

JUSNL representative submitted that Powergrid is doing the work for the 220kV Tenughat-Govindpur line under JCP project. Till date all tower erection has been completed, stringing is in progress and only 3kmstringing is left. He further informed that DVC power line crossing at Loc no.73/02 & 74/02 is going on and the line would get ready for charging by 15th July 2021.

SE Operation, ERPC raised concern about the readiness of associated bays of the aforesaid line. JUSNL representative in this regard submitted that line bay at Govindpur is ready and that of TTPS side is under progress. Further OCC advised JUSNL to expedite the works regarding completion of the bays in all respect without any further delay by engaging more manpower.

JUSNL representative also mentioned that there was some delay due to ROW issue but now that has been resolved.

Powergrid representative informed that there are fund related issues and they could not engage their contractor due to lack of fund and as a result the work is getting hampered.

JUSNL representative submitted that due to increased cost of the said work under JCP project the fund clearance was pending at Govt. end. However, the additional fund has been approved by the Govt. and the revised order had also been placed to Powergrid. He further informed that the fund would be released by the Govt. shortly.

3. Status of O & M agreement with Powergrid for bay equipments at Maithon end and resolution of autorecloser issues in the 220 kV Maithon-Dumka Lines

JUSNL representative submitted that there were some issues regarding the agreement but now it has been resolved and the same would be finalized within 10 days.

OCC advised JUSNL to take up the matter of auto-recloser with Powergrid and get it done at the earliest.

In view of all the above deliberations, MS ERPC opined that a separate meeting may be convened to discuss all the above issues with the higher officials of JUSNL, since these issues are of utmost importance for smooth operation of the Grid.

ITEM NO. B.3: Draft Technical Specifications (TS) of 5/15 minutes IEM with AMR, MDP System.

As per NPC, CEA letter dated 02.12.2020; a Joint Committee comprising of members from RPCs, CEA, and PGCIL/CTU & POSOCO has been constituted to finalize the Technical Specification (TS) of the 5/15 minute IEMs (Interface Energy Meters) with AMR, MDP system.

Subsequently NPC, vide email dated 28.01.2021, has circulated a draft Technical specification (TS) in two parts**.** The 1st meeting of the joint committee held on 05th February'2021, where it was decided for further deliberation at RPC level on Technical Specifications with states/Utilities for consolidated comments of RPCs. It is further informed that ERPC Secretariat vide email dated 04.02.2021, sought comments from States/Utilities, but no comment has been received till date.

In the 179th OCC meeting, OCC advised all the concerned utilities to go through the draft Technical Specifications and submit their comments within a week. But till now no comments has been received.

Members may update.

Deliberation in the meeting:

SE (Comml.), ERPC informed that no comments have been received so far in this regard.

On query, Odisha representative informed that they would discuss the matter with their O&M wing and submit their comments by30th June'21.

Bihar representative informed that they had gone through the technical specifications and after internal discussions they would submit the comments by 30th June'21.

OCC requested all the concerned utilities to submit their comments by 30th June'21 positively.

ITEM NO. B.4: Outage of Important Transmission System.

1. 132kV Sagbari–Melli.

In the 174th OCC meeting, Sikkim informed that 132kVMelli-Sagabari S/C is under outage because of faulty breaker issue at Sagbari end. Sikkim informed that 132 kV Sagbari S/s is under DISCOM jurisdiction.

In the 176thOCC meeting, Sikkim informed that the circuit breaker issue has been resolved.

They further informed that as the line was under outage for more than two years, there were vegetation & RoW issues. They added that there is conductor snapping in the line between loc. 20 and loc. 29.

In 177thOCC Meeting, Sikkim informed that necessary RoW clearance has been received for 80% section of the line and it would take two more weeks to get the clearance for remaining section of the line OCC advised Sikkim to expedite the work and restore the line at the earliest.

In the 179th OCC meeting, Sikkim submitted that patrolling of the line has been completed and necessary maintenance in this regard has already been carried out for 80% of the line section. For the rest 20%, pruning and cutting of trees are to be done and for this they need clearance from the Forest Department.

OCC advised Sikkim to expedite the matter with the Forest Dept. of Sikkim and update the status to ERPC/ERLDC at the earliest.

Sikkim vide mail dated 09.06.2021 updated the following status:

1) In loc 82,83 & 84 we have low ground clearance which need hill cutting but if needed TL can be charged after putting temporarily barbed wire fencing .
2) In loc 98-99 a house had been constructed just below the line and warning had been issued to the owner for not to do vertical extension of the house till any such arrangement is made.
3) In loc 116 &117 land owner demanding for intermediate tower and not allowing for us to clear the jungles.
4) Loc 128 is in dilapidated condition due to sinking effect posing threat to lives and properties .Local public are asking to shift the tower in safe place before restoration of supply in the TL.
5) 80% of jungle clearance has been completed and remaining 20% is in Forest area most of it is under west district and waiting for permission from Forest department.
6) The delay in obtaining permission for following trees in forest land is that it cannot be ascertained whether FCA clearance during construction of TL was obtained as the record is not available either in power department or in DFO Office. Regarding this in the it had been told by ERPC that once obtaining environment clearance at the time of construction there need not to take permission for further clearance of ROW from Forest dept and this matter is been conveyed to the Forest department but they informed us as per Forest Act of Sikkim state permission has to be obtained for fresh felling with payment of compensation. File for approval is being send to conservator of Forest from DFO on 10/6/2021.

   Sikkim may update the status.

Deliberation in the meeting:

Sikkim representative submitted that they had updated the status of work vide mail dated 09.06.2021 and there is no further update regarding the said line.

On query regarding the timeline for completion of the work, he added that due to inclement weather condition the work has been slowed down. Once the weather improves they would resume the work in full strength.

2. 400 KV main bay of Patna-1 at Kishanganj S/s.

The said bay has been out of service due to problem in Y-ph CB mechanism from 10/04/20.

In the 178th OCC meeting, Powergrid informed that the restoration work would be completed

by May' 21 and added that 5-6 days of shutdown for 400 kV Kishanganj-Patna D/C lines would be required for completion of the work.

It was informed that shutdown of 400 kV Kishanganj-Patna lines have already been approved for the month of May-21 for LILO work of Saharsa and for shifting of line on pile foundation at Kankai river.OCC advised Powergrid to optimize their plan for shutdown of 400 kV Kishanganj-Patna D/C lines and complete the work before high hydro period.

ERLDC stated that the shutdowns would be allowed based on the hydro situation.

In the 179th OCC meeting, Powergrid submitted that due to the prevailing Covid pandemic and in view of the ongoing lockdown the team of engineers was unable to come at Kishanganj S/s for the rectification work. The said work is expected to be completed in June 2021 if the lockdown restriction is removed.

Powergrid may update.

Deliberation in the meeting:

Powergrid submitted that they had applied for the shutdown of Bus-1 for two days and engineers are already at site. Since both the 400 kV Kishanganj-Patna lines are under shutdown, they wanted to take up the work during this period. He further mentioned that Bus-2 would remain in service during the shutdown period of Bus-1 and no power interruption would be there but the clearance for the shutdown is yet to be given by ERLDC.

ERLDC representative submitted that during high hydro season shutdown of Bus-1 cannot be allowed. He further added that if any contingency happens in Bus-2, the whole system would be jeopardized and North-East region would also get affected due to this. So, allowing shutdown of Bus-1 would be a very risky affair.

Taking into consideration the major issues highlighted by ERLDC, OCC advised Powergrid to defer the above work for the time being and advised to undertake the work after high- hydro season.

3. 400KV New Purnea-Gokarna & 400KV New Purnea-FSTPP.

In the 175th OCC meeting, Powergrid informed that the line has already been restored on ERS.

In 177th OCC Meeting, Powergrid informed that two out of two pile foundations had been completed and tower erection is under progress along with one open cast foundation.

They further informed that they want to avail the shutdown of both the lines from 23rd March 2021 for the bypass arrangement from Farakka to Gokarna as discussed in 177th OCC Maintenance program meeting.

In 178th OCC, Powergrid informed that the work could not be completed due to non-availability of shutdown by SLDC, West Bengal.

SLDC West Bengal informed that the shutdown would be allowed after getting some hydro supports i.e. end of May'21.

ERLDC stated that based on the discussion on the 178th OCC shutdown meeting, a study

has been carried out and it was found that the proposed shutdown may be allowed in early May-21 before onset of the high hydro period.

OCC opined that after starting of the hydro season it would be difficult to carry out the restoration work at site and also allowing shutdown 400 kV Purnea-Farakka & Purnea-Gokrna line in high hydro is not desirable from grid operation point of view.

OCC advised SLDC West Bengal to facilitate the initial shutdown for two days for bypassing arrangement work in mid of May'21.

In the 179th OCC meeting, Powergrid submitted that the work is in progress and is expected to be completed in the 1st week of June 2021.
On query about slow progress, Powergrid informed that one no. of tower is in the mid-stream of the river Ganges and due to high current in the river; they have to carry up the work very carefully.

Powergrid may update.

Deliberation in the meeting:

Powergrid representative submitted that the work of permanent restoration has been completed and the line was charged to its original configuration on 10th June'21.

He further informed that 2 nos. of pile foundation and one (01) no. open cast foundation towers have been installed to restore the line.

On query, he mentioned that PLCC issue has also been resolved.

ITEM NO. B.5: Repeated disturbances at 132/66 kV Melli S/S in March 2021

The occurrence of repeated grid events at 132/66 kV Melli S/S has been reported in March 2021 resulting in power failure at Melli and Kalimpong areas. In 101st PCC Meeting held on 13.04.2021, the agenda was placed for discussion. PCC referred the issue to OCC for discussion as Sikkim representative were not present in the meeting.

In the 178th OCC meeting, OCC decided that a complete review protection system of Melli S/smay be carried out by a team comprising of the technical experts from Powergrid, West Bengal and Sikkim tentatively in the last week of April'21 and the team has to submit its report to ERPC. Further, OCC advised respective utilities to nominate one representative preferably from the nearby areas.

A site visit by the Team comprising of Powergrid, West Bengal and Sikkim was carried out on 05-05-2021.

In the 179th OCC meeting, Powergrid informed that the team comprising of experts from Powergrid, WBSETCL and Sikkim visited the site on 05.05.2021 but as the lockdown had been announced from 6th May 2021 in Sikkim, major testing could not be done. The following were pointed out by the team:

- It was found that from the Melli end for Zone-2 fault of 132 kV Rangpo-Melli line, the distance protection relay is not operating in desired manner.

- As they could not perform major testing due to paucity of time they could not access the healthiness of distance relay. However, as a temporary measure, the Zone 2 settings had been changed from 350 ms to 100msand kept in observation for any further tripping.
- Whenever the lockdown restriction eases, Powergrid would mobilize the workforce and do a thorough testing of the said relay. In case there is any problem found during the testing, the relay would be replaced by a spare one.
- There is single DC source for all the 132 kV elements in Melli S/s which is an EHV S/s. It is suggested that for ensuring reliable protection operation, there should be one more redundant set of DC supply, which is also as per CEA standards.

Regarding DC supply, OCC advised Sikkim to check the PSDF proposal for Melli S/s, whether there is proposal for two sets of DC supplies. Sikkim representative informed that as of now there is only single DC source. OCC further advised Sikkim to include dual DC supplies under PSDF renovation proposal.

On query, Powergrid informed that they had checked the breaker and some minor issues had been found which were already rectified. Regarding the repeated faults at a particular location, Powergrid informed that they had visited the site and it had been found that there was some clearance issue at that particular location and to mitigate the issue some temporary measures had been taken. Powergrid further suggested that in case of further tripping, restringing of the conductor has to be done for that particular location where the fault is occurring.

In conclusion, OCC advised Powergrid to send updates about the issues observed at Melli S/s, if any, to ERPC/ERLDC so that the issue can be followed up in the PCC forum. Further OCC advised Sikkim to check the PSDF scheme for Melli whether there is proposal for two sets of DC supplies or not. If not, the proposal for dual DC supplies may be included under PSDF proposal.

Sikkim vide mail dated 09.06.2021 updated that provision for double dc backup system has been included in the PSDF project.

Powergrid and Sikkim may update.

Deliberation in the meeting:

SE Operation, ERPC submitted that as per the information provided by Powergrid in last PCC meeting no tripping has been observed after the changes in relay settings at Melli S/s. He further informed that Sikkim vide mail dated 09.06.2021 had confirmed that provision of double DC source backup has been incorporated in the PSDF Project.

OCC opined that this issue should be followed up in the PCC forum for further actions.

ITEM NO. B.6: Repair/rectification of D/C tower at location 79 of 132kV Rangpo-Melli and 132 kV Rangpo –Gangtok line.

Powergrid had informed that their patrolling team had observed bent in part of tower no. 79 of 132kV Rangpo-Melli line and 132 kV Chuzachen(Rangpo)-Gangtok transmission lines which might further degrade the condition of tower.

In 137thOCC, Powergrid informed that tower no. 79 of 132kV Rangpo-Melli line and Chuzachen

(Rangpo)-Gangtok transmission lines falls under the jurisdiction of Energy & Power Department, Govt. of Sikkim.

In 43rd ERPC Meeting, Powergrid informed that the tower at location no. 79 is in vulnerable condition and needs immediate attention so as to avoid any further devastation.

Sikkim informed that they are in process of obtaining approval from State Govt. for rectification of the defective tower

In view of importance of the said line for power supply to State Capital, ERPC advised Sikkim to resolve the issue on priority basis and same shall be monitored in lower forum of ERPC.

In the 178th OCC meeting**,** Sikkim informed that they would communicate the status of the proposal for rectification of the defective tower within a month.

In the 179th OCC meeting, Sikkim representative informed that, they had already prepared the estimate which had been placed for approval in CMO office. As soon as the approval gets accorded by the Govt. they would start the work. He further added that the team is also ready for retrofitting.

OCC advised Sikkim to expedite their internal approval and place the work order as soon as possible.

Sikkim may update.

Deliberation in the meeting:

Sikkim representative submitted that the approval is yet to be accorded by the State Govt. and due to Covid-19 lockdown restrictions the matter is getting delayed further.

OCC stressed upon the fact that this line is vital for the State capital Gangtok. Further OCC advised Sikkim to get the approval done and thereafter complete the work without any further delay.

Sikkim representative ensured that they are following up the issue and as soon as the approval gets accorded by the Govt. they would start the work.

ITEM NO. B.7: List of Important Elements in ER

In compliance with IEGC 5.2 (c) List of Important Grid Elements of Eastern regional Grid has been prepared and draft version of the same was circulated via mail on 12-May-2021. Constituents were requested to review and give input by 25thMay so that it can be finalized by month end.
Subsequently the list of important elements of ER is finalized, based on comments received. The updated list is available on the ERLDC website and can be directly accessed through the following link:

https://app.erldc.in/Content/Upload/System%20Study/Important%20Elements%20in%20ER/List%20of%20Important%20Element_2021.pdf

Members may note.

Deliberation in the meeting:

ERLDC representative informed that they had received comments from Bihar regarding addition of 03 nos. of 132kV S/s in the list and the same is being updated by them.

He further added that DVC's comments, as received, have also been updated in the list. However, no comments have been received from Odisha, West Bengal & Jharkhand.

Odisha representative informed that they would submit the comments to ERLDC by 30th June'21.

OCC advised the remaining concerned utilities to submit their comments positively by 30th June'21 so that the list can be finalized.

ITEM NO. B.8: Review of implementation of PSDF approved projects of ER.

In 10th NPC meeting held on 09.04.2021, RPCs were advised take up the matter for improvement of the fund disbursement and expeditious implementation of the sanctioned projects under PSDF.

In view of the above, status review of the projects being executed under PSDF funding in Eastern Region would be carried out on regular basis for expediting the projects. All the constituents are requested to furnish/update the status of their respective project in every month.

Concerned utilities may update the present status of the project as given in the **Annexure-B8**.

Members may update.

Deliberation in the meeting:

Members updated the status as follows:

Jharkhand: *Submitted their status of work.*

Bihar: *Informed that they had submitted their current status.*

WBPDCL: *Informed that the latest status was submitted vide mail dated 28.05.2021 and there is no further update till date. Any further updated would be intimated to ERPC at the earliest.*

Odisha: *Updated that no more update on PSDF project work has been received from their system department, thus the status which was submitted by them in the last month remains the same and any further update would be intimated to ERPC accordingly.*

WBSETCL: *Submitted that they would float their tender for SAMAST project in the next week.*

The updated status is placed at ***Annexure-B8****.*

ITEM NO. B.9: Status of implementation of AGC as a pilot project in States.

In 42nd TCC, DVC intimated that AGC shall be implemented in unit 7 and 8 of Mejia as per the given schedule by 31st July 2020.

WBPDCL informed that they have already collected offer from Siemens for implementation of AGC and they are awaiting the concurrence from SLDC.

SLDC, WB informed that they are not in a position to implement AGC unless a clear direction is given by WBERC. Further, implementation of intra state DSM is a prerequisite for implementation of AGC in the states.

It was decided to request CERC to include this as an issue in the Agenda for discussion in the meeting of Forum of Regulators.

In 169th OCC Meeting, SLDC DVC informed that due to COVID-19 pandemic, participation in the tender was very less therefore they are floating a new tender for implementation of AGC. AGC would be implemented by Feb 2021.

Odisha informed that they could not visit Barh NTPC and NLDC due to ongoing COVID 19 pandemic situation.

OCC advised SLDC Odisha and OPGC to interact with Barh NTPC & ERLDC to get the technical specifications & the procedure for implementation of AGC.

Latest Status of implementation:

State	Station/Unit	Deliberation in 179th OCC Meeting
DVC	Mejia unit#7 &8	DVC informed that fresh indent to be placed in May21.
West Bengal	Unit-5 of Bakreswar TPP	SLDC West Bengal informed that at present there is no relevant regulation by WBERC for implementation of AGC in state generators. SLDC further informed that FOR should give necessary directions to WBERC on the issue and They would proceed for AGC implementation only after getting direction from WBERC. After detailed deliberation it was decided that the matter would be placed in forthcoming TCC meeting.
Odisha	Unit#3 of OPGC	OPGC informed that a meeting with M/s Siemens is schedule to be held on 25.05.2021 and after sharing necessary technical details with Siemens it would be finalized.

Members may update.

Deliberation in the meeting:

State	Station/Unit	Deliberation in 180th OCC Meeting
DVC	Mejia unit#7 &8	*DVC representative informed that they had invited for fresh budgetary offers in this regard.* *SE (O), ERPC advised DVC to expedite this as it has been getting delayed since last three months.*

		DVC submitted that the process also got delayed due to Covid-19 situation. He further ensured that the matter would be expedited and finalized soon.
West Bengal	Unit-5 of Bakreswar TPP	*SLDC, West Bengal representative informed that for implementation of AGC among state generators there are two parts to sort out.* *Firstly, a quantum of DC of WBPDCL plants has to be kept as a hot spinning reserve out of 100% allotment to WBSEDCL for utilization under AGC. In present regime, the capacity charge of the plants for that quantum spinning reserve cannot be claimed from WBSEDCL. So, there should be a regulation of WBERC to cover these financial settlements of state generators scheduled to its beneficiary and actually declared by the plant under AGC after implementation of AGC as per direction of WBERC.* *Secondly the capital cost involved to implement AGC in different state generators and in SLDC should be approved by WBERC to adjust in tariff.* *Accordingly, necessary orders /regulations need to be issued by WBERC to cover the above points.* *He further requested the forum to place the matter in the next TCC meeting.*
	Unit#3 of OPGC	*OPGC representative informed that they had finalized all the technical specifications in consultation with Siemens and are ready to place the order.* *He further submitted that the necessary command for AGC has to be given by SLDC itself.* *SLDC Odisha representative submitted they would discuss with OPGC and Siemens and resolve the issue by 15th July'21.*

ITEM NO. B.10: Monthly Data on Category-wise consumption of electricity in states.

The data of category-wise consumption of electricity in the states/UTs are being frequently referred to by CEA and Ministry of Power. In this regard, as advised by Member (GO &D), GM division of CEA has advised the following:

- The monthly data of category-wise consumption of electricity in the states/UTs may be discussed in the OCC meeting on regular basis with comparative analysis of the same for corresponding monthly data of previous years.
- In case the utilities have reservations on submitting unaudited data then the same may be mentioned in the data itself that these data are unaudited. In that case the data so received would be used only for the purpose of trend analysis and would not be used in any report of CEA.

In 177th OCC Meeting, OCC advised all SLDCs to take up the issue with their DISCOM(s) and submit the required data on monthly basis to ERPC secretariat.

In the 179th OCC meeting, Odisha informed that they had submitted the data. Jharkhand and DVC submitted that they would update the data after getting it from their commercial team. West Bengal informed that they would submit the status by 24th May 2021.

Members may update.

Deliberation in the meeting:

Members updated the status as follows:

WBSETCL: *Submitted that the data is related to the Discoms (WBSEDCL) since the data is of LT and HT lines. OCC advised WBSETCL to co-ordinate with the Discoms and submit the data to ERPC at the earliest.*

Jharkhand: *Informed that they have not yet received the data from Discom and would update the same by last week of this June'2021.*

DVC: *Informed that their commercial wing has not yet provided the data.*

Bihar: *Submitted the data for the month of May'21.*

Odisha: *Informed that up to March'21 they had submitted all the requisite data and for the month of April'21 partial data was submitted. Odisha representative further informed that they are facing problems in gathering the data from the Discoms and requested the forum to instruct the Discoms for complying the same.*

ITEM NO. B.11: Reactive power performance of Regional Generators during May 2021

A. Performance of Regional Generators

Based on ERLDC SCADA data, it has been observed that reactive power absorption of following regional generating stations was not satisfactory during high voltage condition.

SL.No.	Name of generating unit	Maximum MVAr absorption	Voltage
1	Kahalgaon STPS Stage II - 500 MW Unit -6	<10 MVAr	417 kV
2	Kahalgaon STPS Stage II - 500 MW Unit -7	<20 MVAr	417 kV
3	Barh STPS Stage II - 660 MW Unit -4	<100 MVAr (sometimes absorbing less also)	420 kV
4	Barh STPS Stage II - 660 MW Unit -5	<100 MVAr (sometimes absorbing less also)	420 kV
5	BRBCL - 250 MW Unit -1	Unit is injecting VAR of around 50 MVAR	412 kV
6	BRBCL - 250 MW Unit -2	Unit is injecting VAR of around 50 MVAR	412 kV
7	Nabinagar STPP Stage I - 660 MW Unit -1	<50 MVAr	423 kV
8	MPL - 525 MW Unit -1	<30 MVAr	416 kV
9	MPL - 525 MW Unit -2	<40 MVAr	416 kV
10	JITPL - 600 MW Unit -1	Unit is injecting VAR of around 200 MVAR	415 kV
11	JITPL - 600 MW Unit -2	Unit is injecting VAR of around 200 MVAR	415 kV

MVAr absorption/injection by above generating units at different MW and voltage level as per ERLDC SCADA data is shown in **Annexure-B11.**

In view of the above generating plant to share the following details:

- Reason for not providing VAr absorption in line with capability curve
- Reason for not changing of scheduled voltage for power plant to ensure higher VAr absorption
- Whether GT tap change required to utilize maximum var support (absorption/injection)

Generators may update

Deliberation in the meeting:

ERLDC representative gave a brief presentation regarding the MVAr (Reactive Power) absorption of the generators and raised their concern about the non-satisfactory performances of the regional generating stations regarding MVAr absorption.

On query, NTPC Kahalgaon representative submitted that the MVAr absorption was in auto mode and at present they are trying to improve the absorption. He further ensured that the same would be done by them without any delay.

SE (O), ERPC advised NTPC Kahalgaon to share their outcome of the reactive power absorption for the #Unit 6 & #Unit 7. ERLDC representative further added that since the system demand is low right now they may expedite their finding during this period and share the details with ERLDC at the earliest.

Regarding Barh, ERLDC representative informed that previously reactive power capability testing was done in Nov 2019 for Unit 4 and at that time the unit was able to absorb 230 MVAr but the actual gross absorption was quite low. At that time ERLDC had advised Barh to change the tap settings and look into the matter.

Nabinagar representative informed that they had gone through the detailed study and submitted that there was some excitation problem which would be resolved soon and the system would improve. He further added that right now only one unit is in service and four nos. of outgoing lines is there. Once the 2nd unit comes, the system would get balanced and subsequently the voltage would be improved.

BRBCL representative submitted that they had informed their concerned team to check the tap settings and the correct tap setting would be shared with ERPC & ERLDC.

MPL representative submitted that they can absorb up to their capability curve. OCC advised MPL to coordinate with ERLDC in this regard.

Regarding JITPL, ERLDC submitted that they had already shared their response with JITPL. SE (O), ERPC further advised ERLDC to share the details with ERPC for taking up with JITPL.

ERLDC representative further submitted that the reactive performance has to be monitored in real time.

OCC advised all the concerned generators to look after their reactive performance in real time and if there is any requirement of improvement by the grid operators, generators should co-ordinate with the grid operators.

B. Inadequate reactive power support from Mejia TPS during cyclone Yaas.

During cyclone Yaas, load in Jharkhand and DVC area became very low. As a result, high voltage condition occurred at Maithon. Though MVAr support was expected from nearby generating stations like Mejia B, MVAr absorption was very low by those generating stations (in order of 10-20 MVAr by 500 MW unit). DVC was requested to share reason for inadequate VAR absorption by Mejia B unit 7 & 8 vide mail dated 27th May 2021.

DVC SLDC in coordination with generating station may share reactive power performance of Mejia B and share plan of action in order to improve MVAr support of this generating station.

Reactive power performance of other generating units may also be checked by SLDC.

SLDCs may update.

Deliberation in the meeting:

DVC representative informed that as per the information obtained from Mejia, particularly on the day of Yaas Cyclone, there was high voltage in the system and limitation in terminal voltage absorption was also there. Mejia couldn't perform up to the mark due to the above reasons.

He further informed that they had requested for MVAr data from Mejia for the month of May 2021 and thereafter thorough study would be carried out by them.

OCC advised DVC to share the details of the study along with their findings to ERPC & ERLDC.

ITEM NO. B.12: Submission of Status of installation of Harmonics meter at the connection point of bulk consumers

i. The limits of voltage harmonics by the distribution licensee in its electricity system, the limits of injection of current harmonics by bulk consumers, point of harmonic measurement, i.e., point of common coupling, method of harmonic measurement and other related matters, shall be in accordance with the IEEE 519-2014 standards, as amended from time to time.

ii. Measuring and metering of harmonics shall be a continuous process with meters complying with provisions of IEC 61000-4-30 Class A.

iii. The data measured and metered as mentioned in sub-paragraph (ii) with regard to the harmonics, shall be available with distribution licensee and it shall also be shared with the consumer periodically.

iv. The bulk consumer shall install power quality meter and share the recorded data thereof with the distribution licensee with such periodicity as may be specified by the appropriate Electricity Regulatory Commission: Provided that the existing bulk consumer shall comply with this provision within twelve months from the date of commencement of the Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2018.

v. In addition to harmonics, periodic measurement of other power quality parameters such

as voltage sag, swell, flicker, disruptions shall be done as per relevant International Electro-technical Commission Standards by the distribution licensee and the reports thereof shall be shared with the consumer.

vi. The distribution licensee shall install power quality meters in a phased manner within three years from the date of commencement of the Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2019 covering at least 33% of the 33 kV substations each year."

Therefore SLDCs are requested to coordinate with all the distribution licensees and get the latest status.

Members may note for compliance.

Deliberation in the meeting:

SE (O), ERPC submitted that as per Central Electricity Authority (Technical Standards for Connectivity to the Grid) (Amendment) Regulations, 2019 all Discoms shall install Harmonics Meter at their end in a phased manner.

ERLDC representative added that monitoring shall be done from SLDCs regarding the installation of the same. He further submitted that installation of harmonic meters would help to ensure quality power to the consumer.

OCC advised the concerned utilities to coordinate with their distribution licensees for compliance of the above regulatory requirements.

ITEM NO. B.13: Activation of Transient data record facility in the AVR, if available and sharing the information with RLDC whenever required.

Monitoring of response of all dynamic elements of the grid is extremely important for analyzing various events in the grid and validating dynamic models of the elements.

Modern AVR are having transient data recording facility and can record very high-resolution data. Therefore all generating station must activate the facility for understanding the dynamics of the grid in a much better way. Therefore all generators are requested to submit the following details:

Generator Name	AVR manufacturer	Transient Data recording facility available (Yes/No)	IS the data recording facility activated (Yes/No)

In the 179th OCC meeting, ERLDC submitted that they had received the data from some of the constituents.

ERLDC further suggested that all the generators having the transient data record facility in the AVR should activate the same facility at their end. Also in the upcoming new generators or in the generators where R& M work is going on, possibility of incorporating this feature should be explored.

OCC advised all the concerned utilities to submit the data at the earliest.

Information is yet to be received from following plants

- **Central Sector**
  - Rangit
  - Barh
  - Darlipalli
  - NPGC
  - BRBCL
  - MPTS St- II
- **West Bengal**
  - Kolaghat
  - Sagardighi
  - TLDP-4
  - PPSP
- **Odisha**
  - Hirakud
  - Chiplima
  - Balimela
  - Upper Kolab
  - Indravati
  - Rengali
  - Sterlite
- **Jharkhand**
  - Tenughat
  - Subarnarekah
- **DVC**
  - Bokaro-B
  - DSTPS
  - Mejia-A
  - Waria
  - Raghunathpur
  - Mejia-B
  - Chandrapura
  - Bokaro-A
  - Koderma
  -
- **Bihar**
  - MTPS St- I
  - Barauni TPS

It is further suggested that all generating station must activate the facility where ever available for understanding the dynamics of the grid in a much better way. Data for the same may be shared with ERLDC when need for analysis arises.

Members may update.

Deliberation in the meeting:

ERLDC representative informed that till date no further status in this regard has been received. He further added that they had already informed the concerned generators to activate the transient data recording facility in AVR at their end, if available, and inform to ERLDC.

NTPC Kahalgaon representative informed that the transient data facility in AVR is available at their end but due to shortage of memory they are not in a position to activate the same. He further informed that they would share their views after consulting the concerned department.

OCC advised all the concerned generators to activate the facility at their end, if available, and share the latest status to ERPC and ERLDC at the earliest.

ITEM NO. B.14: Healthiness of 89T isolator of ICT-V at Malda

On 13.03.21 400/220kV 315MVA ICT#5 at Malda required emergency outage (hand tripped), as 400kV side CB lockout occurred. POWERGRID informed via mail that 315 MVA ICT - V cannot be charged through 400 kV TBC because, it was observed that B-ph 89 T PG Isolator spring has broken and is not operational, which compelled for forced manual tripping of ICT-5. On 14.03.2021 early morning, during emergency restoration of ICT-5 through 400kV TBC bay, some

shorting arrangement at 89T isolator of ICT-5 was made to restore ICT-5 through TBC.
On 19.04.2021 at 13:15 hrs, 315MVA, 400/220kV ICT- V at Malda has been Emergency hand tripped due to sudden flash over at 89T isolator. ICT -V was restored through Main Bay.

In the 179th OCC meeting, Powergrid representative informed that problem in 89T isolator still persists, and for that they have already applied shutdown for normalization from TBC bay to Main Bay after isolating the faulty isolator.

Powergrid representative further added that as 89T is a line side Isolator, any maintenance of it would require shutdown of ICT 5. Upon query he mentioned that all the other isolators and breakers of the TBC have been replaced and there is no issue related to the operation. But the said bay isolator has problem due to ageing problem and it was planned to be replaced during the ICT augmentation work. However, Powergrid has planned for phase wise replacement of 89T and 89 M2 under O&M activity which will be done on daily basis shutdown and it would require 7-8 days in order to get the work done.

OCC advised Powergrid to submit the detailed replacement plan to ERPC/ERLDC for further action.

Powergrid may update.

Deliberation in the meeting:

Powergrid representative informed that they had already given the schedule for shutdown details and the same has already been approved. He further added that the work is expected to be completed by July 2021 subject to weather conditions.

ITEM NO. B.15: Agenda by DGPC

1. Test Charging of 400kV Jigmeling – Alipurduar Quad Moose Line

At present, the evacuation of power from Mangdechhu HEP is being done through the 400kV Jigmeling – Punatshangchu – Alipurduar lines, an interim arrangement made till the direct 400kV Jigmeling – Alipurduar Quad Moose line is commissioned.

With the completion of work on the 400kV Jigmeling – Alipurduar direct linesby POWERGRID, the test charging of 400kV Jigmeling – Alipurduar Quad Lines has been started from June 16 to 18, 2021 as per the FTC (first time charging) clearance provided by POSOCO vide email dated June 15, 2021 and by BPSO vide No. 10B/BPC/BPSO/PSOD/Vol-1/2021/148 dated June 08, 2021. After the successful test charging, both lines shall be used for evacuation of Mangdechhu power from thereon. The 400kV Jigmeling – Punatshangchu – Alipurduar lines (interim line for evacuation of Mangdechhu power) shall be kept as standby to ensure alternative power evacuation route for MHEP power during contingencies. Prior information shall be intimated while using this interim line.

The testing of the main and check energy meters at both Jigmeling and Alipurduar end for the Quad Moose lines has been carried out by the concerned stakeholders and the initial reading of the energy meters has been recorded jointly.
With the charging of the 400kV Jigmeling – Alipurduar Quad Moose Lines, the energy accounting for the energy export by Mangdechhu to PTC India Ltd. through the direct Jigmeling – Alipurduar

lines shall have to be accordingly taken care in the REA as per the PPA.

Submitted for kind information.

Deliberation in the meeting:

Powergrid representative informed that the Ckt-I &Ckt-II of 400kV Jigmeling-Alipuduar have been commissioned.

Bhutan representative submitted that since they have started evacuating power, energy accounting in this regard needs to be taken care of.

SE (Comml.), ERPC clarified that the methodology would remain same for energy accounting and the transmission loss would be taken care of accordingly while doing the energy accounting.

Further, ERLDC representative submitted that since one of the interim lines (i.e. 400kV Jigmeling – Punatshangchu – Alipurduar ckts) is in service as an antitheft measure, swapping of antitheft charging for these lineswould be done at an interval of 7-10 days. Bhutan agreed to this point, but mentioned that they need to discuss the matter with their higher officials.

OCC advised Bhutan to communicate their views after discussing with their higher officials to Powergrid ER-II, ERPC & ERLDC.

Powergrid representative added that as per the decision taken in the last Indo-Bhutan OCC, they had provided an energy meter for the ICT installed at Jigmeling. However, the latest status about the installation of the meter and its settings is yet to be communicated to Powergrid.

Bhutan representative submitted that they would inform the issue to BPC & BPSO and would provide the information to Powergrid after obtaining the same from BPC & BPSO.

2. Shut Down of 400kV Tala - Siliguri Feeder – 1

Tala-Siliguri 400kV Feeder 1 tripped on June 4, 2021 at 23.40 (BST) on L3-E fault. During the tripping incident heavy spark and loud sound was observed at the POTHEAD YARD premises. At the time of feeder tripping, there was heavy rain with severe lightning and thunders around the powerhouse premises from the evening and throughout the night of 04.06.2021. On detailed inspection of the associated equipment of the feeder at POTHEAD YARD, severe external burnt marks were observed on the Outdoor Termination of the XLPE Cable on Y-Phase.

The matter was discussed with M/s Sudkabel, Germany, the supplier of the XLPE cable and associated equipment. Sudkabel has informed that the failed termination has to be replaced but they will be able to attend it only after the global improvement of COVID-19 pandemic situation. DGPC has explored the availability of the failed components with the projects which are currently under construction in Bhutan. The required components with exactly same specifications are available with one of the projects and have agreed to spare, but there is no person in Bhutan who can carry out this specialized work.

DGPC is constantly in touch with Sudkabel and trying the best to restore the feeder at the earliest possible. However, it is likely that the feeder can be restored only by the end of 2021 in view of challenges posed by the prevailing COVID-19 pandemic in arranging the experts from Germany in time.

The remaining three 400 kV feeders are in service and can cater to the full evacuation of Tala power even during the peak generation season.

Submitted for kind information.

Deliberation in the meeting:

Bhutan representative informed that due to heavy rainfall and lighting in recent days the 400kV Tala-Siliguri Feeder 1 is out of service because of breaking down of 400kV XLPE termination kit due to lighting. He further added that for the replacement of the same they had already taken up with the OEM at Germany for deputing their service engineer but due to the ongoing Covid situation the manufacturer is unable to depute their engineer.

ITEM NO. B.16: Status of CEA regulation compliance of grid-connected RE (33kV & Above)

With the steady growth of RE integration, it has become extremely important to closely monitor the compliance of various connectivity standards by the RE plants and Distributed Generation Resources.
As per CEA connectivity regulation: "Compliance of regulations"

1. It shall be the responsibility of the concerned licensee to ensure that before connectivity to the grid, all the provisions with regard to the connectivity stipulated in these regulations are complied with by the applicant.
2. The user may be disconnected from the grid by the licensee for non-compliance of any provision of these regulations, under-report by the licensee to the appropriate Electricity Regulatory Commission."

Therefore SLDC's are requested to submit the following compliance status for each RE plant separately:

a. Communication status with SLDC
b. Metering status
c. LVRT status
d. Active power control in case of frequency event
e. Cyber security compliance status
f. Harmonics measurement sharing status
g. Modelling details submission status

**The above points are not inclusive of all the technical compliance, SLDC should ensure all other technical compliance as well

SLDCs may update.

Deliberation in the meeting:

ERLDC representative informed that as per the CEA connectivity Regulations, compliance of regulations is needed to be confirmed by all the solar generators. He submitted that in Eastern Region considerable amount of solar generation is there and for that communication between

SLDC and solar plants is of utmost importance. ERLDC representative further stated that solar power plants connected to the ISTS as well as state networks need to follow the LVRT so that in case of any tripping the grid connectivity can be maintained.

It was also informed that all the above data need to be monitored by SLDCs.

Bihar: *On query, SLDC Bihar informed that they have some solar power plants which have connectivity at 33kV and above level, out of which some of them are communicating with the SLDC and for the rest SLDC is coordinating with them to get it complied. It is expected that within 15 days the status of communication between SLDC and solar power plants for the rest would be collected by SLDC.OCC advised Bihar to submit the necessary details regarding the same to ERPC and ERLDC.*

Jharkhand: *SLDC Jharkhand submitted that they have no solar power plant connected at 33kV level and above.*

DVC: *DVC submitted that they have no solar power plant connected at 33kV level and above.*

Odisha: *GRIDCO representative submitted that regarding the solar power plants which are connected at 132kV network, there is already a provision in SCADA system. Last year GRIDCO had implemented the data communication to SLDC for the RE projects that are connected at 11kV & 33kV level. She further informed that till date they have covered 16 nos. of locations and the work is going on and after successful completion of the pilot project they awarded the work to M/s Chemtrols Ltd.*

She further submitted that work for the implementation of the above points from (a) to (g) is currently under progress and the work is expected to be completed within 2 months for all 16 nos. of locations (11kV & 33kV level) and for 132kV level the same is already available

OCC advised GRIDCO to submit the aforesaid data in tabular format to ERPC & ERLDC.

West Bengal: *SLDC West Bengal representative informed that presently they do not have any solar power plant connected at 132kV system. However, only 1 no. of10MW solar power plant is there under WBSEDCL which is connected at 33kV level. He further submitted that neither SCADA data nor any status as mentioned in the above points (a) to (g) is available with them. He told that an official proposal would be put before the competent authority so that the same can be forwarded to the solar power plant for getting the necessary data and status. He further assured that as soon as any decision is taken, the same would be intimated to the forum.*

ERLDC representative mentioned that as per regulation, for renewable generations connected at 33kV and above these said features are mandatory requirements.

SE (O), ERPC opined that as SLDC is an apex body of the State and they are already empowered to collect the requisite data, as per regulatory requirements.

SLDC WB representative ensured that they would write to WBSEDCL about this regulatory information and would share the details to ERPC and ERLDC.

ITEM NO. B.17: Additional Agenda

1. Standard Operating Procedure for Islanding Scheme

A meeting was held on 16.04.2021 through video conference (VC) under the chairmanship of Secretary (Power) to review Islanding schemes of India Grid. As per decision taken in the meeting, CEA has to prepare Standard Operating Procedure (SOP) for the Islanding Schemes. The SOP for the Islanding Schemes has been prepared by CEA. The draft SOP is placed at **Annexure-1.1**.

MOP vide letter dated 16.06.2021 forwarded the comments/observations of on the draft SOP. The same is placed at **Annexure-1.2.**

In the observations of the MoP on Standard Operating Procedure (SOP) SL. No. (f) it has been submitted that:
"*A model islanding scheme, one of the better available islanding schemes, may be enclosed for ease of reference*".

In line with the above observation all the concerned utilities are advised to provide requisite data as per **Annexure-1.3** to ERPC secretariat latest by 25.06.2021 for onward submission to MoP.

Further all the concerned utilities are advised to send their comments/observations, if any, on the SOP to ERPC secretariat latest by 25.06.2021.

Members may discuss.

Deliberation in the meeting:

SE (O), ERPC advised all the concerned to go through the above SOP and submit their views/comments/observations, if any, latest by 24th June'2021 to ERPC for onward submission to CEA for finalization of the same.

He further submitted that in reference to the Annexure 1.3, one model Islanding Scheme from every region needs to be made available so that it can be used as a reference for implementing the Islanding scheme for all major cities in India. In Eastern region only CESC islanding scheme covers major city (Kolkata) under its scheme. Hence it is proposed to consider CESC Islanding Scheme as a model Islanding Scheme for Eastern Region.

OCC agreed and advised CESC to go through the Annexure 1.3, and submit the necessary details as per the given format to ERPC at the earliest.

2. Agenda points related to AMR at ER: Powergrid

As committed earlier the comprehensive AMC of AMR Phase-1 and Phase-2 (total 656 Meter), LOA awarded to M/S Tata Consultancy Services with Value of 5,63,01,576.00 INR (including GST). This AMC is valid till 31-Mar-2026.

Progress of AMR Phase-4 project as on 15-06-2021:-

SL No	Line Item	Total Qty as per LOA	Completed Qty	Remarks
1	Integration of new Meters	200	101	Work in progress for new Meter integration and DCU installation. Total work will be completed within next 4 months timeline tentatively.
2	Installation of new DCU	25	2	
3	LAN Integration with DCU	40	40	Total work completed in Mar-2021.
4	New Report Generation for ERLDC-SCADA team	1	1	Total work completed in Mar-2021.

PGCIL requests to all utilities to extend their help and co-operation to M/S TCS during the new AMR system installation or AMR-AMC related work, for smooth execution& maintenance of AMR system throughout Eastern Region.
M/S TCS has successfully implemented SFTP solution in their existing system. No open FTP port will be used for data transmission. (This is as per the new guideline of Cyber Swachhata Kendra).

Members may kindly note the same.

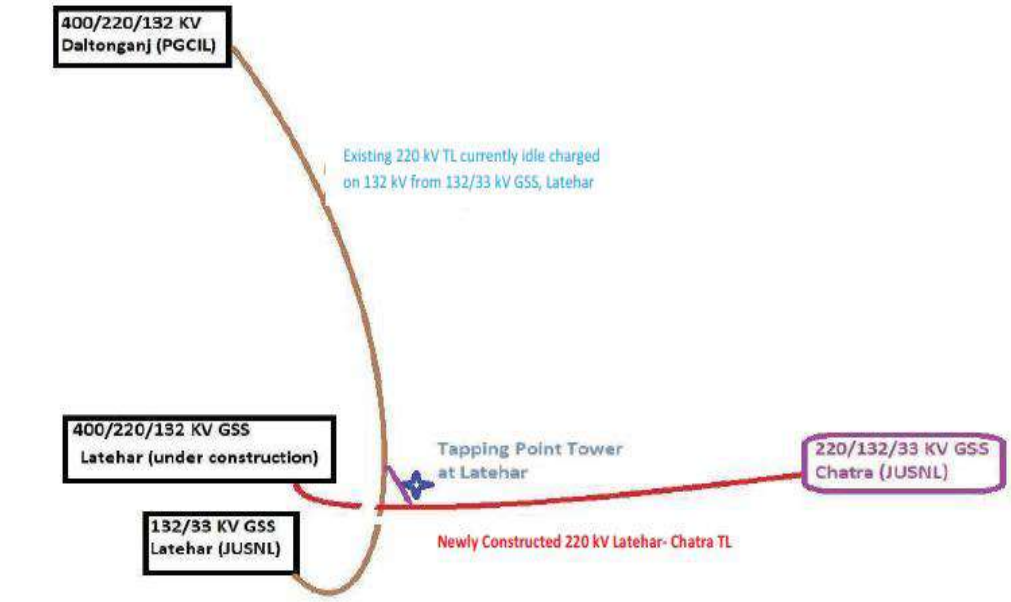
Deliberation in the meeting:

Members noted.

3. Connectivity of 400/220/132 kV, Daltonganj of PGCIL to newly constructed 220/132/33 KV (2x150+2x50) MVA Grid Substation Chatra (Itkhori) of JUSNL

Presently there is acute power crisis in Chatra district and nearby area. In order tomeet the power requirement of Chatra region, JUSNL has completed the construction work of220/132/33 KV (2x150+2x50) MVA Grid Substation Chatra (Itkhori). This Grid have to be energized from 440/220/132 GSS, Latehar through 220 kV Chatra-Latehar Transmission line. The construction activity of 400/220/132 kV GSS, Latehar which is being done byM/s PGCIL through JCP Project is in progress but it will take time in completion.Hence, for early commissioning of Constructed 220/132/33 KV (2x150+2x50) MVAGrid Substation Chatra (Itkhori) JUSNL, it has been proposed for making connectivity from400/220/132 kV, Daltonganj of PGCIL through newly constructed 220 kV Chatra- Latehar Transmission Line & existing 220 kV Latehar- Daltonganj (PGCIL) Transmission line.

The schematic diagram for making connectivity as given below:



This is the temporary arrangement and after completion of 400/220/132 kV GSS, Latehar, Power will be feed as per approved plan/scheme.

After early commissioning of Chatra GSS, power may be extended to 132/33KV GSS at Chatra (Dhara) of JUSNL and power crisis in Chatra District and nearby villages can be resolved instantly.

Therefore, we request you to kindly approve the above arrangement, so that complete 220KV Daltonganj-Chatra transmission line and 220/132/33 KV GSS, Chatra can be energised and sufficient power can be transmitted to Chatra and nearby Grid Sub-Stations.

Members may discuss.

Deliberation in the meeting:

JUSNL representative submitted that 220/132/33kv GSS Chatra (JUSNL) is ready for charging and the said Sub-station is to be connected with 400/220/132 kV Latehar (under JCP project executed by PGCIL) which is under construction. He mentioned that due to non-readiness of the 400 kV Latehar S/s they are unable to charge the Chatra S/s. Further JUSNL representative requested the forum to give them permission for charging the Chatra S/s from 400/220/132kV S/s Daltonganj (PGCIL) by tapping the 220kV Daltonganj-Latehar (JUSNL) T/L for the time being taking into consideration the power crisis scenario.

In this context, Powergrid representative submitted that the progress of the work regarding construction of 400/220/132 kV Latehar has been at standstill since last 1.5 years because of fund issues.

JUSNL representative submitted that fund has been allocated by their Government recently and their Finance Wing would disburse the fund within a week.

After detailed discussion, OCC advised JUSNL to submit a complete proposal as follows:

1. *SLD /Sketch of the project with all the nearby existing and future sub-stations and lines along with modification required.*
2. *Details of the scheme which was approved in the ERPC-TP standing committee and the target date of commissioning.*
3. *Reason for their interim arrangement.*

OCC further opined that after getting the detailed proposal from JUSNL, a separate meeting would be convened to discuss the proposal for further course of action.

PART C: ITEMS FOR UPDATE

ITEM NO. C.1: ER Grid performance during May'2021

The average and maximum consumption of Eastern Region and Max/Min Demand (MW), Energy Export for the month May-2021 were as follows:

Average Consumption (MU)	Maximum Consumption (MU)/ Date	Maximum Demand (MW) Date/Time	Minimum Demand(MW) Date/Time	Schedule Export (MU)	Actual Export (MU)
426	497 23-05-2021	24347 MW, 23-05-2021 22:41 Hrs.	11348 MW, 27-05-2021 10:08 Hrs.	3396	3289

ERLDC may present performance of Eastern Regional Grid.

Deliberation in the meeting:

*The presentation on performance of Eastern Regional Grid during the month May'2021 is placed at **Annexure C1**. Members noted.*

ITEM NO. C.2: Performance of Primary frequency response of ER generating units

A meeting to discuss and deliberate on the performance of governor response of ISGS and IPPs generating power plants of the Eastern Region was organized by ERLDC on 31st May 2021. **Some of the major issues and important points deliberated during the meeting are as follows:**

1. It is observed that before the events some generating units were being run at more than maximum continuous rating (MCR). It reduced the margin available for primary frequency response. As a result, sufficient response could not be obtained during the events.
2. It was reported by units like NTPC Kahalgaon and Farakka that their boiler pressure correction loop is limiting the governor's response. ERLDC intimated that as per IEGC, any controller should not inhibit the governor RGMO/FGMO function and generating units if observes such issues should rectify the same without any delay.
3. During the meeting held on 23rd July 2020, all generating stations were strictly advised not to operate their units in valve wide open (VWO) mode as this reduces the margin for primary frequency response expected from the generators. During the deliberation, it has been observed that responses from some generating units are unsatisfactory because of running units in VWO mode. It was again informed by ERLDC during the meeting that running the unit continuously in valve wide open will be treated as a violation of IEGC and will be informed to ERPC forum and CERC.
4. Response of some generating units was satisfactory during testing. But sufficient response was not observed for those generating units during the events that occurred after the testing. ERLDC advised plants for implementing the necessary changes and fine-tuning in the governor setting as suggested by the testing agency.
5. It was informed that the tuning of the governor in generating plant is a continuous process and response to be checked for each event. Grid is changing from time to time with an increase in generation, load, and RE penetration. Therefore sudden frequency change detection has to be done at regular intervals.

6. It was intimated by ERLDC during previous meetings that as per CERC TCT 2019-2024 Clause 30.2.i & ii.
   i. "In case of a new project, the rate of return on equity shall be reduced by 1.00% for such period as may be decided by the Commission, if the generating station or transmission system is found to be declared under commercial operation without commissioning of any of the Restricted Governor Mode Operation (RGMO) or Free Governor Mode Operation (FGMO), data telemetry, communication system up to load dispatch centre or protection system based on the report submitted by the respective RLDC;"
   ii. in case of existing generating station, as and when any of the requirements under (i) above of this Regulation are found lacking based on the report submitted by the concerned RLDC, rate of return on equity shall be reduced by 1.00% for the period for which the deficiency continues;

It has further been elaborated that in case of insignificant improvement and persistent violation for governor response in line with IEGC regulations, ERLDC will send their report to CERC for taking suitable action in view of maintaining Indian power system reliability and security.

Based on the discussion, ERLDC advised all power plants:

1. Take all corrective actions as discussed during the meeting without any significant delays to improve their response.
2. Performing PFR test at earliest and check issues along with their timely resolution at earliest for adequate governor response their units.
3. Resolving issues related to RGMO logic tuning, pressure correction loop logic, optimal run of the power plant to keep the margin for primary response, valve wide open operation, running unit above MCR without keeping primary response.

Deliberation in the meeting:

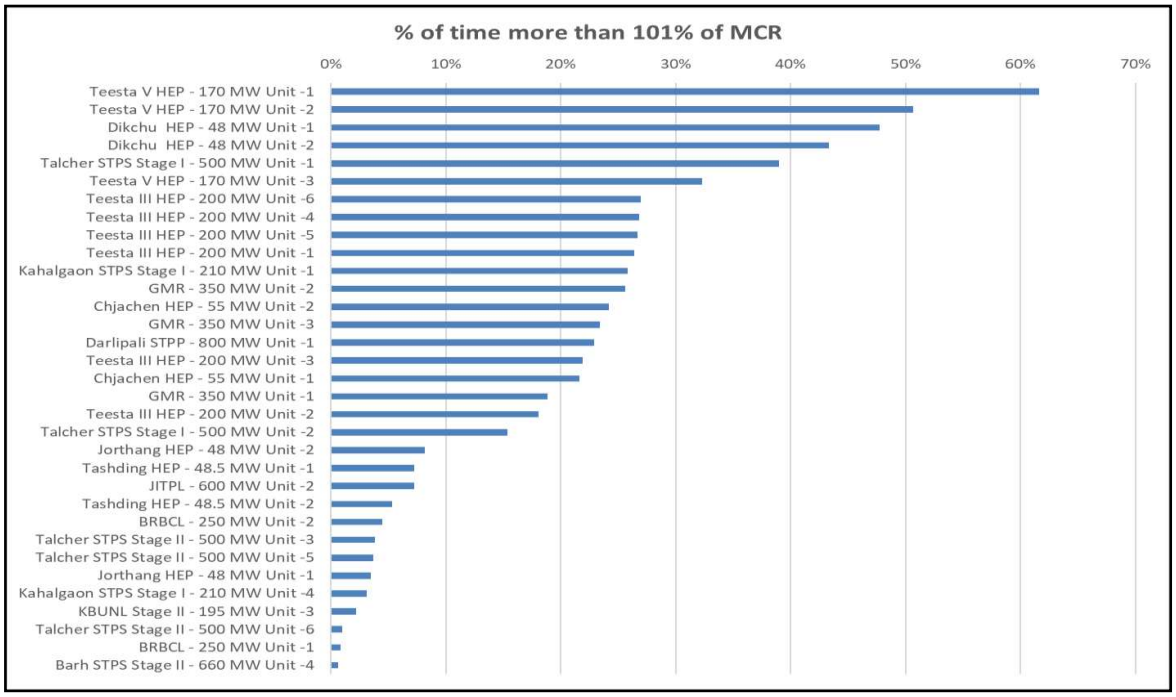
ERLDC representative informed that a meeting was convened on 31st May 2021 by ERLDC to discuss and deliberate on the performance of governor response of ISGS and IPPs generating power plants of the Region. He gave a brief presentation on the major issues and important points deliberated during the meeting. The minutes of the meeting is attached at ***Annexure-C2.***

OCC advised all the respective generators to comply with the requirements for satisfactory performance of the primary frequency response as discussed in the above meeting.

Members noted for compliance.

ITEM NO. C.3: Running Generating units at more than MCR

During meeting held on 31-05-2021 to discuss primary frequency response of ER generating units, it was learnt that generating units could not provide sufficient primary frequency response during the event of sudden frequency change as machines were being run at more than MCR or at VWO. As per IEGC section 5.2(h), generating units are not to run their units in VWO. During May 2021, instances of running units at more than MCR have been captured in ERLDC SCADA data. Generating units whose generation was more than 101% of MCR (1% measurement error of SCADA data is considered) has been shown in following chart.



In view of inability of generating units to deliver adequate primary frequency response during generation at more than MCR,

- Thermal generating units are advised not to run at VWO and sufficient margin for primary frequency response may be ensured to compliance of IEGC and CERC regulations of Terms and conditions of Tariff, 2019
- Hydro generating stations are advised not to run their generating units at more than MCR except at water spillage condition. During water spillage condition, ERLDC control room may be informed in advance so that extra precaution may be taken to ensure margin for primary frequency response at other generating units.

Members may note.

Deliberation in the meeting:

Respective members noted for compliance.

ITEM NO. C.4: Primary Frequency Response Testing of ISGS Generating Units

In 176th OCC Meeting, ERLDC informed that as per preliminary report received for units where PFR have been completed, the primary frequency response observed during testing were satisfactory.

In 177th OCC Meeting, ERLDC informed that information regarding testing schedule of JITPL & GMR has not been received.

OCC advised GMR & JITPL to share their schedule for PFR testing to ERLDC.

In the 178th OCC meeting, GMR updated that the PFR testing for their units have been scheduled

in the month of May'21 and the date of scheduling would be intimated shortly.

In the 179th OCC meeting, GMR updated that the PFR testing for their units have been scheduled in the month of May'21 but due to the prevailing pandemic situation and lockdown restriction it has been delayed. On query GMR further updated that, once confirmed, the next date would be intimated to the OCC forum. The status of the testing schedule for the generators is enclosed at **Annexure-C4**.

Generators may update.

Deliberation in the meeting:

ERLDC representative informed that as per communication received form GMR and JITPL PFR testing has been scheduled by Siemens in August'21.

MPL representative submitted that they would carry out the PFR testing in the month of July'21.

ITEM NO. C.5: Testing of Primary Frequency Response of State Generating units by third party agency.

In the 171stOCC Meeting, OCC advised all the SLDC's to prepare the action plan for their state generators and submit the details to ERPC and ERLDC at the earliest.

DVC vide-mail dated 6th Oct 2020 informed that the Primary Frequency Response Testing may be carried out for the following generating units:

Sl. No.	Name of the Units	Capacity (MW)
1	BTPS-A	500
2	CTPS Unit #7&8	2X250
3	DSTPS Unit#1&2	2X500
4	KTPS Unit # 1&2	2X500
5	MTPS Unit # 3 to 8	2 X 210 +2 X 250 + 2X 500
6	RTPS Unit # 1 & 2	2 X 600

DVC informed that both the agencies M/s Siemens & M/s Solvina have agreed to carry out the testing at pre-agreed rates, terms & conditions.

In the 176thOCC meeting, OPGC informed that they would finalize the order with Siemens by end of Feb'2021.SLDC, DVC informed that indent has been placed for PFR testing of their generating units.On request from WBPDCL, OCC advised ERLDC to share all relevant documents related to selection of the vendor for PFR Testing along with contact details of the vendors to West Bengal SLDC for further sharing by them with their state generators.

In 177thOCC Meeting, SLDC, Bihar informed that PFR testing for Barauni TPS would be completed by April '2021. OHPC informed that PFR testing is being planned to be carried out for units of Indravati & Rengali. OCC advised OHPC to submit a schedule for testing to ERLDC/ERPC secretariat.

OCC advised SLDC DVC, SLDC West Bengal & SLDC Jharkhand to coordinate with their generators and submit the schedule of PFR testing.

In the 178th OCC meeting**,** WBPDCL informed that they have received some of the relevant documents from SLDC West Bengal. Further they informed that they are collecting some other information to finalize the scope and purchase order for PFR testing.

DVC informed that the indent has been placed for PFR testing of generating units and the order would be placed tentatively in October'21.

In the 179th OCC meeting, WBPDCL submitted that they are in contact with Siemens in this regard and once they get any update, they would intimate the same in the next OCC meeting.

Members may update.

Deliberation in the meeting:

WBPDCL representative submitted that they are consulting with DVC Mejia and NTPC Farakka regarding this and informed that they would share the further update to ERPC and ERLDC.

SLDC Jharkhand representative informed that they had communicated with Tenughat, buy yet to get any update from them.

DVC representative informed that they had already placed the indent in the month of April'21. OCC advised DVC to give the update to ERPC and ERLDC.

OHPC representative submitted that PFR testing has been proposed for Rengali and Upper Indravati Stage-I. Accordingly, they have contacted M/s Solvina and are in process of placing order to them. He further informed that the work is expected to be completed by July'21.

ITEM NO. C.6: PSS tuning of Generators in Eastern Region.

The PSS tuning activity is mandatory in line with IEGC and CEA regulations. The Procedure of PSS tuning for helping utilities in getting this activity carried out has been approved in 171st OCC Meeting and shared with all concerned utilities.

In 177th OCC Meeting, DVC informed that PSS tuning of Unit#1 of Bokaro-A TPS had been completed.

WBSEDCL stated that the status of PSS tuning in PPSP units would be submitted shortly.

In the 178th OCC meeting, ERLDC informed that PSS tuning for APNRL units were carried out however it was not successful due to some technical issue at APNRL end.

It was informed that PSS tuning of Unit#4 of Mejia TPS of DVC had been completed on 07.04.2021.
In the 179th OCC meeting, on query ERLDC submitted that they are yet to receive update from APNRL and JITPL.

The updated schedule for PSS tuning of the units is attached at **Annexure-C6**.

Members may update.

Deliberation in the meeting:

ERLDC submitted that they are yet to receive any update from APNRL and JITPL.

ITEM NO. C.7: Status of UFRs healthiness installed in Eastern Region.

UFRs healthiness status has been received from West Bengal.

Members may update.

Deliberation in the meeting:

Bihar, West Bengal, CESC and DVC have submitted the UFR status.

Odisha representative submitted that they would provide the status by 23rd June'21.

Jharkhand representative submitted that they would submit the status at the earliest.

ITEM NO. C.8: Status of Islanding Schemes healthiness installed in Eastern Region.

In 108thOCC meeting, respective constituents agreed to certify that the islanding schemes under their control area are in service on monthly basis.

Details received from the constituents are as follows:

Sl. No	Name of Islanding Scheme	Confirmation from Generator Utility end	Confirmation from Transmission Utility end
1	CESC as a whole Islanding	Healthy	Healthy
2	BkTPS Islanding Scheme	Healthy	
3	Tata Power Islanding Scheme Haldia		
4	Chandrapura TPS Islanding Scheme, DVC	Not in service	
5	Farakka Islanding Scheme, NTPC	Not in service	
6	Bandel Islanding Scheme, WBPDCL		

Members may update.

Deliberation in the meeting:

OCC advised SLDC WB to co-ordinate with TATA power for getting the status of islanding healthiness of Tata Power Islanding Scheme Haldia.

ITEM NO. C.9: Transfer capability determination by the states.

Latest status of State ATC/TTC declared by states during the month of Sept-2021

Sl No	State/Utility	TTC (MW)		RM(MW)		ATC Import (MW)		Remark
		Import	Export	Import	Export	Import	Export	
1	BSPTCL	6075	--	122	--	5953	--	May-21
2	JUSNL	1577	--	52	--	1525	--	July-21
3	DVC	1728	3343	68	54	1660	3289	July-21
4	OPTCL	2767	1340	90	61	2677	1279	Aug-21
5	WBSETCL	5490	--	400	--	5090	--	Aug-21
6	Sikkim	315	--	2.44	--	315.56	--	Feb-21

Declaration of TTC/ATC on SLDC Website:

Sl. No	SLDC	Declared on Website	Website Link	Constraint Available on Website	Type of Website Link
1	BSPTCL	Yes	http://www.bsptcl.in/ViewATCTTCWeb.aspx?GL=12&PL=10	Yes	Static Link-Table
2	JUSNL	Yes	http://www.jusnl.in/pdf/download/ttc_atc_nov_2020.pdf	Yes	Static link –pdf file
3	DVC	Yes	https://application.dvc.gov.in/CLD/atcttcmenu.jsp#	Yes	Static Link-Word file
4	OPTCL	Yes	https://www.sldcorissa.org.in/TTC_ATC.aspx	Yes	Static Link-pdf file
5	WBSETCL	Yes	http://www.wbsldc.in/atc-ttc	No (Not updating)	Static Link-Table
6	Sikkim	No	https://power.sikkim.gov.in/atc-and-ttc	No (Not updating)	Static Link-Excel file

After collecting state ATC/TTC value from SLDCs, NLDC is publishing all value at a single location in their website; it is available under monthly ATC subsection of Market section. As some

of the states in Eastern Region are not declaring ATC/TTC on 3- Month ahead while few don't declare constraint, it becomes very difficult to publish the values uniformly for all the states in a timely manner.

A meeting with the state reliability coordinators was held on 22nd April for harmonizing the TTC declaration process and to remove all the gaps. Following that meeting, response is yet to be received from any of the states. All states are requested to comply with the TTC declaration requirement with highest priority.

Members may update.

Deliberation in the meeting:

SLDC Bihar representative submitted that they had sent the data up to August'21 and the same for the month of Sept'21 would be share within a week.

ERLDC representative informed that both DVC and Odisha had submitted data up to Sept'21.

ITEM NO. C.10: Mock Black start exercises in Eastern Region

Mock black start date for financial year 2021-22 is as follows:

Sl. No	Name of Hydro Station	Schedule	Tentative Date	Schedule	Tentative Date
		Test-I		Test-II	
1	U. Kolab	Last week of Oct 2021		Second Week of Feb 2022	
2	Balimela	Second week of Nov 2021		First Week of March 2022	
3	Rengali	Second week of Nov 2021		First 2eek of March 2022	
4	Burla	Second week of Nov 2021		First Week of March 2022	
5	U. Indravati	Last week of Oct 2021		Second Week of Feb 2022	
6	Maithon	Third Week of Nov 2021		First Week of March 2022	
7	TLDP-III	Second week of Nov 2021		Second Week of Feb 2022	
8	TLDP-IV	Third Week of Nov 2021		First Week of March 2022	
9	Subarnarekha	Second week of Nov 2021		Second Week of Feb 2022	
10	Teesta-V	Third Week of Nov 2020		Third Week of March 2022	
11	Chuzachen	Second week of Nov 2021		First Week of March 2022	
12	Teesta-III	Third Week of Nov 2021		First Week of March 2022	

13	Jorethang	Third Week of Nov 2021		First Week of March 2022	
14	Tasheding	Second week of Nov 2021		First Week of March 2022	
15	Dikchu	Second week of Nov 2021		Second Week of Feb 2022	

In the 179th OCC meeting, ERLDC submitted that Chuzachen had done the Mock Black Start on 9th April 2021.

Members may update.

Deliberation in the meeting:

ERLDC representative informed that they have not received any further update on Mock Black Start.

Odisha representative submitted that they have not started the Mock Black Start due to ongoing Covid-19 Vaccination drive.

ITEM NO. C.11: Updated Operating Procedure of Eastern Region, 2020

The Operating Procedure of every region must be updated and revised annually by the concerned RLDC, in compliance to section 5.1(f) of the IEGC.

To discuss the revised operating procedure of Eastern Region, one special meeting was held on 27-11-2020. Based on the deliberation in the meeting, operating procedure of Eastern Region has been revised and the final procedure was shared with all regional utilities vide mail dated 04-01-2021. The final procedure is also uploaded on the ERLDC website.

It is almost a year since the Operating Procedure has been put for approval. It is proposed to approve the same.

Members may update.

Deliberation in the meeting:

SE, (O) ERPC highlighted that the points raised by SLDC, West Bengal in their comments are mostly Intra-state matter and that is basically under WBSETCL control area.

All the comments submitted by West Bengal were discussed in detail and the final decision of OCC is as given below:

Clause no.	***Decision Taken***
5.5.6	*The issue is being taken care in the monthly Shutdown meetings of OCC.*
5.5.11	*The matter was discussed in the special meeting in detail. The decision of the meeting shall be followed.*

5.6.4	*The outage procedure as finalized in OCC shall be followed.*
5.6.7	*Existing procedure shall be followed.*
5.6.17	*The matter was discussed in the special meeting in detail. The decision of the meeting shall be followed.*
6.7.1.2	*FTC to ERLDC needs to be followed for 400kV and above Inter-state/Intra-state element or any line connected with ISTS node.* *However, necessary details for new elements connected to the intra-state system need to be submitted to OCC.*
7.4.4.3	*The matter was discussed in the special meeting in detail. The decision of the meeting shall be followed.*
2.3	*OCC opined that as this point is related to the real time conditions, thus the existing procedure should continue.*

In conclusion, OCC decided that the Operating Procedure as finalized in the Special meeting held on 27-11-2020 and succeeding OCC meetings shall be considered as final Operating Procedure of ER. Further, if there is any Intra-state issues arise due to its implementation; West Bengal can place it in OCC forum for deliberation and needful action.

ERLDC added that while finalizing of Operating Procedure we have already entered into the year 2021 therefore, the finalized Operating Procedure may be named as Operating Procedure for Eastern Region- 2021.

OCC agreed and advised ERLDC to publish the final Operating Procedure for Eastern Region – 2021 and share it with all the stakeholders of Eastern Region.

ITEM NO. C.12: LDC Excellence Award

Institution of "LDC Excellence Award" to recognize the exceptional work done by the Load Despatch Centres (LDCs) in the Indian Power Sector. Further , 1st LDC Excellence award would be presented in the 9th ICPS 2021 which is scheduled to be held at IIT Kharagpur during 16-18 December 2021. Notification of the Award by ICPS organising committee is notified at the official website of ICPS 2021, and can be accessed at the following link:

http://www.icps2021.iitkgp.ac.in/awards.html

In this regard, the respective LDC is requested to submit entries as per the nomination form detailed in the "Report on Selection Criteria and Sustainability Model for 'Load Despatch Centre (LDC) Excellence Award". The report/application format can be accessed at the following URL. (The application format is annexed in the pages 11-17 of the report)

https://forumofld.in/wp-content/uploads/2021/02/Final-Report_LDC-Excellence-Award_NPSC_ICPS_17-01-2021.pdf

The complete application may be submitted to the FOLD Secretariat from 01st March 2021 till 15th July 2021 at the fold@posoco.in .

Members may note.

Deliberation in the meeting:

OCC requested all LDCs to kindly participate and submit their nomination/entries as per the format given in the aforesaid link by the target date.

ITEM NO. C.13: Ensuring reliability of the transmission network and adhering to best operation and maintenance practice during ongoing pandemic.

NLDC vide letter dated 07th June 2021 on the above subject shared analysis of line faults for important transmission lines during the last 3 months. Where it was found that tripping of the lines taking place more during the mid-day i.e. hour of 1000hrs to 1600 Hrs when ambient temperature is high and vegetation may be a reason for such faults.

It was requested that concerned officials may please be advised to look into these issues and take necessary measures of preventive line maintenance/vegetation management and/or other best practices to enhance transmission system reliability. A copy of measures taken in this regard may please be shared with us as well.

Members may note.

Deliberation in the meeting:

ERLDC representative informed that they have not received any communication related to the aforesaid. He further added that all the utilities have already started their activities in this regard viz. Patrolling of the line, Vegetation management, checking of protection settings etc.

OCC advised all the utilities to make a Standard Procedure as per their current preventive measures adopted and past experience so that it can be followed up during maintenance of lines and sub-stations.

PART D: OPERATIONAL PLANNING

ITEM NO. D.1: Anticipated power supply position during July 2021

The abstract of peak demand (MW) vis-à-vis availability and energy requirement vis-à-vis availability (MU) for the month of July 2021 were prepared by ERPC Secretariat on the basis of LGBR for 2021-22 and feedback of constituents, keeping in view that the units are available for generation and expected load growth etc. is enclosed at **Annexure-D1**.

Members may update.

Deliberation in the meeting:

The updated anticipated power supply position for the month of July'2021 is placed at ***Annexure D1.***

ITEM NO. D.2: Shutdown proposal of transmission lines for the month of July'2021

The Shutdown proposals of the transmission lines for the month of July, 2021was discussed and finalized in the Shutdown meeting of Transmission line held on 15.06.2021.

Members may note.

Deliberation in the meeting:

Members noted.

ITEM NO. D.3: Shutdown proposal of generating units for the month of July' 2021.

Generator unit shutdown schedule for July' 2021 is given in the table.

Proposed Maintenance Schedule of Thermal Generating Units of ER during 2020-21 in the month of July'2021 (as finalised in LGBR meeting for 2020-21)

System	Station	Unit	Capacity (MW)	Period (as per LGBR 2020-21)		No.of Days	Reason
				From	To		
TUVNL	Tenughat TPS	1	210	10.07.2021	31.07.2021	22	R&M+OH
NTPC	FSTPS	6	500	01.07.2021	09.08.2021	40	Boiler+FGD+DeNOx
	KhSTPS	3	210	15.07.2021	13.08.2021	29	Boiler
	Darlipalli STPS	1	800	01.07.2021	12.07.2021	12	TG PG Test
	Nabinagar TPS	1	250	25.07.2021	08.09.2021	15	OH
KBUNL	KBUNL	3	195	01.07.2021	05.08.2021	36	LPT+Boiler
IPP	APNRL	1	270	05.07.2021	20.08.2021	46	AOH

Members may update.

Deliberation in the meeting:

NTPC Farakka representative submitted that due to Covid-19 pandemic the schedule got delayed and they want to take shutdown of Unit #1 from 15th July'21 and after completion of Unit #1 they would take shutdown of #Unit 6.

In this regard, both Bihar and West Bengal representatives raised their concern due to delay of this shutdown of NTPC units.

Bihar representative submitted that the above planned outages were agreed in LGBR meeting considering the availability of power from the upcoming generation capacity of NTPC (NPGC Unit#2, BARH Unit#1, and BTPS Unit #9) however, none of the Units have started supply of power to BSPHCL yet.

After detailed deliberation OCC advised NTPC to pre-pone the date of Farraka Unit #1 if possible, however, for Unit# 6OCC advised NTPC to place the proposal in respective OCC for further discussion.

NTPC representative ensured that shutdown of unit #1 would be taken after bringing the Unit #2 into service by 28th June'21.

DVC representative submitted that Koderma Unit #1which was earlier planned for shutdown from 21st May'21 could not be taken due to peak summer demand and requested for revised schedule from 15.07.2021 to 19.08.2021.

OCC advised DVC to mail the requisite details regarding the same to ERPC & ERLDC and accordingly it would be considered.

CESC SGCS requested for shutdown of Unit#1 from 15th July 21 to 19 July'21. OCC agreed.

The final list of maintenance schedule as approved by OCC is as given below:

Approved Maintenance Schedule of Thermal Generating Units of ER for the month of July'2021 (as approved in 180th OCC)

System	Station	Unit	Capacity (MW)	Period		No.of Days	Reason
				From	To		
NTPC	KhSTPS	3	210	01.07.2021	30.07.2021	29	Boiler
	Nabinagar TPS	1	250	25.07.2021	08.09.2021	45	OH
DVC	Koderma	1	500	15.07.2021	19.08.2021	35	COH
CESC	SGCS	1	67.5	15.07.2021	19.07.2021	4	Boiler OH

ITEM NO. D.4: Major Generating Units/Transmission Element outages/shutdown in ER Grid (as on 11.06.2021)

a) Thermal Generating Stations outage report:

Sl. No	Station	State	Agency	Unit No.	Capacity in Mw	Reason(s)	Outage Date
1	KOLAGHAT	WEST BENGAL	WBPDCL	1	210	ESP R & M	07-Jun-18
2	KOLAGHAT	WEST BENGAL	WBPDCL	2	210	ESP & Ash Handling R & M	26-Dec-19
3	BOKARO'B'	DVC	DVC	3	210	INITAILLY OUT DUE TO ASH PONDAGE PROBLEM UPTO 31/12/21. LATER OUT DUE TO POLLUTION CLERANCE ISSUE	21-Oct-20
4	BARAUNI TPS	BIHAR	BSPHCL	6	110	ABNORMAL TSI PARAMETER	17-Mar-21
5	BANDEL TPS	WEST BENGAL	WBPDCL	1	82.5	Furnace wall tube leakage	20-Apr-21
6	TENUGHAT	JHARKH AND	TVNL	1	210	Maintenance Work	24-Apr-21
7	KOLAGHAT	WEST BENGAL	WBPDCL	6	210	Low System Demand	02-May-21
8	BARAUNI TPS	BIHAR	BSPHCL	7	110	Low System Demand	18-May-21
9	MEJIA TPS	DVC	DVC	2	210	Low System Demand	25-May-21
10	DPL	WEST BENGAL	WBPDCL	8	250	Boiler Tube Leakage	31-May-21
11	KOLAGHAT	WEST BENGAL	WBPDCL	4	210	Low System Demand	06-06-2021
12	MEJIA TPS	DVC	DVC	6	250	Boiler Tube Leakage	10-06-2021
13	SAGARDIGHI	WEST BENGAL	WBPDCL	3	500	Maintenance Work	11-06-2021

All Generating stations are requested to update expected restoration time and reason outage to ERLDC/ERPC on weekly basis in case of any change at their end.

Generators/ constituents may to update the expected date of revival of the units.

b) Major Generating stations Out on Reserve Shutdown due to low system demand:

S.No	Station	State	Agency	Unit No.	Capacity in Mw	Reason(s)	Outage Date
1	KOLAGHAT	WEST BENGAL	WBPDCL	6	210	Low System Demand	02-May-21
2	BARAUNI TPS	BIHAR	BSPHCL	7	110	Low System Demand	18-May-21
3	MEJIA TPS	DVC	DVC	2	210	Low System Demand	25-May-21
4	KOLAGHAT	WEST	WBPDCL	4	210	Low System	06-Jun-21

		BENGAL				Demand	
5	KOLAGHAT	WEST BENGAL	WBPDCL	5	210	Low System Demand	12-Jun-21
6	MEJIA TPS	DVC	DVC	1	210	Low System Demand	14-Jun-21
7	RTPS	DVC	DVC	1	600	Low System Demand	12-Jun-21
8	Muzaffarpur-TPS	BIHAR	BSPHCL	1	110	Low System Demand	12-Jun-21

c) Hydro Unit Outage Report:

Sl. No.	Station	State	Agency	Unit No	Capacity	Reason(s)	Outage
1	BALIMELA HPS	ODISHA	OHPC	1	60	R & M WORK	05-Aug-2016
2	BALIMELA HPS	ODISHA	OHPC	2	60	R & M WORK	20-Nov-2017
3	BURLA HPS/HIRAKUD I	ODISHA	OHPC	5	37.5	R & M WORK	25-Oct-2016
4	BURLA HPS/HIRAKUD I	ODISHA	OHPC	6	37.5	R & M WORK	16-Oct-2015
5	BURLA HPS/HIRAKUD I	ODISHA	OHPC	7	37.5	ANNUAL MAINTENANCE	20-Jan-2020
6	BALIMELA HPS	ODISHA	OHPC	5	60	STATOR EARTH FAULT	13-Dec-2020
7	RENGALI HPS	ODISHA	OHPC	2	50	Heavy oil leakage in cylinder of first gate	20-Mar-2021
8	U.KOLAB	ODISHA	OHPC	2	80	TGB PAD VIBRATION HIGH	19-Mar-2021
9	CHIPLIMA HOS	ODISHA	OHPC	1	24	CLOSURE & DRYNESS OF POWER CHANNEL FROM HEAD REGULATOR TO CHIPLIMA PH	19-Jun-2021
10	CHIPLIMA HPS	ODISHA	OHPC	2	24	CLOSURE & DRYNESS OF POWER CHANNEL FROM HEAD REGULATOR TO CHIPLIMA PH	15-Jun-2021
11	CHIPLIMA HPS	ODISHA	OHPC	3	24	CLOSURE & DRYNESS OF POWER CHANNEL FROM HEAD REGULATOR TO CHIPLIMA PH	15-Jun-2021

It is seen that about 494.5 MW hydro capacities in Odisha is under forced outage / planned outage and therefore not available for providing the much needed peaking support during evening peak. SLDC / OHPC may please indicate restoration plan of the units.

d) Long outage report of transmission lines:

SL NO	Transmission Element / ICT	Agency	Outage DATE	Reasons for Outage
1.	400 KV IBEUL JHARSUGUDA D/C	IBEUL	29-04-2018	TOWER COLLAPSE AT LOC 44,45
2.	220/132 KV 100 MVA ICT I AT LALMATIA	FSTPP/JUSNL	22-01-2019	FAILURE OF HV SIDE BREAKER
3.	220 KV PANDIABILI - SAMANGARA D/C	OPTCL	03-05-2019	49 NOS OF TOWER COLLAPSED.AS REPORTED BY SLDC OPTCL, TOTAL 60 NOS OF TOWER IN BETWEEN 220KV PANDIABILI – SAMANGARA LINE IN WHICH 48 NOS TOWERS FULLY DAMAGED AND 12 NOS TOWERS PARTIALLY DAMAGED. WORK UNDER PROGRESS.PRESENTLY CHARGED FROM PANDIABILLI END (LOC 156) TO LOC 58
4.	220kV Barauni-Hajipur Ckt-1	BSPTCL	28-09-2019	TOWER COLLAPSE AT LOCATION 38 & 39. CKT-2 IS ON ERS SINCE 13.01.2020.
5.	220/132 KV 100 MVA ICT 3 at Chandil	JUSNL	30-04-2020	ICT BURST AND DAMAGED AFTER FIRE REPORTED
6.	220KV/132 KV 100 MVA ICT 4 AT RANGPO	PGCIL	08-04-2021	HAND TRIPPED AFTER TRIPPING OF ALL 400/220 ICTS AT RANGPO ON 8.4.21 AFTER DISTURBANCE AND THERAFTER DEVELOPED RELAY RESET PROBLEM
7.	400KV/220KV 315 MVA ICT 2 AT Meeramandali	OPTCL	21-02-2021	FIRE HAZARD
8.	400KV/220KV 315 MVA ICT 4 AT JEERAT	WBSETCL	09-04-2021	TRIPPED ON DIFFERENTIAL AND PRD PROTECTION PROTECTION OPTD, ICT. ICT CURRENTLY UNDER BREAKDOWN DUE TO BUSHING FAILURE.
9.	132KV MAIN BUS - 1 AT MOTIHARI	DMTCL	21-04-2021	BUS EXTENSION MODULE SF6 GAS PRESSURE LOW
10.	220 KV GODDA-LALMATIA D/C	JUSNL	21-04-2021	TOWER COLLAPSED AT LOC. NO. 4
11.	220KV-FSTPP-LALMATIA-1	JUSNL	21-04-2021	THREE TOWER COLLAPSED NEAR LALMATIA
12.	400/220KV 315 MVA ICT 1 AT RANGPO	PGCIL	13-05-2021	SF6 GAS LEAKAGE RECTIFICATION WORK IN 315MVA 400/220KV ICT-1 BAY-409 UPTO 17/06/21
13.	400KV-INDRAVATI(PG)-INDRAVATI(GR)-1	OPTCL	01-06-2021	CONTINUOUS SD UP TO 8TH JUNE FOR REPLACEMENT OF EQUIPMENTS UNDER PSDF SCHEME DUE TO LEAKAGE IN EXISTING TIE -2 CT AND LINE CVT AT INDRAVATI (GR)
14.	765KV-JHARSUGUDA-ANGUL-4	PGCIL	04-06-2021	VOLTAGE REGULATION
15.	400KV-BINAGURI-TALA-1	PGCIL	04-06-2021	BINAGURI: B-N, FC- 2.035 KA, FD-174.7 KM; TALA: B-N, FC- 1.12 KA, FD-85.4 KM; LATER TAKEN EMERGENCY S/D ON 07-06-21 10:07HRS TO ATTEND BURNT MARKS OBSERVED IN THE XLPE CABLE TERMINATIONS

16.	400KV-TALCHER-MERAMUNDALI-1	PGCIL	06-06-2021	UNDER CONTINOUS S/D UPTO 15.06.2021. LINE DIVERSION WORK FOR CONSTRUCTION OF RAILWAY TRACK BY RVNL FROM LOC:116 TO LOC:120.
17.	400KV-TALCHER-MERAMUNDALI-2	PGCIL	06-06-2021	UNDER CONTINOUS S/D UPTO 15.06.2021. LINE DIVERSION WORK FOR CONSTRUCTION OF RAILWAY TRACK BY RVNL FROM LOC:116 TO LOC:120.
18.	400KV/220KV 315 MVA ICT 2 AT DURGAPUR	PGCIL	08-06-2021	UNDER CONTINUOUS S/D UPTO 15.06.2021 FOR REPLACEMENT OF 01 NO 220 KV & 01 NO 52 KV BUSHING OF ICT.
19.	765 KV JHARSUGUDA-RAIPUR PS (DURG)-1	PGCIL	08-06-2021	VOLTAGE REGULATION
20.	400KV-LAPANGA-OPGC (IB THERMAL)-1	OPTCL	11-06-2021	LAPANGA: Z-1, R-PH, 2.37KM, IF=25.52KA; LINE IS UNDER PATROLLING

Transmission licensees/ Utilities are requested to update expected restoration date & work progress regarding restoration regularly to ERLDC/ERPC on monthly basis by 5th of each month so that status of restoration can be reviewed in OCC. Utilities are also requested to update outage of any elements within their substation premises like isolator/breaker to ERLDC/ERPC regularly. (Reported as per Clause 5.2(e) of IEGC)

Deliberation in the meeting:

OCC advised all the utilities to share the updated status, if any, to ERPC & ERLDC.

ITEM NO. D.5: Commissioning of new units and transmission elements in Eastern Grid in the month of May-2021

The details of new units/transmission elements commissioned in the month of May -2021 based on the inputs received from beneficiaries:

Monthly commissioning List of Transmission element and generators: May 2021					
SL NO	**Element Name**	**Owner**	**Charging Date**	**Charging Time**	**Remarks**
1	765KV TIE BAY OF (262 MVAR B/R-1 AND GT1) AT DARLIPALI (DSTPS)	NTPC DSTPP	08-05-2021	14:45	
2	220KV-SITAMARHI-MOTIPUR-1	BSPTCL	19-05-2021	12:28	Synchronized at Sitamarhi end.

Members may update.

Deliberation in the meeting:

OCC advised all the concerned utilities to submit the necessary details regarding the commissioning of any new intra-state elements to ERPC and ERLDC.

ITEM NO. D.6: UFR operation during the month of May 2021

Frequency profile for the month as follows:

Month	Max (Date/Time)	Min (Date/Time)	Less IEGC Band (%)	Within IEGC Band (%)	More IEGC Band (%)
May, 2021	50.28 Hz, 01-05-2021 18:02 Hrs.	49.63 Hz , 28-05-2021 22:39 Hrs	6.65	74.5	18.85

Hence, no report of operation of UFR has been received from any of the constituents.

Members may note.

Deliberation in the meeting:

Members noted.

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Annexure-B8

POWER SYSTEM DEVELOPMENT FUND

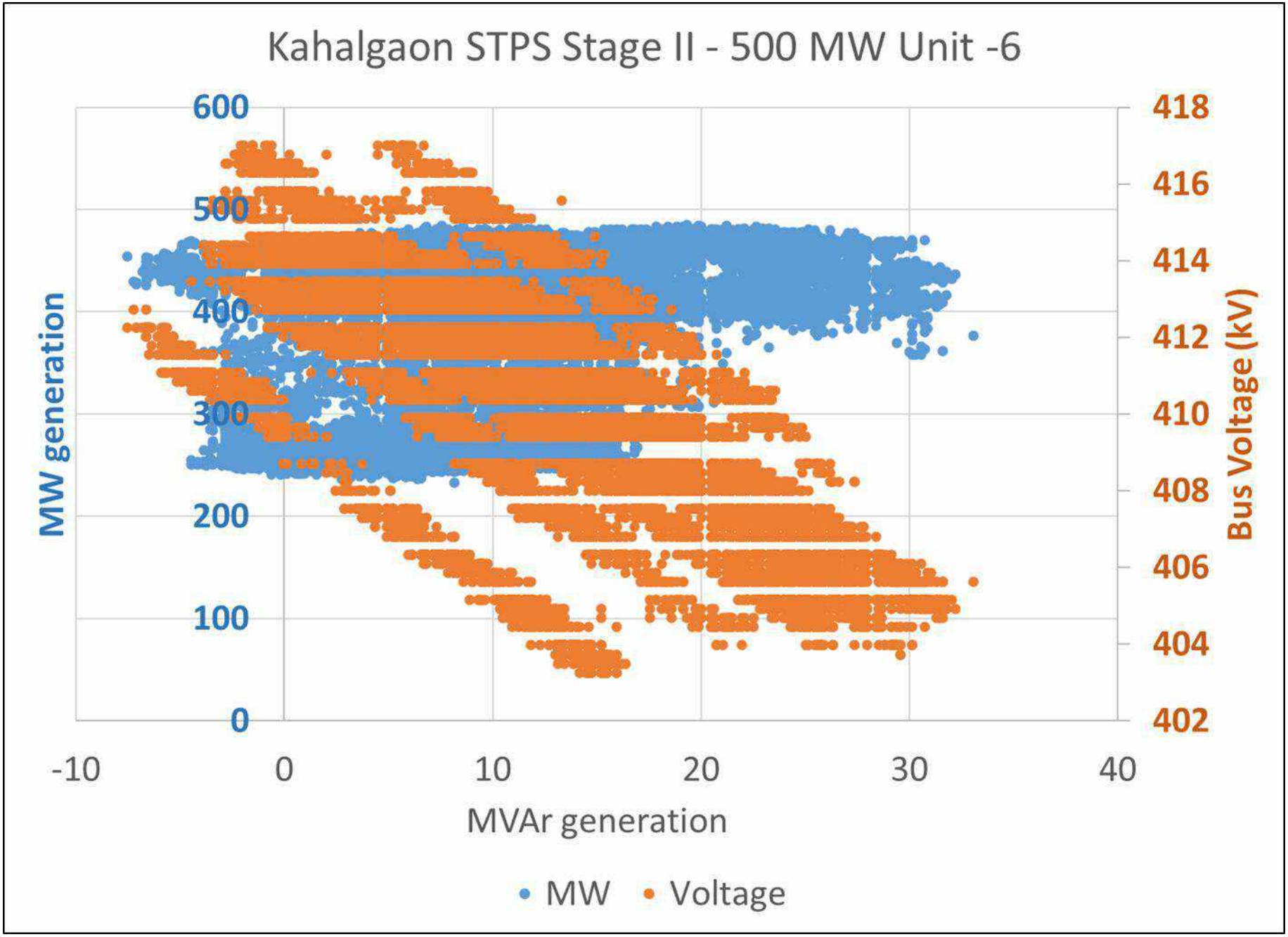
Status of the Projects in Eastern Region

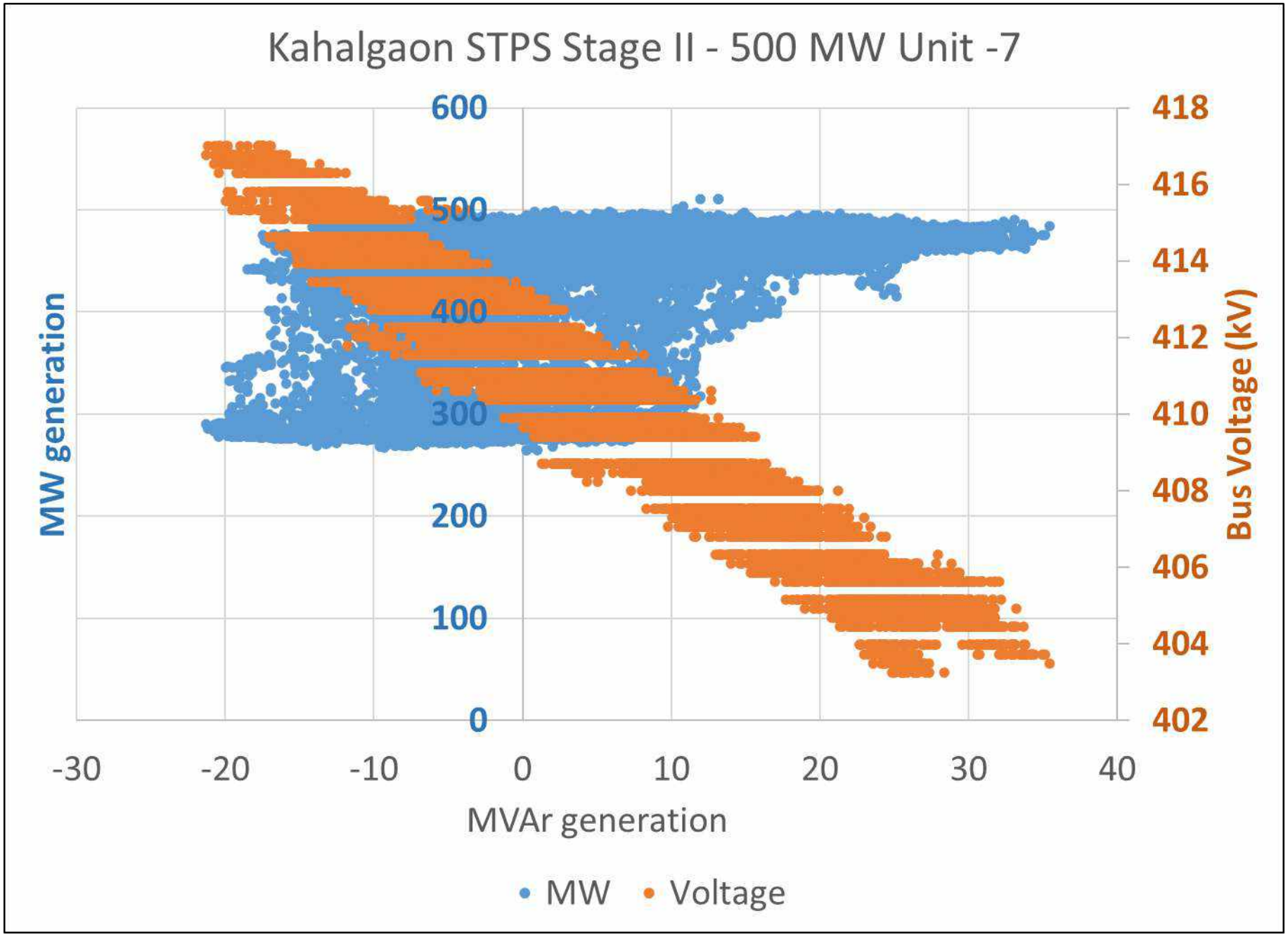
Sl No	State	Entity	Name of the scheme	Grant Approved	Grant sanctioned on	1st Installment grant released on	Completion Schedule	Completion schedule w.r.t date of 1st instalment	Grant aviled so far	Under process of release	Total awards amount of placed of till date	Latest status
1	Bihar	BSPTCL	Renovation and Upgradation of protection system of substations. (18)	64.22	42135	42506	24	43236	56.04		69.195	90% grant availed on award cost.
2			Installation of Capacitor bank in 20 Nos of Grid Sub Station. (74)	18.882	42618	43550	24	44281	16.99		21.55	
			Total	**83.10**					**73.03**		**90.745**	
5	Jharkhand	JUSNL	Renovation & Upradation of protection system of Jharkhnad. (161)	138.13	15-Nov-17	28-Mar-19	16	28-Jul-20	114.68	1.01	145.674	90% grant availed on award cost. Project closure is expected by Q-2 of 2021-22.
6			Reliable Communication & data acquisition system upto 132kV Substations ER. (177)	22.36	24-May-19		24					Price bid has been opened. Tender on awarding stage.
			Total	**160.49**					**114.68**		**145.674**	
7	Odisha	OPTCL	Renovation and Upgradation of protection system of substaions. (08)	162.50	11-May-15	22-Mar-16	24	22-Mar-18	46.04		63.31	Project Completed on Dec-20. Request for release of final 10 % fund has been placed.
8			Implementation of OPGW based reliable communication at 132 kv and above substations. (128)	25.61	15-Nov-17	29-Mar-19	36	29-Mar-22	23.04		51.22	90% grant availed on award cost.
9			Installation of 125 MVAR Bus Reactor along with construction of associated by each at 400kV Grid S/S of Mendhasal, Meramundali & New Duburi for VAR control & stabilisation of system voltage. (179)	27.23	27-Jul-18	1-Apr-19	18	1-Oct-20	8.17		8.166	30% grant availed
10			Implementation of Automatic Demand Management System (ADMS) in SLDC, Odisha. (196)	2.93	24-May-19	19-Feb-20	10	19-Dec-20	0.29		0.29	10% grant availed
11			Protection Upgradation and installation os Substation Automatic System (SAS) for seven nos of 220/132/33kV Substations (Balasore, Bidanasi, Budhipadar, Katapali, Narendrapur, New-Bolangir & Paradeep). (209)	36.63	24-May-19	13-Feb-20	18	13-Aug-21	8.87		8.87	30% grant availed
12		OHPCL	Renovation and Upgradation of protection and control system of OHPC. (109)	22.35	22-May-17	25-May-18	24	25-May-20	14.94		21.25	90% grant availed on award cost.
			Total	**277.25**					**101.35**		**153.106**	
14		WBSETCL	Installation of switchable reactor & shunt capacitor for voltage improvement. (88)	43.37	22-May-17	22-Jun-18	19	22-Jan-20	33.07		40.83	90% grant availed on award cost.
15			Renovation & Modernisation of Transmission System. (87)	70.13	22-May-17	25-Jun-18	25	25-Jul-20	63.12		96.44	
16			Installation of Bus Reactors at different 400kV Substation within the state of West Bengal for reactive power management of the Grid. (210)	71.74	24-May-19	23-Oct-19	19	23-May-21	39.3		45.62	30% grant availed on award cost.
17			Project for establishment of reliable communication and data acquisition at different substation at WBSWTCL. (222)	31.19	24-May-19	23-Oct-19	25	23-Nov-21	3.12			Expected to be completed by Jul'22.
18			Implementation of Integated system for Scheduling, Accounting, Metering and Settlement of Transactions (SAMAST) system in West Bengal. (197)	10.08	43910		12					10% grant not yet requested
19		WBPDCL	Renovation and Modernization of 220/ 132 kV STPS switch yard and implementation of Substaion Automation System. (72)	23.48	5-Sep-16	18-May-17	18	18-Nov-18	21.13		32.09	Target date for completion of project is Sept., 21 subject to availability of S/D & Covid scenario. Request for release for final 10% grant has been placed.
21			Renovation and Modernization of switchyard and related protection system of different power stations (BTPS, BKTPS and KTPS) of WBPDCL (155)	45.16	27-Jul-18	27-Mar-19	12	27-Mar-20	34.52		41.68	Target date for completion of project is Oct., 21 subject to availability of S/D & Covid scenario. 90% grant availed on award cost.
			Total	**295.15**					**194.26**		**256.661**	

POWER SYSTEM DEVELOPMENT FUND												
Status of the Projects in Eastern Region												
Sl No	**State**	**Entity**	**Name of the scheme**	**Grant Approved**	**Grant sanctioned on**	**1st Installment grant released on**	**Completion Schedule**	**Completion schedule w.r.t date of 1st instalment**	**Grant aviled so far**	**Under process of release**	**Total awards amount of placed of till date**	**Latest status**
22	DVC	DVC	Renovation and Upgradation of the protection and control system of Ramgarh Sub Station. (81)	25.96	2-Jan-17	31-May-17	24	31-May-19	22.95	2.57	28.603	90% grant availed on award cost.
23			Renovation and Modernization of control and protection system and replecement of equipment at Parulia, Durgapur, Kalyanewari, Giridhi Jamsedpur, Barjora, Burnpur, Dhanbad and Bundwan substation. (106)	140.50	16-May-17	14-Dec-17	24	14-Dec-19	102.34	3.29	126.87	
			Total	**166.46**					**125.29**		**155.473**	
24	Sikkim	ENPD, Sikkim	Drawing of optical ground wire (OPGW) cables on existing 132kV & 66kV transmission lines and integration of leftover substations with State Load Despatch Centre, Sikkim. (173)	10.00	24-May-19		18		3.00		20	30% grant availed on award cost
				10.00					**3.00**		**20.00**	
26	ERPC	ERPC	Creation and Maintenance of web based protection database management. (67)	20.00	17-Mar-16	28-Jun-16	18	28-Dec-17	14.83		16.48	Project Completed
27			Study Programme on power trading at NORD POOL Academy for Power System Engineers of Eastern Region. (122)	5.46	27-Jul-18	27-Mar-19	13	27-Apr-20	4.61		5.37	
28			Traning Program for Power system Engineers of various constituents of Eastern Region. (117)	0.61	27-Jul-18	11-Apr-19	24	11-Apr-21	0.54		0.60888	90% grant availed on award cost.
			Total	**26.07**					**19.98**		**22.45888**	
			GrandTotal	**1,018.53**					**631.59**		**844.12**	

MVAr absorption/injection performance of regional generating units during May 2021

Based on ERLDC SCADA data


Kahalgaon STPS Stage II - 500 MW Unit -6
MW generation
600
500
400
300
200
100
0
Bus Voltage (kV)
418
416
414
412
410
408
406
404
402
-10
0
10
20
30
40
MVAr generation
MW
Voltage


Kahalgaon STPS Stage II - 500 MW Unit -7
MW generation
Bus Voltage (kV)
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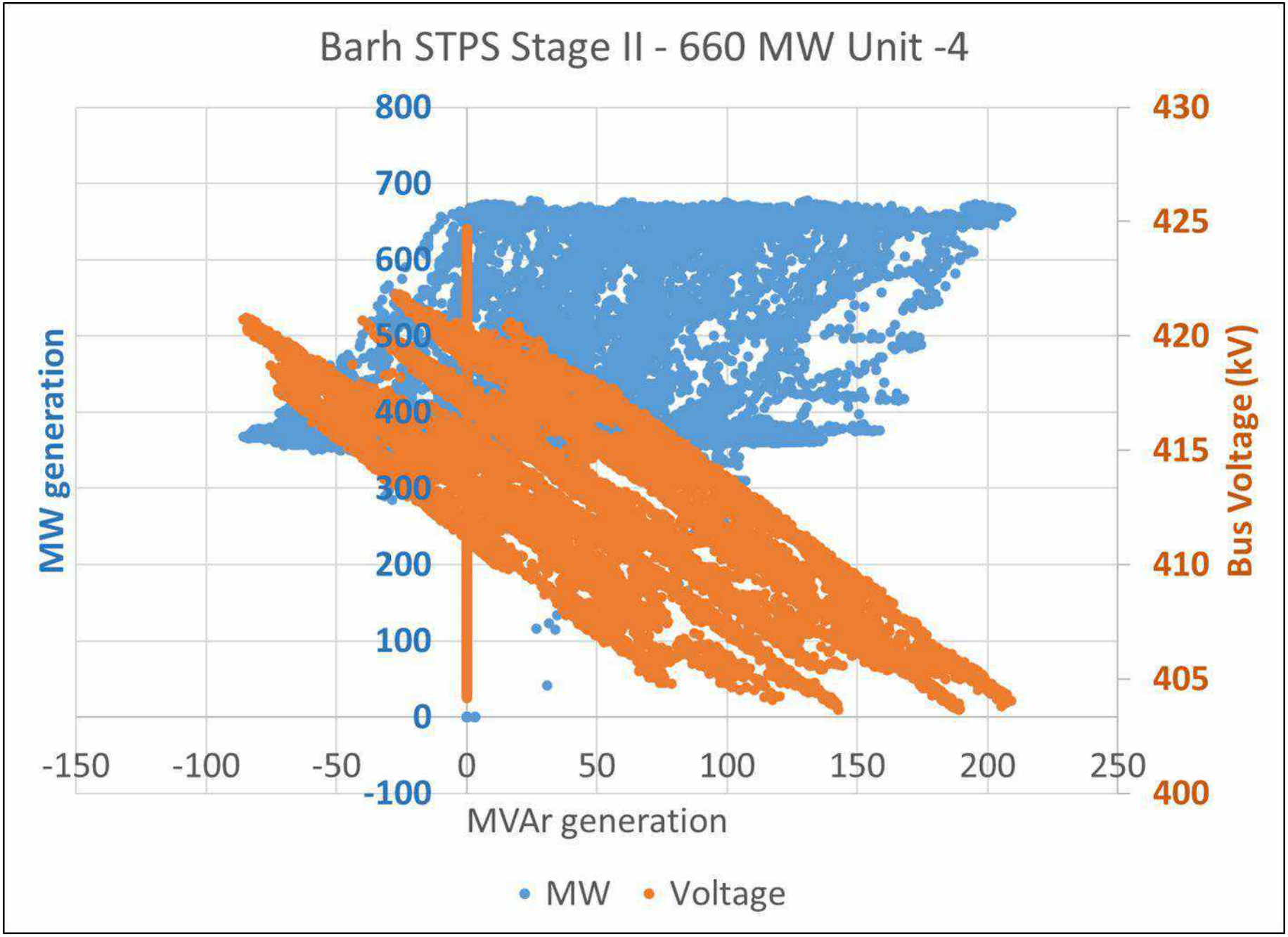
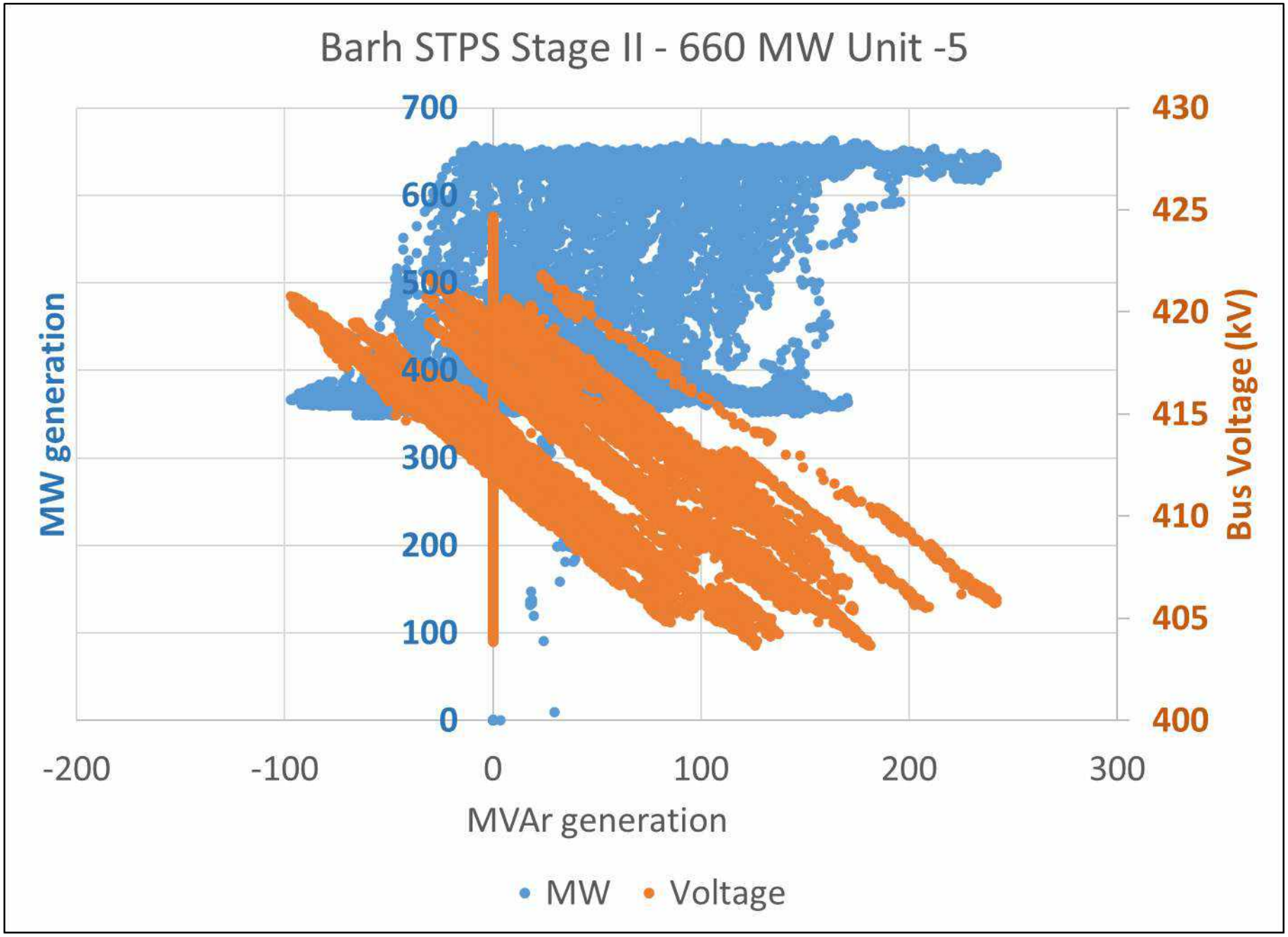
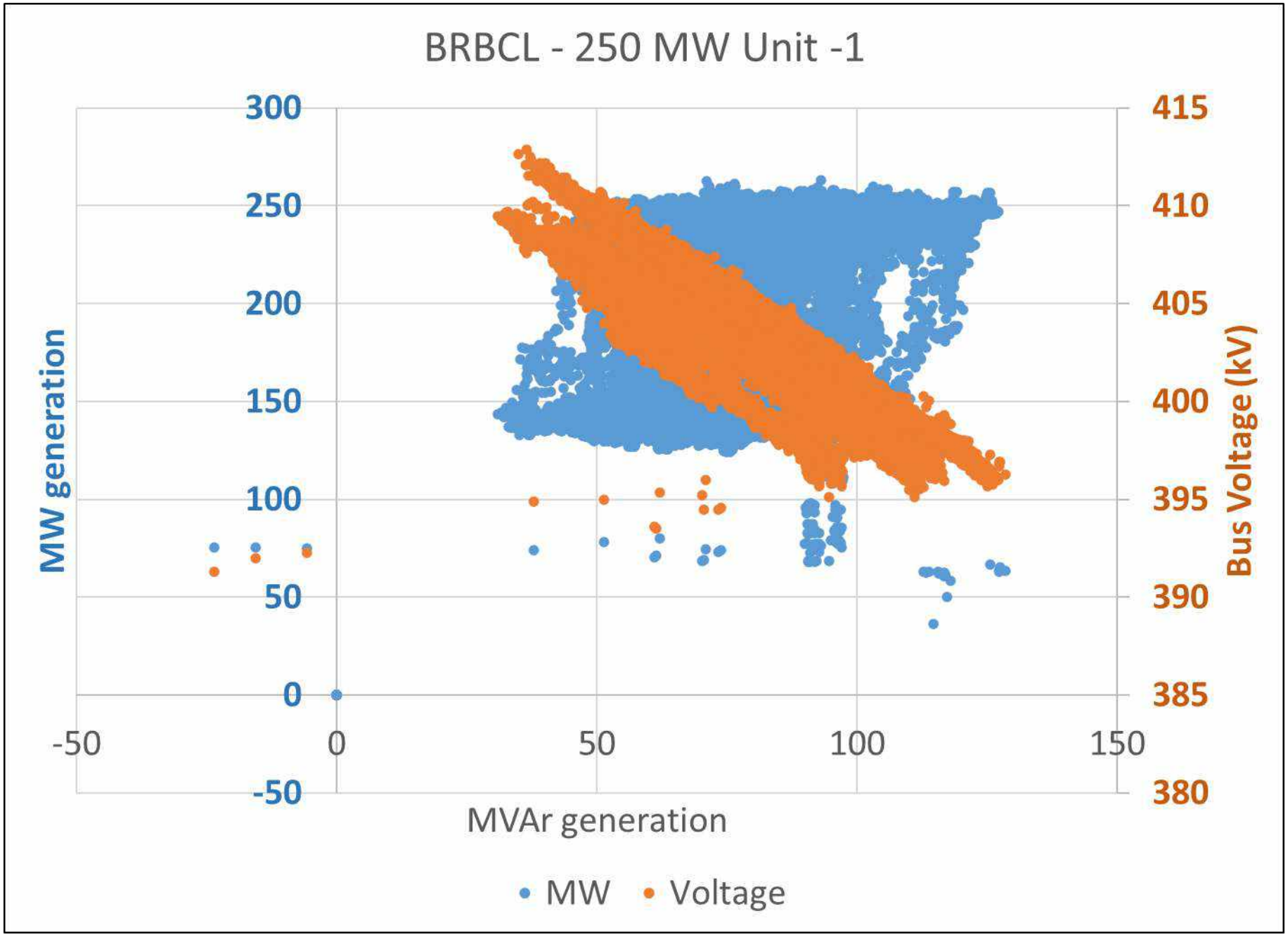
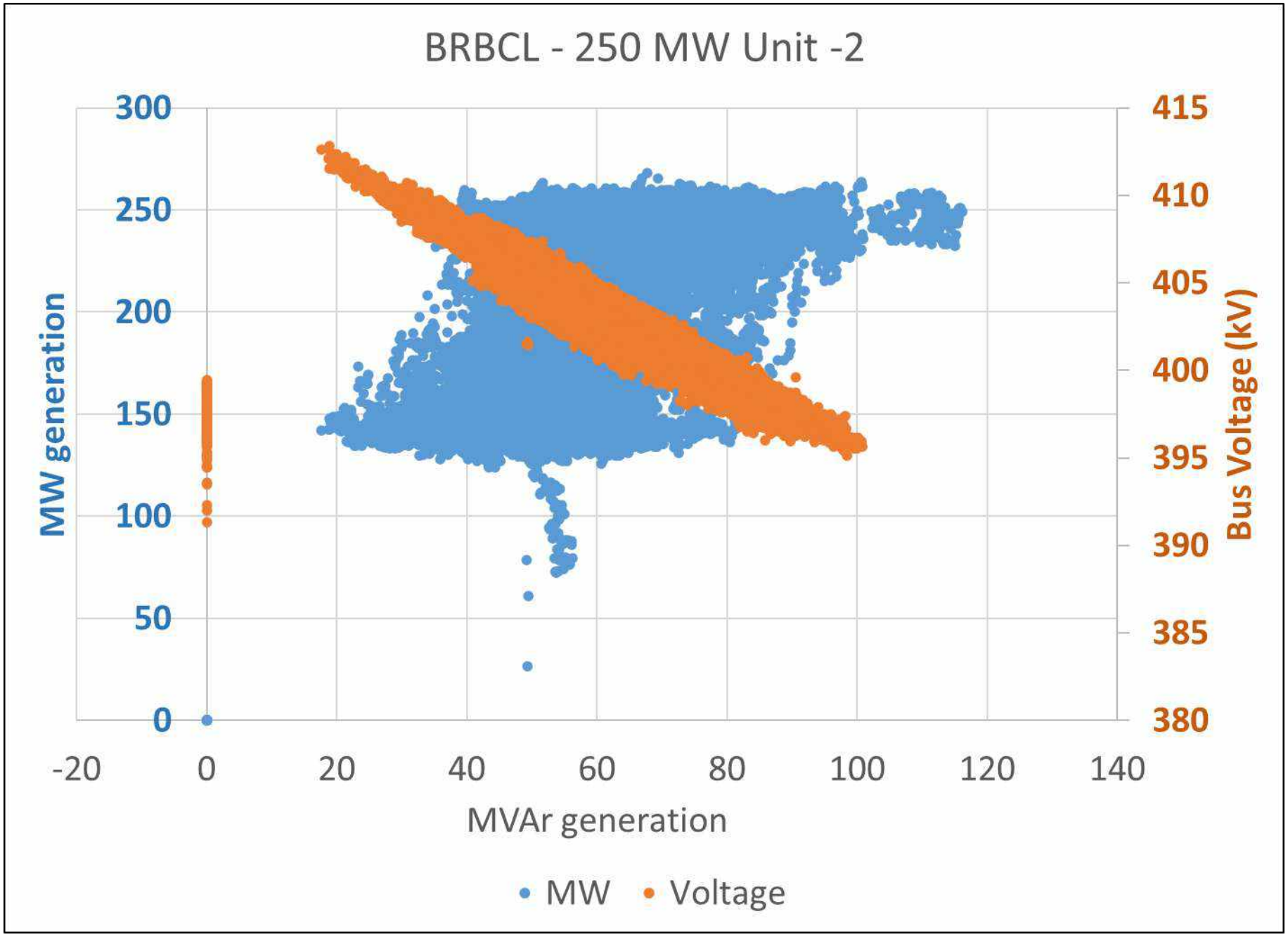
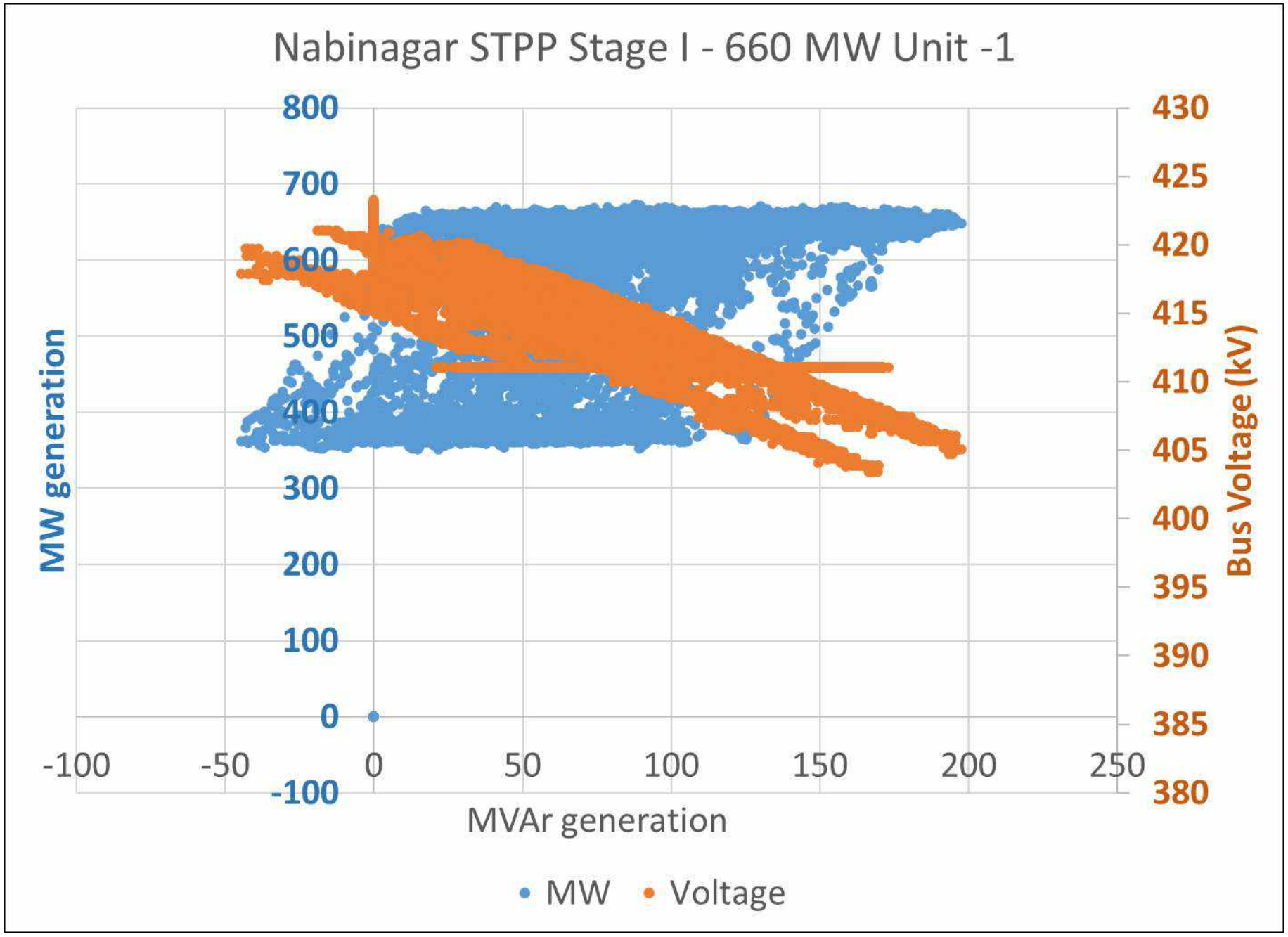
500
400
300
200
100
0
418
416
414
412
410
408
406
404
402
-30
-20
-10
0
10
20
30
40
MVAr generation
MW
Voltage

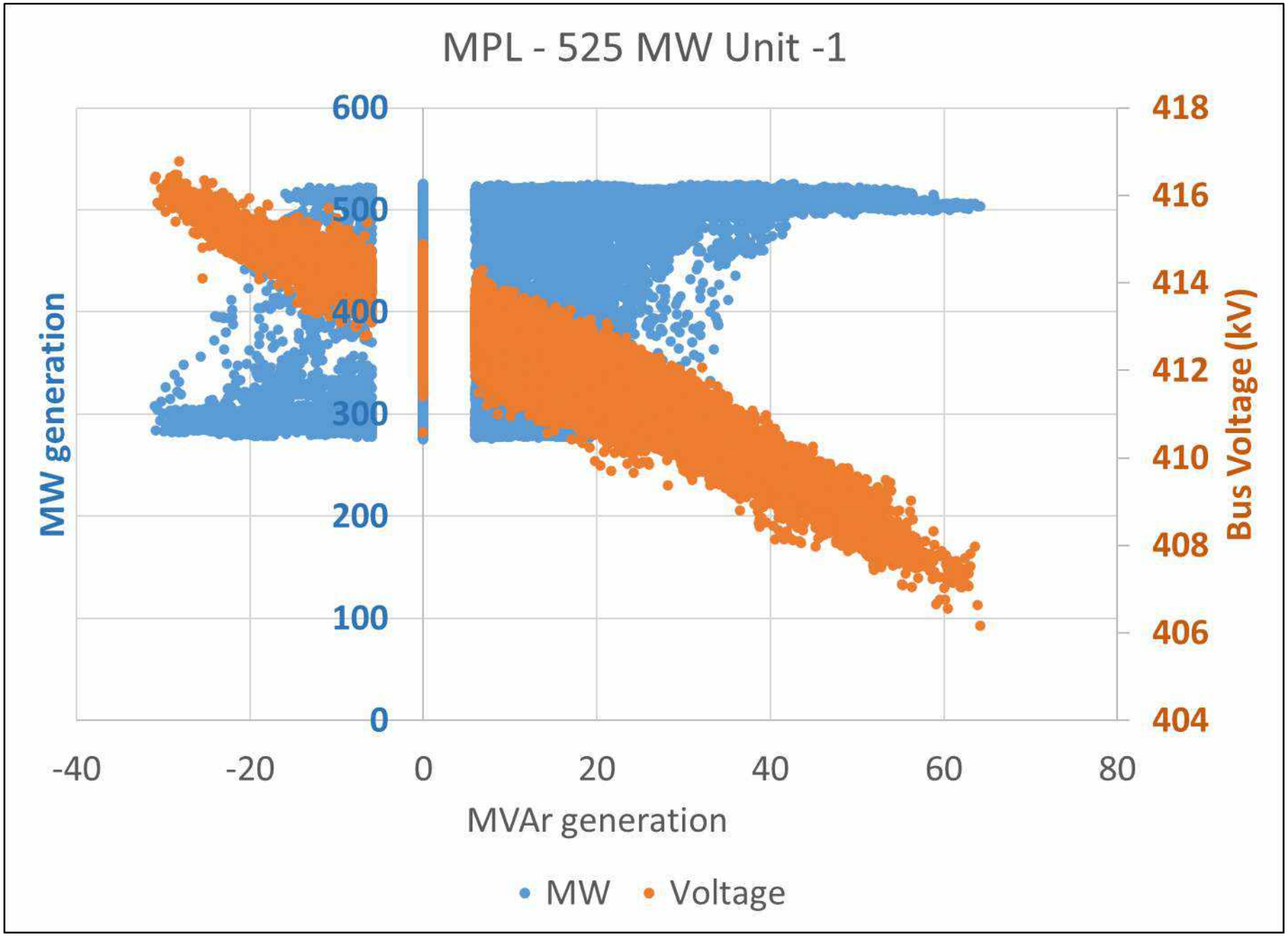

Barh STPS Stage II - 660 MW Unit -4
MW generation
Bus Voltage (kV)
MVAr generation
800
700
600
500
400
300
200
100
0
-100
430
425
420
415
410
405
400
-150
-100
-50
0
50
100
150
200
250
MW
Voltage

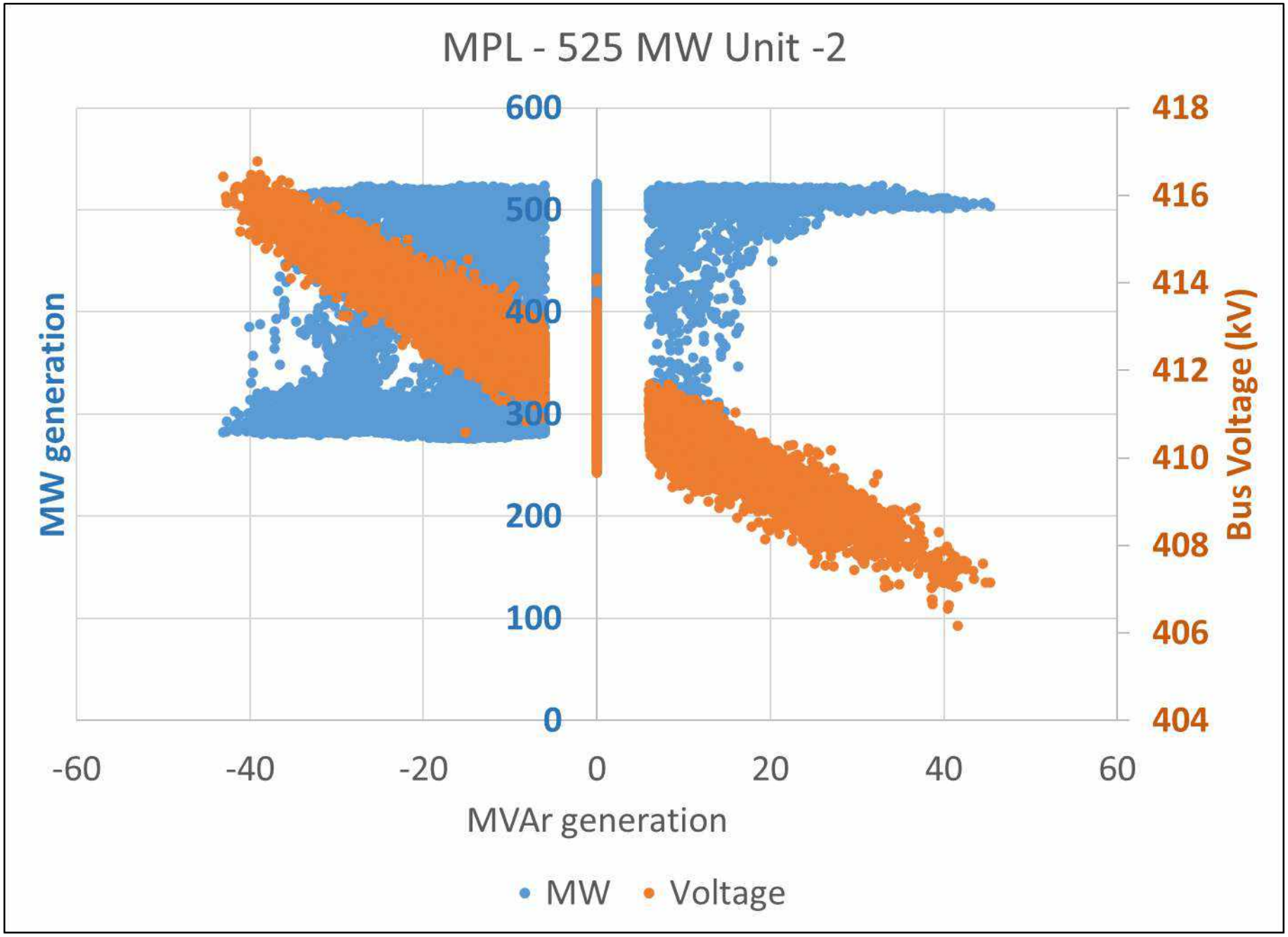

Barh STPS Stage II - 660 MW Unit -5
MW generation
Bus Voltage (kV)
700
600
500
400
300
200
100
0
430
425
420
415
410
405
400
-200
-100
0
100
200
300
MVAr generation
MW
Voltage

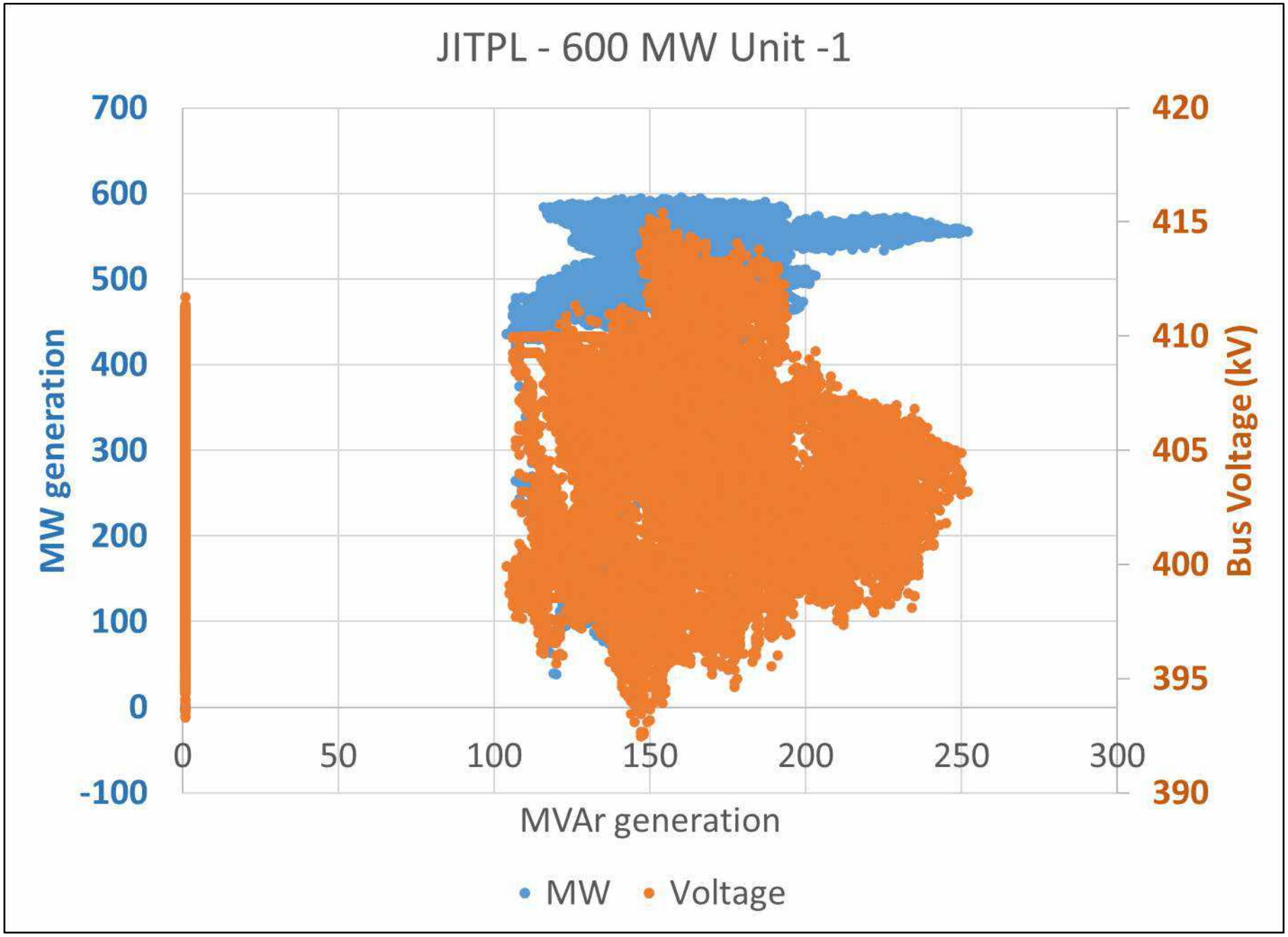

BRBCL - 250 MW Unit -1
MW generation
Bus Voltage (kV)
300
250
200
150
100
50
0
-50
415
410
405
400
395
390
385
380
-50
0
50
100
150
MVAr generation
MW
Voltage

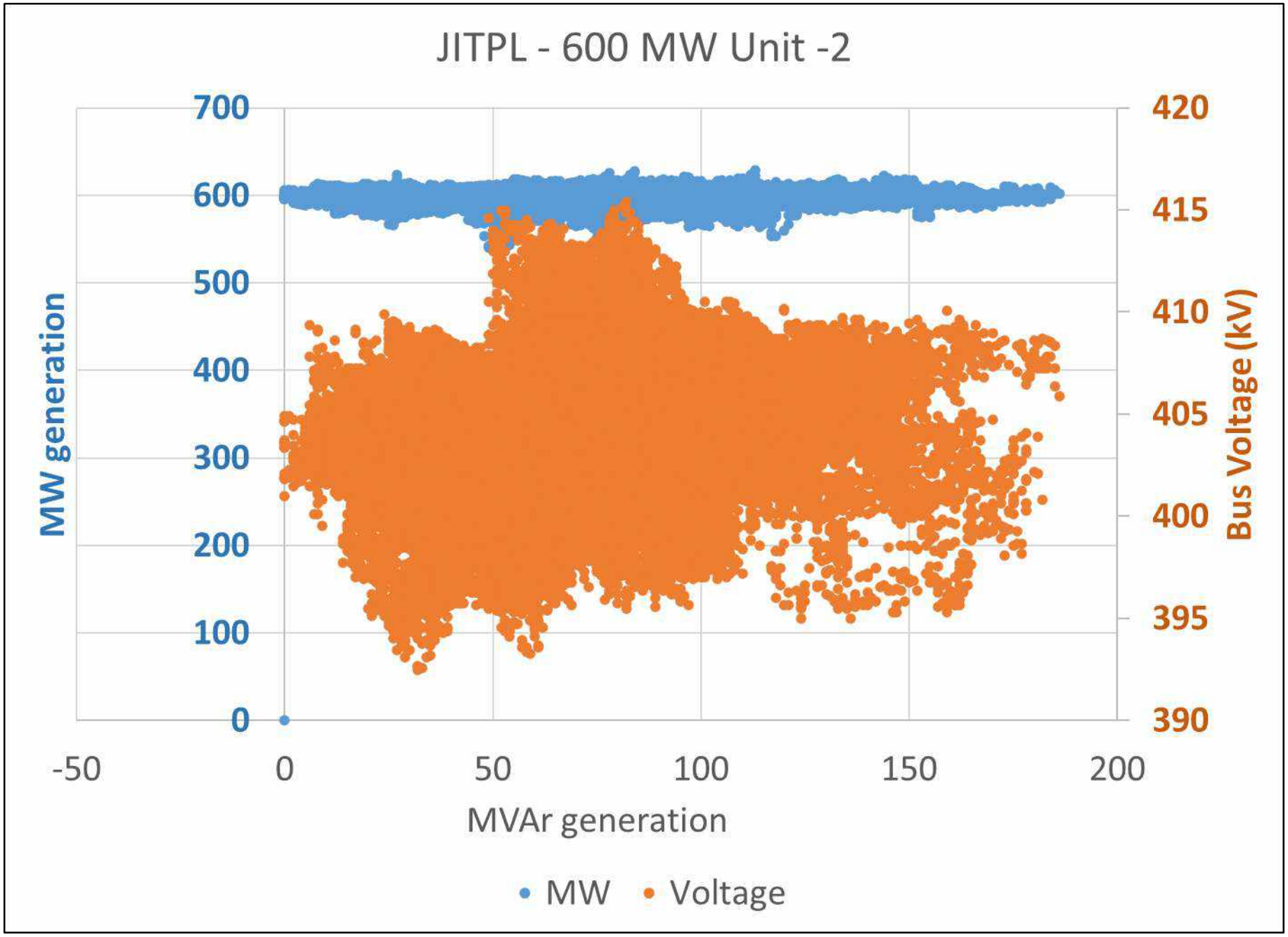

BRBCL - 250 MW Unit -2
MW generation
Bus Voltage (kV)
300
250
200
150
100
50
0
415
410
405
400
395
390
385
380
-20
0
20
40
60
80
100
120
140
MVAr generation
MW
Voltage


Nabinagar STPP Stage I - 660 MW Unit -1
MW generation
800
700
600
500
400
300
200
100
0
-100
Bus Voltage (kV)
430
425
420
415
410
405
400
395
390
385
380
-100
-50
0
50
100
150
200
250
MVAr generation
MW
Voltage


MPL - 525 MW Unit -1
MW generation
600
500
400
300
200
100
0
Bus Voltage (kV)
418
416
414
412
410
408
406
404
-40
-20
0
20
40
60
80
MVAr generation
MW
Voltage


MPL - 525 MW Unit -2
MW generation
Bus Voltage (kV)
600
500
400
300
200
100
0
418
416
414
412
410
408
406
404
-60
-40
-20
0
20
40
60
MVAr generation
MW
Voltage


JITPL - 600 MW Unit -1
700
600
500
400
300
200
100
0
-100
MW generation
420
415
410
405
400
395
390
Bus Voltage (kV)
0
50
100
150
200
250
300
MVAr generation
MW
Voltage


JITPL - 600 MW Unit -2
MW generation
Bus Voltage (kV)
700
600
500
400
300
200
100
0
420
415
410
405
400
395
390
-50
0
50
100
150
200
MVAr generation
MW
Voltage

Standard Operating Procedure for Islanding Schemes

1. Design Protocol:

i. As per Clause 10 of the Central Electricity Authority (Grid Standards), Regulations, 2010: *"Islanding Schemes.- (1) The **Regional Power Committees** shall prepare Islanding schemes for separation of systems with a view to save healthy system from total collapse in case of grid disturbance. (2) The Entities shall ensure proper implementation of the Schemes referred to in subregulation (1)."*

ii. As per Indian Electricity Grid code amended from to time ,all regional constituents shall ensure that the islanding schemes are always functional.

iii. Islanding Schemes for survival of some predefined generations and loads at the time of grid disturbance may be designed to avoid total blackout and quicker restoration of failed grid.

iv. Islanding schemes may also be designed for major cities having loads of VIP areas, Defence, Space, Airport, Metro, ports and important industries etc.

v. Ministry of Defence may be consulted to include their defense loads in such Islanding schemes.

vi. In case MoD requests any of their locations for which Islanding schemes is to be designed, the same would be considered. Only thosedefence establishments may be included in the Islanding Schemes for which MoD is agreed.

vii. The Ministry of Defence/Dept. of Military Affairs shall furnish information regarding their requirements as per format given at **Annexure I**.

viii. The Essential loads falling under an Islanding schemes may be taken under consideration while designing Islanding schemes. Generally the essential loads are classified into two categories (i) Super critical Load and (ii) Critical loads. The super Critical load may cover the loads of Defence load, Raj Bhawan, Parliament house, residence of VIPs, Metro rails. The Critical loads may consist of loads of hospitals, Airport, Railways, Important Industries etc falling under the area covered in Islanding schemes.

ix. All the Islanding scheme may coverthe critical and super critical load of the major city in consultation with the DISCOMs/SLDC and MoD.

x. All the existing islanding scheme may be reviewed to include the Defence load in the scheme.

xi. Defence load of small capacity (2 MW) not falling under any major cities may be continued with their arrangement of backup supply.

xii. The existing Islanding Scheme shall be reviewed periodically/seasonally to identify the constraints in them. Load-generation balance in Islanding Scheme may change based on season, there would be need to review the scheme on seasonal basis. Such review should also capture network changes taking place in the interim period. The constraints/change, if any, identified shall be rectified in a time bound manner.

xiii. If there is a need to establish a power plant in / around such a city for the purpose, the proposal for the same may be submitted for consideration of the MoP. Possibility of installation of storage system at such location may also be explored.

xiv. Generating Stations, which are spatially near to strategic and essential loads, shall be given priority in designing the Islanding schemes.

xv. The cyber security in the power system for Islanding schemes must be ensured and in accordance with the guidelines issued by Government of India.

xvi. Sufficient gaps should be maintained between frequency band of normal operation, frequency band for pre-islanding defense mechanism and trigger frequencies of islanding schemes.

xvii. In every islanding scheme, adequate automated mechanism should be implemented for achieving load generation balance in the islanded sub-system. Also, for frequency control of islanded subsystem there should be sufficient number/capacity of generating units in the island on free/restricted governor mode of operation.

xviii. Also, load connection/ disconnection should be remotely from the dispatch centre of the islanded sub-system. Health of all facilities required in the islanding scheme should be closely monitored so as keep at the necessary electrical, mechanical, electronics and communication systems in good health all the time.

xix. Islanding schemes should generally be implemented for only those sub-parts of network which connect to rest of grid in an electrically radial manner or with only a few interconnecting lines and having their own load generation balance to a large extent, requiring comparatively smaller exchanges with rest of the grid.

xx. Islanding schemes should not be taken as a system for continued supply to important loads. Necessary arrangement for emergency supply to important critical loads must be made separately.

xxi. Frequency of Island formation may be 47.9 Hz. Islanding scheme could be a **two-tier scheme**. At frequency level of say 47.9 Hz, signal for formation of islands comprising of more than one generating stations along with pre-identified load could be initiated. However, if after the formation of island, frequency continues to fall further to say 47.7 Hz, these islands could be further broken into smaller islands comprising of single generating station with pre-identified loads.

xxii. Islanding Schemes are to be formed with anticipated load-generation balance and with tripping of predetermined feeders/ ICTs/ generators.

xxiii. Islanded system should preferably have 20% excess generation than load.

xxiv. Islanding scheme should preferably have a good mix of Thermal–Hydro–Gas based generation.

xxv. Islanding schemes involving only hydro generation is generally not recommended due to wide variation in hydro generation from season to season and during peak/off-peak hours of day.

xxvi. AUFR &df/dt Loads are not be considered in the Island since they would have given their load relief as per their frequency setting much before formation of Islanding commences at 47.9 Hz.

xxvii. Lift Irrigation & Pumped Loads are not to be considered in the Island due to their uncertain nature, and should be tripped at a suitable frequency, say, 48.5 Hz, much before the formation of Islanding commences at 47.9 Hz.

xxviii. Wind/ solar generating stations, because of their uncertain nature, shall not form part of Islanding Scheme; hence incoming wind/ solar feeders to the substation are to be tripped at Islanding Frequency of 47.9 Hz..

xxix. Load flow studies are to be carried out for verifying the operation of the Islanded system.

xxx. All generation shall go to House-Load in the unavoidable eventuality of unsuccessful formation of Island.

xxxi. If the frequency rises above 52 Hz even after FGMO/RGMO operation (due to non-availability of anticipated loads at the time of separation), high-frequency time-graded tripping of generators is to be carried out.

2. Monitoring of Vital Parameters:

Since formation of Island can take place at any time, monitoring of the following vital parameters, which have a significant role in on successful Island formation, is of paramount interest:

- Anticipated/ actual Generation within the electrical boundary of the Island
- Anticipated/ actual Load within the electrical boundary of the Island
- Voltage, Frequency & Power Flows along the peripheral lines which are required to be tripped to form the Island

Above parameters are to be monitored in real-time basis in the Control Room/ Despatch Centre (i.e Sub SLDCs/SLDC/RLDC/NLDC)of the area by creating a dedicated page specific to the Islanding Scheme in the SCADA display. To accomplish this, provision should also be made, if

required, for installing adequate measuring instruments (like PMU's) at suitable locations within the Island.

3. Certification of Healthiness of Islanding Scheme:

Since healthiness of an integrated system depends on the healthiness of its constituting components, healthiness of Islanding Scheme has to be ascertained/ ensured by seeking monthly certificate for healthiness of batteries, installed at all Substations located within the electrical boundary of the Islanding Scheme (esp. those at the boundary).

The idea is since these battery banks provide power supply to Relays, RTUs and PLCC equipment, healthiness of the former is critical to operation of the latter when called for.

It is to confirm the healthiness of islanding schemes by participating Generators as well as concerned transmission utilities for their respective portion in the monthly OCC meeting.

The data in the following formats may be submitted by STU/Discomsetc to RPCson monthly basis to certify the healthiness of Islanding Schemes.

Format for Generating Station		
Name of Islanding Scheme	**Healthiness of Islanding Relay**	**Healthiness of Communication channel**

Format for Transmission Utility/Discoms				
Name of Islanding Scheme	**Name of Feeders considered for tripping to from Island**	**For communication based tripping logic of feeders**	**For UFR based tripping logic of feeders**	
		Healthiness of Communication channel	**Healthiness of PT Fuse and status of DC supply to UFR relay***	**Healthiness of Relay#**

* Where dedicated UFR relay have been installed for tripping of the feeders under islanding scheme

Where UFR function have been enabled within backup protection relay of the line

The following format may be used to get Relay details of the Islanding scheme:

Description	A) UFRs (for load relief)	B) df/dt (for load relief)	C) Relay for Island creation

Relay location (S/s name)			
Relay make & model			
Frequency setting of the relay (at which load shedding is envisaged)			
Feeder name (voltage level and source-destination name) signalled by the Islanding Relay for separation /load shedding/separation from outside grid			
Quantum of load relief due to tripping of feeder (as per state's peak of previous year)			
Quantum of load (Min, Avg, Max in MW) on the feeder (as per state's peak of previous year)			

4. Coordination Activities:

This is proposed to be achieved by having a Nodal Officer for each participating Utility in the Island [i.e., those who own assets (Generating stations, substations, transmission lines, distribution lines, etc.) within the Island), and a Chief Nodal Officer from the concerned Despatch/ Control Centre. The Chief Nodal Officer from LDC and Utility-specific Nodal Officers ensure free flow of information among them w.r.t. Islanding Scheme Operational status, and ensure correct & prompt communication between the SCADA Control Centre and various stations (Generating Stations/ Substations (esp. those at Island boundary).

An updated list of contact details of all Nodal Officers as mentioned above shall be maintained with LDC & all Utilities involved.

The Details of officials as mentioned above may be obtained in the following format:

S/s Name	Name	Designation	Organization	Email ID	Mobile No.

5. Sensitization Training of Officers involved:

Even though chances of Island formation in a strongly integrated grid are remote, since the Islanding schemes are designed to protect major critical loads/ sensitive generation in the unfortunate event of failing of all other defence mechanisms, The Nodal Officers & concerned field staff associated with O& M of various stations (gen. stations as well as substations) within the electrical boundary of the Island should be sufficiently sensitized about the colossal loss of those critical assets on account of Island failure, and consequent disruption to various sectors & businesses.

To ensure this, apart from conducting periodic orientation training programmes, the concerned Officers/ staff should also be involved in the activities concerning management of grid under stressed conditions, SCADA control, communication upkeep, and in the activities relating to audit/ inspection of critical loads & sensitive stations within the Island.

6. Periodic Inspection/ Audit of Essential Components:

Inspection/ audit of all essential components as given below shall be carried out regularly (by third party) and inspection/Audit report may be submitted to respective RPCs:

- Under Frequency Relays (UFR's) on Island forming elements (Lines & ICTs) - Quarterly
- Associated communication equipment at all stations within Island - Bi-monthly

7. Review Plan of Islanding Schemes:

Considering the fact that Network Changes (additions/ deletions/ reconfigurations of transmission elements & generators) in an evolving grid such as Indian electrical grid are unavoidable/ inevitable, it is but necessary to review the Islanding scheme operation w.r.t. prevailing grid conditions at regular intervals, and incorporate requisite changes so as to make them reliable & dependable.

In such review, all details as used in the existing scheme have to be re-collected including the new changes for studying the modifications to be carried out in the In-service Island. These details, among others, include participating generators, anticipated generation, participating loads, anticipated load, elements (lines and/ or ICT's) to be tripped to form the modified Island, geographical map & SLD of the modified Island, AUFR load relief, df/dt load relief, pumped loads details, etc. Using these details, system studies also need to be carried out to verify stability (including voltage profile & line loadings profile) of the modified Island.

It is recommended to carry out above review of the In-Service Islanding scheme once in six months by all concerned utilities.

8. Identification of Short-comings & Remedial action:

Based on the shortcomings noticed as a result of the activities performed in monitoring of vital parameters of the Island, ascertaining healthiness of Island, carrying out periodic inspection/ audit of essential components of the Island, prompt remedial action shall be taken to redress the observed deficiencies. The period of redressal from the instant of noticing shortcomings shall be at most one week/ fortnight. The compliance report may be submitted to RPCs in this regard.

9. Post Islanding survival:

In every islanding scheme, adequate automated mechanism should be implemented for achieving load generation balance in the islanded sub-system. Also, for frequency control of islanded subsystem there should be sufficient number/capacity of generating units in the island on restricted/ free governor mode of operation. Also, load connection/ disconnection should be possible remotely from the dispatch centre of the islanded sub-system. Health of all facilities in the islanding scheme should be closely monitored so as keep necessary electrical, mechanical, electronics and communication systems in good health all the time.

10. SOP Template for Islanding Schemes is at Annexure-II

*****

Annexure –I

MINISTRY OF POWER
CENTRAL ELECTRICITY AUTHORITY

Details of information to be furnished by Defence installations for the purpose of designing the Electrical Islanding schemes:

Item No.	Description	Details
1	**Basic Details:**	
1.1	Service: Army/Navy/Airforce/MES etc.	
1.2	Name of the Establishment	
1.3	Location (State, District, Taluk & Village)	
1.4	Name of the nearest City & Distance from it	
2.	**Power Supply Details:**	
2.1	Name of the DISCOM (Power Supply Distribution Company) from which supply is being availed:	
2.2	Name of the DISCOM Substation from which supply is being availed:	
2.3	Number of incoming lines/feedersof supply and Voltage level	
3	**Load Details:**	
3.1	Contracted Capacity in kVA/MVA	
3.2	Maximum Demand in kVA/ MVA	
3.3	Connected Load in kW/MW	
3.4	Critical Load(kW/MW)/ Non Critical Load(kw/MW)	
3.5	Any other information on Load details	
4	**Backup Power Supply:**	
4.1	Details of DG sets: (Number of DG sets & their Rating in kVA/MVA & No. of hours they can run/sustain)	
4.2	Battery Banks/ UPS Rating:	
4.3	In-house Solar Generation in kW/MW	
4.4	Captive Generation, if any, in kW/ MW	
5	**Specific Requirement from Ministry of Power, CEA/RPCs, NLDC, RLDC, ST, SLDC and Discomswrt uninterrupted power supply to Defence installation**	
6	**Other Relevant Information, if any**	

Annexure -II

SOP Template for Islanding Schemes

1. Purpose
2. Design
    i. Generation
        a. Coal
        b. Gas
        c. Nuclear
        d. Hydro
        e. Solar
        f. Wind
        g. Total generation
        h. PLF or availability /scheduling
        i. Generation considered
        j. Generators on prolonged outage
        k. Probability of the anticipated generation
        l. Pumped storage?
        m. ISGS
        n. SGS
        o. IPP/MPP
    ii. Load
        a. Drinking water
        b. Irrigation
        c. Agriculture
        d. Industrial
        e. Commercial
        f. Domestic
        g. Hospital
        h. Railways/Metro
        i. Defence
        j. Lift Irrigation System/Scheme
    iii. Load relief
        a. df/dt-I
        b. df/dt-II
        c. AUFR-I
        d. AUFR-II
        e. AUFR-III
        f. AUFR-IV
    iv. Transmission lines in the islanded area
        a. 765 kV
        b. 400 kV
        c. 220/230 kV
        d. 132/110 kV
        e. 66 kV
        f. 11/22/33 kV
        g. Inter regional lines
        h. Inter-state lines
        i. Intra-state lines oSubstations in the area
        j. CTU
        k. STU
        l. ISTS

v. Transmission lines that get disconnected on operation of df/dt and AUF relays
   - 220/230 kV
   - 132/110 kV
   - 66 kV
   - 11/22/33 kV

vi. Transmission lines to be tripped for forming Island
   a. 765 kV
   b. 400 kV
   c. 220/230 kV
   d. 132/110 kV
   e. 66 kV
   f. 11/22/33 kV

vii. Name of the cities covered
   a. 10 million
   b. 1 million
   c. Defence locations

viii. Diagrams
   a. SLD map of the island
   b. Geographical map of the island with boundary
   c. Major cities/critical loads/defence loads marked
   d. Substations marked

3. SCADA mapping

   Island generation and island loads on the SCADA display

4. Constraints
   a. Generation limits
   b. Line loading limits
   c. ICT loading limits oFrequency set points
   d. df/dt-I
   e. df/dt-II
   f. AUFR-I
   g. AUFR-II
   h. AUFR-III
   i. AUFR-IV
   j. LIS relief frequency
   k. RE generation disconnection frequency
   l. Islanding frequency

5. Controlling generation in islanded area
   a. AGC
   b. RGMO/FGMO

i. Controlling load in islanded area
   a. Automatic
   b. Flow based
   c. Voltage based
   d. Frequency based
   e. Manual

ii. Validation check list
   - Generation > Load?
   - Non-Hydro only islanding?
   - Less number of disconnecting lines?
   - All disconnecting lines with AUFR?

- RE-solar/wind excluded?
- LIS loads excluded?
- LF studies for islanded area, converging?
- In the converged LF studies, line loadings profile & voltage profile are within permissible lmits?
- All critical load/defence loads included?
- Critical/defence loads are not part of SPS, df/dt or AUFR schemes?
- Islanding frequency - (47.9 Hz)?
- Adequate margin between lower frequency of IEGC band and first stage AUFR?
- Adequate margin between islanding frequency and AUFR last stage?
- Scheme was discussed & approved in OCC/ PCC?
- Scheme approved in RPC?

50.2		
50.1		
50.05		
50		IEGC band
49.9		
49.8		
49.7		Urgent load mgmt
49.6		
49.5		
49.4		emergency Load mgmt
49.3		
49.2		
49.1		
49		UFR load shedding
48.9		
48.8		
48.7		
48.6		
48.5		
48.4		
48.3		
48.2		

48.1		
48		
47.9		Islanding frequencies
47.8		

**** Above values are subject to change as per newly adopted frequency settings in NPC*

6. Operation
   i. Successful
      - Generation in the islanded area
      - Load in the islanded area
      - Date & time island formation
      - Date & time of island closed/shutdown
      - Frequency of the islanded area
      - Voltage profile of the buses
      - Flows/ Loadings on critical lines
      - Duration of island survival
      - Whether anticipated generation was there?
      - Whether anticipated load was there?
      - All the lines were disconnected as per the plan?
      - Reason for islanding success
      - Any measures to further improve

   ii. Failure
      a. Generation in the islanded area
      b. Load in the islanded area
      c. Date & time island formation
      d. Date & time of island closed/shutdown
      e. Duration of island survival
      f. Whether anticipated generation was there?
      g. Whether anticipated load was there?
      h. All the lines were disconnected as per the plan?
      i. Reason for islanding failure
      j. Remedial measures
7. Review plan
   i. Island formed and approved date
   ii. Change in generation
      - Addition
      - Deletion
      - Alteration

   iii. Change in load
      a. Addition
      b. Deletion
      c. Alteration

   iv. Change of the lines to be disconnected
   v. Any new lines to be included for disconnecting
   vi. Requirement of additional df/dt& AUFR relays

8. Nodal officers of Islanding Scheme
   i. RLDC

ii. SLDC
iii. STU
iv. SGS
v. ISGS
vi. ISTS (SR-I, SR-II)

9. Sensitization Training of nodal officers
    i. Training by RLDC
    ii. Training by NPTI/PSTI
    iii. Training by SLDC
    iv. SRPC special meetings

10. Periodic Inspection of Essential components of Islanding Scheme
    - Inspection of UF relays of disconnecting lines
    - Ensuring adequate relief under df/dt and AUFR stages
    - Ensuring relays for disconnecting RE sources
    - Ensuring relays for disconnecting LIS
    - Ensuring critical/defence loads are not under df/dt& AUFR stages
    - Monitoring the anticipated generation and load in the islanded area

11. Mock drill
    i. Mock drill to follow any major or near miss incidents
    ii. Frequent heavy over drawl by states
    iii. Frequent Very low frequency of operation
    iv. Before peak period of the region
    v. Before peak period of the state
    vi. Loss of many lines due to cyclone/weather
    vii. Loss of generating plants due to cyclone/weather
    viii. RE is highest and entirely absorbed by states

12. Certifications of healthiness of IS
    i. Batteries
    ii. Relays
    iii. Lines within the islanded area

13. Identifications of short comings

14. Further updations

सं. 22-1306/37/2020-ओएम
भारत सरकार
Government of India
विद्युत् मंत्रालय
Ministry of Power
श्रम शक्ति भवन, रफ़ी मार्ग, नयी दिल्ली-110 001
Shram Shakti Bhawan, Rafi Marg, New Delhi-110 001

Dated 16th June, 2021

To
The Chairperson
Central Electricity Authority,
Sewa Bhawan, R.K. Puram,
New Delhi-110066

Subject: Standard Operating Procedure (SOP) for the Islanding Schemes - reg.

Sir/Madam,

I am directed to refer to CEA's e-mail dated 16.05.2021 on the subject mentioned above, whereunder the draft SOP for Islanding Schemes was forwarded to Ministry of Power for approval.

2. The comments/observations of the Ministry on the draft SOP are annexed. It is requested that the comments/observations be suitably incorporated in the draft SOP and the revised SOP be sent to the Ministry urgently.

Encl: as above

Yours faithfully,

(Rita Singh)
Under Secretary to the Govt. of India
Telefax: 23717737
Email:opmonitor-power@nic.in

Copy to:

1. Ms. Rishika Sharan, Chief Engineer (National Power Committee), Central Electricity Authority, Sewa Bhawan, R.K. Puram, New Delhi-110066

Observations of the Ministry on Standard Operating Procedure (SOP)

(a) **Point xiii** under the heading "Design Protocol" says, "If there is need to establish a power plant in/around such a city for the purpose, the proposal may be submitted for consideration of the MoP. Possibility of installation of storage system at such location may also be explored." As many important cities may not have adequate capacity of generating stations required for load balancing in the islanding area, this provision may lead to flurry of requests to MoP to establish power plants. I believe the primary responsibility of successful run of islanding scheme lies with the concerned state. Therefore, the request for establishing new power plant should be placed with the state concerned under intimation to MoP. Further, this provision may be suitably qualified for extremely sensitive loads only.

(b) **Point xxviii** under the heading "Design Protocol" says, "Wind/solar generating stations, because of their uncertain nature, shall not form part of islanding scheme; hence incoming wind/solar feeders to the substation are to be tripped at Islanding frequency of 47.9 Hz". In this regard it is all right to not take into account wind/solar stations as far as load balancing is concerned in the islanding area. However, at the time of islanding, if solar/wind generators are available, it may help in balancing the load and therefore, tripping of solar/wind feeders necessarily at islanding doesn't seem appropriate. If at the time to islanding, there is need to cut down generation, the solar/wind generation may be the first ones to be disconnected.

(c) Under the heading "Design Protocol" there are 31 sub points. Some issues are repeated across several points. This "Design Protocol" part can be made more concise.

(d) Formats for collection of various information can all be numbered and kept as annexures.

(e) Roles and responsibilities of identified officers, may be by designation, and training protocols may be included in the SoP.

(f) A model islanding scheme, one of the better available islanding schemes, may be enclosed for ease of reference.

Annexure-1.3

Information needed for Islanding Scheme

1) Name of the Islanding Scheme (better available):
2) Brief Working/design of the above Islanding Scheme (with SLD and other details .
3) Other Data Required in respect of the above IS

i. Format (I)

Format (I) for Generating Station			
S.NO	Name of Islanding Scheme	Healthiness of Islanding Relay	Healthiness of Communication channel

ii. Format (II)

Format (II) for Transmission Utility/Discoms					
S.NO	Name of Islanding Scheme	Name of Feeders considered for tripping to from Island	For communication based tripping logic of feeders	For UFR based tripping logic of feeders	
			Healthiness of Communication channel	Healthiness of PT Fuse and status of DC supply to UFR relay*	Healthiness of Relay#

iii. **Format (III)** :

Format (III) : Relay details of the Islanding scheme				
S.NO	Description	(A) UFRs (for load relief)	(B) df/dt (for load	(C) Relay for Island creation

			relief)	
1	Relay location (S/s name)			
2	Relay make & model			
3	Frequency setting of the relay (at which load shedding is envisaged)			
4	Feeder name (voltage level and source-destination name) signalled by the Islanding Relay for separation /load shedding/separation from outside grid			
5	Quantum of load relief due to tripping of feeder (as per state's peak of previous year)			
6	Quantum of load (Min, Avg, Max in MW) on the feeder (as per state's peak of previous year)			

iv. Format IV

Format **IV**:Contact details of all Nodal Officers					
S/s Name	Name	Designation	Organization	Email ID	Mobile No.

Power System Operation Corporation Ltd.

180th OCC Meeting

At ERPC, Kolkata

22nd June, 2021

ER Grid Performances

Highlights for the month of May-2021

Frequency Profile

Average Freq:- 50.0 Hz

Avg FVI: - 0.037

Lowest FVI:- 0.022

Max- 50.28 Hz on 01st May'21

Min- 49.63 Hz on 28th May'21

74.50 % of the time frequency was with in IEGC Band

Peak Demand*

ER: 24347 MW on 23rd May 2021 at 22:41 hrs

% Growth in Average Demand Met w.r.t. last year: (+)17.4%

BSPHCL : 6083 MW ; ON 17/05/21

JUVNL: 1699 MW; ON 23/05/21

DVC: 3093 MW; ON 24/05/21

GRIDCO: 5983 MW; ON 18/05/21

WB: 9217 MW; ON 23/05/21

SIKKIM: 101 MW; ON 24/05/21

Energy met

Max. 497 MU on 23rd May' *2021*

%Growth w.r.t. last year on Max energy : 16.18%

Avg. 426 MU in May' *2021*

%Growth w.r.t. last year on Avg. energy : 19.32%

New Unit

NIL

Open Access

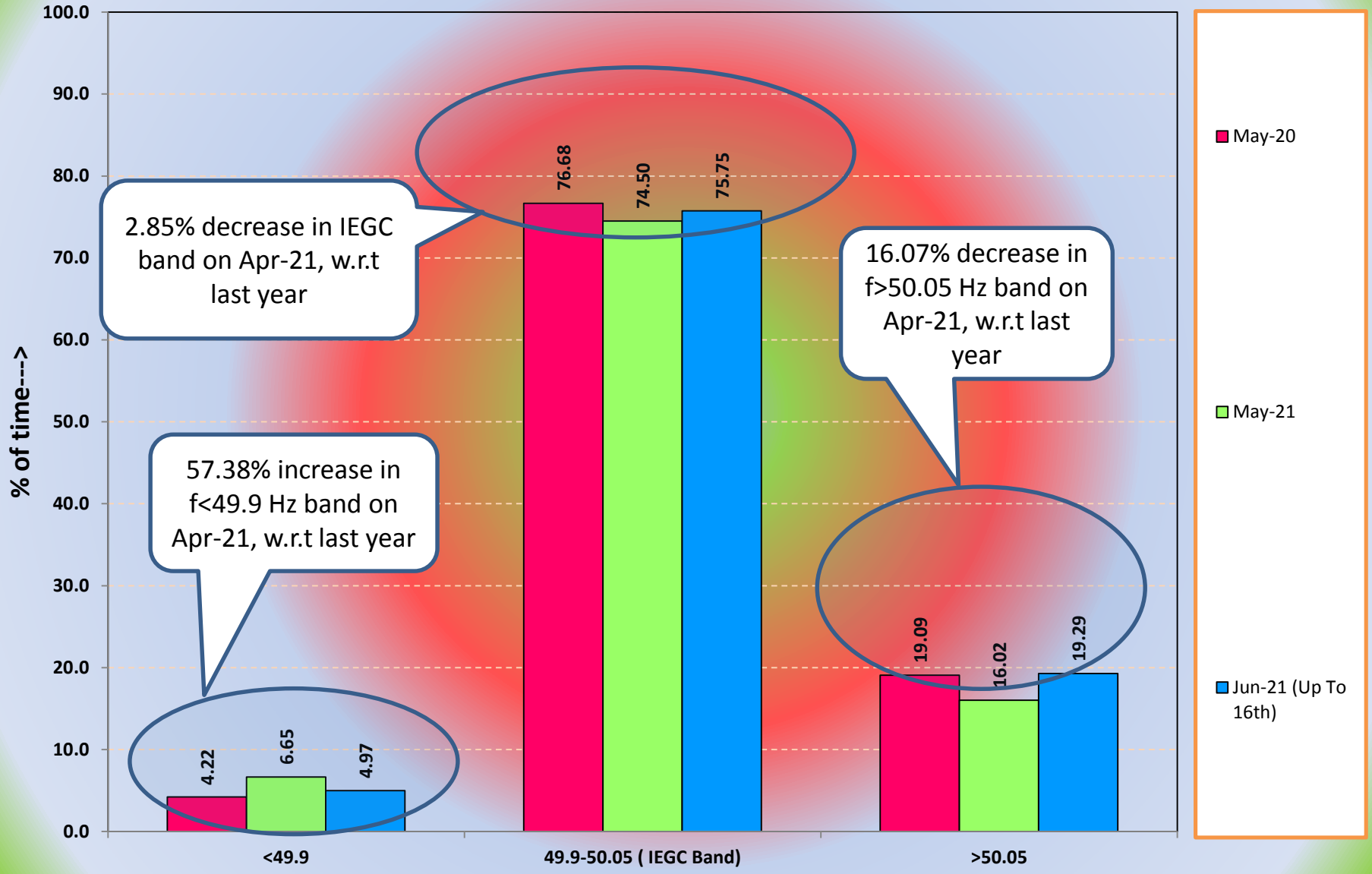
STOA transactions approved : 769 nos.

Energy Approved- 1022.1 MUs

New Element addition during the month:

SL No.	Element Name	Owner	Charging Date	Charging Time	Remarks
1	765KV TIE BAY OF (262 MVAR B/R-1 AND GT1) AT DARLIPALI (DSTPS)	NTPC DSTPP	08-05-2021	14:45	
2	220KV-SITAMARHI-MOTIPUR-1	BSPTCL	19-05-2021	12:28	Synchronised at Sitamarhi end.

Monthly Frequency Profile of Grid



So Far Highest Demand (* As on 16th-Jun-21)

Constitute	Demand (in MW)	Date	Time	Demand met (MW) on 07th April'21 (Max. demand met day)	
				MW	Time
Bihar	6213	07-Jun-21	22:03	5720	20:39
DVC	3543	21-Dec-19	18:06	3168	19:22
Jharkhand	1701	13-Apr-21	21:06	1652	20:42
Odisha	5983	18-May-21	22:34	5461	22:47
Sikkim	155	11-Jan-20	19:22	69	18:21
W. Bengal	9546	27-May-19	23:31	9316	23:14
ER	24656	27-Apr-21	22:50	24656	22:50

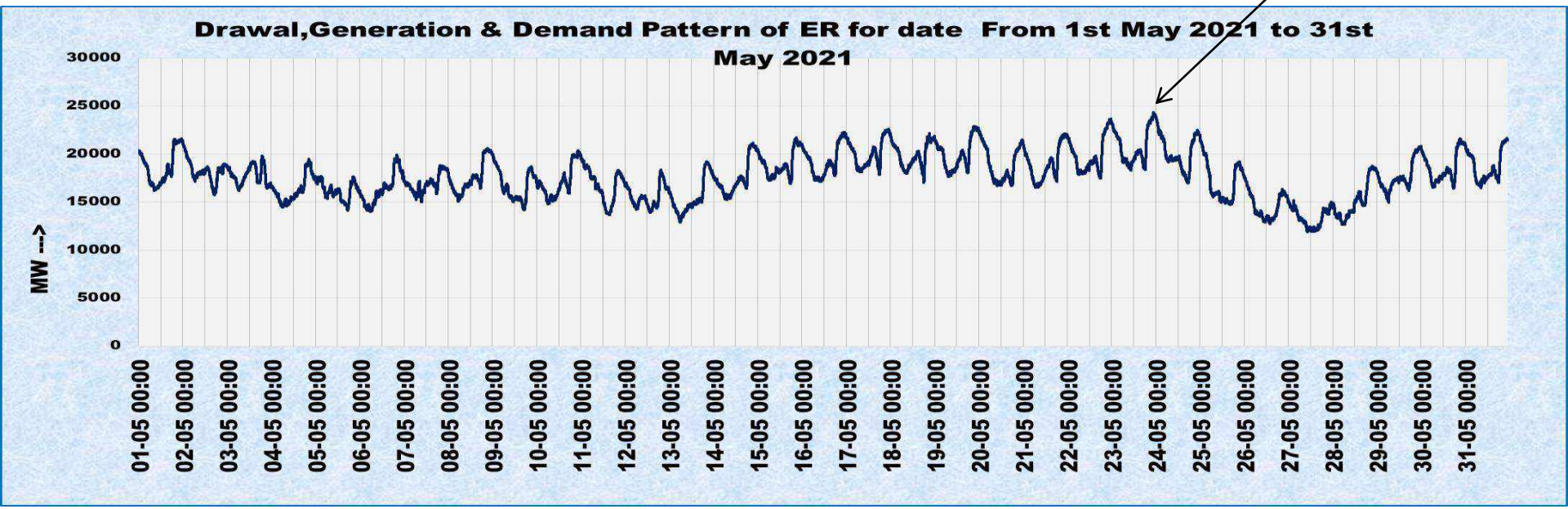
So Far Highest Energy Consumption

Constitute	Energy consumption (in MUs)	Date	Energy met on 07th April'21 (Max. demand met day)
Bihar	124.3	08-Jun-21	116.4
DVC	75.8	12-Jul-18	67.6
Jharkhand	31.1	28-Apr-21	30.1
Odisha	123.5	02-Oct-18	108.0
Sikkim	2.5	28-Jan-20	1.02
W. Bengal	199.9	28-May-19	190.9
ER	525.3	28-Apr-21	514.0

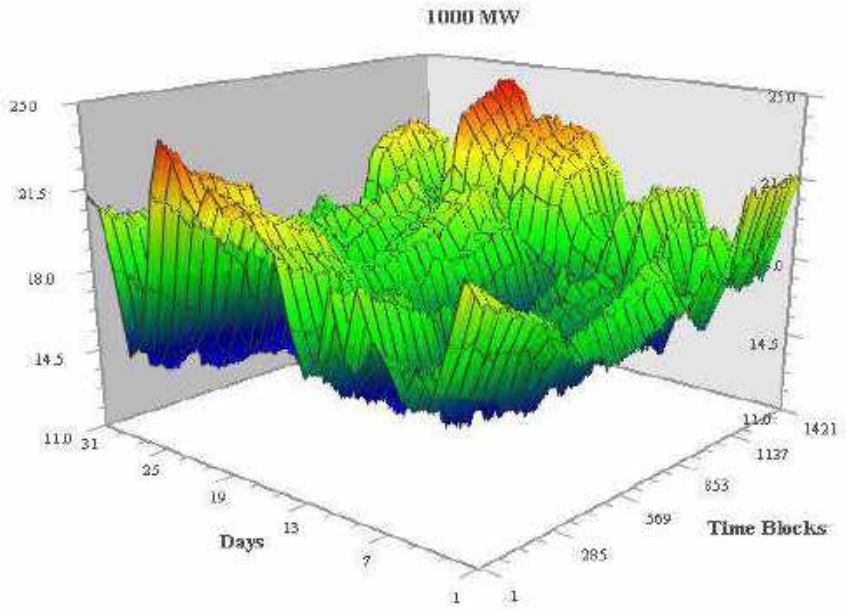
3D VIEW OF ER DEMAND PATTERN

ER Demand Pattern in May-21

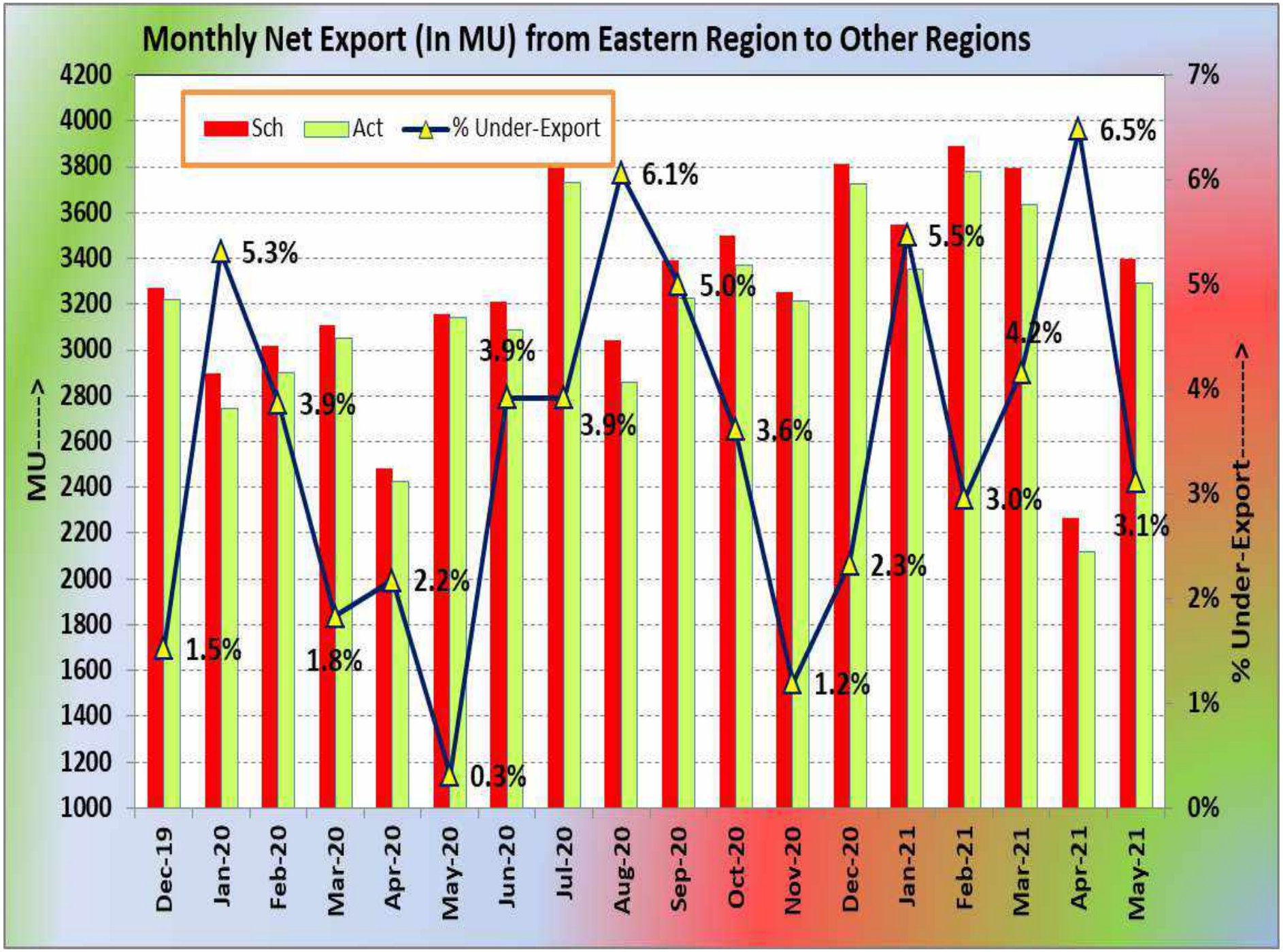
Maximum Demand on 23rd May-21 : 24347 MW



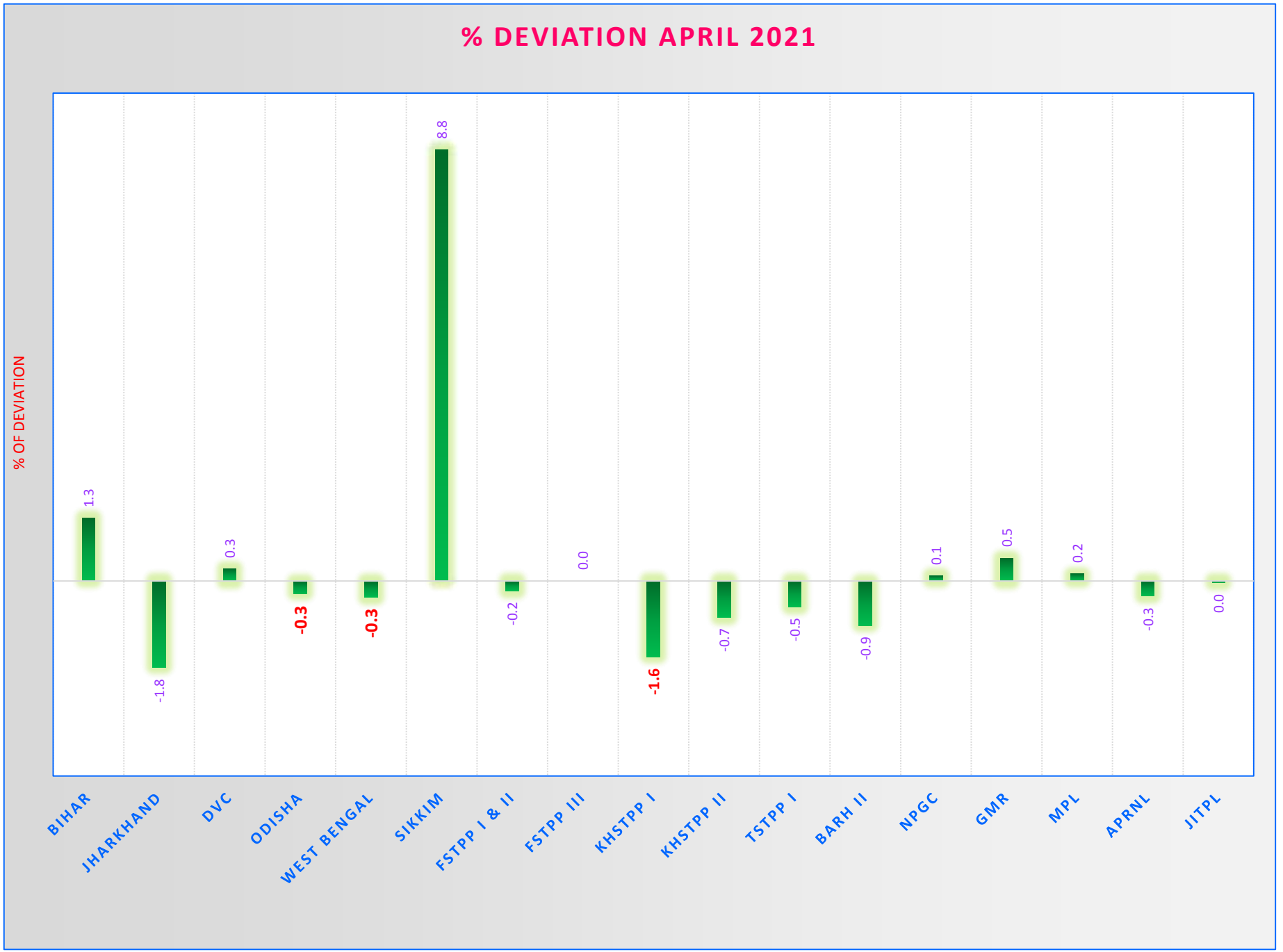
EASTERN REGION DEMAND
3D CURVES (May'21)



Over Drawl / Under Injection by ER Entities
Non-compliance of direction issued by SLDC

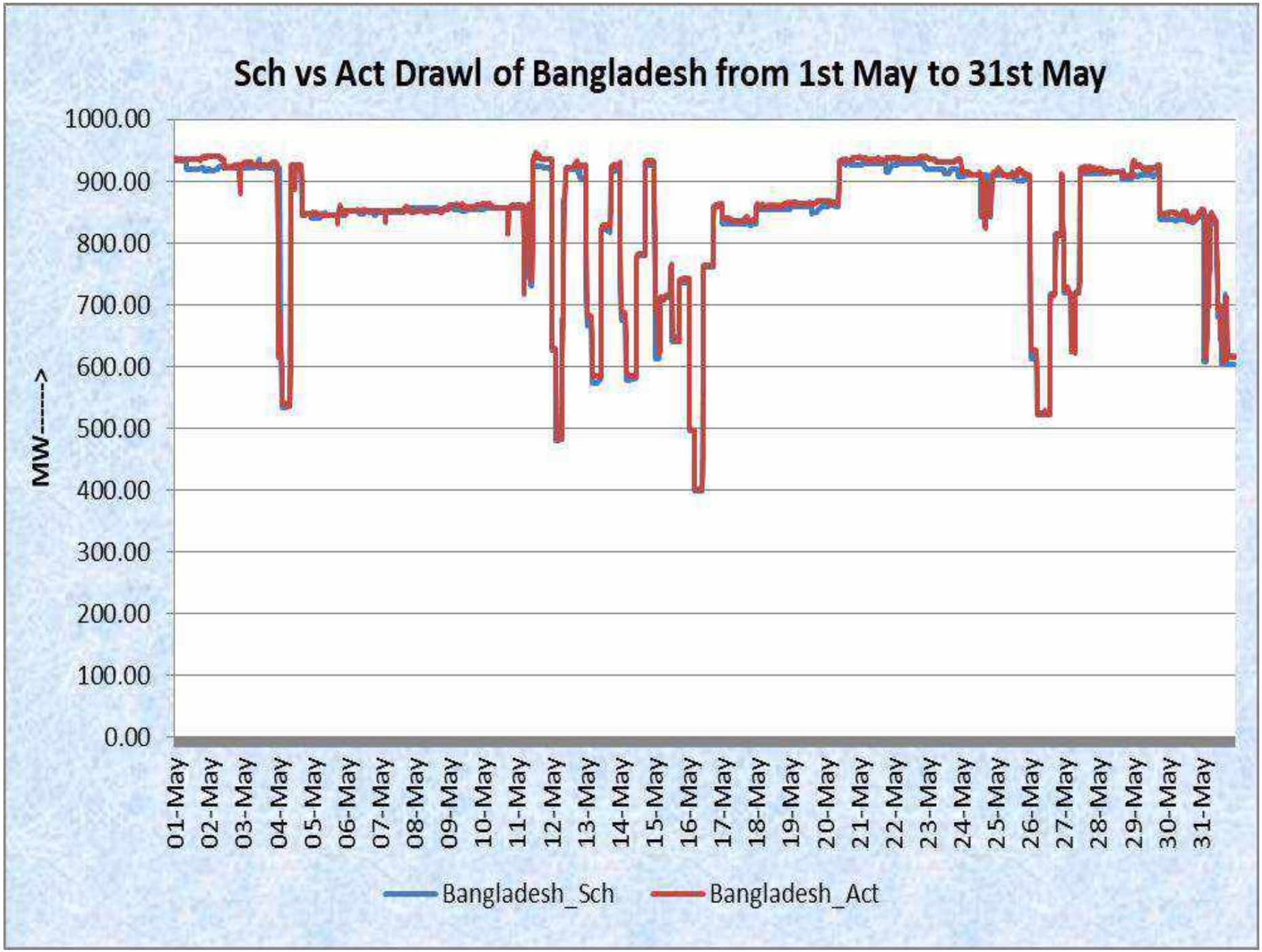

Monthly Net Export (In MU) from Eastern Region to Other Regions
Sch
Act
% Under-Export
MU----->
% Under-Export------>
4200
4000
3800
3600
3400
3200
3000
2800
2600
2400
2200
2000
1800
1600
1400
1200
1000
7%
6%
5%
4%
3%
2%
1%
0%
1.5%
5.3%
3.9%
1.8%
2.2%
0.3%
3.9%
6.1%
3.9%
5.0%
3.6%
1.2%
2.3%
5.5%
3.0%
4.2%
6.5%
3.1%
Dec-19
Jan-20
Feb-20
Mar-20
Apr-20
May-20
Jun-20
Jul-20
Aug-20
Sep-20
Oct-20
Nov-20
Dec-20
Jan-21
Feb-21
Mar-21
Apr-21
May-21

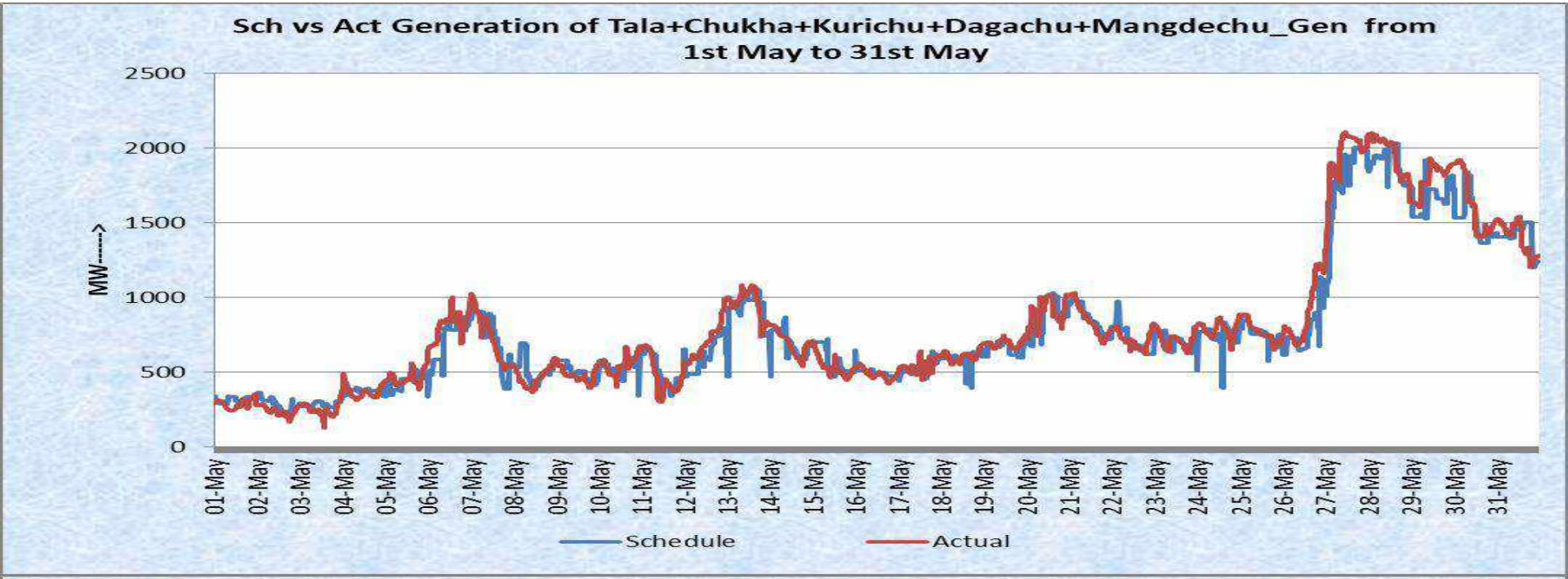
% DEVIATION APRIL 2021



May 2021 Schedule vs Actual Status

	Schedule (MU)	Actual (MU)	OD (MU)	Daily Avg OD (MU)	% Deviation
Bihar	2760	2795	35	1.1	1.3
Jharkhand	675	663	-12	-0.4	-1.8
DVC	-1378	-1374	4	0.1	0.3
Odisha	995	992	-3	-0.1	**-0.3**
West Bengal	970	967	-3	-0.1	**-0.3**
Sikkim	41	45	4	0.1	8.8
FSTPP I & II	690	689	-1	0.0	-0.2
FSTPP III	246	248	3	0.1	0.0
KHSTPP I	489	481	-8	-0.2	**-1.6**
KHSTPP II	942	935	-7	-0.2	-0.7
TSTPP I	593	590	-3	-0.1	-0.5
BARH II	521	516	-5	-0.2	-0.9
NPGC	372	372	0	0.0	0.1
GMR	375	377	2	0.1	0.5
MPL	632	633	1	0.0	0.2
APRNL	265	264	-1	0.0	-0.3
JITPL	662	662	0	0.0	0.0


Sch vs Act Drawl of Bangladesh from 1st May to 31st May
MW------>
1000.00
900.00
800.00
700.00
600.00
500.00
400.00
300.00
200.00
100.00
0.00
01-May
02-May
03-May
04-May
05-May
06-May
07-May
08-May
09-May
10-May
11-May
12-May
13-May
14-May
15-May
16-May
17-May
18-May
19-May
20-May
21-May
22-May
23-May
24-May
25-May
26-May
27-May
28-May
29-May
30-May
31-May
Bangladesh_Sch
Bangladesh_Act


Sch vs Act Generation of Tala+Chukha+Kurichu+Dagachu+Mangdechu_Gen from 1st May to 31st May
MW----->
2500
2000
1500
1000
500
0
01-May
02-May
03-May
04-May
05-May
06-May
07-May
08-May
09-May
10-May
11-May
12-May
13-May
14-May
15-May
16-May
17-May
18-May
19-May
20-May
21-May
22-May
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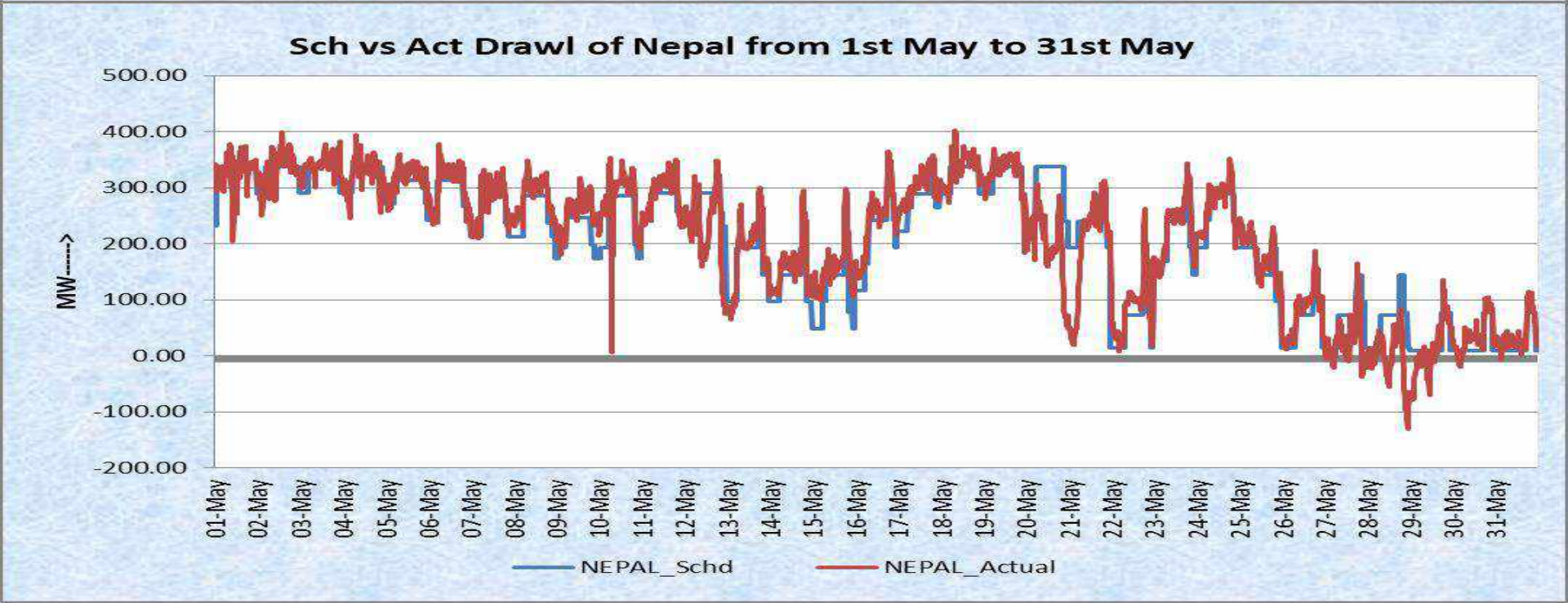
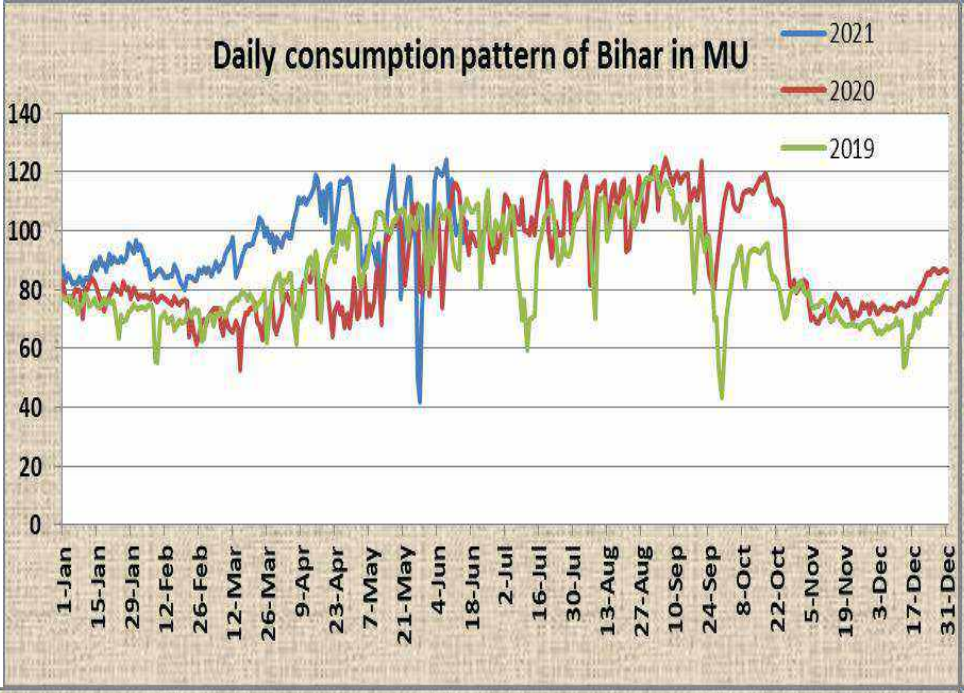
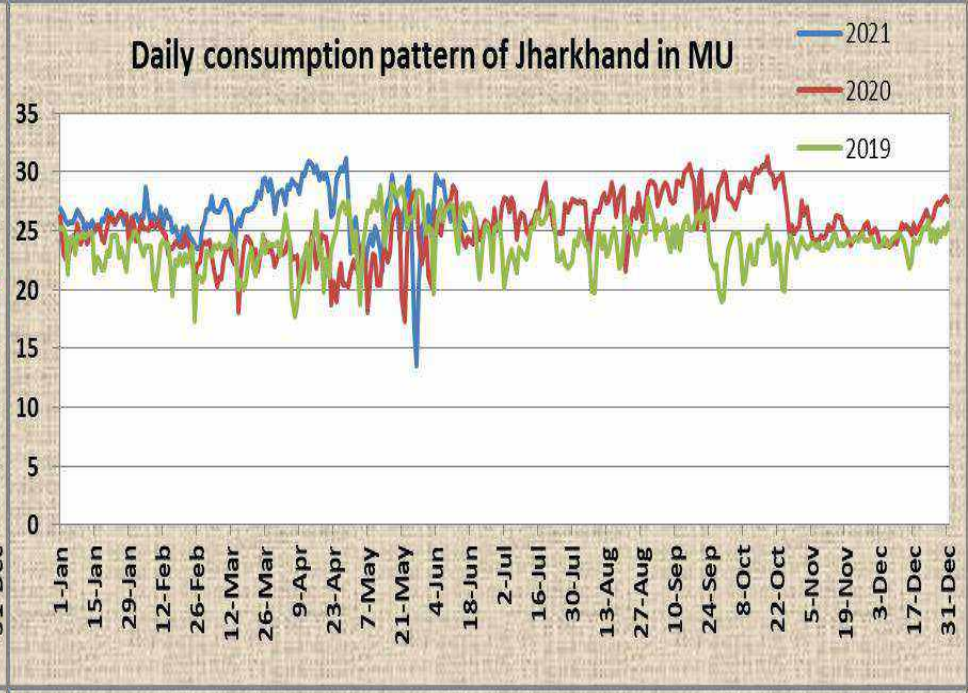
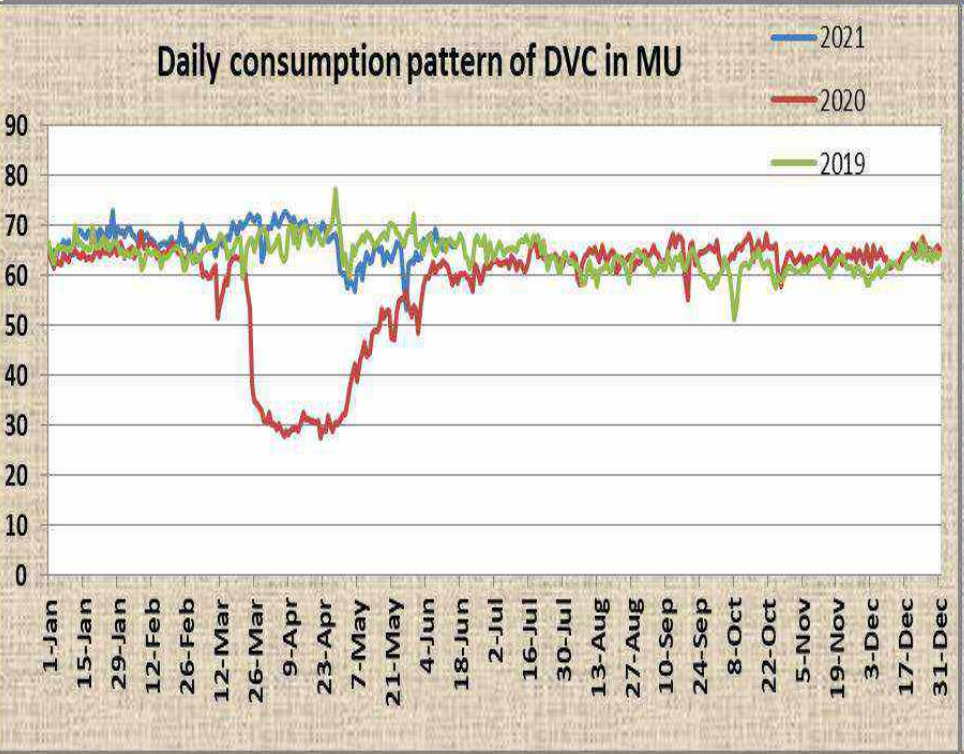
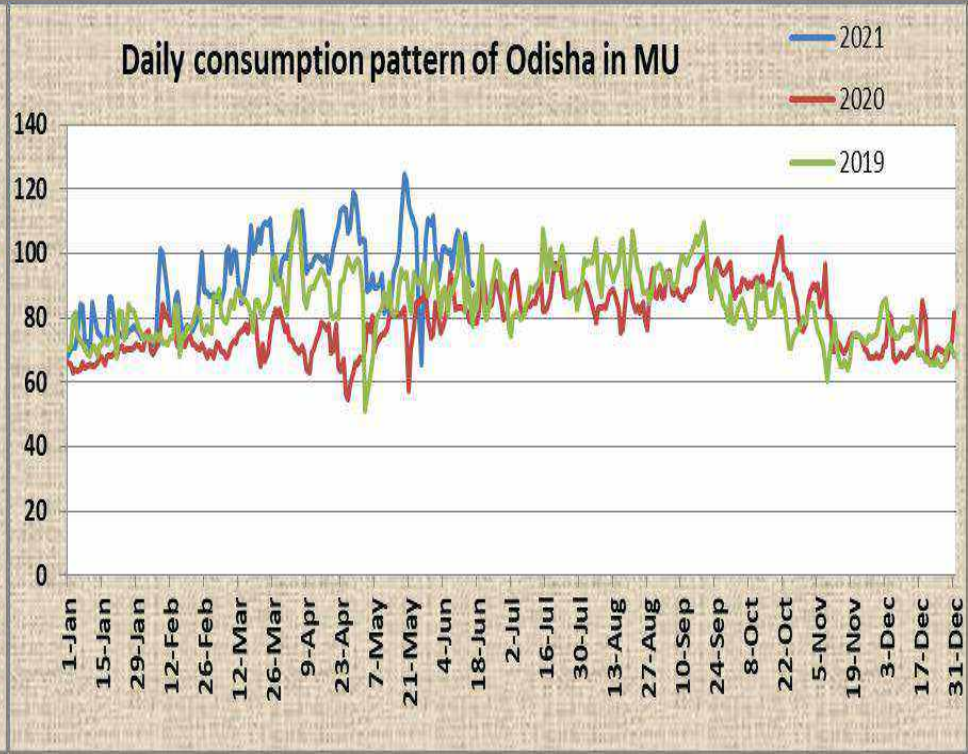
26-May
27-May
28-May
29-May
30-May
31-May
Schedule
Actual

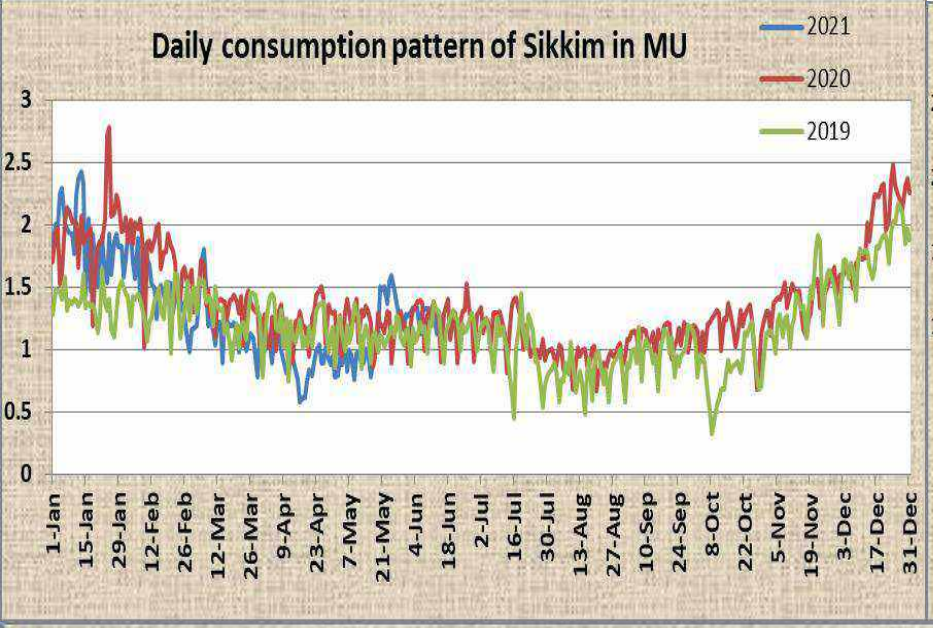

Sch vs Act Drawl of Nepal from 1st May to 31st May
MW----->
500.00
400.00
300.00
200.00
100.00
0.00
-100.00
-200.00
01-May
02-May
03-May
04-May
05-May
06-May
07-May
08-May
09-May
10-May
11-May
12-May
13-May
14-May
15-May
16-May
17-May
18-May
19-May
20-May
21-May
22-May
23-May
24-May
25-May
26-May
27-May
28-May
29-May
30-May
31-May
NEPAL_Schd
NEPAL_Actual

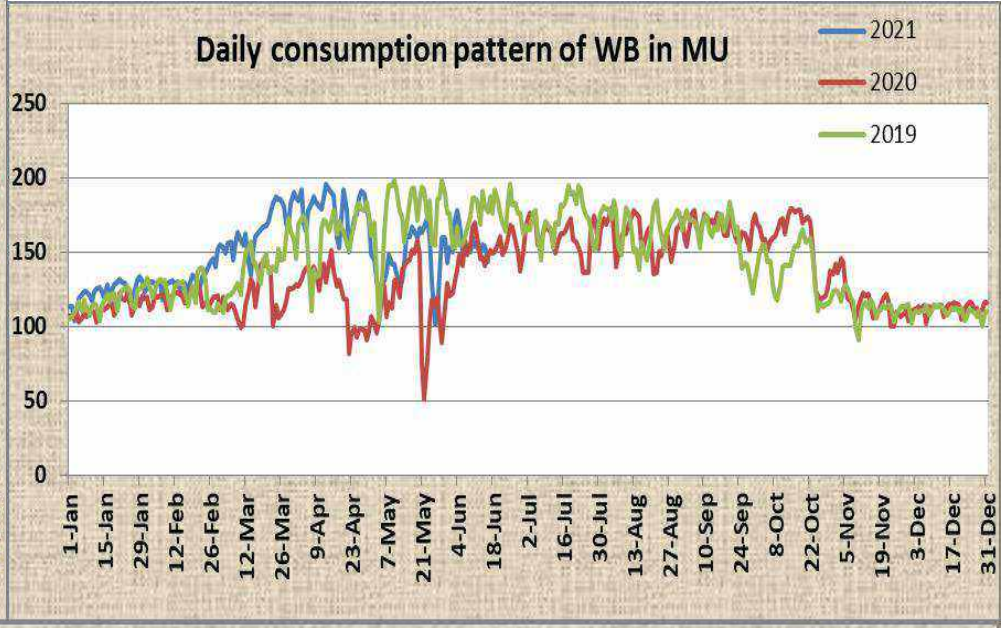

Daily consumption pattern of Bihar in MU
2021
2020
2019
140
120
100
80
60
40
20
0
1-Jan
15-Jan
29-Jan
12-Feb
26-Feb
12-Mar
26-Mar
9-Apr
23-Apr
7-May
21-May
4-Jun
18-Jun
2-Jul
16-Jul
30-Jul
13-Aug
27-Aug
10-Sep
24-Sep
8-Oct
22-Oct
5-Nov
19-Nov
3-Dec
17-Dec
31-Dec

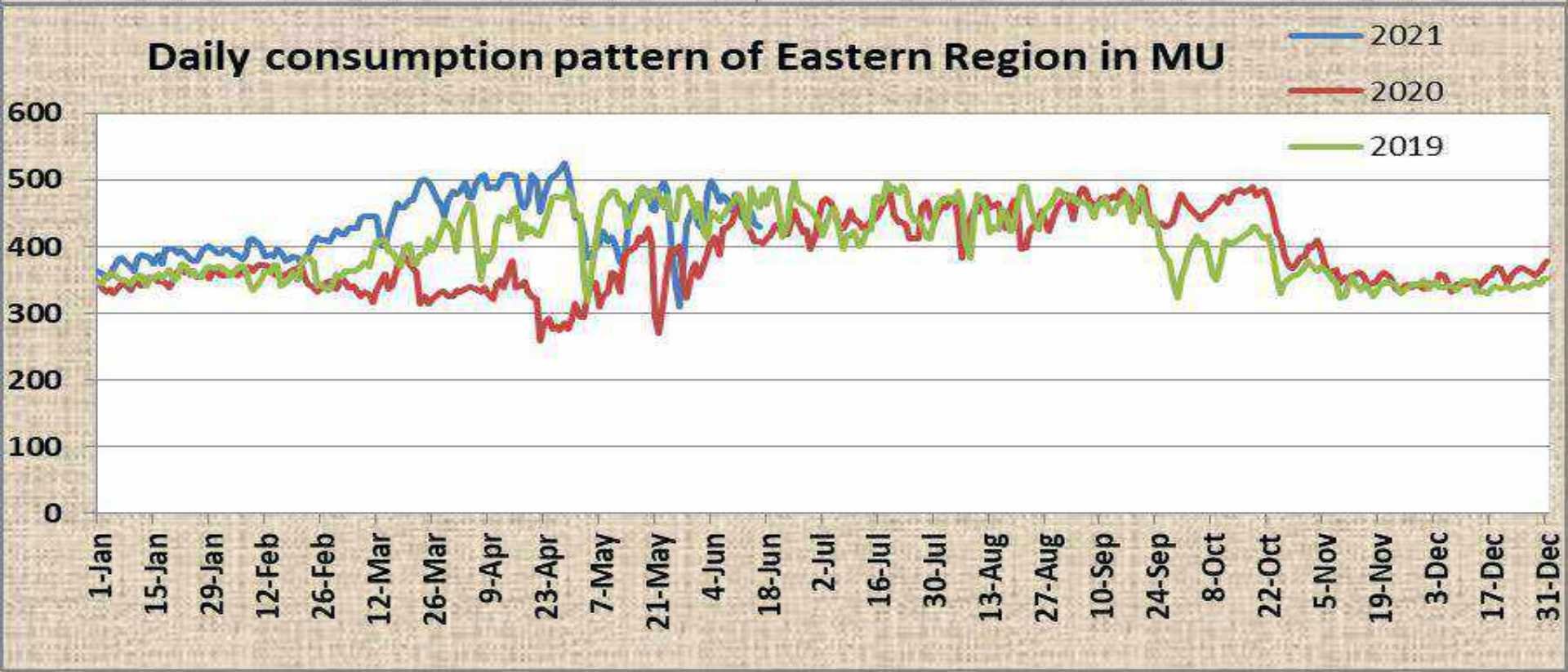

Daily consumption pattern of Jharkhand in MU
2021
2020
2019
35
30
25
20
15
10
5
0
1-Jan
15-Jan
29-Jan
12-Feb
26-Feb
12-Mar
26-Mar
9-Apr
23-Apr
7-May
21-May
4-Jun
18-Jun
2-Jul
16-Jul
30-Jul
13-Aug
27-Aug
10-Sep
24-Sep
8-Oct
22-Oct
5-Nov
19-Nov
3-Dec
17-Dec
31-Dec


Daily consumption pattern of DVC in MU
2021
2020
2019
90
80
70
60
50
40
30
20
10
0
1-Jan
15-Jan
29-Jan
12-Feb
26-Feb
12-Mar
26-Mar
9-Apr
23-Apr
7-May
21-May
4-Jun
18-Jun
2-Jul
16-Jul
30-Jul
13-Aug
27-Aug
10-Sep
24-Sep
8-Oct
22-Oct
5-Nov
19-Nov
3-Dec
17-Dec
31-Dec

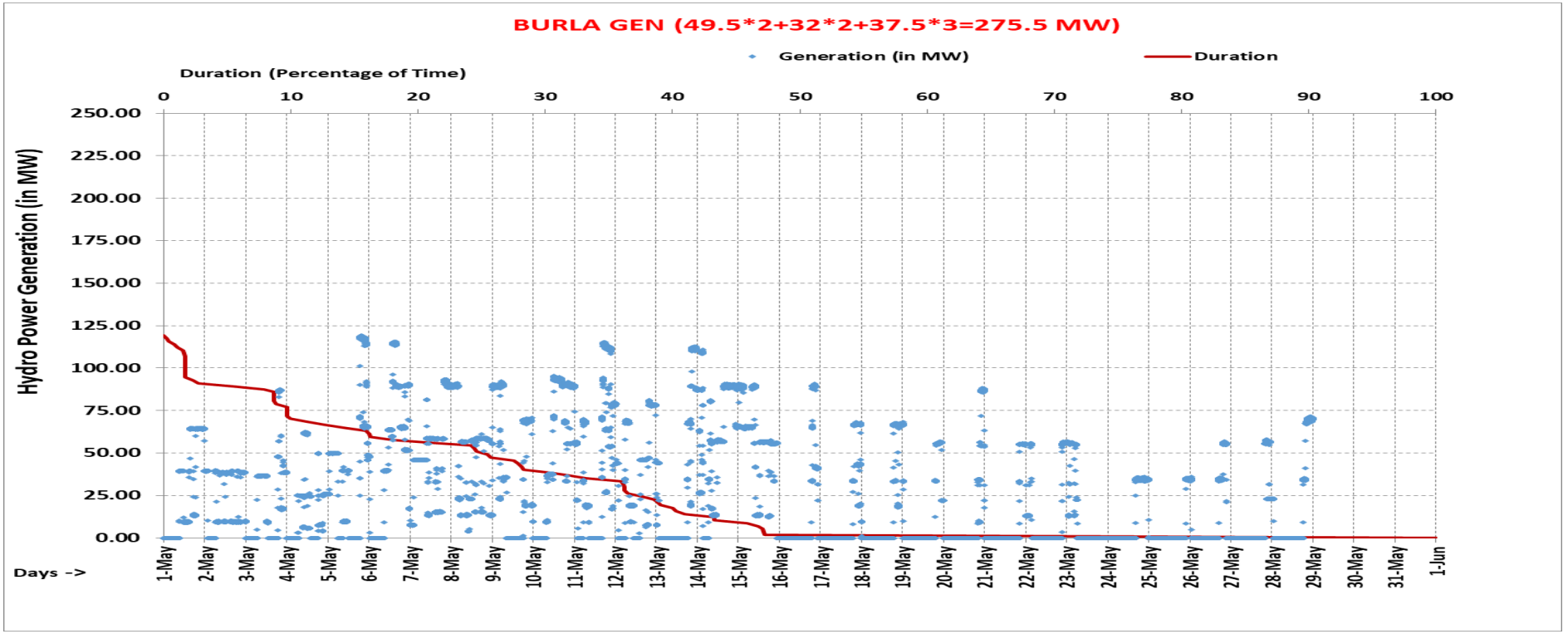

Daily consumption pattern of Odisha in MU
2021
2020
2019
140
120
100
80
60
40
20
0
1-Jan
15-Jan
29-Jan
12-Feb
26-Feb
12-Mar
26-Mar
9-Apr
23-Apr
7-May
21-May
4-Jun
18-Jun
2-Jul
16-Jul
30-Jul
13-Aug
27-Aug
10-Sep
24-Sep
8-Oct
22-Oct
5-Nov
19-Nov
3-Dec
17-Dec
31-Dec

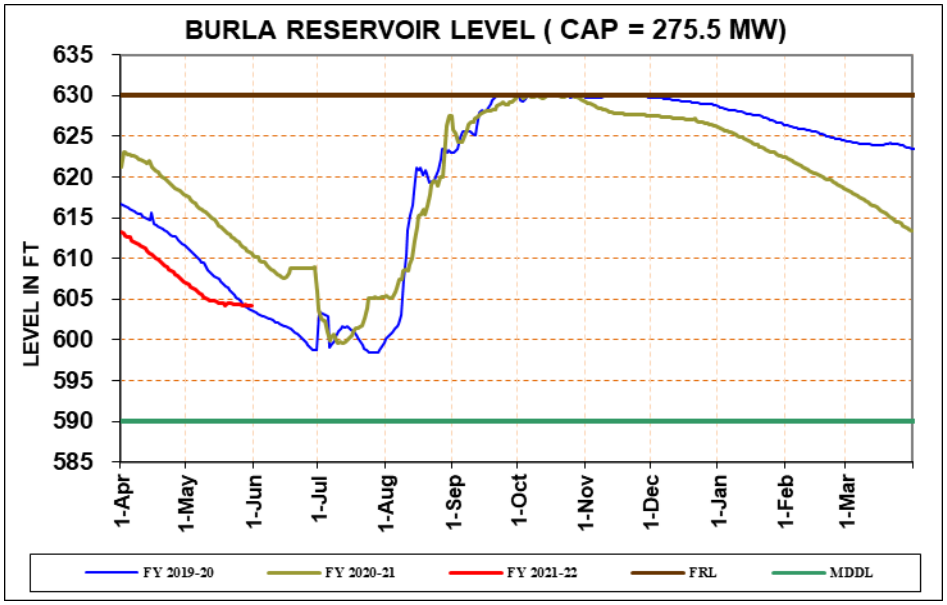

Daily consumption pattern of Sikkim in MU
2021
2020
2019
3
2.5
2
1.5
1
0.5
0
1-Jan
15-Jan
29-Jan
12-Feb
26-Feb
12-Mar
26-Mar
9-Apr
23-Apr
7-May
21-May
4-Jun
18-Jun
2-Jul
16-Jul
30-Jul
13-Aug
27-Aug
10-Sep
24-Sep
8-Oct
22-Oct
5-Nov
19-Nov
3-Dec
17-Dec
31-Dec

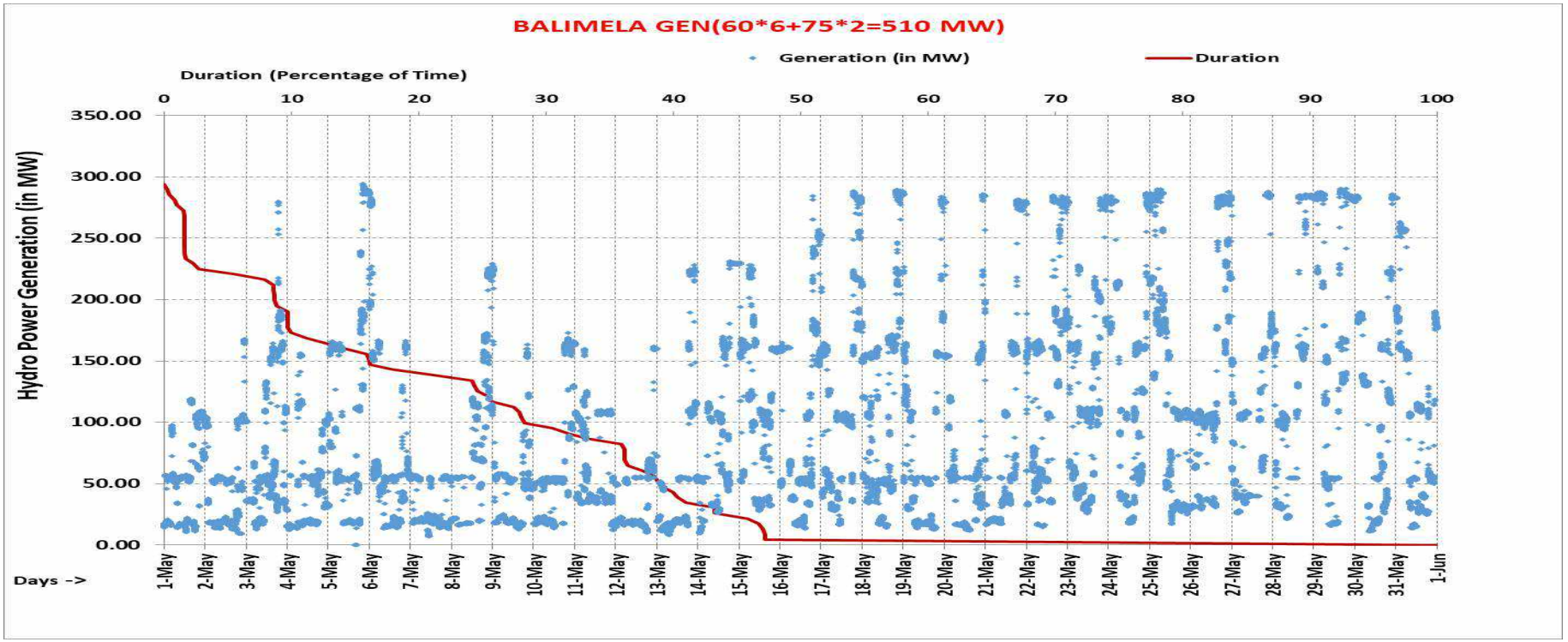

Daily consumption pattern of WB in MU
2021
2020
2019
250
200
150
100
50
0
1-Jan
15-Jan
29-Jan
12-Feb
26-Feb
12-Mar
26-Mar
9-Apr
23-Apr
7-May
21-May
4-Jun
18-Jun
2-Jul
16-Jul
30-Jul
13-Aug
27-Aug
10-Sep
24-Sep
8-Oct
22-Oct
5-Nov
19-Nov
3-Dec
17-Dec
31-Dec

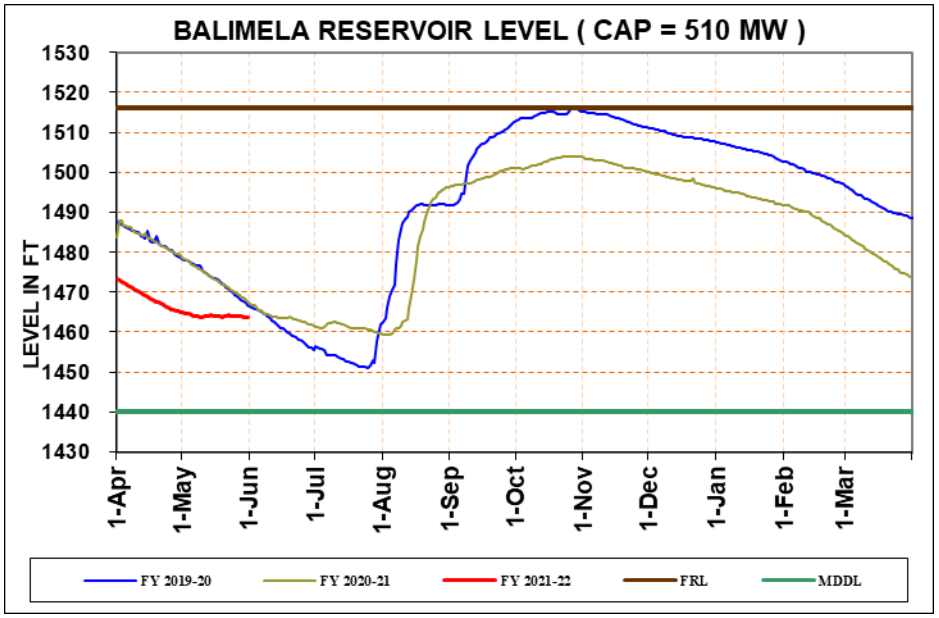

Daily consumption pattern of Eastern Region in MU
2021
2020
2019
600
500
400
300
200
100
0
1-Jan
15-Jan
29-Jan
12-Feb
26-Feb
12-Mar
26-Mar
9-Apr
23-Apr
7-May
21-May
4-Jun
18-Jun
2-Jul
16-Jul
30-Jul
13-Aug
27-Aug
10-Sep
24-Sep
8-Oct
22-Oct
5-Nov
19-Nov
3-Dec
17-Dec
31-Dec

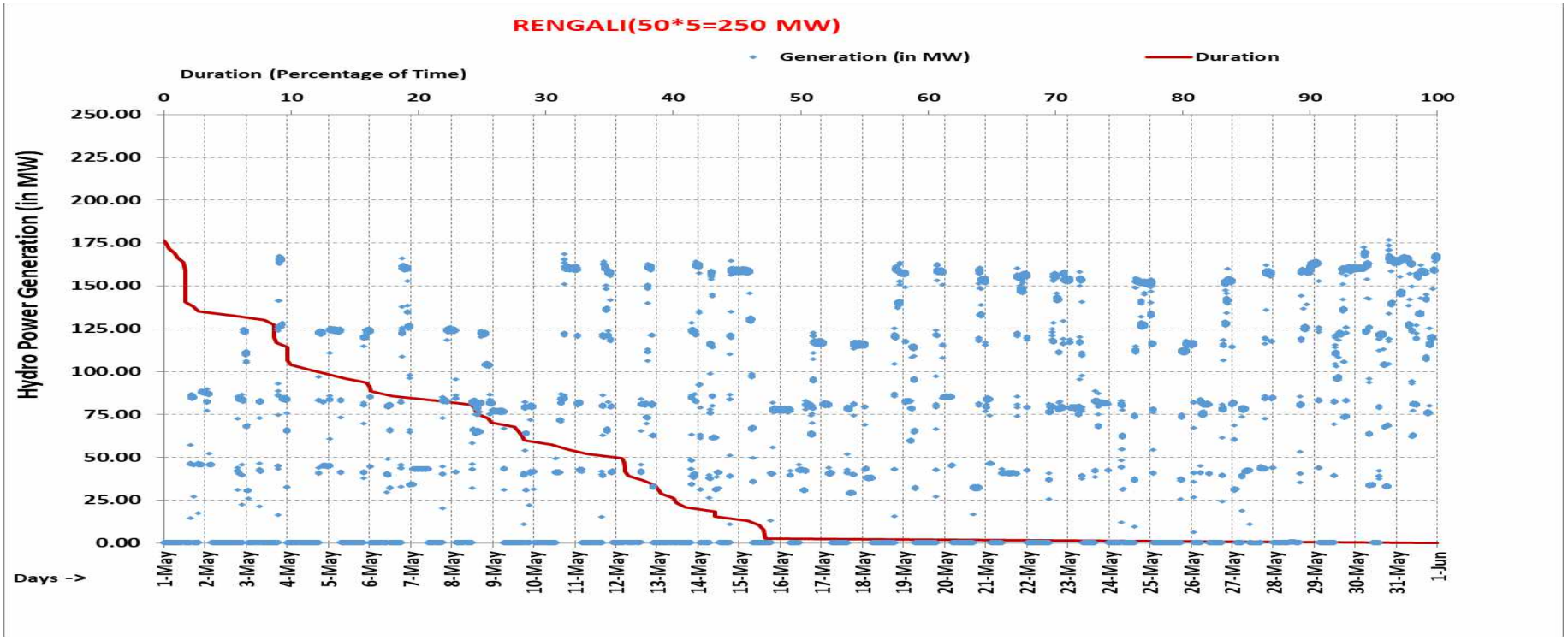
State Hydro Generators Performance

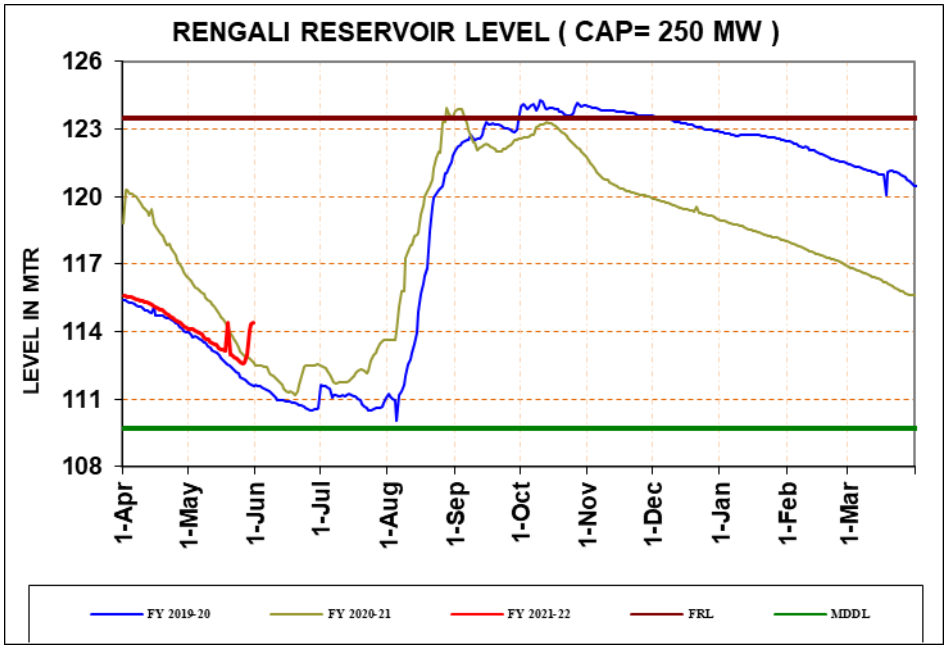

BURLA GEN (49.5*2+32*2+37.5*3=275.5 MW)
Generation (in MW)
Duration
Duration (Percentage of Time)
0
10
20
30
40
50
60
70
80
90
100
Hydro Power Generation (in MW)
250.00
225.00
200.00
175.00
150.00
125.00
100.00
75.00
50.00
25.00
0.00
Days -v
1-May
2-May
3-May
4-May
5-May
6-May
7-May
8-May
9-May
10-May
11-May
12-May
13-May
14-May
15-May
16-May
17-May
18-May
19-May
20-May
21-May
22-May
23-May
24-May
25-May
26-May
27-May
28-May
29-May
30-May
31-May
1-Jun

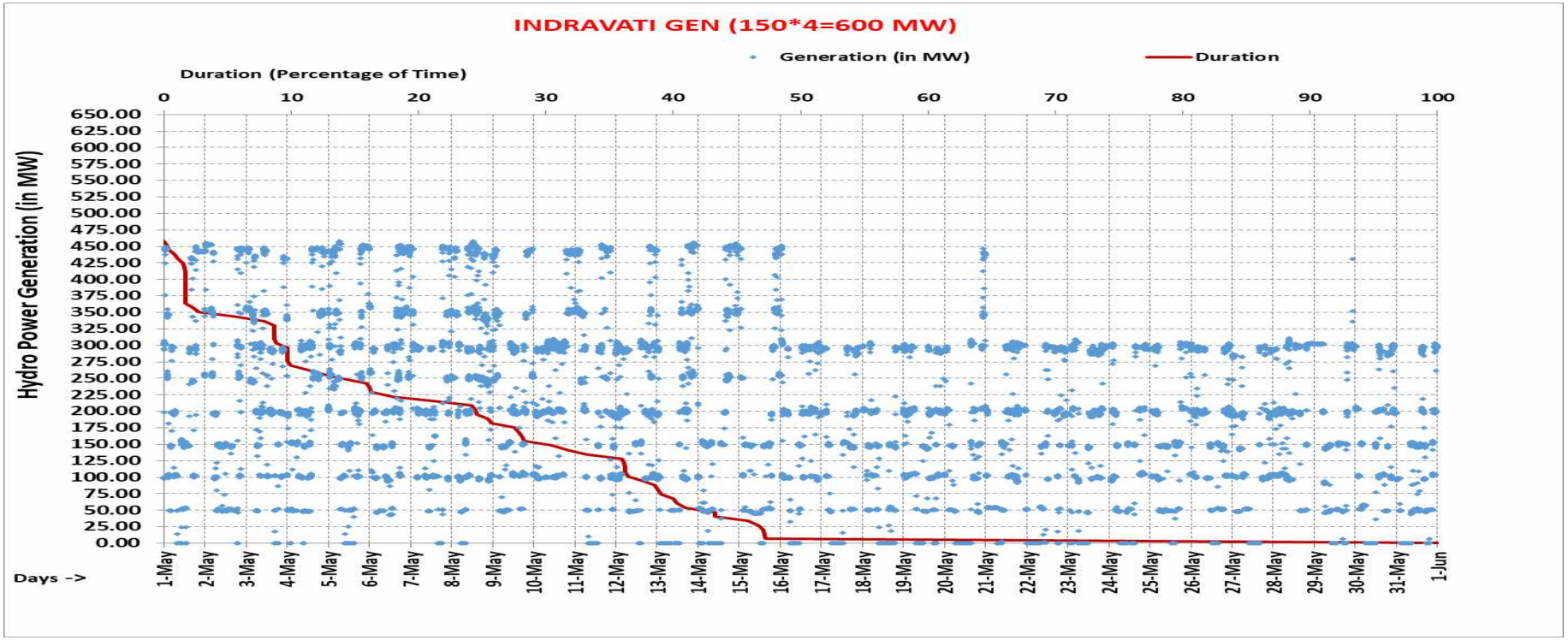

BURLA RESERVOIR LEVEL (CAP = 275.5 MW)
LEVEL IN FT
635
630
625
620
615
610
605
600
595
590
585
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
FY 2019-20
FY 2020-21
FY 2021-22
FRL
MDDL

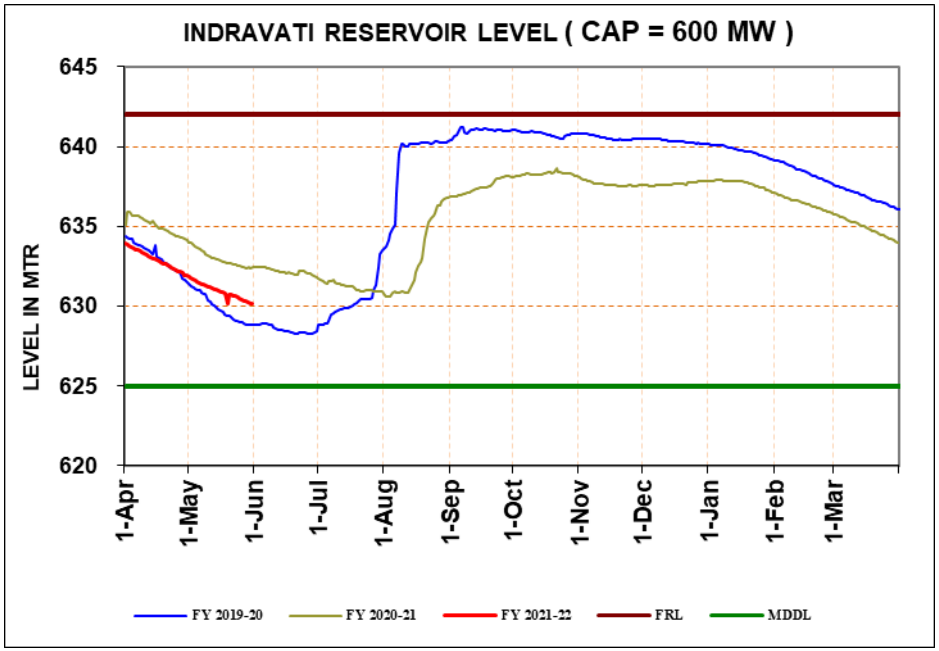

BALIMELA GEN(60*6+75*2=510 MW)
Generation (in MW)
Duration
Duration (Percentage of Time)
0
10
20
30
40
50
60
70
80
90
100
Hydro Power Generation (in MW)
350.00
300.00
250.00
200.00
150.00
100.00
50.00
0.00
Days ->
1-May
2-May
3-May
4-May
5-May
6-May
7-May
8-May
9-May
10-May
11-May
12-May
13-May
14-May
15-May
16-May
17-May
18-May
19-May
20-May
21-May
22-May
23-May
24-May
25-May
26-May
27-May
28-May
29-May
30-May
31-May
1-Jun

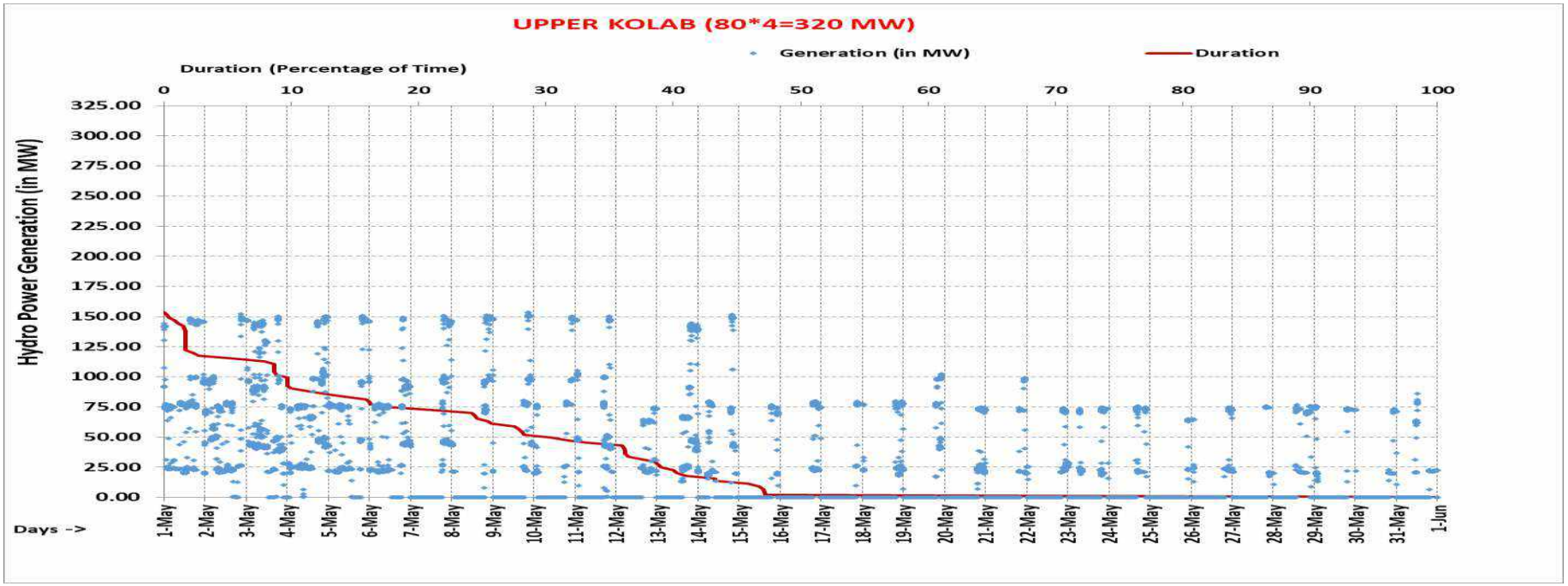

BALIMELA RESERVOIR LEVEL (CAP = 510 MW)
LEVEL IN FT
1530
1520
1510
1500
1490
1480
1470
1460
1450
1440
1430
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
FY 2019-20
FY 2020-21
FY 2021-22
FRL
MDDL

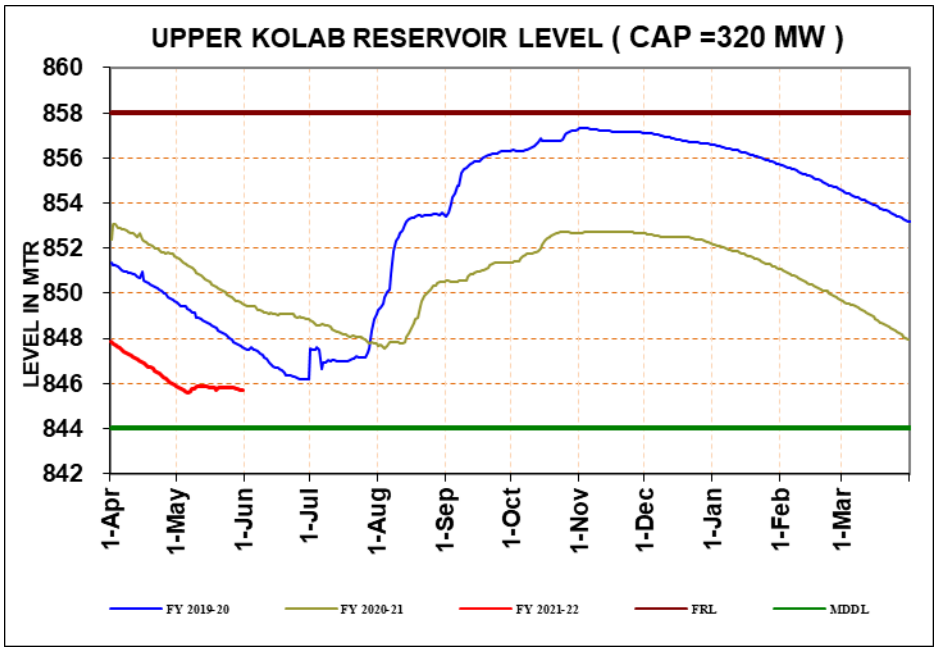

RENGALI(50*5=250 MW)
Generation (in MW)
Duration
Duration (Percentage of Time)
Hydro Power Generation (in MW)
Days ->

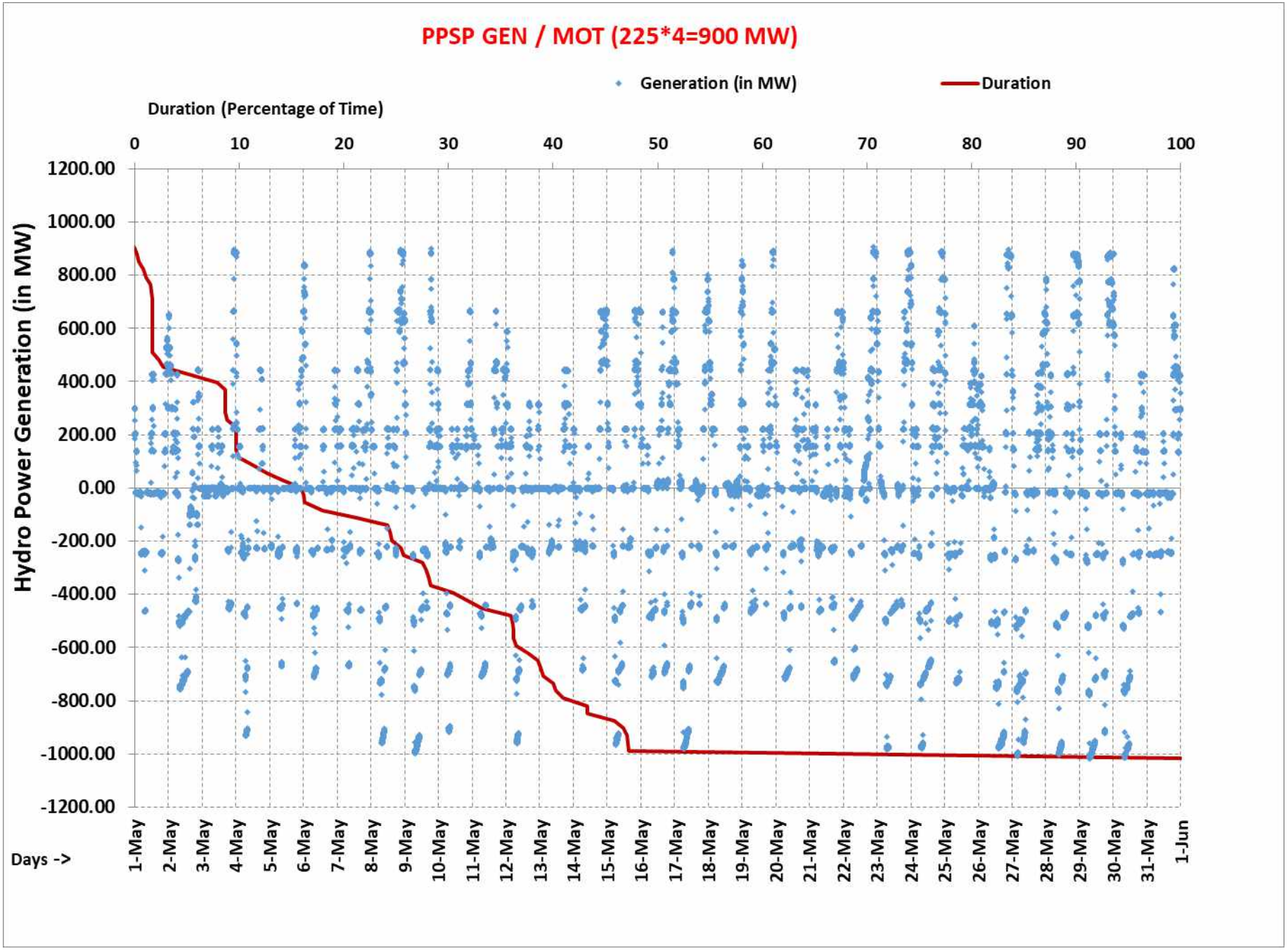

RENGALI RESERVOIR LEVEL (CAP= 250 MW)
LEVEL IN MTR
FY 2019-20
FY 2020-21
FY 2021-22
FRL
MDDL


INDRAVATI GEN (150*4=600 MW)
Generation (in MW)
Duration
Duration (Percentage of Time)
Hydro Power Generation (in MW)
Days ->


INDRAVATI RESERVOIR LEVEL (CAP = 600 MW)
LEVEL IN MTR
FY 2019-20
FY 2020-21
FY 2021-22
FRL
MDDL


UPPER KOLAB (80*4=320 MW)
Generation (in MW)
Duration
Duration (Percentage of Time)
0
10
20
30
40
50
60
70
80
90
100
Hydro Power Generation (in MW)
325.00
300.00
275.00
250.00
225.00
200.00
175.00
150.00
125.00
100.00
75.00
50.00
25.00
0.00
Days -->
1-May
2-May
3-May
4-May
5-May
6-May
7-May
8-May
9-May
10-May
11-May
12-May
13-May
14-May
15-May
16-May
17-May
18-May
19-May
20-May
21-May
22-May
23-May
24-May
25-May
26-May
27-May
28-May
29-May
30-May
31-May
1-Jun


UPPER KOLAB RESERVOIR LEVEL (CAP =320 MW)
LEVEL IN MTR
860
858
856
854
852
850
848
846
844
842
1-Apr
1-May
1-Jun
1-Jul
1-Aug
1-Sep
1-Oct
1-Nov
1-Dec
1-Jan
1-Feb
1-Mar
FY 2019-20
FY 2020-21
FY 2021-22
FRL
MDDL


PPSP GEN / MOT (225*4=900 MW)
Generation (in MW)
Duration
Duration (Percentage of Time)
0
10
20
30
40
50
60
70
80
90
100
Hydro Power Generation (in MW)
1200.00
1000.00
800.00
600.00
400.00
200.00
0.00
-200.00
-400.00
-600.00
-800.00
-1000.00
-1200.00
Days ->
1-May
2-May
3-May
4-May
5-May
6-May
7-May
8-May
9-May
10-May
11-May
12-May
13-May
14-May
15-May
16-May
17-May
18-May
19-May
20-May
21-May
22-May
23-May
24-May
25-May
26-May
27-May
28-May
29-May
30-May
31-May
1-Jun


THANKS

Minutes of the Meeting to discuss the performance of primary frequency response of ISGS and IPP Generating plants in Eastern Region on 31st May 2021

A meeting to discuss and deliberate on the performance of governor response of ISGS and IPPs generating power plants of the Eastern Region was organised by ERLDC on 31st May 2021. The meeting started with a welcome address by the Deputy General Manager (SO & SS), ERLDC in which he highlighted the importance of frequency control and compliance of the relevant regulatory stipulations by the generators. He further informed that testing of primary frequency response has been carried out for generating units in Teesta V HEP, Teesta III HEP, Farakka STPS and Kahalgaon STPS. It is observed that some of the generating units which have shown satisfactory response during testing are not providing adequate response during actual frequency events. This aspect needs to be analysed internally by all power plants and corrective action to be taken immediately. Any deviation from the test result and actual response is not acceptable and is indicative that the plant is not keeping units governor and other parameters in optimal condition to respond for frequency stability.

After this, ERLDC took up the analysis of response observed from each ISGS and IPPs power plant for the frequency events shown in the following table and based on the MoM of the last Meeting on RGMO held on 23rd July 2020.

Event No	Date and Time	Change in Frequency
1	06-08-2020 at 13:50:17 Hrs	**50.07 Hz to 49.96 Hz**. Later stabilized at 50.03 Hz.
2	13-08-2020 at 07:03:05 Hrs	**49.93 Hz to 49.82 Hz**. Later stabilized at 49.88 Hz.
3	12-10-2020 at 10:05:04 hrs	**50.054 Hz to 50.277 Hz**. Later stabilized at 50.155 Hz.
4	29-11-2020 at 13:16:30 hrs	**50.016 Hz to 49.927 Hz**. Later stabilized at 50.001Hz followed by **another dip of 0.05Hz** in frequency.
5	26-12-2020 at 10:18:09 hrs	**50.042 Hz to 49.962 Hz**. Later stabilized at 50.019 Hz
6	19-02-2021 at 15:26:52 Hrs	**49.985 Hz to 49.854 Hz**. Later stabilized at 49.938 Hz
7	10-03-2021 at 19:35:34 Hrs	**50.01 Hz to 49.87 Hz**. Later stabilized at 49.94 Hz
8	24-03-2021 at 12:16:19 Hrs	**50.022 Hz to 49.856 Hz**. Later stabilized at 49.907 Hz
9	08-04-2021 at 03:31:34 Hrs	**49.994Hz to 49.903 Hz**. Later stabilized at 49.95 Hz

During the meeting, no representatives from Talcher STPS, Daripalli STPS, Adhunik TPS and Teesta V HEP were present. Hence response from those generating stations could not be

discussed during the meeting. The summary of the discussions held with generators is provided in attached table 1.

Some of the major issues and important points deliberated during the meeting are as follows:

1. It is observed that before the events some generating units were being run at more than maximum continuous rating (MCR). It reduced the margin available for primary frequency response. As a result, sufficient response could not be obtained during the events.
2. It was reported by units like NTPC Kahalgaon and Farakka that their boiler pressure correction loop is limiting the governor's response. ERLDC intimated that as per IEGC, any controller should not inhibit the governor RGMO/FGMO function and generating units if observes such issues should rectify the same without any delay.
3. During the meeting held on 23rd July 2020, all generating stations were strictly advised not to operate their units in valve wide open (VWO) mode as this reduces the margin for primary frequency response expected from the generators. During the deliberation, it has been observed that responses from some generating units are unsatisfactory because of running units in VWO mode. It was again informed by ERLDC during the meeting that running the unit continuously in valve wide open will be treated as a violation of IEGC and will be informed to ERPC forum and CERC.
4. Response of some generating units was satisfactory during testing. But sufficient response was not observed for those generating units during the events that occurred after the testing. ERLDC advised plants for implementing the necessary changes and fine-tuning in the governor setting as suggested by the testing agency.
5. It was informed that the tuning of the governor in generating plant is a continuous process and response to be checked for each event. Grid is changing from time to time with an increase in generation, load, and RE penetration. Therefore sudden frequency change detection has to be done at regular intervals.
6. It was intimated by ERLDC during previous meetings that as per **CERC TCT 2019-2024 Clause 30.2.i & ii.**
   i. "In case of a new project, the rate of return on equity shall be reduced by 1.00% for such period as may be decided by the Commission, if the generating station or transmission system is found to be declared under commercial operation without commissioning of any of the Restricted Governor Mode Operation (RGMO) or Free Governor Mode Operation (FGMO), data telemetry, communication system up to load dispatch centre or protection system based on the report submitted by the respective RLDC;"

ii. in case of existing generating station, as and when any of the requirements under (i) above of this Regulation are found lacking based on the report submitted by the concerned RLDC, rate of return on equity shall be reduced by 1.00% for the period for which the deficiency continues;

It has further been elaborated that in case of insignificant improvement and persistent violation for governor response in line with IEGC regulations**, ERLDC will send their report to CERC for taking suitable action in view of maintaining Indian power system reliability and security.**

Based on the discussion, ERLDC advised all power plants :

1. Take all corrective actions as discussed during the meeting without any significant delays to improve their response.
2. Performing PFR test at earliest and check issues along with their timely resolution at earliest for adequate governor response their units.
3. Resolving issues related to RGMO logic tuning, pressure correction loop logic, optimal run of the power plant to keep the margin for primary response, valve wide open operation, running unit above MCR without keeping primary response.

The meeting ended with a vote of thanks from the Manager (SS), ERLDC and all generators assured to take corrective action as discussed during this meeting. The list of participants is given in **Annexure 1**. Presentations shown by generating stations during the meeting are attached in **Annexure 2.**

Table 1: Generator Primary Frequency Response and Meeting Discussion

Generating Power Plants	Course of action decided during last meeting on 23rd July 2020	Response Discussed on 31st May 2021	Status on Course of Action and Future work
Farakka NTPC (PFR Testing has been completed for unit #2, #3, #4, #5, #6 and response was satisfactory during testing**)**	**Stage 1 Unit 1, 2 & 3 (3 X 200 MW):** NTPC informed these unit have **o**ld Siemens Make SSI system where finetuning of RGMO is not feasible. Old system would be replaced with new BHEL make MAX DNA DCS system during AOH. RGMO tuning would be completed after such upgradation. **Stage 2 Unit 4 & 5 (2 X 500 MW):** Response was not adequate. NTPC has implemented the RGMO logic for Unit 4 & 5, and would complete its tuning by 15th Aug 2020. **Stage 3 Unit 6 (500 MW):** Software has been upgraded for the better response of Governing system	Response was not satisfactory for Unit 2 and 3 for any event. During few events, satisfactory response has been observed for unit 4, 5 and 6. **PFR testing was completed for unit 2,3,4,5 ad 6 in Jan 2021.** ERLDC informed that unsatisfactory response has been observed at Farakka units even after PFR testing where the response of units were quite satisfactory. **It has been observed during on many occasions units were being run at more than MCR**. During this condition, the response is not observed on all occasions which is possible as adequate margins were not kept available for unit's response during such events. **Persistent violation of IEGC Clauses on FGMO/RGMO is not desirable.**	NTPC Farakka assured generating units would not be run at more than MCR and system parameters will be kept to have adequate primary response margin as per IEGC. They informed that plant output started to reduce due to activation of pressure correction loop. To solve this issue limit would be increased to 3.5 kg/cm^2. Support from OEM is not required for the necessary tuning of generating units. Corrected setting would be implemented at all units by July, 2021. This should resolve the issues being observed at present. For unit 1, R&M activities will be completed by July 2021 after which EHG governor system will be installed in the plant.

Generating Power Plants	Course of action decided during last meeting on 23rd July 2020	Response Discussed on 31st May 2021	Status on Course of Action and Future work
Kahalgaon NTPC (PFR Testing has been completed for unit #5, #6,	**Stage 1: Unit 1, 2, 3 & 4 (4 X 210 MW):** These are Russian make old units having mechanical governor. Tuning of generating units to be done during next AOH	FGMO has been implemented in stage 1 units. Due to pressure correction loop interaction, response observed in the units were not satisfactory.	PFR testing of unit 1 would be performed. Based on performance during testing, tuning would be done.

#7 and response was satisfactory during testing**)**	**Stage 2: Unit 5, 6 & 7(3 X 500 MW):** Further tuning has been done for stage 2 units. NTPC to check response after tuning.	**PFR testing was completed for unit 5, 6 and 7 in Feb 2021.** Response was not satisfactory for most of the events even after successfully clearing the PFR testing. **It has been observed that during few events, units were being run at more than MCR**. During this condition, the response is not observed on all occasions which is possible as adequate margins were not kept available for unit's response during such events. NTPC informed due to the interaction of pressure correction loop, boiler pressure is not sustaining resulting in the withdrawal of governor response.	NTPC Kahalgaon assured generating units would not be run at more than MCR and system parameters will be kept to have adequate primary response margin as per IEGC. Modified Sliding pressure throttle set point would be implemented Unit #5, #6 and U#7. For trial purpose it is implemented at U#5 and responses are recorded successfully. Reference speed of all units used for RGMO Logic with reference to grid frequency would be adjusted by June 2021. Adjustment of speed integration time used for RGMO logic in progress and would be completed by June 2021. New speed pickup would be set up for Unit #7 during unit next Overhauling / opportunity. Next overhauling date is November 2021. ERLDC intimated that significant deviation from test result is not desirable and NTPC Kahalgaon to take all action to comply with IEGC now.

Generating Power Plants	Course of action decided during last meeting on 23rd July 2020	Response Discussed on 31st May 2021	Status on Course of Action and Future work
Talcher NTPC (PFR Testing has been completed for unit #3, #4, #5 and response was satisfactory during testing**)**	**Stage 1: unit 1 & 2 (2 X 500 MW):** R& M was completed for unit 1 in Feb, 2020 and old GE governor was replaced by Emereson Governor. Fine tuning of governor response to be done for unit 1. Unit 2 R&M would be completed during planned Nov-Dec 2020 AOH activity. **Stage 2: Unit 3, 4, 5 & 6 (4 X 500 MW):** Tuning for governor to be done with help of DVC for sustained response and gradual reduction with 1 % limit.	**No representative was present in the meeting**. **PFR testing was completed for Unit 3,4,5 in Nov 2020.** Response observed in units was found to be **unsatisfactory for most of the events** even after successfully clearing the PFR testing. **It has been observed during some events, units were being run at more than MCR**. During this condition, the response is not observed on all occasions which is possible as adequate margins were not kept available for unit's response during such events.	NTPC informed that EHC of units# 1 & 2 are replaced (Unit-2 in Apr-21) by GE make. 1 set of tuning has been done in Unit-1. Further tuning of both Unit-1&2 will be done by GE, getting delayed due to prevailing Covid-19 situations. **NTPC to conduct PFR testing at their units at Stage 1 at the earliest.** **Reason for poor response to be analysed by NTPC.** ERLDC informed during the meeting that significant deviation from test results is not desirable and NTPC Talcher to take all action to comply with IEGC now.

Generating Power Plants	Course of action decided during last meeting on 23rd July 2020	Response Discussed on 31st May 2021	Status on Course of Action and Future work
Barh NTPC	**Unit 4 and 5 (2X660 MW):** NTPC Barh units have Siemens make governor. For unit 4, fine tuning of governor logic would be done within a week with helps of Siemens. Unit 5 boiler modification and fine tuning to be taken up by NTPC by next AOH. In the meantime, RGMO logic of Unit 4 will be implemented for U-5 also after successful validation in the Unit4.	Response was not satisfactory for most of the events. NTPC informed due to the interaction of pressure correction loop, the governor response is being withdrawn. NTPC informed that implementation of new logic and necessary tuning has been done. Response of units would be checked during next event and further tuning would be done.	NTPC to check the response of the units during the next event. ERLDC advised NTPC to maintain a sufficient pressure margin to avoid problems due to the interaction of the pressure correction loop. **NTPC to conduct PFR testing at their units at the earliest and further tune their generating units during upcoming PFR testing of their units.**

Generating Power Plants	Course of action decided during last meeting on 23rd July 2020	Response Discussed on 31st May 2021	Status on Course of Action and Future work
BRBCL	**Unit 1, 2 and 3 (3 X 250 MW):**Unit 3 logic has been implemented and response has been observed to be satisfactory. RGMO has been implemented in Unit 1 and 2 and final testing and fine tuning will be completed by Aug 2020.	**It has been observed during some events, units were being run at more than MCR**. During this condition, the response is not observed on all occasions which is possible as adequate margins were not kept available for unit's response during such events. Response is satisfactory for few units. BRBCL informed that they are facing a problem due to the sampling rate used to calculate the moving average frequency. ERLDC informed tuning of governor is a continuous process and response to be checked for each event. Grid is changing from time to time with an increase in generation, load, and RE penetration. Therefore sudden frequency change detection has to be done at regular intervals.	Tuning of HPCV and EHTC Governor Characteristics, to be done in the next scheduled Overhauling which is in August 2021. After this new logic will be implemented. New logic to be implemented in units 2 and 3 during the next opportunity shutdown. ERLDC informed during the meeting that BRBCL to take all action to comply with IEGC. **BRBCL to conduct PFR testing at their units at the earliest.**

Generating Power Plants	Course of action decided during last meeting on 23rd July 2020	Response Discussed on 31st May 2021	Status on Course of Action and Future work
NPGC Nabinagar	**Unit 1 (1 x 660 MW)** Hunting has been observed in some events and the response in some event is not satisfactory. NPGC to tune their generating unit.	NPGC informed response was not satisfactory due to ID fan problem and interaction of pressure control feedback.	NPGC to further tune their generating units to respond. It is a newly commissioned plant and should comply with IEGC in full spirit. NPGC informed ID fan problem will be solved by June 2021. ERLDC informed during the meeting that NPGC to take all action to comply with IEGC Primary frequency response requirements. **NPGC to conduct PFR testing at their unit at the earliest.**
Darlipalli	**Unit 1 (800 MW)** NTPC to check response.	**Response is not satisfactory.** No representative from NTPC Darlipalli was present in the meeting.	The matter will be taken up with NTPC Darlipalli. Being a newly commissioned plant, it should comply with IEGC in full spirit along with Primary frequency response requirements. **NTPC to conduct PFR testing at their unit at the earliest.**

Generating Power Plants	Course of action decided during last meeting on 23rd July 2020	Response Discussed on 31st May 2021	Status on Course of Action and Future work
GMR	**Unit 1, 2 & 3 (3 x 350 MW)** The units are Chinese make. HP Control Valve issue observed for unit 1 & 2 has been taken up with OEM and based on opportunity it will be resolved.	Response is satisfactory for most of the events. Due to the unavailability of one HPCV, response of units 2 and 3 is less particularly at near full load condition.	HPCV at units 2 and 3 would be made available in any shutdown opportunity of 5-6 days. **GMR to conduct PFR testing at their units at the earliest.**

Generating Power Plants	Course of action decided during last meeting on 23rd July 2020	Response Discussed on 31st May 2021	Status on Course of Action and Future work
JITPL	**Unit 1 & 2 (2 x 600 MW)** JITPL to tune their generating units in order to get better governor response.	No response was observed in units MW output. RGMO controller responded based on frequency change. It was informed unit was being run at valve wide open mode. Unit 2 can not be run at a load lower than MCR due to a problem at LP2 rear turbine.	JITPL informed that the technical problem at unit 2 will be solved by October 2021 and the machine can respond in governor response after that. During CMC mode operations, delta pressure is influencing final load control output to maintain CMC reference. Action to be taken to implement RGMO through CMC also. **JITPL to conduct PFR testing at their units at the earliest.** ERLDC informed during the meeting that JITPL to take all action to comply with IEGC Primary frequency response requirements. **It has not to operate any unit in VWO as it's not in compliance with IEGC and relevant CEA standards.**

Generating Power Plants	Course of action decided during last meeting on 23rd July 2020	Response Discussed on 31st May 2021	Status on Course of Action and Future work
MPL	**Unit 1 & 2 (2 x 525 MW)** Unit 1 response is good. Unit 2 will be tuned for sustaining the RGMO response with backing down at 1 % rate after the RGMO response.	Due to high CW temp, poor vacuum and high ambient temperature, machines is to run in VWO. For few events, the response from unit 2 is satisfactory. Unit 1 has some technical problems.	**ERLDC informed MPL that it should not to operate units in VWO as this is not in compliance with IEGC and relevant CEA standards** MPL informed problem at unit 1 will be solved within 4 months (i.e., Sept 2021). **MPL to conduct PFR testing at their units at the earliest with Siemens.**
APNRL	**Unit 1 & 2 (2 x 270 MW)** New logic for RGMO was implemented. Issue of delayed response to be resolved by 1st Week of August 2020.	**Response is not satisfactory**. No representative from APNRL was present in the meeting.	Matter will be taken with APNRL. ERLDC informed during the meeting that APNRL to take all action to comply with IEGC Primary frequency response requirements.
Teesta V PFR Testing has been completed for unit #1, and response was satisfactory during testing**)**	**Unit 1, 2 & 3 (3 x 170 MW)** Generation response is slow during frequency response event.	During most of the event, either there was no margin for governor response due to spillage condition or unit was not in service or unit tripped during the event. **PFR testing for Unit 1 was completed in Jan 2021.** No event could be analysed after testing.	Teesta V to check the performance of its units during frequency events.

Generating Power Plants	Course of action decided during last meeting on 23rd July 2020	Response Discussed on 31st May 2021	Status on Course of Action and Future work
Teesta III (PFR Testing has been completed for unit #1, #2, #3, #4, #5, #6 and response was satisfactory during testing**)**	**Unit 1, 2, 3, 4, 5 & 6 (6 x 200 MW)** The response of Teesta III Units is fast, adequate and sustaining.	Response is satisfactory. **PFR testing was completed for All units in Jan-Feb 2021.**	Adequate and Satisfactory Response during all events. However, there is scope for improving the response of Unit 6 which needs to be investigated by TUL.
Dikchu	**Unit 1 & 2 (2 x 48 MW)** Units are running in FGMO. Response was satisfactory.	During most of the events, either there was no margin for governor response due to spillage condition or unit was not in service or unit tripped during the event.	Dikchu HEP to conduct PFR testing at their units at the earliest.

Annexure 1

Power System Operation Corporation Limited

Eastern Regional Load Despatch Center

Meeting to discuss the performance of the primary frequency response of regional generating units

Date	**31-05-2021**				
Sl No	Name	Organization	Designation	Contact Information	
				Phone	Email ID
1	Saugato Mondal	ERLDC	DGM (SS & SO)	9433041855	saugato@posoco.in
2	Parwez Alam	SLDC/ Jharkhand	Sr. Manager	9122581804	g02parwez@gmail.com
3	Sumanta Kumar Padhi	Teesta-III HEP	Team Member	9816661260	sumanta.padhi@andritz.com
4	Anwaruddin Biswas	SKPPPL-Dikchu HEP	Manager-O&M	9547636468	anwaruddin.b@budhilhydro.com
5	Saurabh Kumar	BRBCL	Manager-EEMG	7091092410	saurabhkumar01@ntpc.co.in
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8	K K Thakur	NPGC	AGM(Operation)	9450963022	kkthakur01@ntpc.co.in
9	Kuldeep Gupta	NPGC	Sr. Manager(C&I)	9424140718	kuldeepgupta@ntpc.co.in
10	Saibal Ghosh	ERLDC	Dy. Manager	8584072079	Saibal@posoco.in
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16	Sabyasachi Ghosh	HEL	E & I	9831011363	sabyasachi.ghosh@rpsg.in
17	Raj Protim Kundu	ERLDC	Manager	9903329591	rajprotim@posoco.in
18	M.Karikalchozhan	NTPC Farakka	AGM(EEMG)	9445869031	mcchozhan@ntpc.co.in
19	Sukhamoy Roy	NTPC Kahalgaon	AGM(C&I)		sukhmoyroy@ntpc.co.in
20	Sankar Samanta	JITPL	VP- Operation & Factory manager	9583040150	headopn.orissa@Jindalgroup.com

Annexure 2

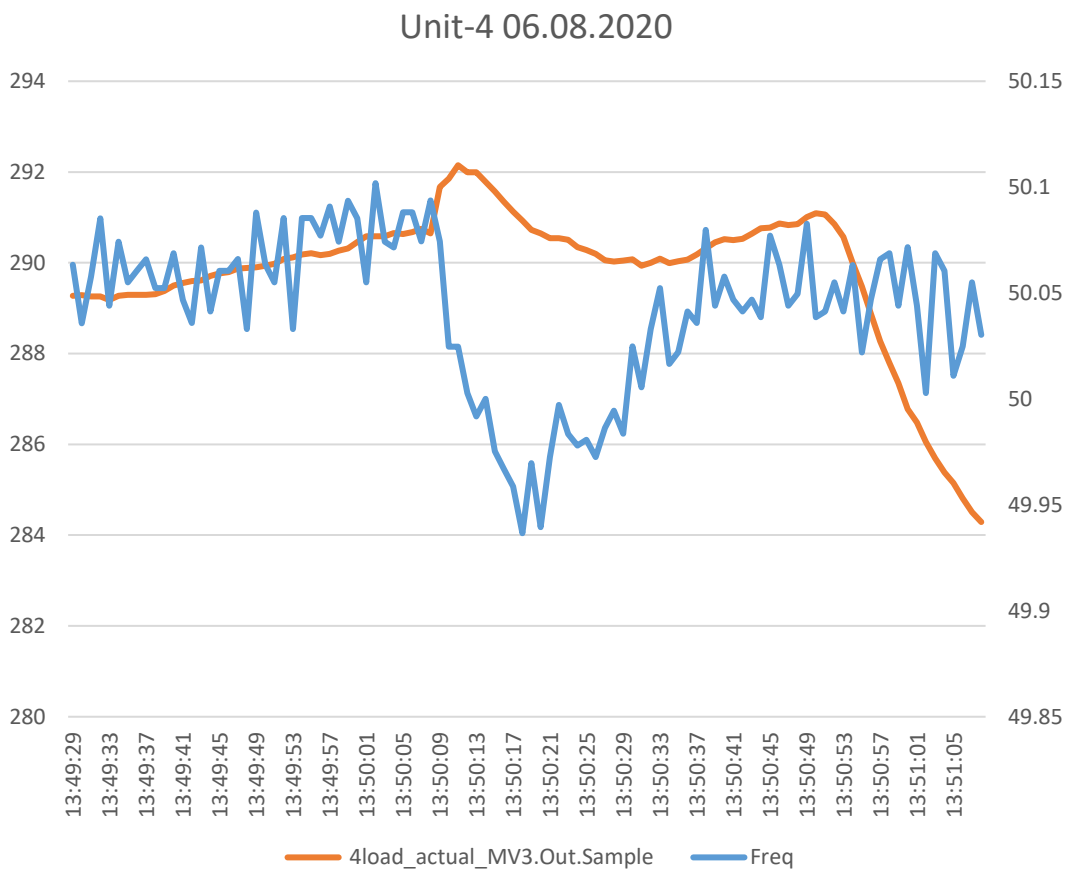
NTPC Farakka RGMO response

Event summary

Date of event	Time	ST I &II	ST III
06-08-2020	13:45:00- 14:00:00	820.33	257.81
	14:00:00- 14:15:00	820.33	257.81
	14:15:00- 14:30:00	820.33	257.81
13-08-2020	07:00:00- 07:15:00	820.33	257.81
	07:15:00- 07:30:00	820.33	257.81
	07:30:00- 07:45:00	820.33	257.81
12-10-2020	10:00:00- 10:15:00	717.788	395.753
	10:15:00- 10:30:00	717.79	322.753
	10:30:00- 10:45:00	717.79	322.753
29-11-2020	13:15:00- 13:30:00	615.25	257.81
	13:30:00- 13:45:00	615.25	257.81
	13:45:00- 14:00:00	615.25	257.81
26-12-2020	10:15:00- 10:30:00	1260	468.7525
	10:30:00- 10:45:00	1260	468.7525
	10:45:00- 11:00:00	1260	468.7525
19-02-2021	15:15:00- 15:30:00	1491.5068	468.75
	15:30:00- 15:45:00	1491.5036	468.75
	15:45:00- 16:00:00	1491.5036	468.75
10-03-2021	19:30:00- 19:45:00	1491.49815	468.75
	19:45:00- 20:00:00	1491.49815	468.75
	20:00:00- 20:15:00	1491.49815	468.75
24-03-2021	12:15:00- 12:30:00	1450	450
	12:30:00- 12:45:00	1450	450
	12:45:00- 13:00:00	1450	450
08-04-2021	03:30:00- 03:45:00	650	455
	03:45:00- 04:00:00	650	455
	04:00:00- 04:15:00	650	455

	Technical Minimum
	Lean season-Unit load less than tech minimum

06.08.2020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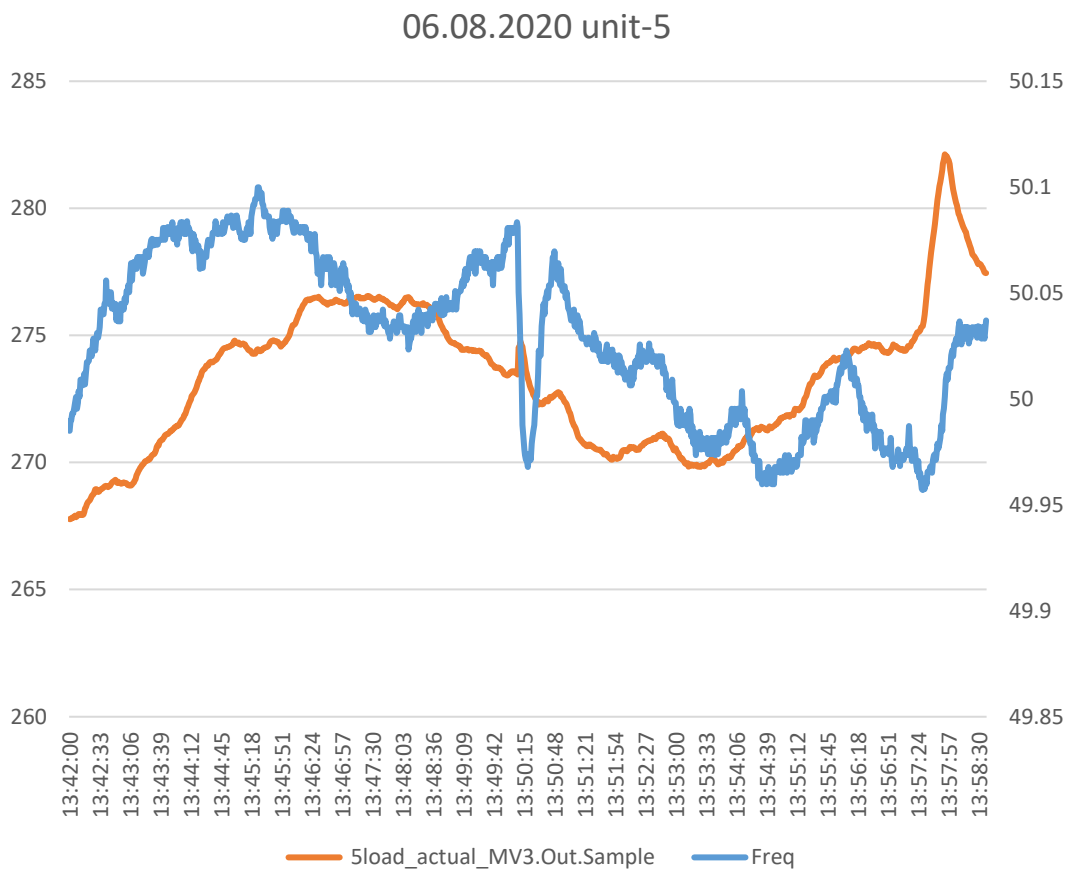
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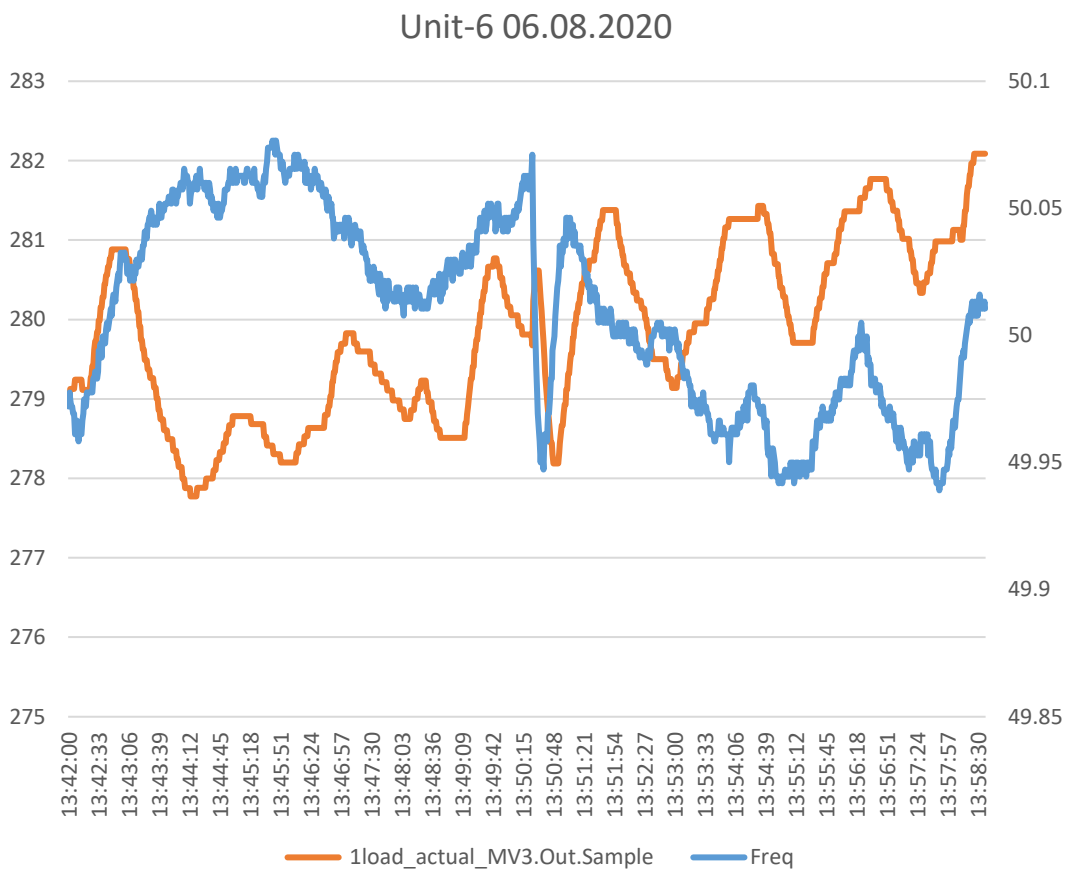
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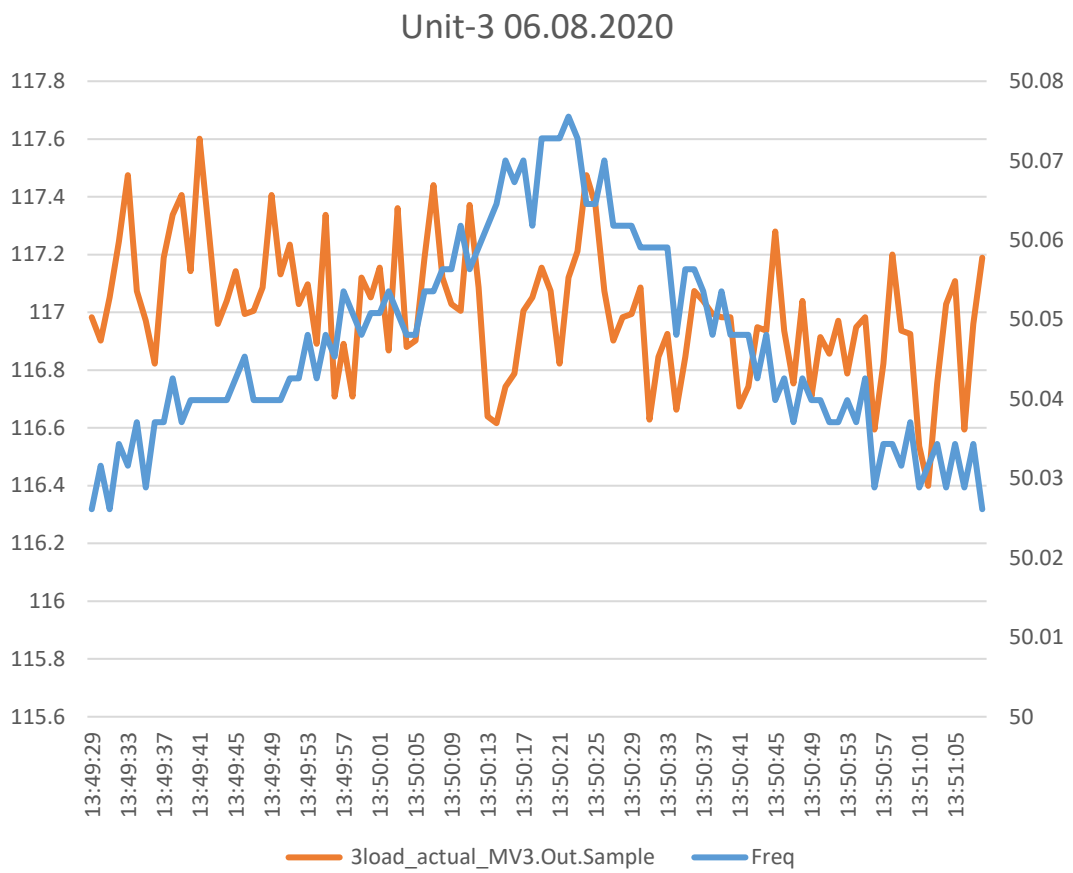
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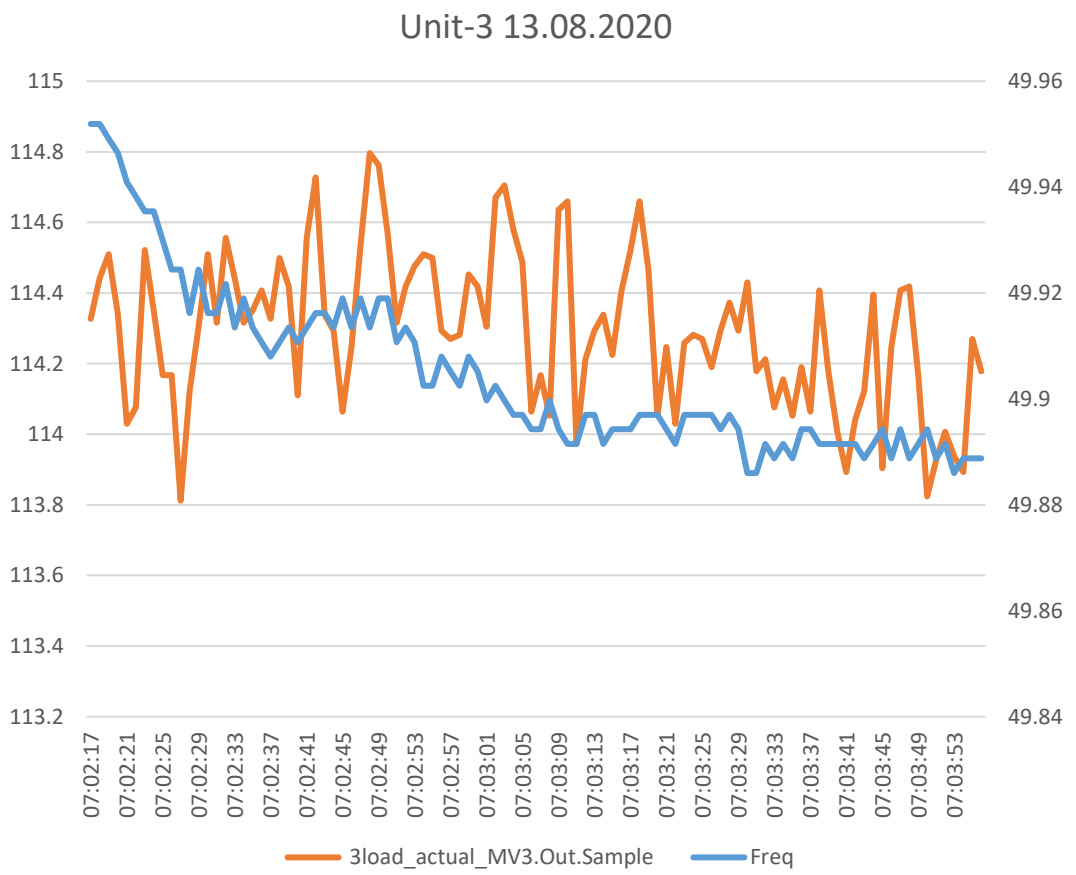
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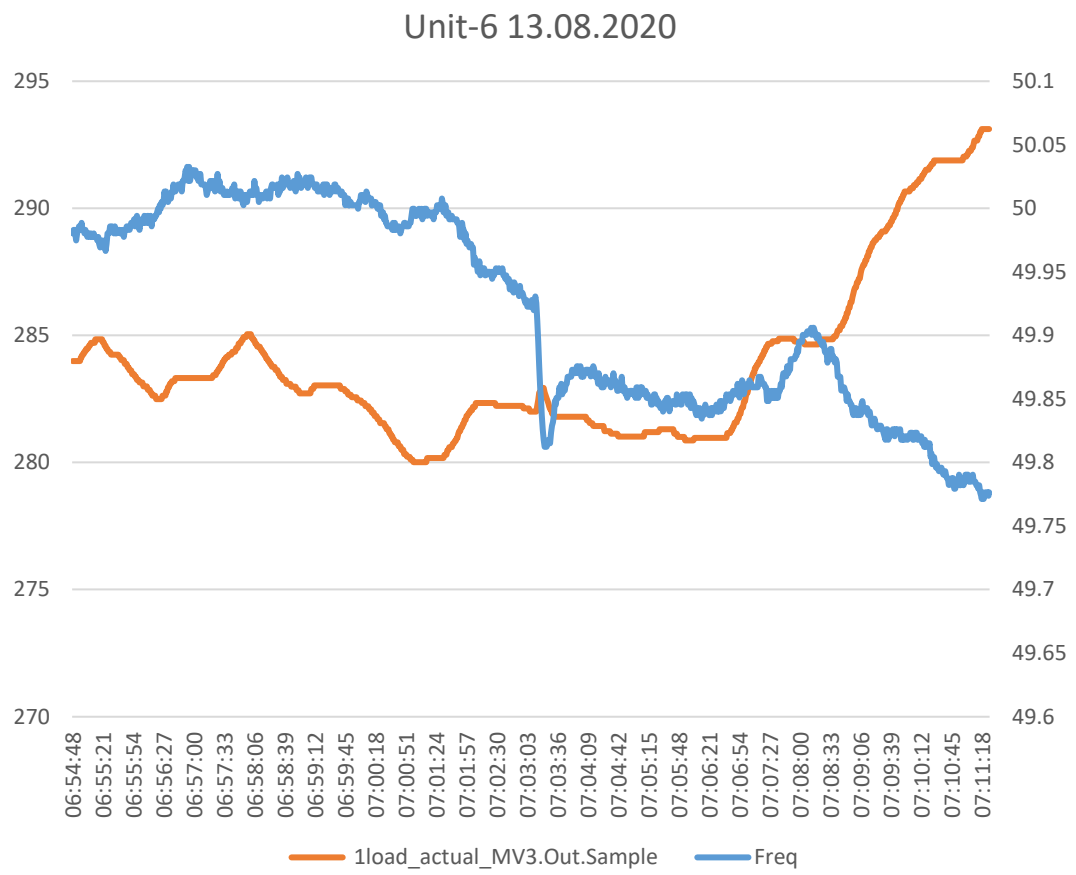
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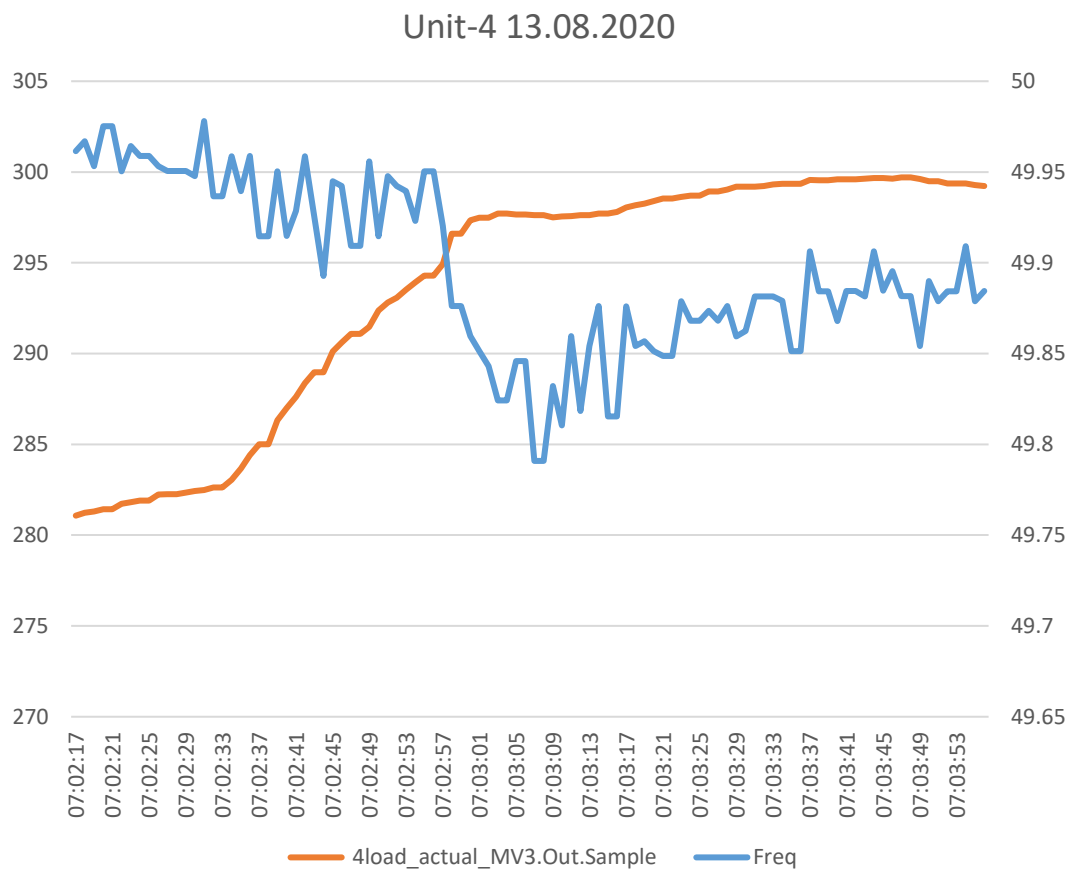
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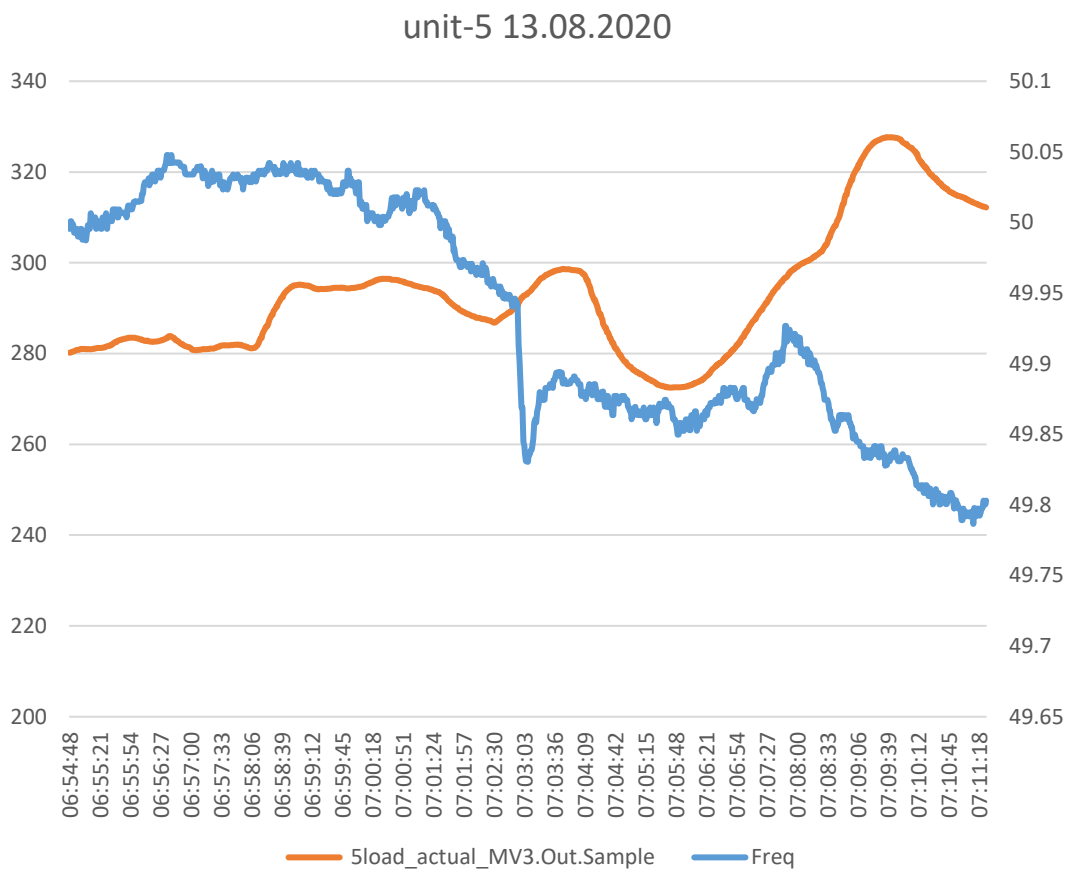
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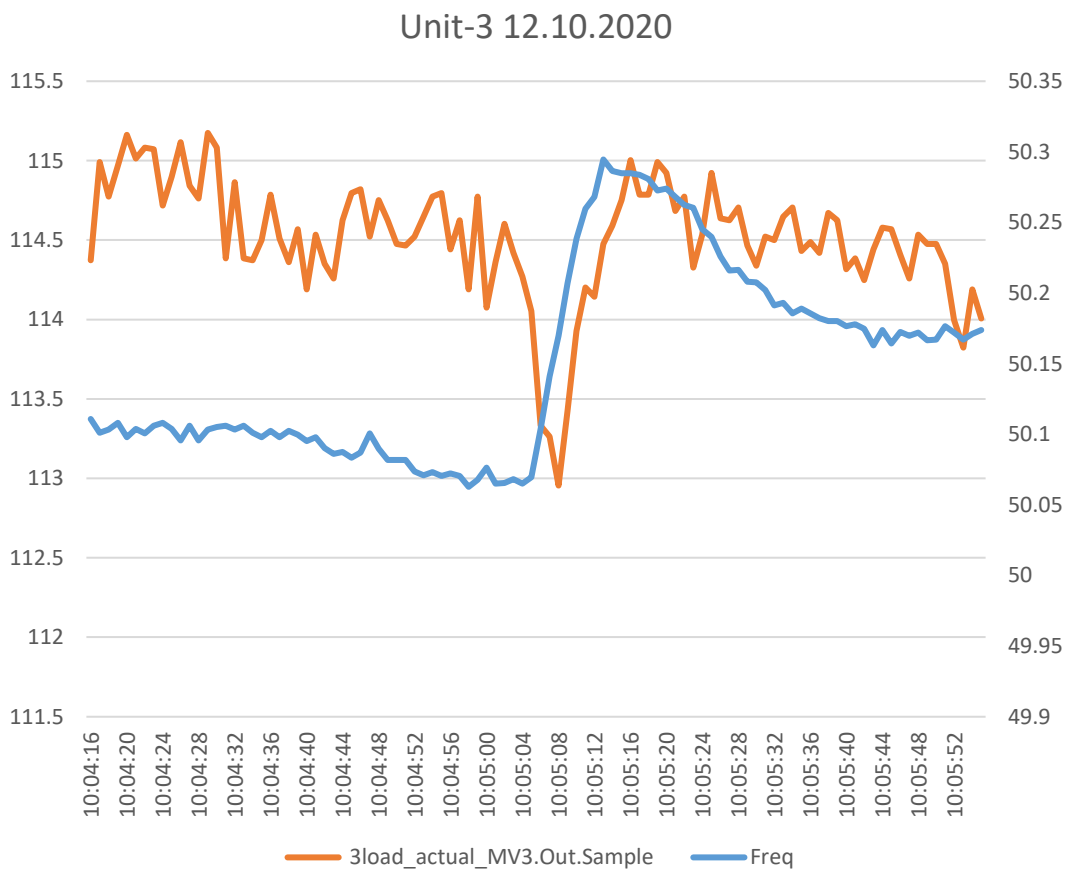
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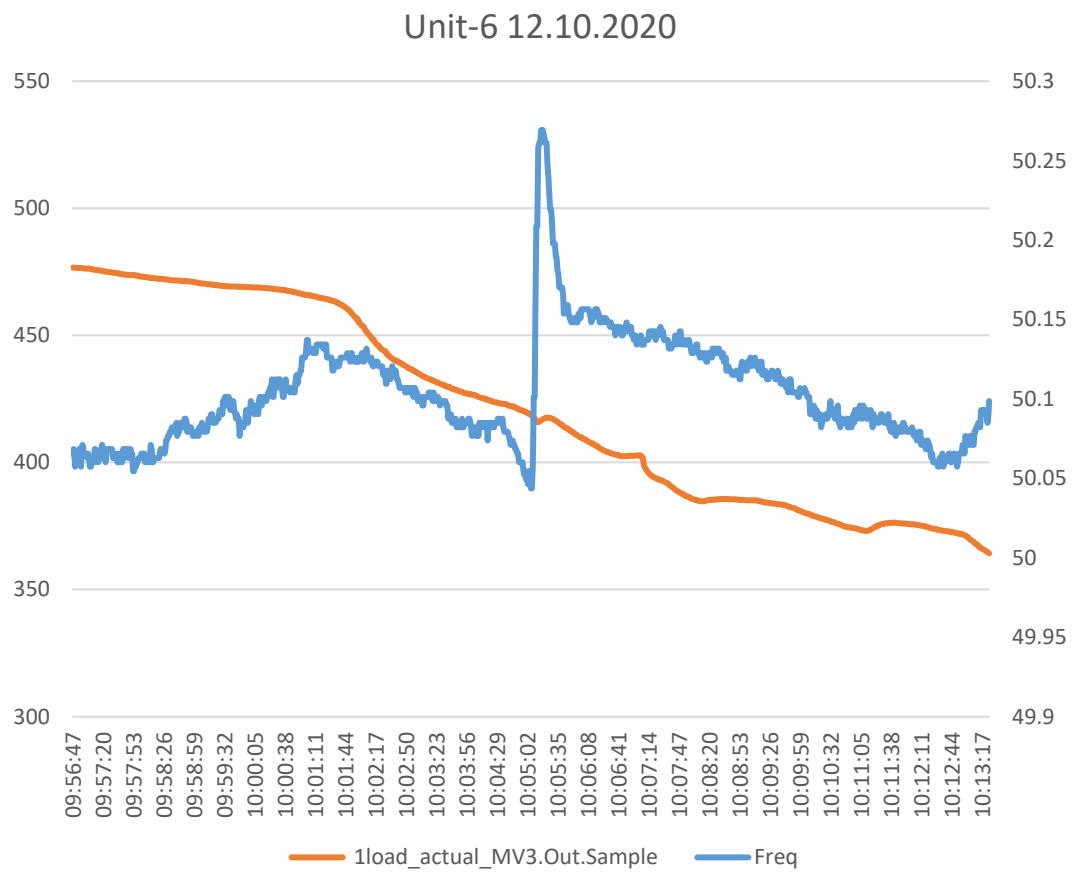
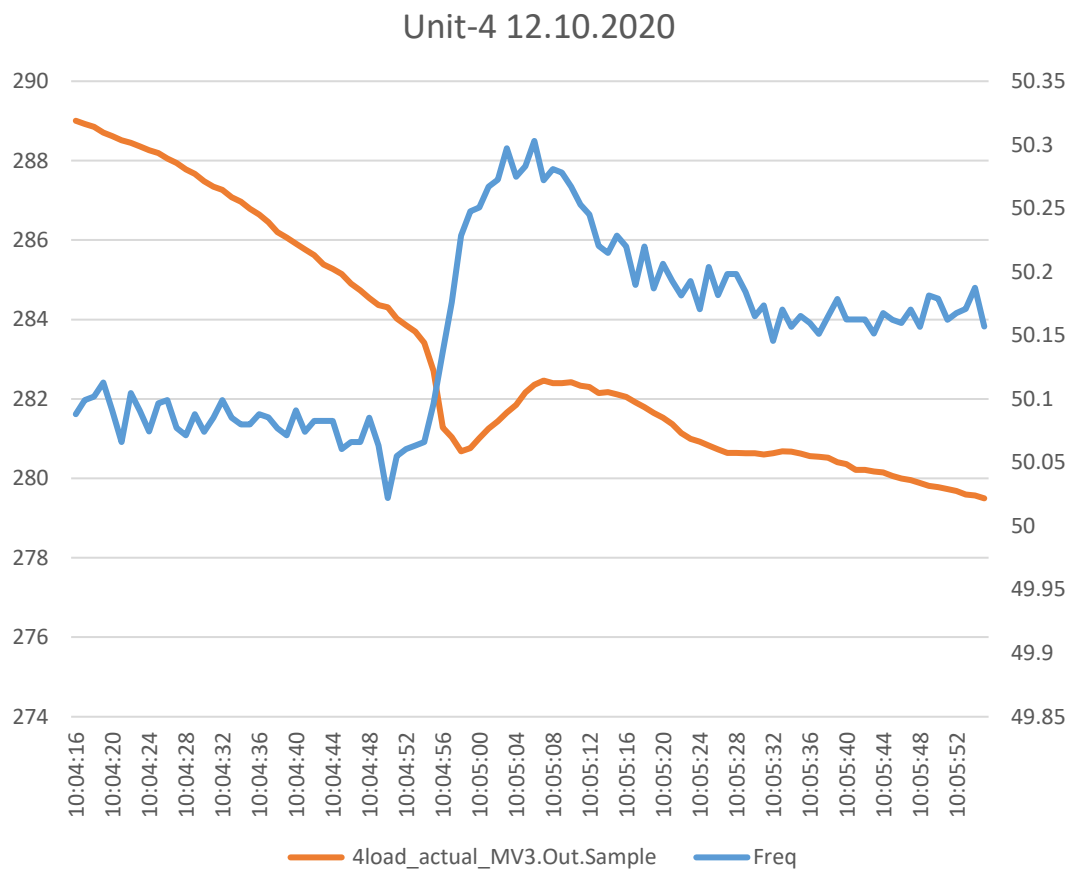
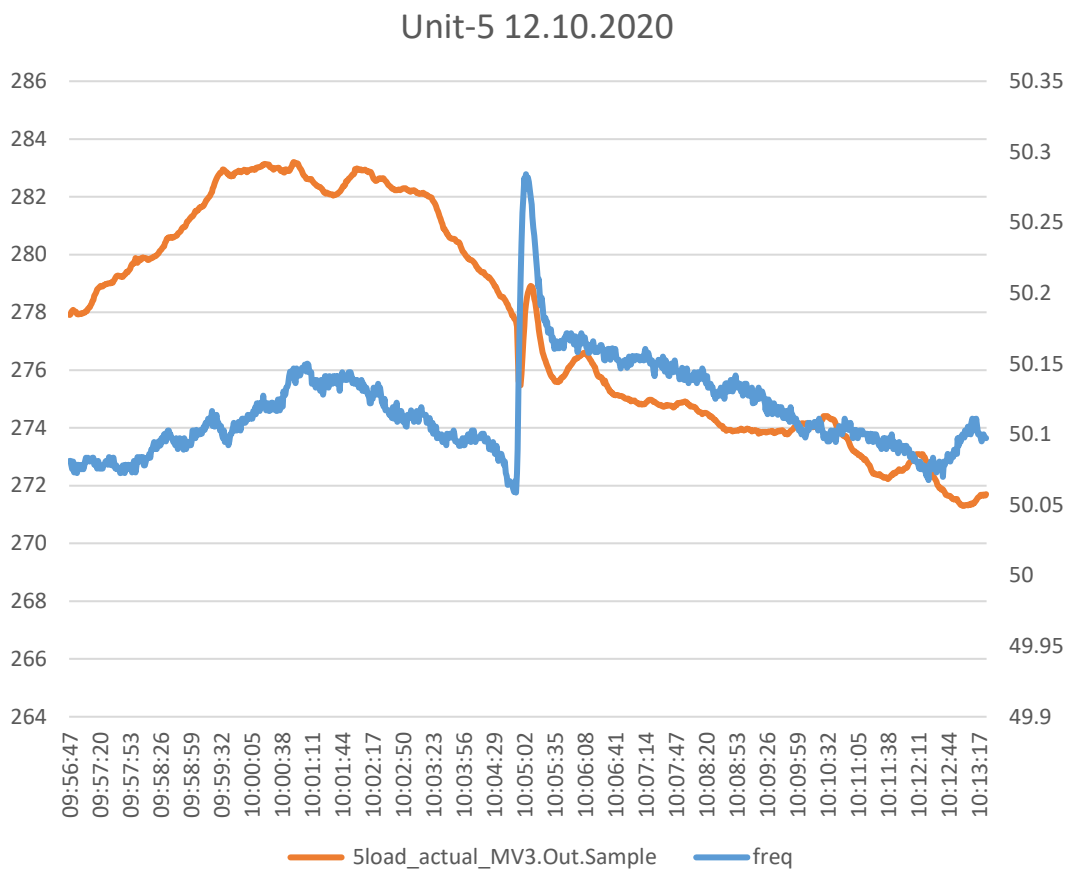
3load_actual_MV3.Out.Sample
Freq

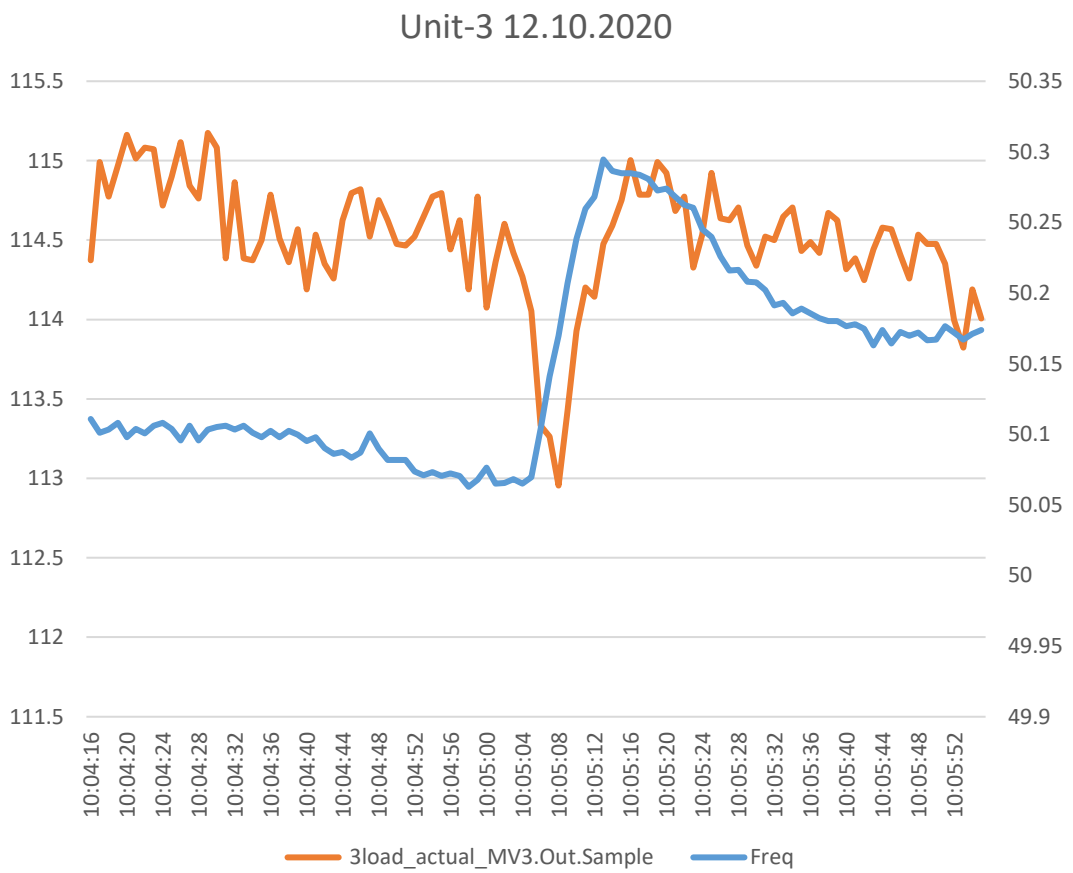

Unit-6 12.10.2020
550
500
450
400
350
300
50.3
50.25
50.2
50.15
50.1
50.05
50
49.95
49.9
09:56:47
09:57:20
09:57:53
09:58:26
09:58:59
09:59:32
10:00:05
10:00:38
10:01:11
10:01:44
10:02:17
10:02:50
10:03:23
10:03:56
10:04:29
10:05:02
10:05:35
10:06:08
10:06:41
10:07:14
10:07:47
10:08:20
10:08:53
10:09:26
10:09:59
10:10:32
10:11:05
10:11:38
10:12:11
10:12:44
10:13:17
1load_actual_MV3.Out.Sample
Freq

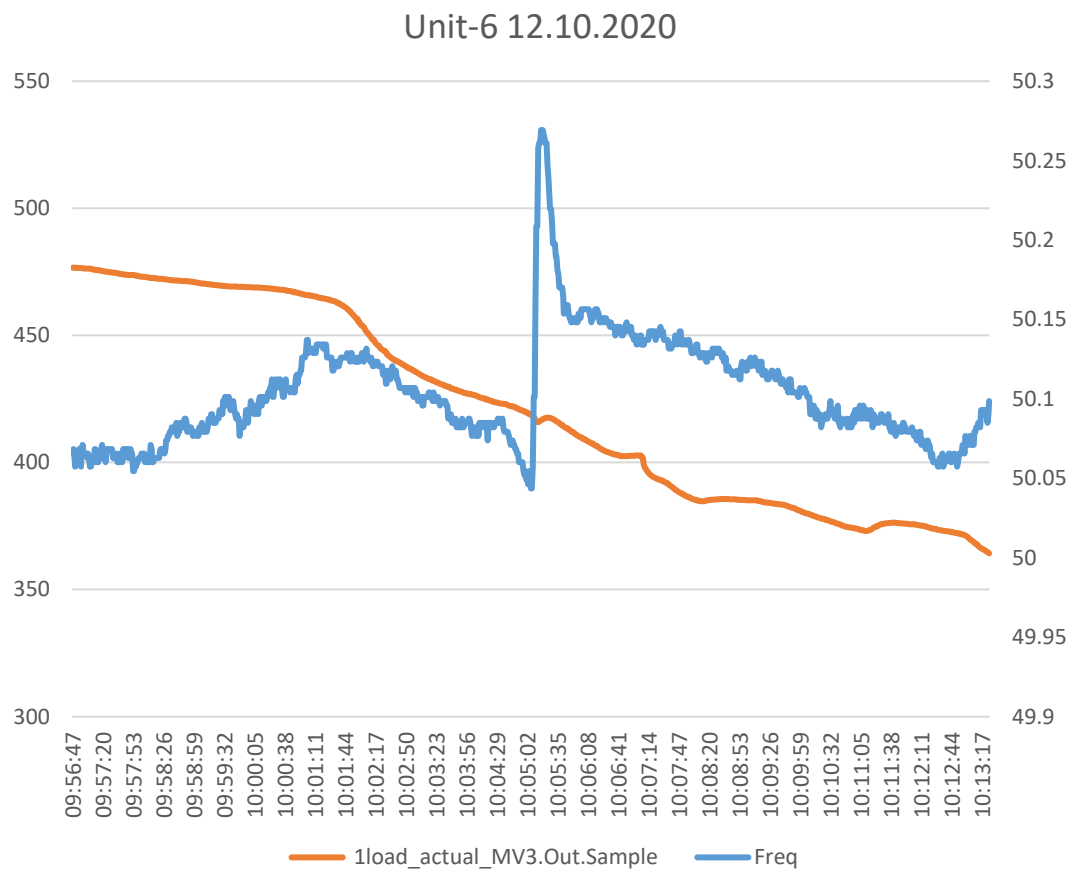
12.10.2020


Unit-4 12.10.2020
290
288
286
284
282
280
278
276
274
50.35
50.3
50.25
50.2
50.15
50.1
50.05
50
49.95
49.9
49.85
10:04:16
10:04:20
10:04:24
10:04:28
10:04:32
10:04:36
10:04:40
10:04:44
10:04:48
10:04:52
10:04:56
10:05:00
10:05:04
10:05:08
10:05:12
10:05:16
10:05:20
10:05:24
10:05:28
10:05:32
10:05:36
10:05:40
10:05:44
10:05:48
10:05:52
4load_actual_MV3.Out.Sample
Freq

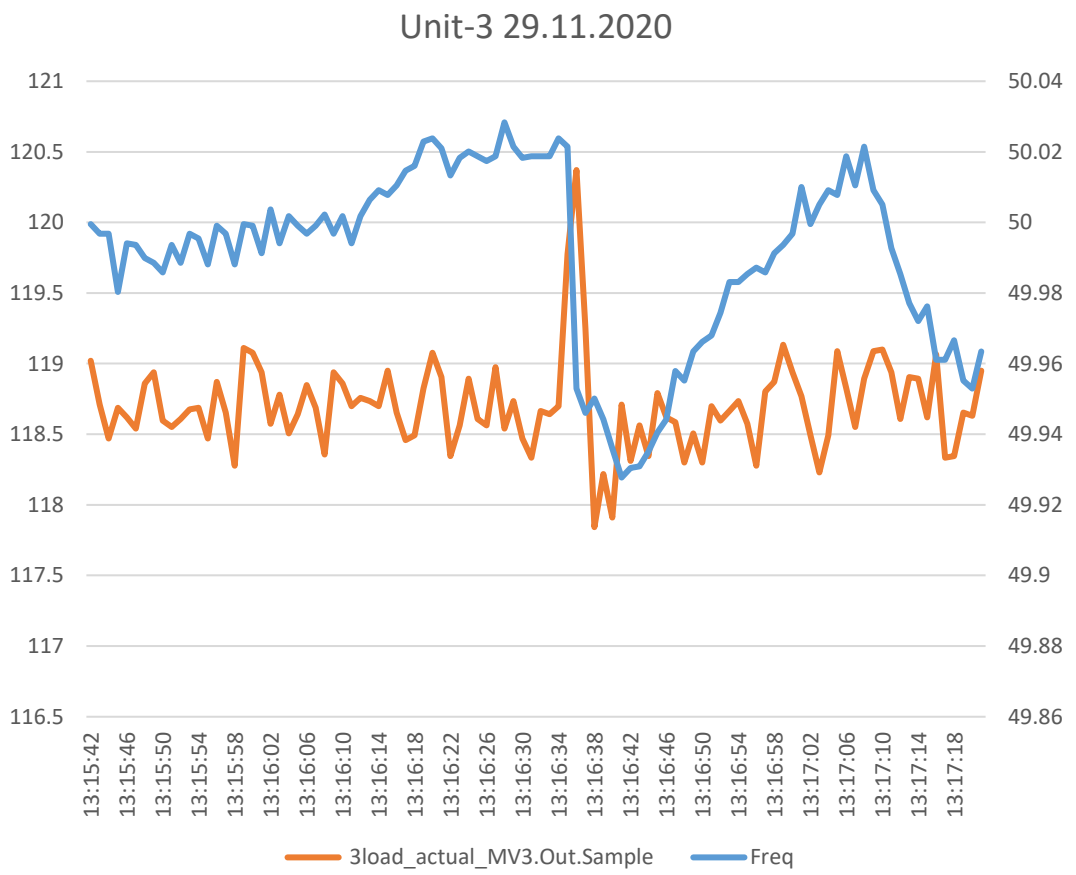

Unit-5 12.10.2020
286
284
282
280
278
276
274
272
270
268
266
264
50.35
50.3
50.25
50.2
50.15
50.1
50.05
50
49.95
49.9
09:56:47
09:57:20
09:57:53
09:58:26
09:58:59
09:59:32
10:00:05
10:00:38
10:01:11
10:01:44
10:02:17
10:02:50
10:03:23
10:03:56
10:04:29
10:05:02
10:05:35
10:06:08
10:06:41
10:07:14
10:07:47
10:08:20
10:08:53
10:09:26
10:09:59
10:10:32
10:11:05
10:11:38
10:12:11
10:12:44
10:13:17
5load_actual_MV3.Out.Sample
freq

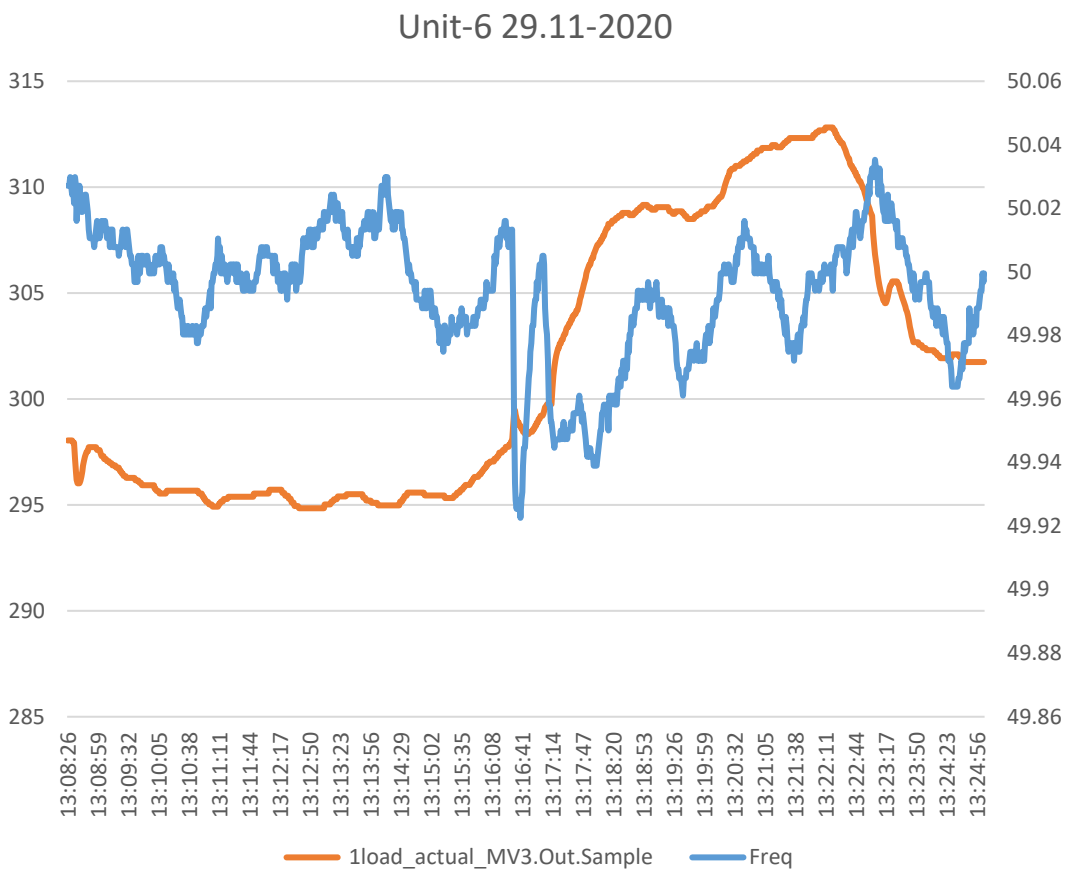
12.10.2020


Unit-3 12.10.2020
115.5
115
114.5
114
113.5
113
112.5
112
111.5
50.35
50.3
50.25
50.2
50.15
50.1
50.05
50
49.95
49.9
10:04:16
10:04:20
10:04:24
10:04:28
10:04:32
10:04:36
10:04:40
10:04:44
10:04:48
10:04:52
10:04:56
10:05:00
10:05:04
10:05:08
10:05:12
10:05:16
10:05:20
10:05:24
10:05:28
10:05:32
10:05:36
10:05:40
10:05:44
10:05:48
10:05:52
3load_actual_MV3.Out.Sample
Freq

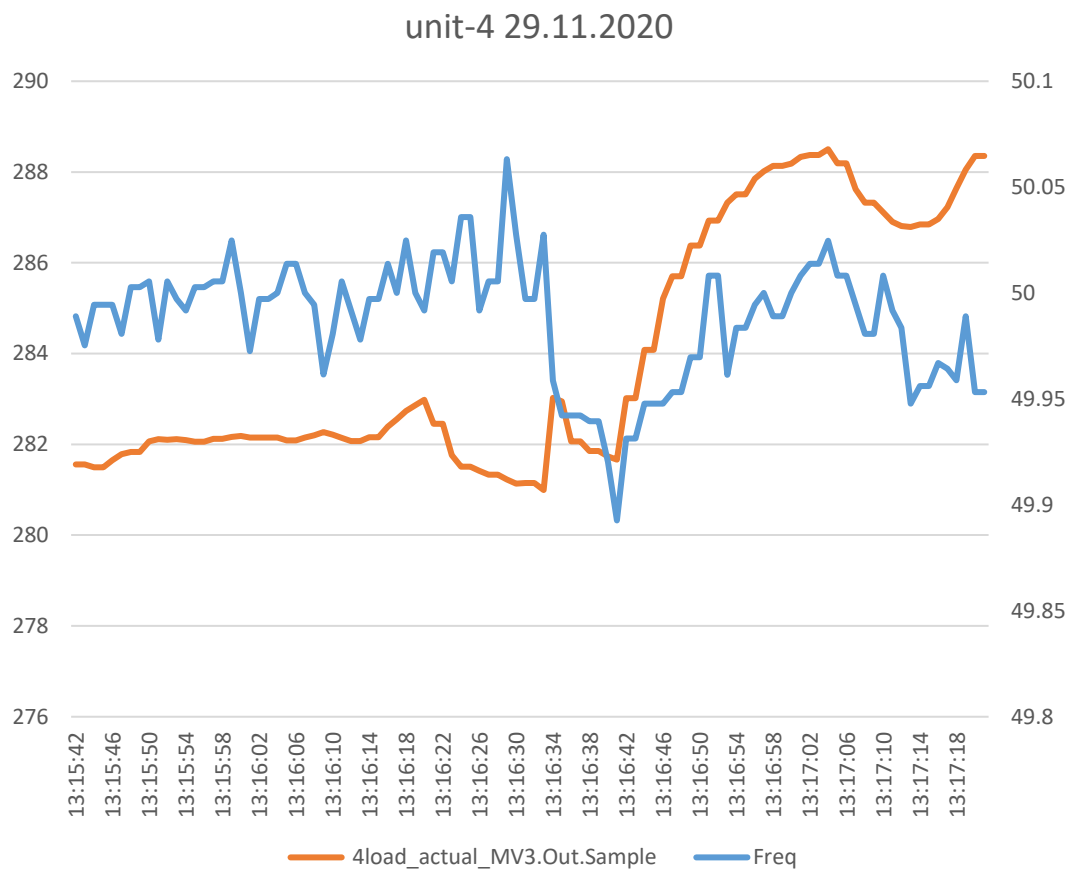

Unit-6 12.10.2020
550
500
450
400
350
300
50.3
50.25
50.2
50.15
50.1
50.05
50
49.95
49.9
09:56:47
09:57:20
09:57:53
09:58:26
09:58:59
09:59:32
10:00:05
10:00:38
10:01:11
10:01:44
10:02:17
10:02:50
10:03:23
10:03:56
10:04:29
10:05:02
10:05:35
10:06:08
10:06:41
10:07:14
10:07:47
10:08:20
10:08:53
10:09:26
10:09:59
10:10:32
10:11:05
10:11:38
10:12:11
10:12:44
10:13:17
1load_actual_MV3.Out.Sample
Freq

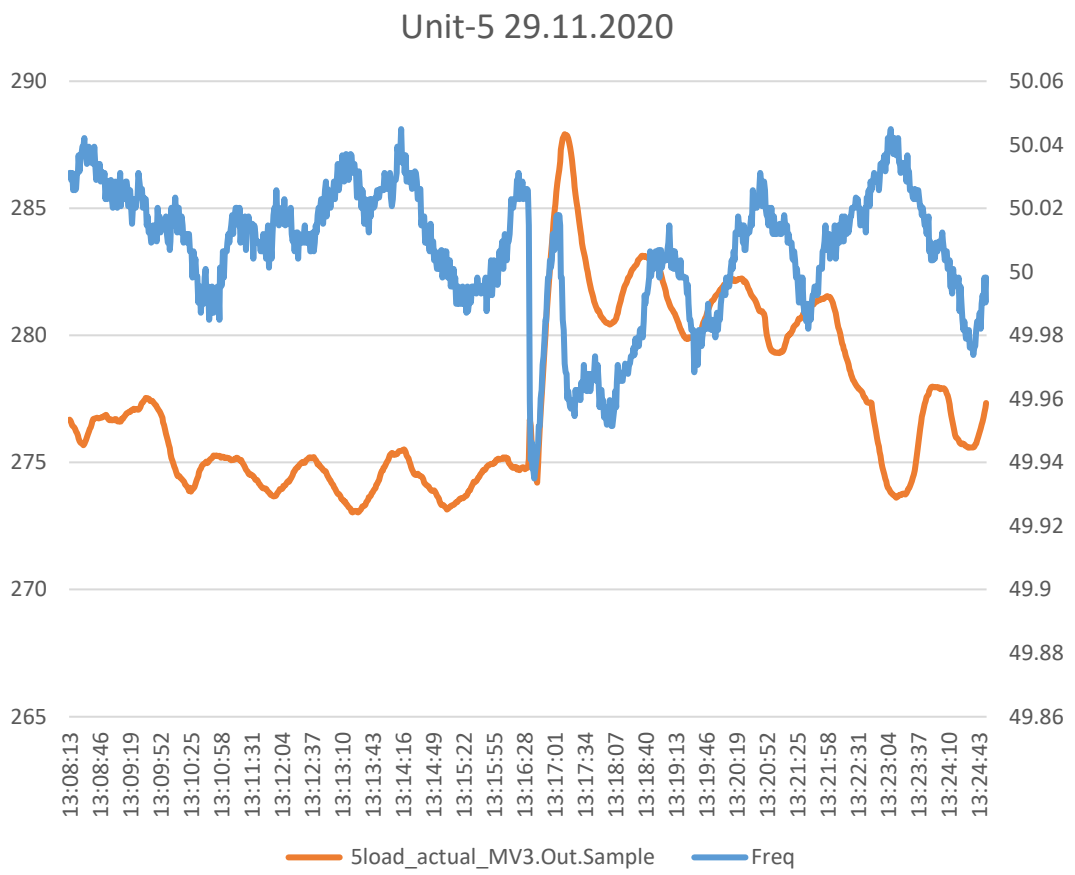
29.11.2020


Unit-3 29.11.2020
121
120.5
120
119.5
119
118.5
118
117.5
117
116.5
50.04
50.02
50
49.98
49.96
49.94
49.92
49.9
49.88
49.86
13:15:42
13:15:46
13:15:50
13:15:54
13:15:58
13:16:02
13:16:06
13:16:10
13:16:14
13:16:18
13:16:22
13:16:26
13:16:30
13:16:34
13:16:38
13:16:42
13:16:46
13:16:50
13:16:54
13:16:58
13:17:02
13:17:06
13:17:10
13:17:14
13:17:18
3load_actual_MV3.Out.Sample
Freq

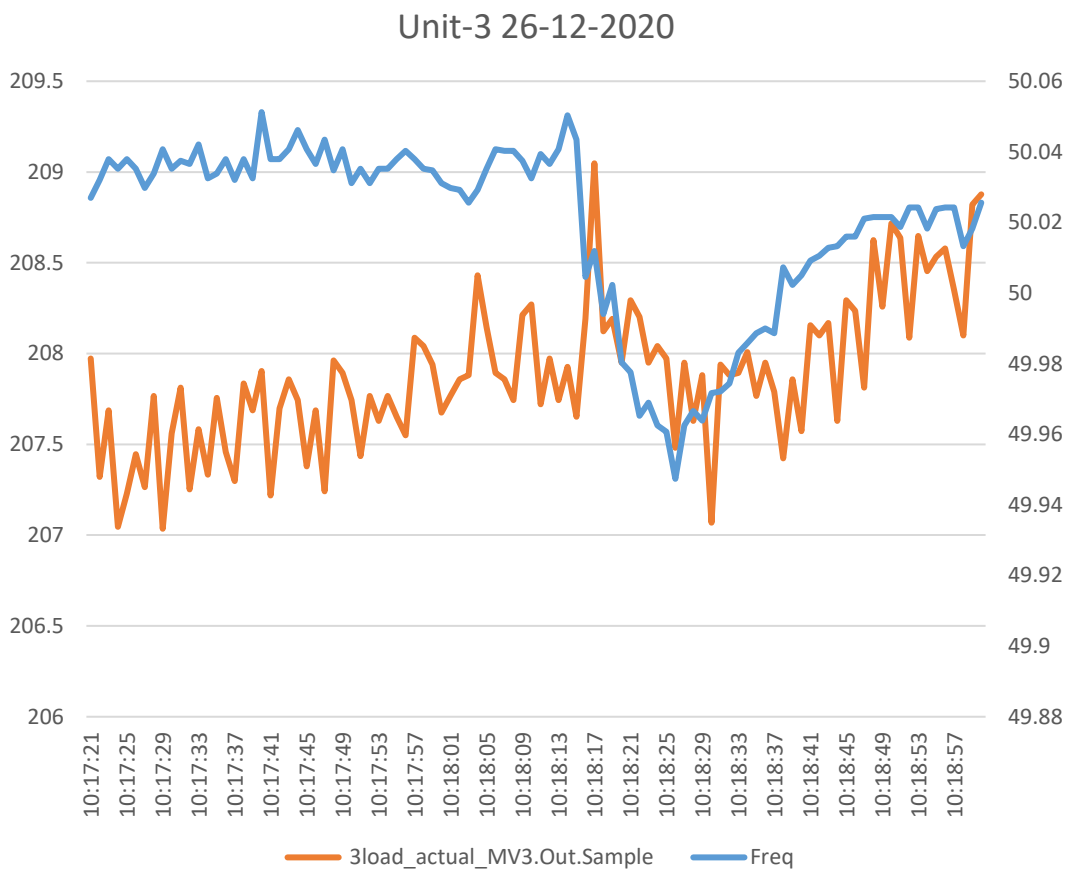

Unit-6 29.11-2020
315
310
305
300
295
290
285
50.06
50.04
50.02
50
49.98
49.96
49.94
49.92
49.9
49.88
49.86
13:08:26
13:08:59
13:09:32
13:10:05
13:10:38
13:11:11
13:11:44
13:12:17
13:12:50
13:13:23
13:13:56
13:14:29
13:15:02
13:15:35
13:16:08
13:16:41
13:17:14
13:17:47
13:18:20
13:18:53
13:19:26
13:19:59
13:20:32
13:21:05
13:21:38
13:22:11
13:22:44
13:23:17
13:23:50
13:24:23
13:24:56
1load_actual_MV3.Out.Sample
Freq

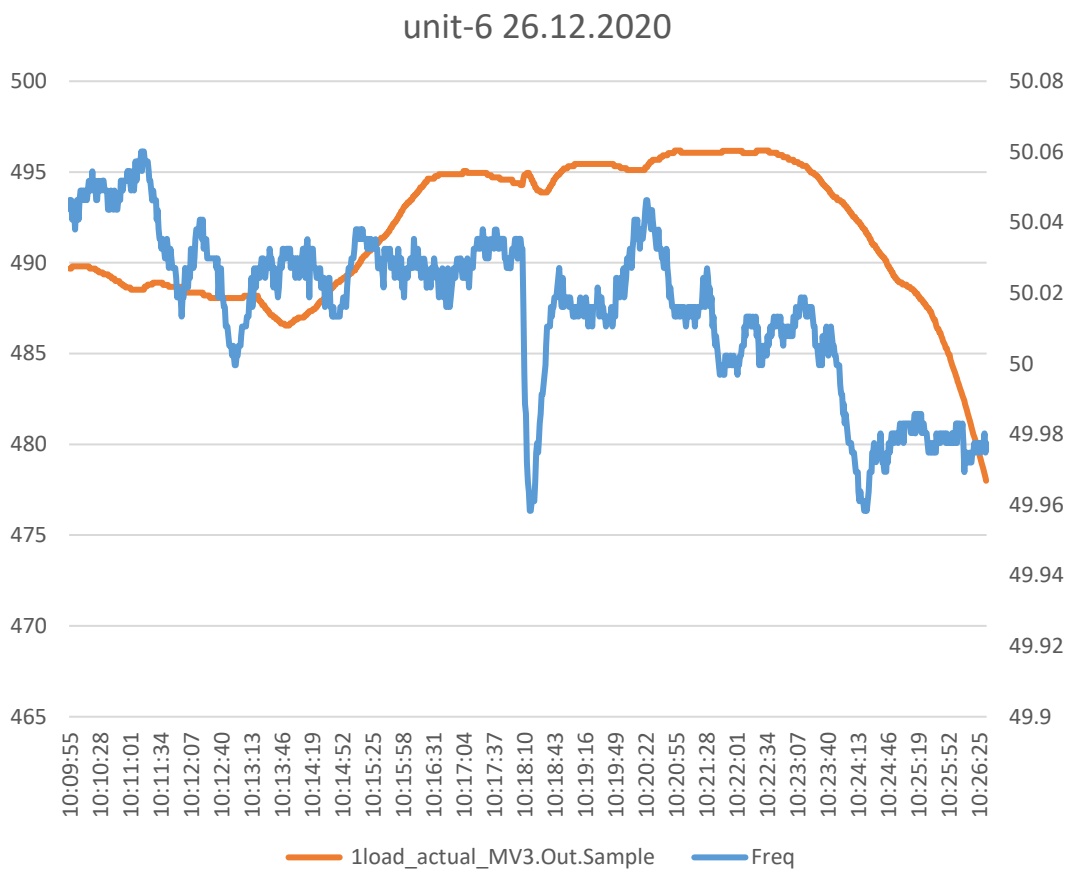
29.11.2020


unit-4 29.11.2020
290
288
286
284
282
280
278
276
50.1
50.05
50
49.95
49.9
49.85
49.8
13:15:42
13:15:46
13:15:50
13:15:54
13:15:58
13:16:02
13:16:06
13:16:10
13:16:14
13:16:18
13:16:22
13:16:26
13:16:30
13:16:34
13:16:38
13:16:42
13:16:46
13:16:50
13:16:54
13:16:58
13:17:02
13:17:06
13:17:10
13:17:14
13:17:18
4load_actual_MV3.Out.Sample
Freq

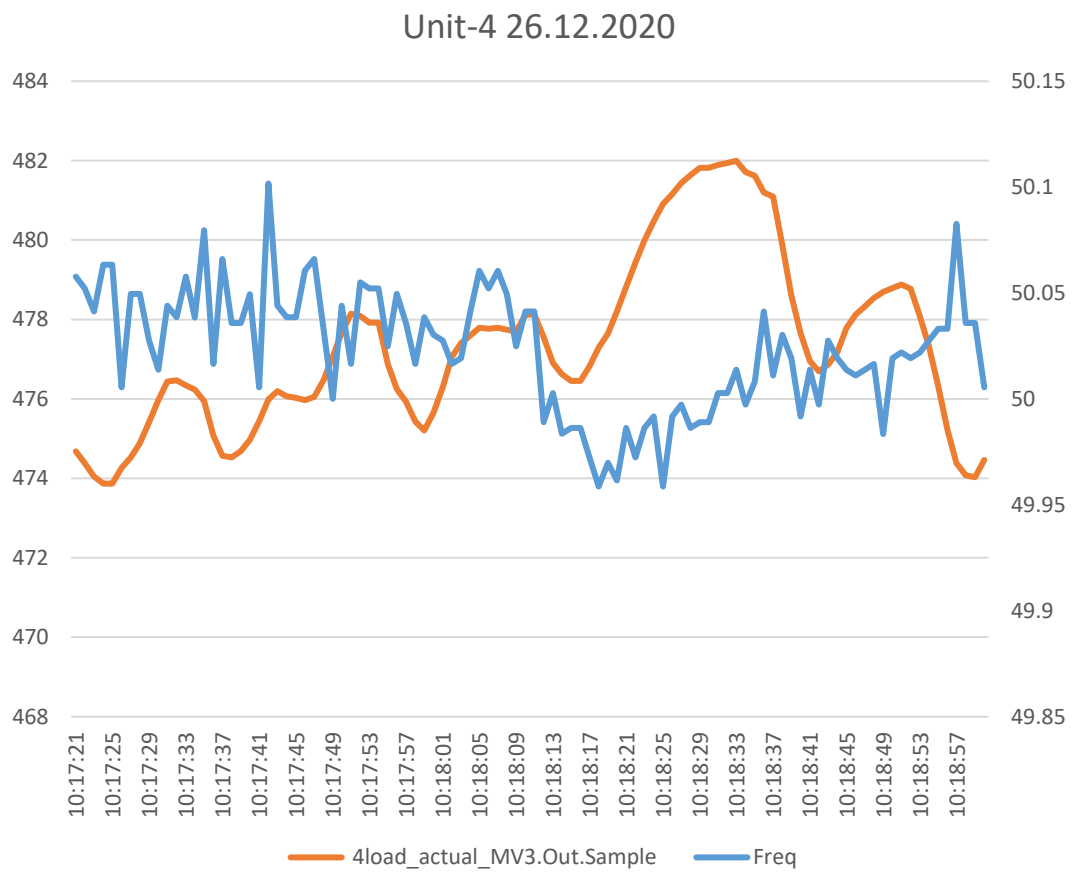

Unit-5 29.11.2020
290
285
280
275
270
265
50.06
50.04
50.02
50
49.98
49.96
49.94
49.92
49.9
49.88
49.86
13:08:13
13:08:46
13:09:19
13:09:52
13:10:25
13:10:58
13:11:31
13:12:04
13:12:37
13:13:10
13:13:43
13:14:16
13:14:49
13:15:22
13:15:55
13:16:28
13:17:01
13:17:34
13:18:07
13:18:40
13:19:13
13:19:46
13:20:19
13:20:52
13:21:25
13:21:58
13:22:31
13:23:04
13:23:37
13:24:10
13:24:43
5load_actual_MV3.Out.Sample
Freq

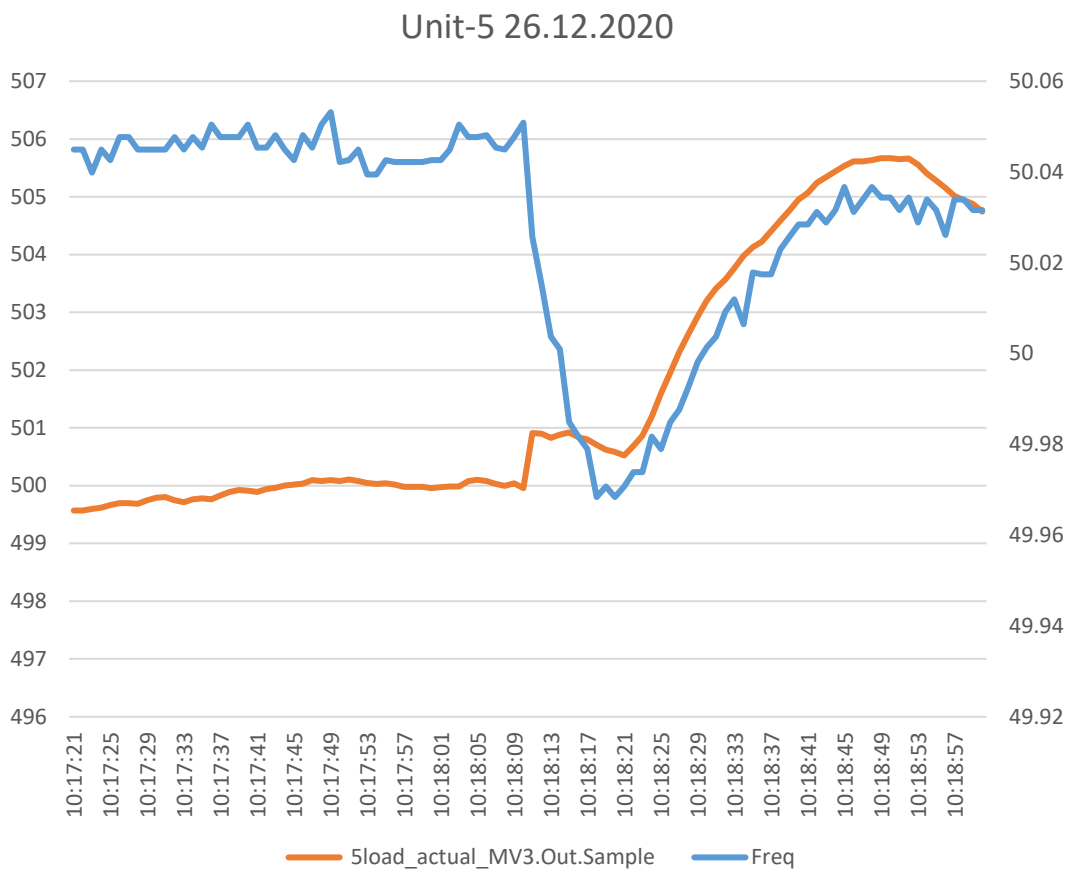
26.12.2020


Unit-3 26-12-2020
209.5
209
208.5
208
207.5
207
206.5
206
50.06
50.04
50.02
50
49.98
49.96
49.94
49.92
49.9
49.88
10:17:21
10:17:25
10:17:29
10:17:33
10:17:37
10:17:41
10:17:45
10:17:49
10:17:53
10:17:57
10:18:01
10:18:05
10:18:09
10:18:13
10:18:17
10:18:21
10:18:25
10:18:29
10:18:33
10:18:37
10:18:41
10:18:45
10:18:49
10:18:53
10:18:57
3load_actual_MV3.Out.Sample
Freq


unit-6 26.12.2020
500
495
490
485
480
475
470
465
50.08
50.06
50.04
50.02
50
49.98
49.96
49.94
49.92
49.9
10:09:55
10:10:28
10:11:01
10:11:34
10:12:07
10:12:40
10:13:13
10:13:46
10:14:19
10:14:52
10:15:25
10:15:58
10:16:31
10:17:04
10:17:37
10:18:10
10:18:43
10:19:16
10:19:49
10:20:22
10:20:55
10:21:28
10:22:01
10:22:34
10:23:07
10:23:40
10:24:13
10:24:46
10:25:19
10:25:52
10:26:25
1load_actual_MV3.Out.Sample
Freq

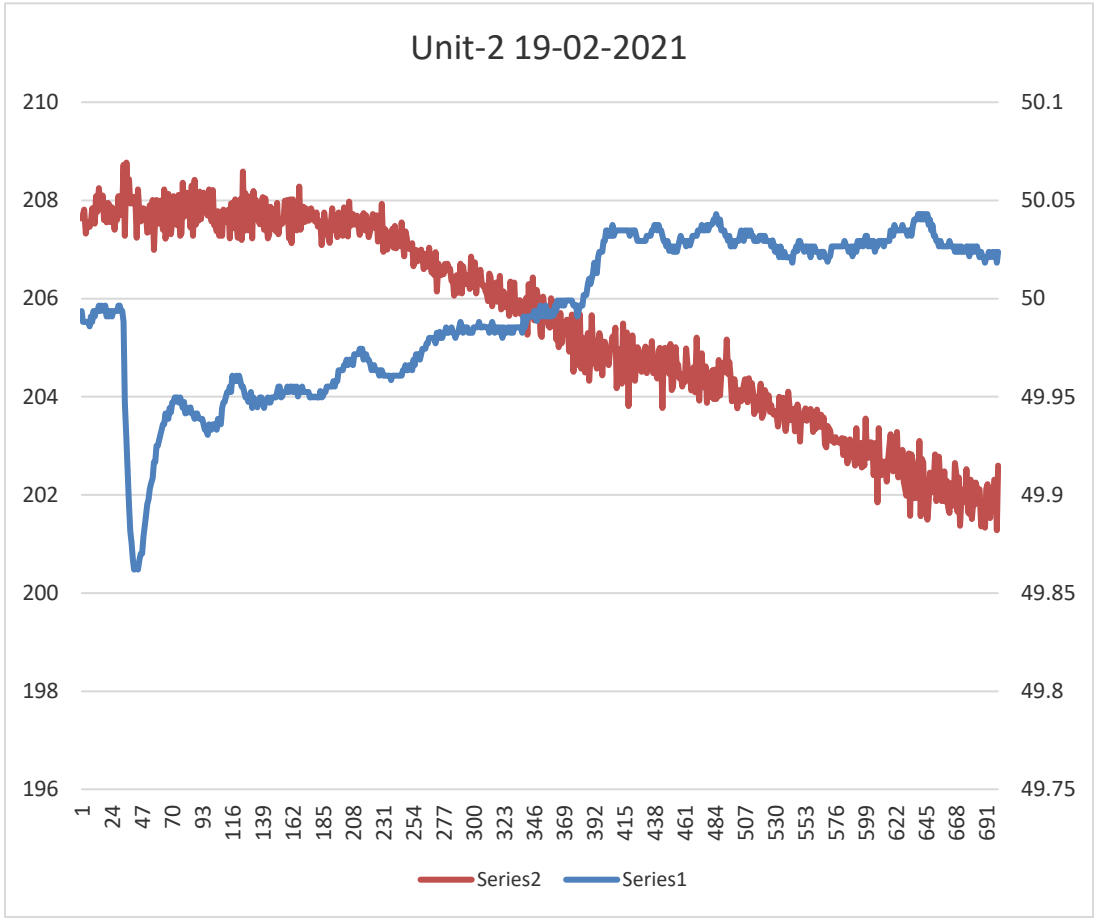
26.12.2020

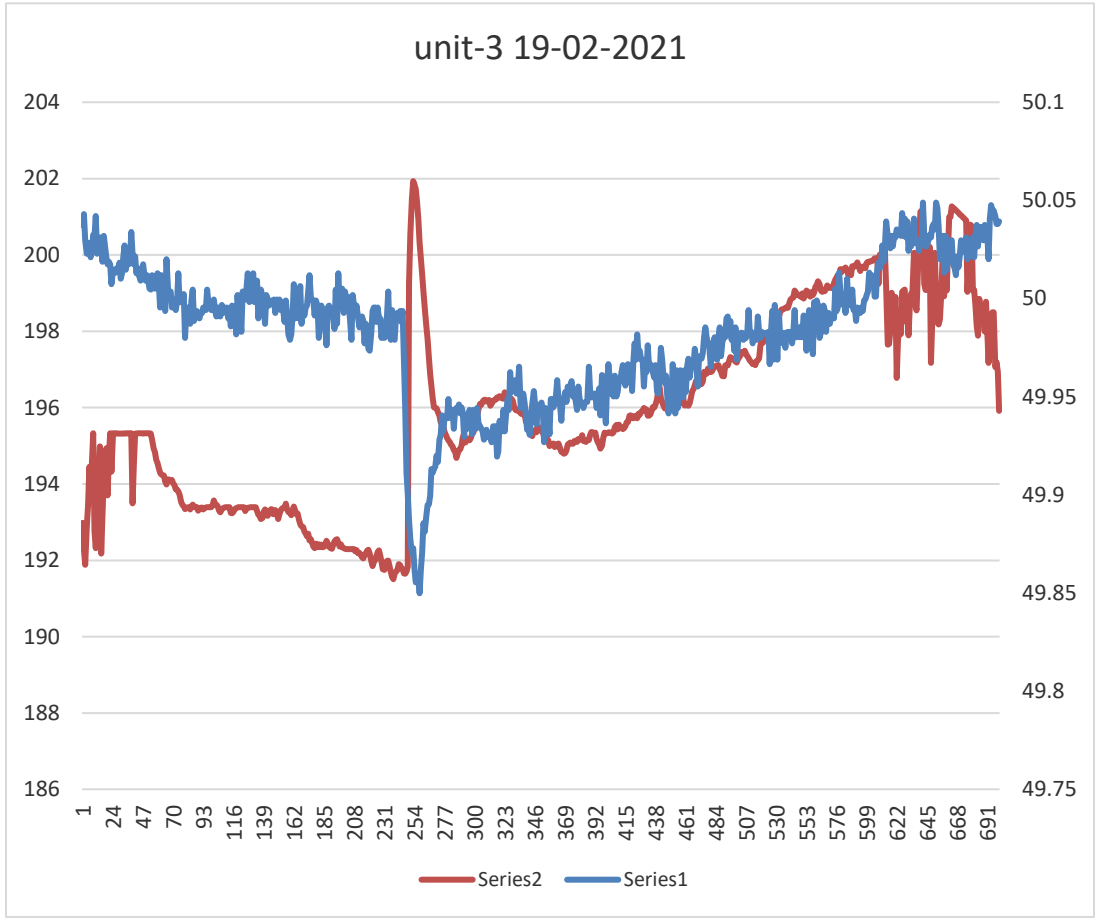

Unit-4 26.12.2020
484
482
480
478
476
474
472
470
468
50.15
50.1
50.05
50
49.95
49.9
49.85
10:17:21
10:17:25
10:17:29
10:17:33
10:17:37
10:17:41
10:17:45
10:17:49
10:17:53
10:17:57
10:18:01
10:18:05
10:18:09
10:18:13
10:18:17
10:18:21
10:18:25
10:18:29
10:18:33
10:18:37
10:18:41
10:18:45
10:18:49
10:18:53
10:18:57
4load_actual_MV3.Out.Sample
Freq


Unit-5 26.12.2020
507
506
505
504
503
502
501
500
499
498
497
496
50.06
50.04
50.02
50
49.98
49.96
49.94
49.92
10:17:21
10:17:25
10:17:29
10:17:33
10:17:37
10:17:41
10:17:45
10:17:49
10:17:53
10:17:57
10:18:01
10:18:05
10:18:09
10:18:13
10:18:17
10:18:21
10:18:25
10:18:29
10:18:33
10:18:37
10:18:41
10:18:45
10:18:49
10:18:53
10:18:57
5load_actual_MV3.Out.Sample
Freq

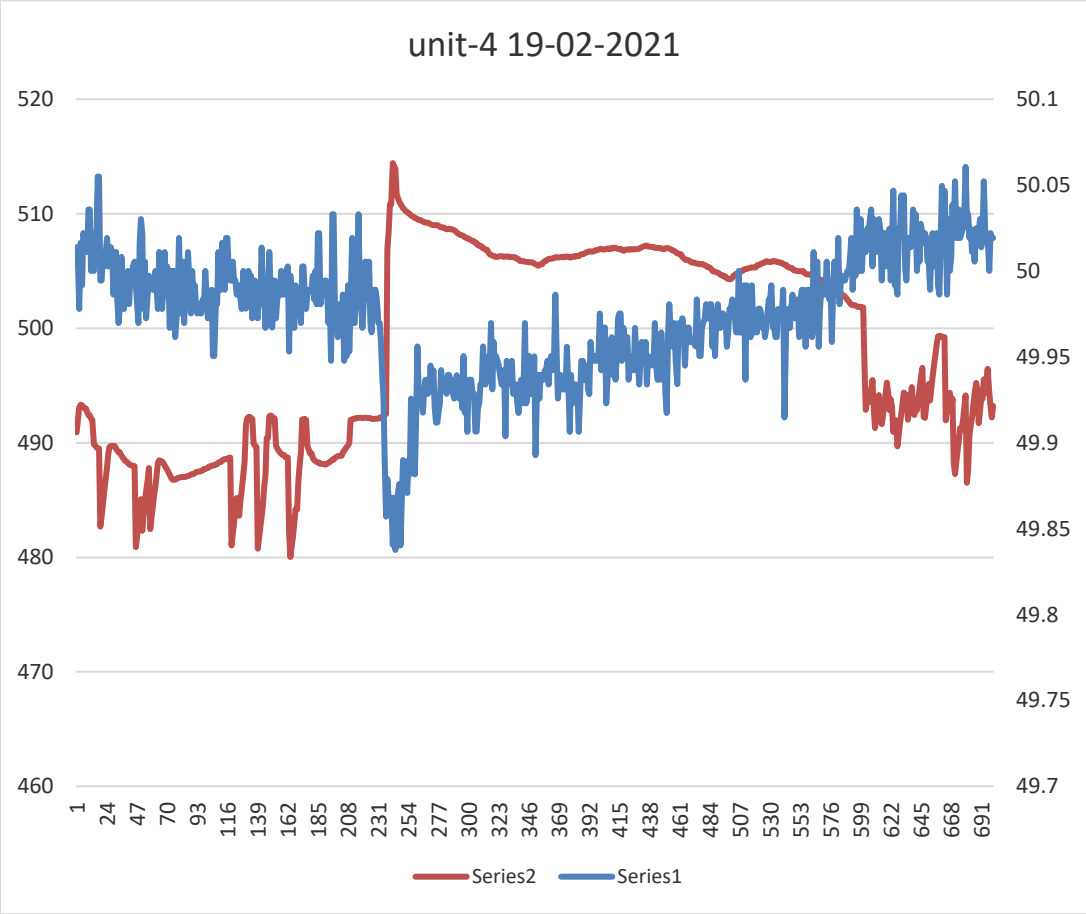
19-02-2021							
	starting frequency	ending frequency	starting load	end load	Expected response	Actual response	
unit-2	49.985	49.854	208	210	2	2	responded
unit-3	49.985	49.854	192	202	9.6	10	responded
unit-4	49.985	49.854	492	514	24.6	22	responded
unit-5	49.985	49.854	492	517	24.6	25	responded
unit-6	49.985	49.854	501	525.4	24	24.4	responded

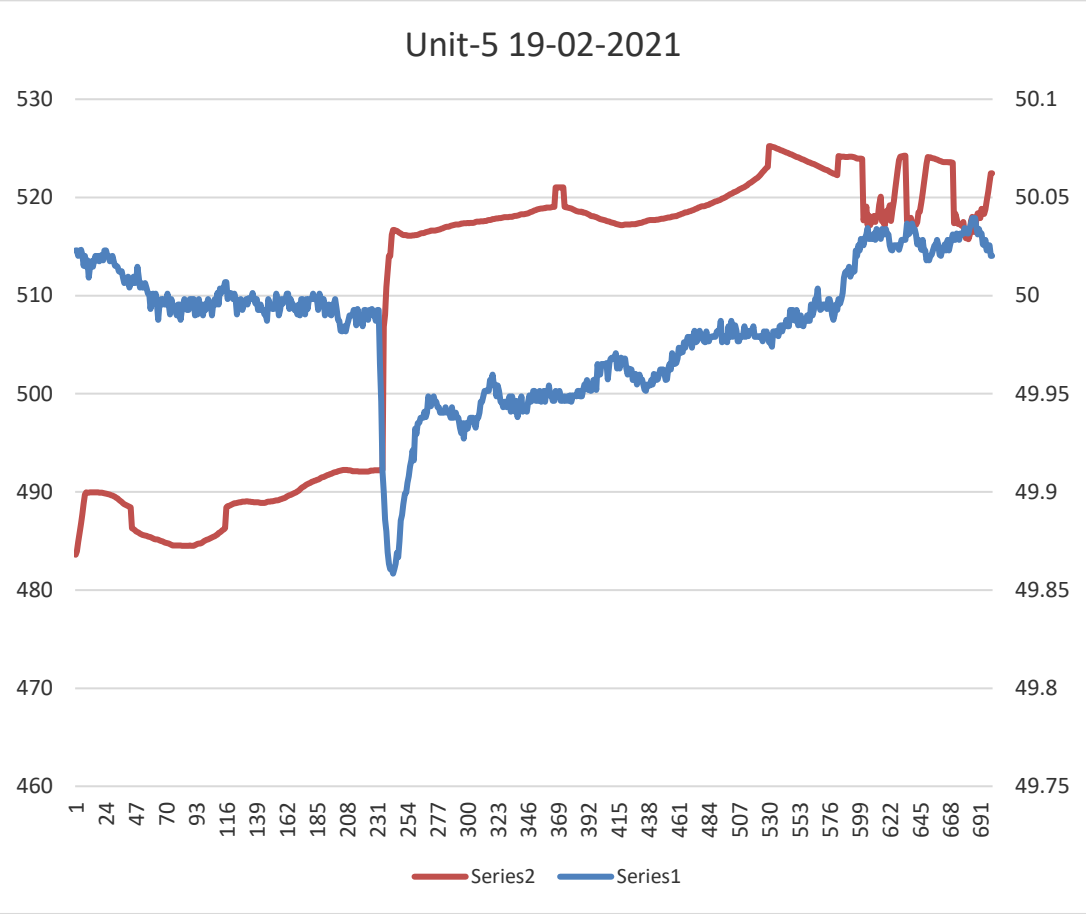
19.02.2021


Unit-2 19-02-2021
210
208
206
204
202
200
198
196
50.1
50.05
50
49.95
49.9
49.85
49.8
49.75
1 24 47 70 93 116 139 162 185 208 231 254 277 300 323 346 369 392 415 438 461 484 507 530 553 576 599 622 645 668 691
Series2
Series1

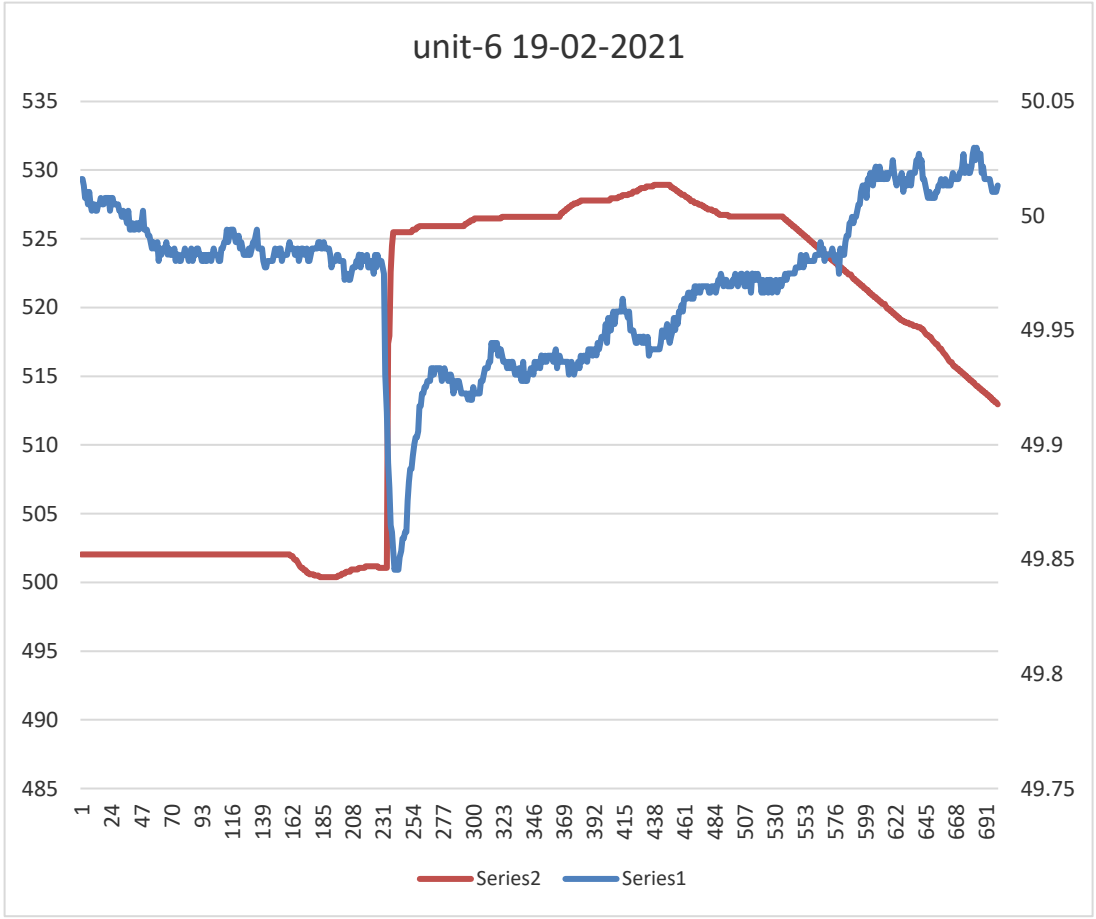

unit-3 19-02-2021
204
202
200
198
196
194
192
190
188
186
50.1
50.05
50
49.95
49.9
49.85
49.8
49.75
1 24 47 70 93 116 139 162 185 208 231 254 277 300 323 346 369 392 415 438 461 484 507 530 553 576 599 622 645 668 691
Series2
Series1

19.02.2021


unit-4 19-02-2021
520
510
500
490
480
470
460
50.1
50.05
50
49.95
49.9
49.85
49.8
49.75
49.7
1 24 47 70 93 116 139 162 185 208 231 254 277 300 323 346 369 392 415 438 461 484 507 530 553 576 599 622 645 668 691
Series2
Series1


Unit-5 19-02-2021
530
520
510
500
490
480
470
460
50.1
50.05
50
49.95
49.9
49.85
49.8
49.75
1 24 47 70 93 116 139 162 185 208 231 254 277 300 323 346 369 392 415 438 461 484 507 530 553 576 599 622 645 668 691
Series2
Series1

19.02.2021

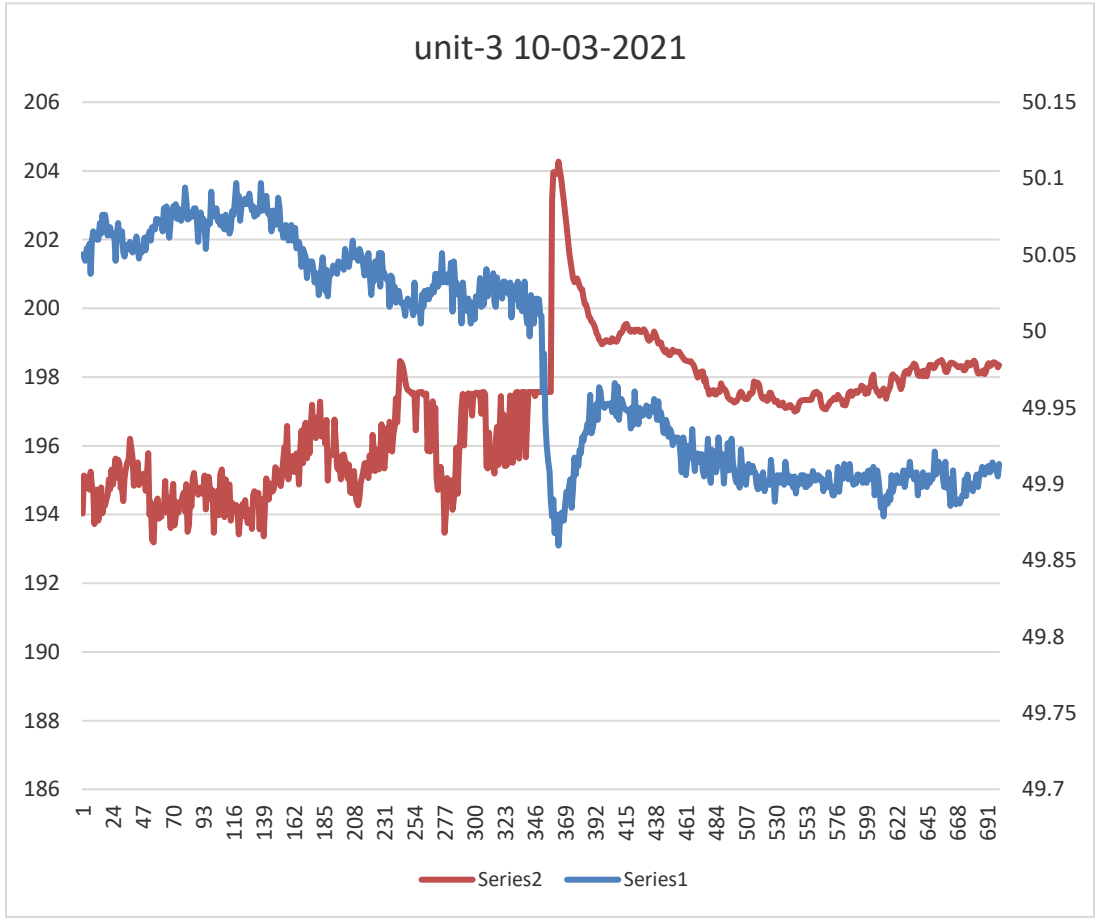

unit-6 19-02-2021
535
530
525
520
515
510
505
500
495
490
485
50.05
50
49.95
49.9
49.85
49.8
49.75
1
24
47
70
93
116
139
162
185
208
231
254
277
300
323
346
369
392
415
438
461
484
507
530
553
576
599
622
645
668
691
Series2
Series1

10.03.2021

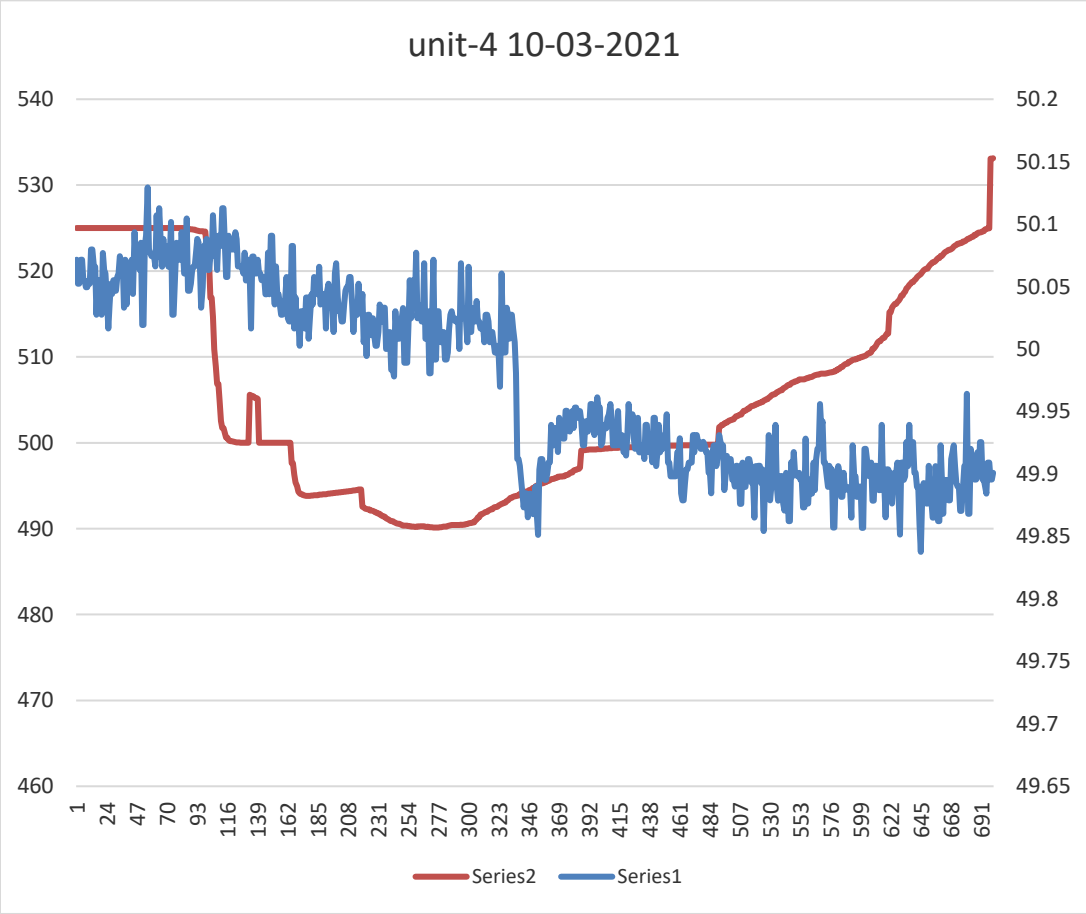
	starting frequency	ending frequency	starting load	end load	Expected response	Actual response	
unit-2	50.01	49.87	210	224	0	14	Responded
unit-3	50.01	49.87	197	204	9.85	7	Responded
unit-4	50.01	49.87	490	510	24.5	20	Responded
unit-5	50.01	49.87	510	525	15	15	Responded
unit-6	50.01	49.87	506	530	19	24	Responded

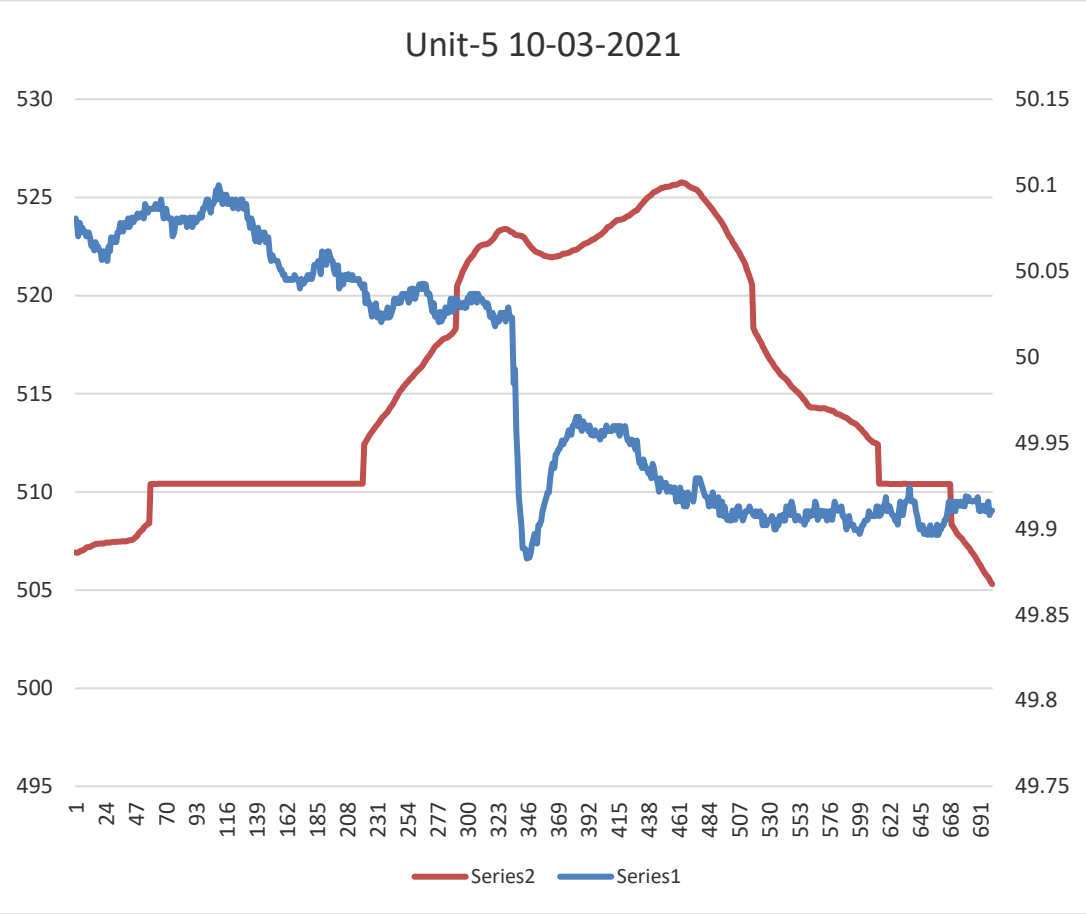
10.03.2021


unit-2 10-03-2021
225
220
215
210
205
200
50.1
50.05
50
49.95
49.9
49.85
49.8
1 24 47 70 93 116 139 162 185 208 231 254 277 300 323 346 369 392 415 438 461 484 507 530 553 576 599 622 645 668 691
Series2
Series1

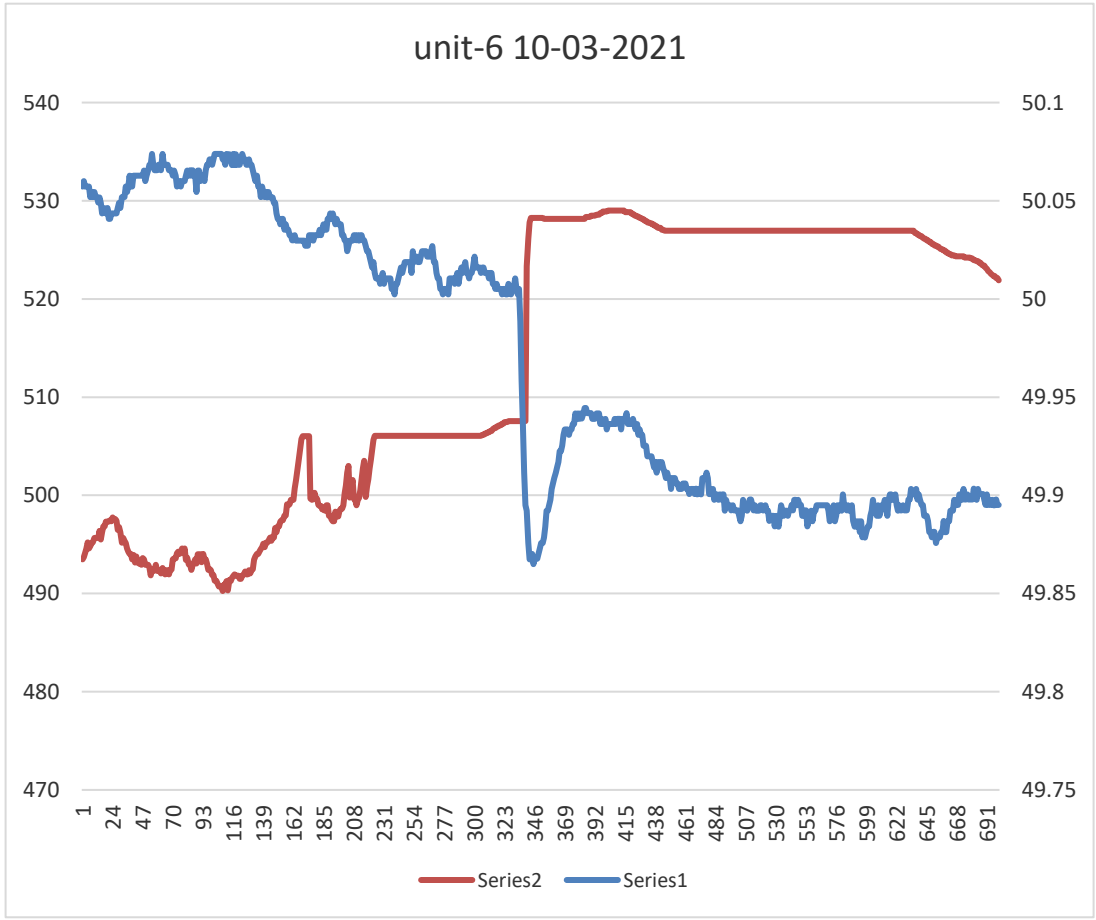

unit-3 10-03-2021
206
204
202
200
198
196
194
192
190
188
186
50.15
50.1
50.05
50
49.95
49.9
49.85
49.8
49.75
49.7
1 24 47 70 93 116 139 162 185 208 231 254 277 300 323 346 369 392 415 438 461 484 507 530 553 576 599 622 645 668 691
Series2
Series1

10.03.2021


unit-4 10-03-2021
540
530
520
510
500
490
480
470
460
50.2
50.15
50.1
50.05
50
49.95
49.9
49.85
49.8
49.75
49.7
49.65
1 24 47 70 93 116 139 162 185 208 231 254 277 300 323 346 369 392 415 438 461 484 507 530 553 576 599 622 645 668 691
Series2
Series1


Unit-5 10-03-2021
530
525
520
515
510
505
500
495
50.15
50.1
50.05
50
49.95
49.9
49.85
49.8
49.75
1 24 47 70 93 116 139 162 185 208 231 254 277 300 323 346 369 392 415 438 461 484 507 530 553 576 599 622 645 668 691
Series2
Series1

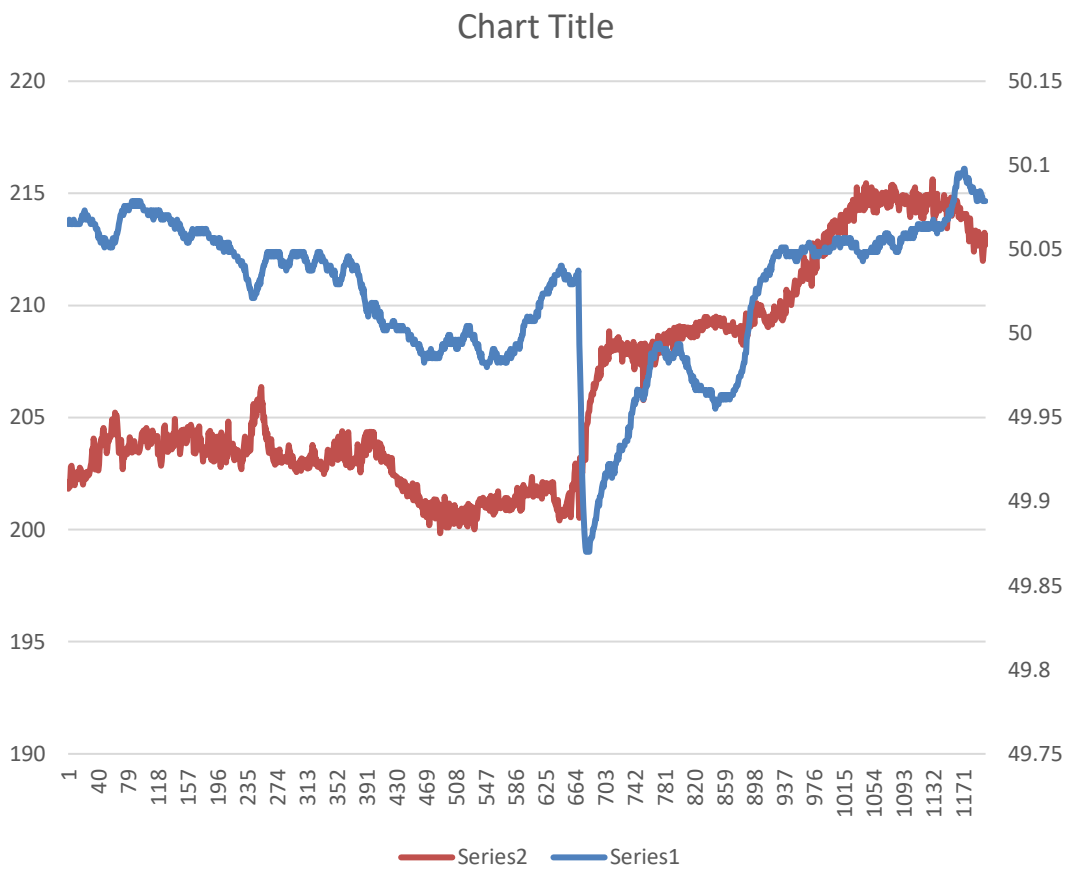
10.03.2021


unit-6 10-03-2021
540
530
520
510
500
490
480
470
50.1
50.05
50
49.95
49.9
49.85
49.8
49.75
1
24
47
70
93
116
139
162
185
208
231
254
277
300
323
346
369
392
415
438
461
484
507
530
553
576
599
622
645
668
691
Series2
Series1

24.03.2021

	starting frequency	ending frequency	starting load	end load	Expected response	Actual response	
unit-2	50.022	49.856	201.4	208.4	8.6	7	Responded
unit-3	50.022	49.856	206	210	4	4	Responded
unit-4	50.022	49.856	460	464	23	4	Responded
unit-5	50.022	49.856	497	505	24.85	8	Responded
unit-6	50.022	49.856	492	493	24.6	1	No response

24.03.2021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220
215
210
205
200
195
190
50.15
50.1
50.05
50
49.95
49.9
49.85
49.8
49.75
1
40
79
118
157
196
235
274
313
352
391
430
469
508
547
586
625
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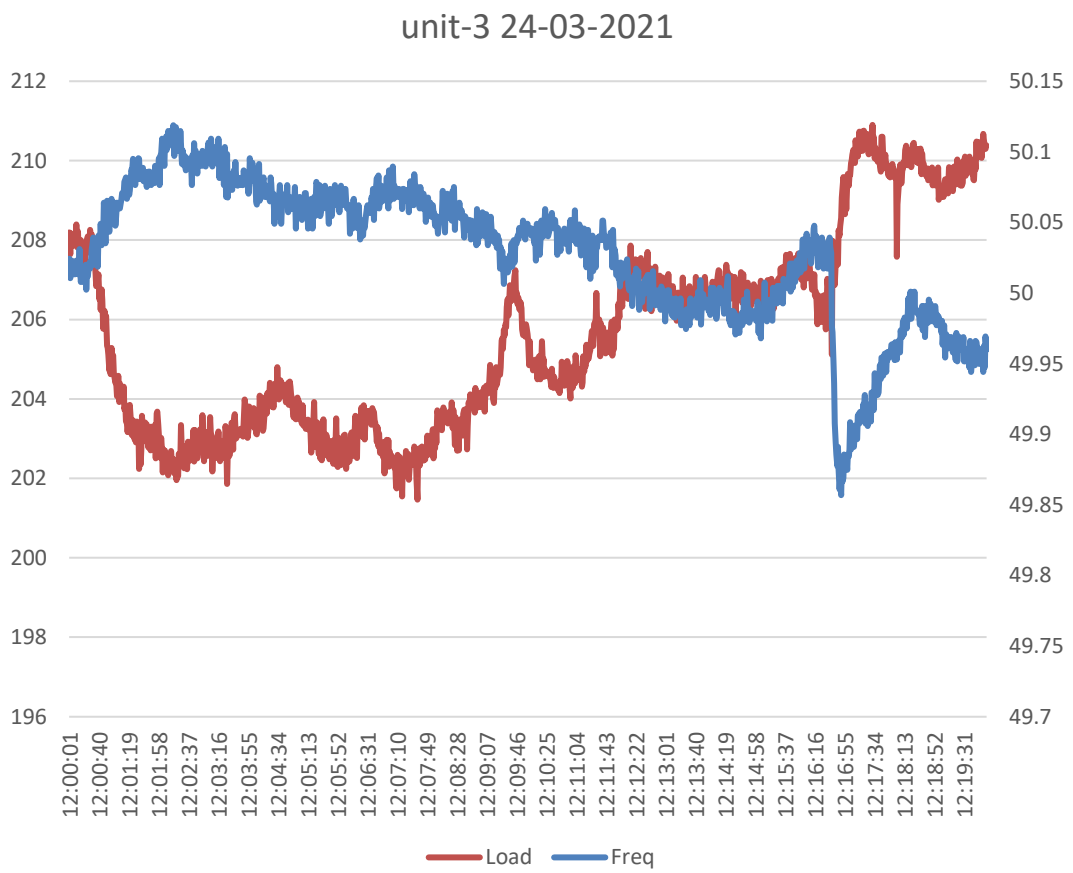
898
937
976
1015
1054
1093
1132
1171
Series2
Series1


unit-3 24-03-2021
212
210
208
206
204
202
200
198
196
50.15
50.1
50.05
50
49.95
49.9
49.85
49.8
49.75
49.7
12:00:01
12:00:40
12:01:19
12:01:58
12:02:37
12:03:16
12:03:55
12:04:34
12:05:13
12:05:52
12:06:31
12:07:10
12:07:49
12:08:28
12:09:07
12:09:46
12:10:25
12:11:04
12:11:43
12:12:22
12:13:01
12:13:40
12:14:19
12:14:58
12:15:37
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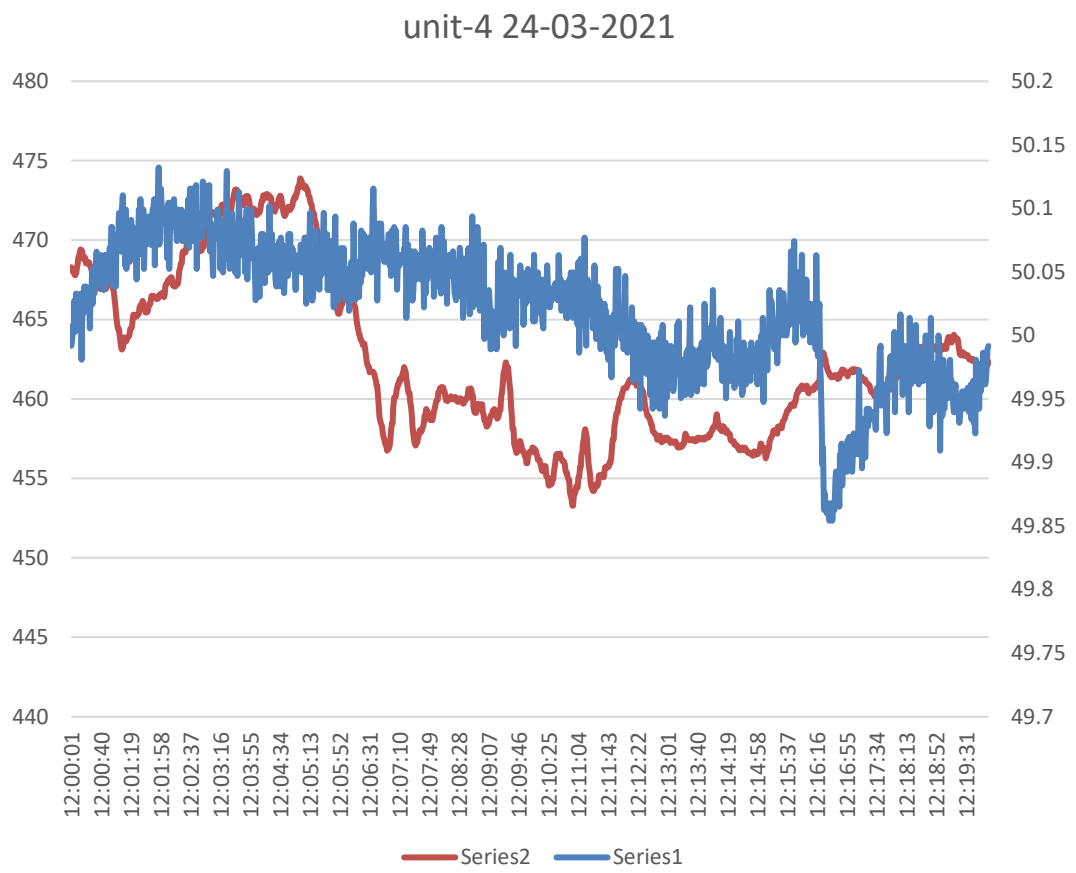
12:18:52
12:19:31
Load
Freq

24.03.2021


unit-4 24-03-2021
480
475
470
465
460
455
450
445
440
50.2
50.15
50.1
50.05
50
49.95
49.9
49.85
49.8
49.75
49.7
12:00:01
12:00:40
12:01:19
12:01:58
12:02:37
12:03:16
12:03:55
12:04:34
12:05:13
12:05:52
12:06:31
12:07:10
12:07:49
12:08:28
12:09:07
12:09:46
12:10:25
12:11:04
12:11:43
12:12:22
12:13:01
12:13:40
12:14:19
12:14:58
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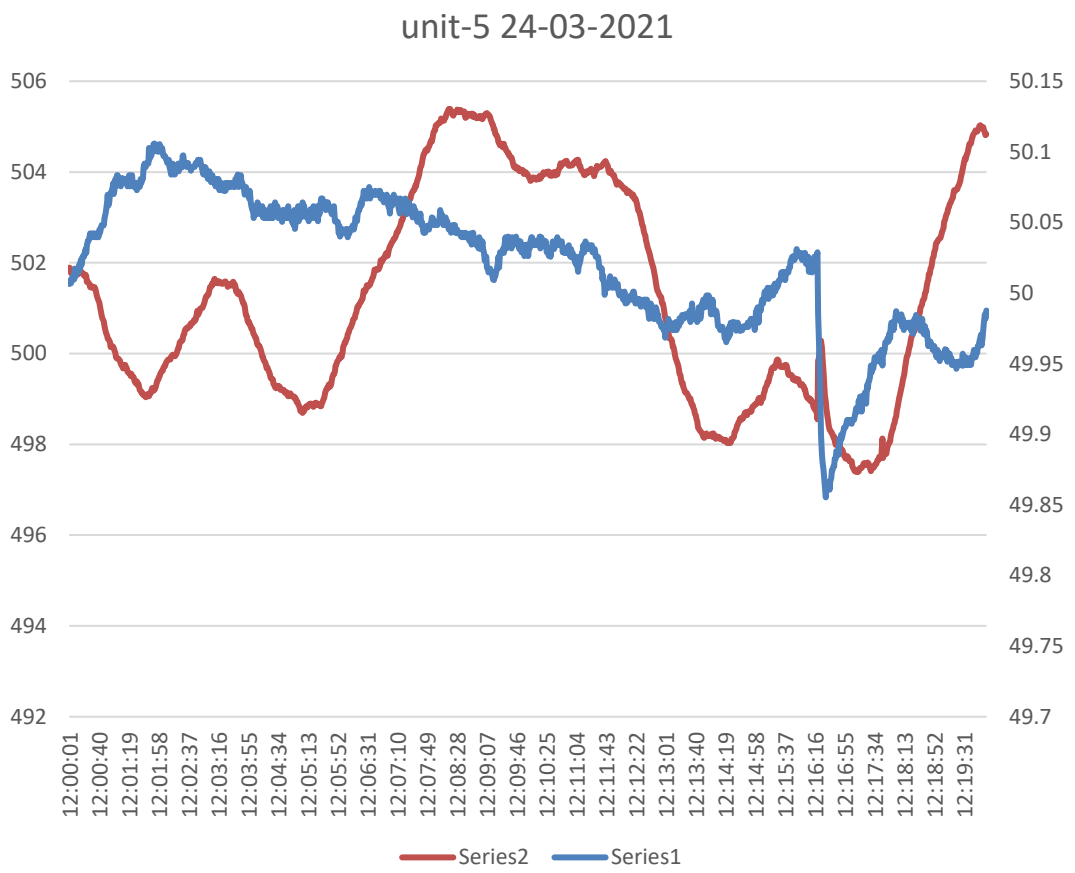
12:18:52
12:19:31
Series2
Series1


unit-5 24-03-2021
506
504
502
500
498
496
494
492
50.15
50.1
50.05
50
49.95
49.9
49.85
49.8
49.75
49.7
12:00:01
12:00:40
12:01:19
12:01:58
12:02:37
12:03:16
12:03:55
12:04:34
12:05:13
12:05:52
12:06:31
12:07:10
12:07:49
12:08:28
12:09:07
12:09:46
12:10:25
12:11:04
12:11:43
12:12:22
12:13:01
12:13:40
12:14:19
12:14:58
12:15:37
12:16:16
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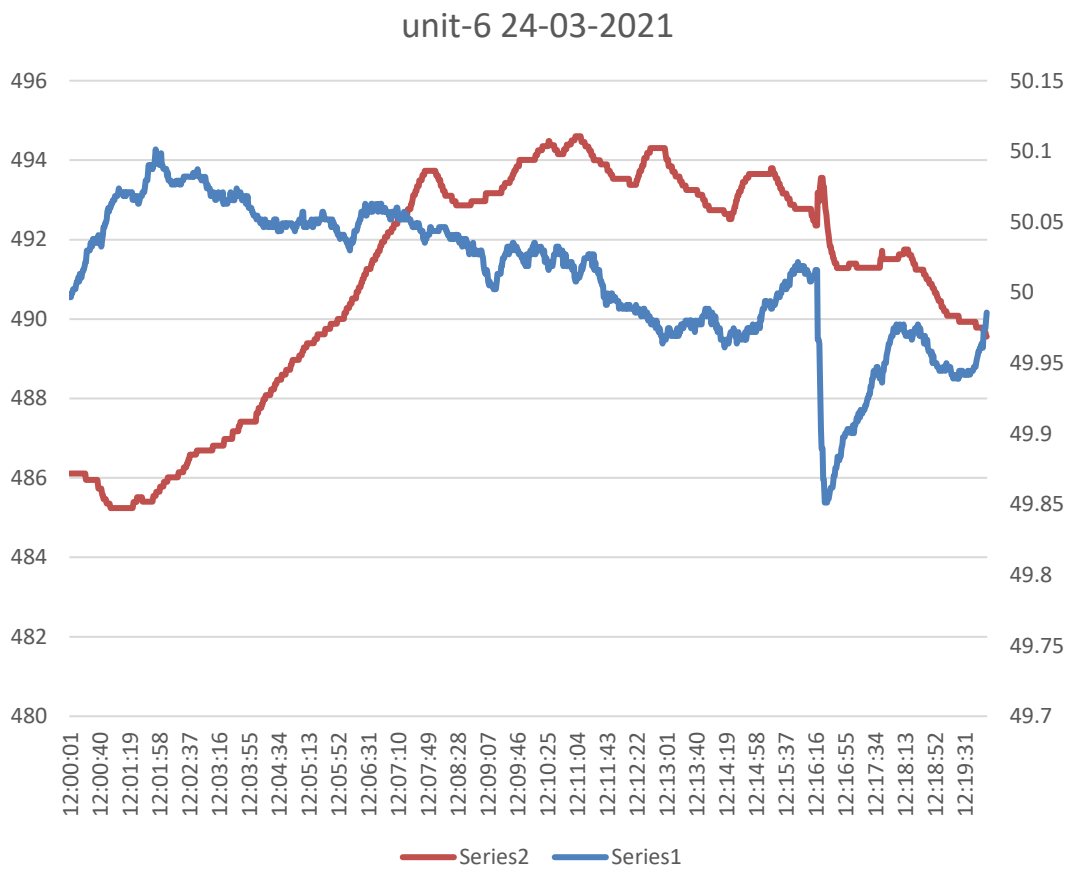
12:17:34
12:18:13
12:18:52
12:19:31
Series2
Series1

24.03.2021


unit-6 24-03-2021
496
494
492
490
488
486
484
482
480
50.15
50.1
50.05
50
49.95
49.9
49.85
49.8
49.75
49.7
12:00:01
12:00:40
12:01:19
12:01:58
12:02:37
12:03:16
12:03:55
12:04:34
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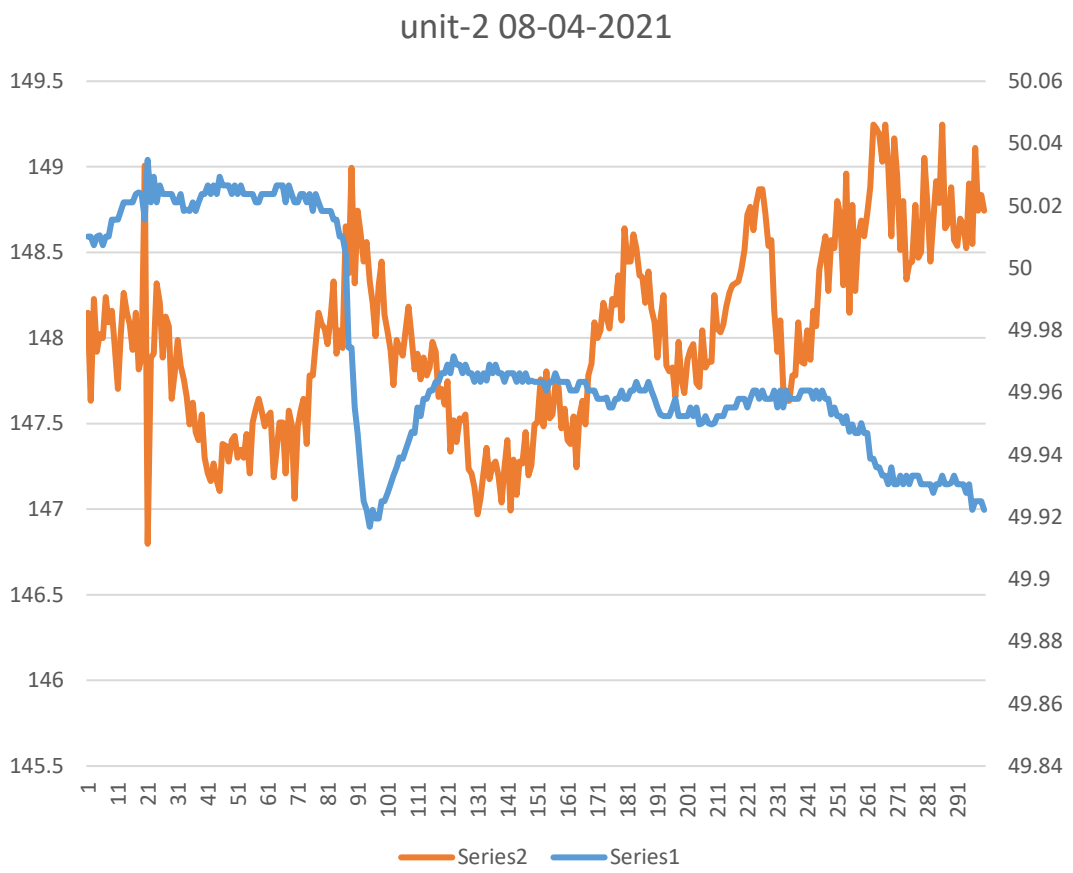
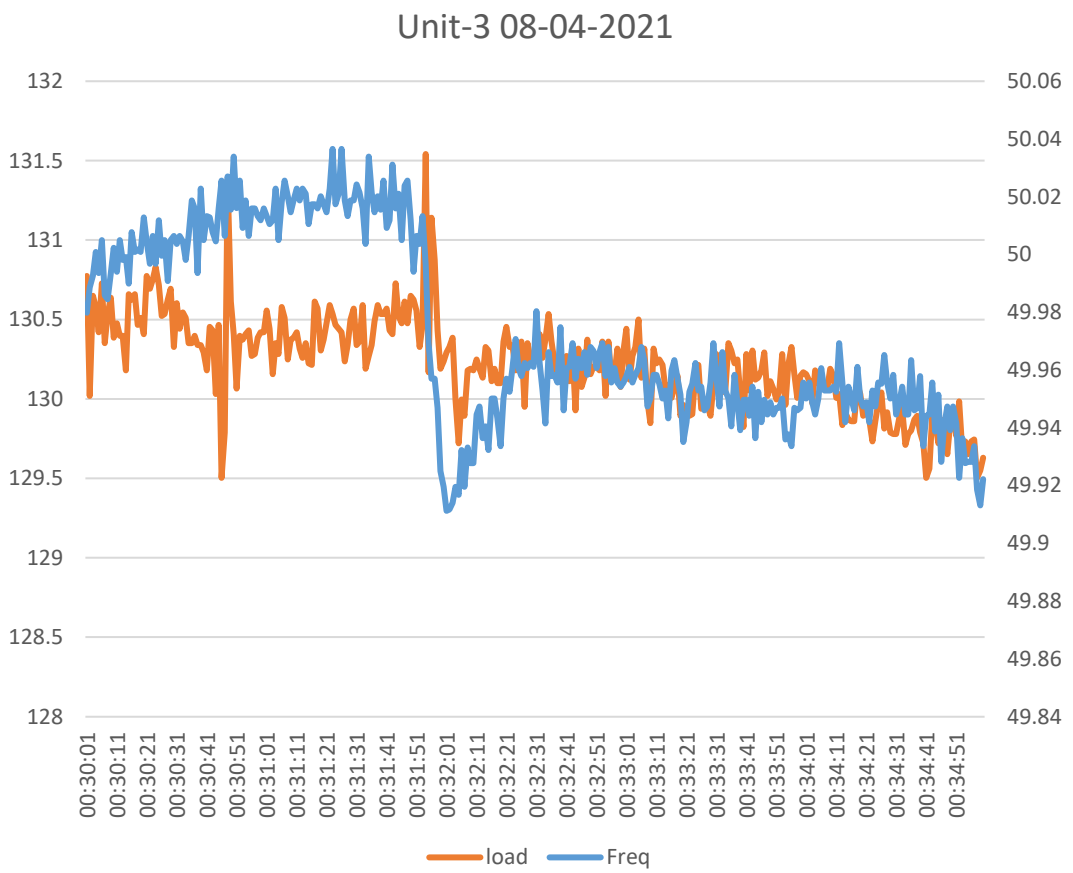
12:11:04
12:11:43
12:12:22
12:13:01
12:13:40
12:14:19
12:14:58
12:15:37
12:16:16
12:16:55
12:17:34
12:18:13
12:18:52
12:19:31
Series2
Series1

08.04.2021

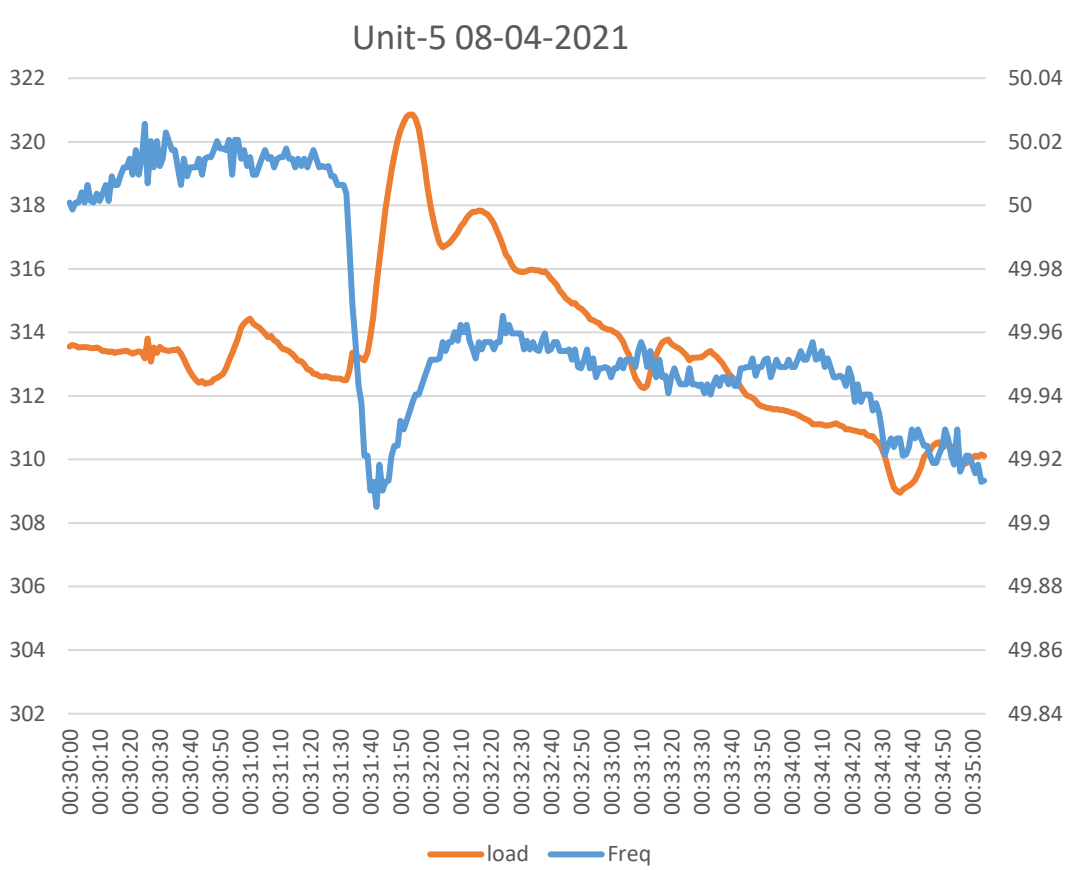
	starting frequency	ending frequency	starting load	end load	Expected response	Actual response	
unit-2	49.99	49.9	147	149	7.2	2	08-04-2021
unit-3	49.99	49.9	130	131	6.5	1	No response
unit-4	49.99	49.9			0	0	S/D
unit-5	49.99	49.9	312	321	15.6	9	Responded
unit-6	49.99	49.9	488	489	18	1	No response

08.04.2021


unit-2 08-04-2021
149.5
149
148.5
148
147.5
147
146.5
146
145.5
50.06
50.04
50.02
50
49.98
49.96
49.94
49.92
49.9
49.88
49.86
49.84
1 11 21 31 41 51 61 71 81 91 101 111 121 131 141 151 161 171 181 191 201 211 221 231 241 251 261 271 281 291
Series2
Series1


Unit-3 08-04-2021
132
131.5
131
130.5
130
129.5
129
128.5
128
50.06
50.04
50.02
50
49.98
49.96
49.94
49.92
49.9
49.88
49.86
49.84
00:30:01 00:30:11 00:30:21 00:30:31 00:30:41 00:30:51 00:31:01 00:31:11 00:31:21 00:31:31 00:31:41 00:31:51 00:32:01 00:32:11 00:32:21 00:32:31 00:32:41 00:32:51 00:33:01 00:33:11 00:33:21 00:33:31 00:33:41 00:33:51 00:34:01 00:34:11 00:34:21 00:34:31 00:34:41 00:34:51
load
Freq

08.04.2021


Unit-5 08-04-2021
322
320
318
316
314
312
310
308
306
304
302
50.04
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49.98
49.96
49.94
49.92
49.9
49.88
49.86
49.84
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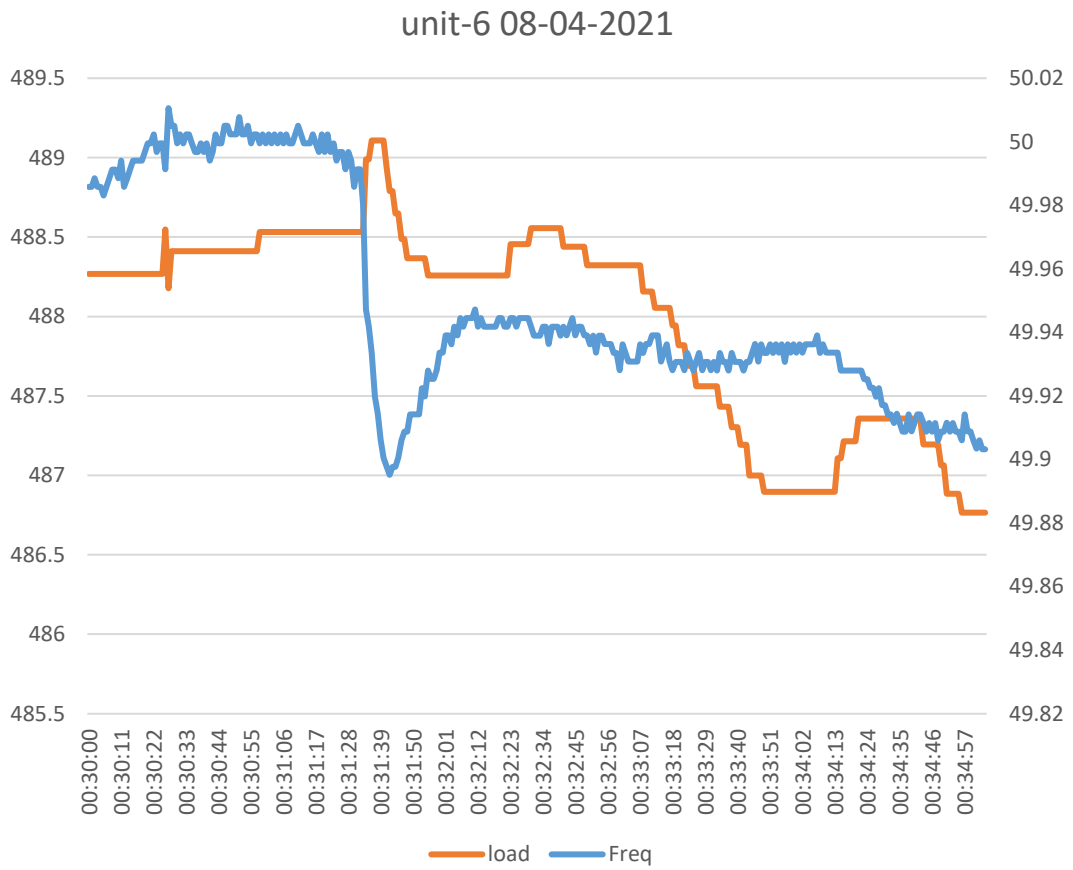
load
Freq


unit-6 08-04-2021
489.5
489
488.5
488
487.5
487
486.5
486
485.5
50.02
50
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49.96
49.94
49.92
49.9
49.88
49.86
49.84
49.82
00:30:00
00:30:11
00:30:22
00:30:33
00:30:44
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00:31:17
00:31:28
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00:32:12
00:32:23
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00:33:40
00:33:51
00:34:02
00:34:13
00:34:24
00:34:35
00:34:46
00:34:57
load
Freq

08.04.2021

NTPC Kahalgaon response

UNIT#5	EVENT1	EVENT2	EVENT3	EVENT4	EVENT5	EVENT6	EVENT7	EVENT8	EVENT9
UNIT RUNNING LOAD (MW)			342.6			390	329	485.84	500
FREQUENCY CHANGE DURING THE EVENT (F) (Hz)			0.11			-0.131	-0.13	-0.144	-0.091
IDEAL RESPONSE (Pid) (MW)						MIN(26.2, **19.5**)	MIN(26, **16.45**)	MIN(28.8, **24.29**)	MIN(**18.2**, 25)
RESPONSE OBSERVED (P) (MW)							(343.3 - 329.92) = 14.38	(507.8 - 485.84)= 21.96	
TIME TO REACH FULL RESPONSE	UNDER SHUTDOWN	UNDER SHUTDOWN		UNDER SHUTDOWN	UNDER SHUTDOWN		AROUND 30 SEC	AROUND 30 SEC	
DURATION OF THE RESPONSE							LESS THAN 1 MIN	MORETHAN 4 MINS	
RESPONSE OF THIS UNIT (P/Pid)%							87.84%	90.40%	
SATISFACTORY/UN-SATISFACTORY			UNSATISFACTORY			UNSATISFACTORY	UNSATISFACTORY	SATISFACTORY	UNSATISFACTORY
REMARKS			PERFORMANCE TO BE REVIEWED AND CORRECTED			PERFORMANCE TO BE REVIEWED AND CORRECTED	PERFORMANCE TO BE REVIEWED AND CORRECTED		PERFORMANCE TO BE REVIEWED AND CORRECTED

UNIT#6	EVENT1	EVENT2	EVENT3	EVENT4	EVENT5	EVENT6	EVENT7	EVENT8	EVENT9
UNIT RUNNING LOAD (MW)	279.8			475.5	477.63	491.2	471.5	493.9	497.84
FREQUENCY CHANGE DURING THE EVENT (F) (Hz)	-0.04			-0.073	-0.038	-0.131	-0.13	-0.144	-0.091
IDEAL RESPONSE (Pid) (MW)	MIN(8,13.99)			MIN(14.6, 23.7)	MIN(7.6, 23.8)	MIN(26.2, **24.5**)	MIN(26, **23.57**)	MIN(28.8, **24.7**)	MIN(**18.2**, 24.89)
RESPONSE OBSERVED (P) (MW)	(292.6-279.8)= 12.8								
TIME TO REACH FULL RESPONSE	AROUND 35 SEC	UNDER SHUTDOWN	UNDER SHUTDOWN						
DURATION OF THE RESPONSE	AROUND 3 MIN								
RESPONSE OF THIS UNIT (P/Pid)%	91.40%								
SATISFACTORY/UN-SATISFACTORY	SATISFACTORY			UNSATISFACTORY	UNSATISFACTORY	UNSATISFACTORY	UNSATISFACTORY	UNSATISFACTORY	UNSATISFACTORY
REMARKS				PERFORMANCE TO BE REVIEWED AND CORRECTED	PERFORMANCE TO BE REVIEWED AND CORRECTED	PERFORMANCE TO BE REVIEWED AND CORRECTED	PERFORMANCE TO BE REVIEWED AND CORRECTED	PERFORMANCE TO BE REVIEWED AND CORRECTED	PERFORMANCE TO BE REVIEWED AND CORRECTED

UNIT#7	EVENT1	EVENT2	EVENT3	EVENT4	EVENT5	EVENT6	EVENT7	EVENT8	EVENT9
UNIT RUNNING LOAD (MW)	290.8		346.3	458.3	478.6	488	477.9	494.5	477.45
FREQUENCY CHANGE DURING THE EVENT (F) (Hz)	-0.04		0.11	-0.073	-0.038	-0.131	-0.13	-0.144	-0.091
IDEAL RESPONSE (Pid) (MW)	MIN (**8**, 14.54)			MIN(**14.6**, 22.9)	MIN(**7.6**, 23.9)	MIN(26.2, **24.4**)	MIN(26, **23.9**)	MIN(28.8, **24.7**)	MIN(**18.2**, 23.87)
RESPONSE OBSERVED (P) (MW)	(302.8-290.8) = 12						(482.5-477.9)= 5		
TIME TO REACH FULL RESPONSE	AROUND 30 SEC	UNDER SHUTDOWN		RAMP DOWN IN PROGRESS					
DURATION OF THE RESPONSE	MORE THAN 3 MIN								
RESPONSE OF THIS UNIT (P/Pid)%	82.75%								
SATISFACTORY/UN-SATISFACTORY	SATISFACTORY		UNSATISFACTORY	UNSATISFACTORY	UNSATISFACTORY	UNSATISFACTORY	UNSATISFACTORY	UNSATISFACTORY	UNSATISFACTORY
REMARKS			PERFORMANCE TO BE REVIEWED AND CORRECTED	PERFORMANCE TO BE REVIEWED AND CORRECTED	PERFORMANCE TO BE REVIEWED AND CORRECTED	PERFORMANCE TO BE REVIEWED AND CORRECTED	PERFORMANCE TO BE REVIEWED AND CORRECTED	PERFORMANCE TO BE REVIEWED AND CORRECTED	PERFORMANCE TO BE REVIEWED AND CORRECTED

BARH


NTPC Barh

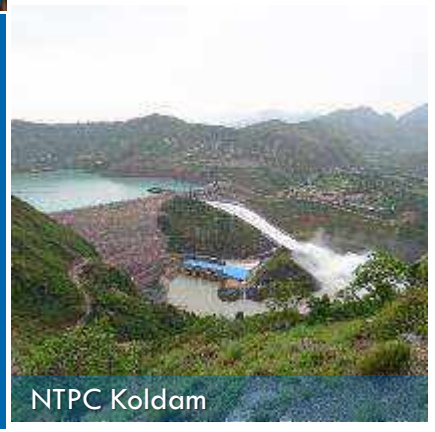

NTPC Bhadla


NTPC Barh

NTPC Barh

RGMO Performance Meeting

(31-May-21)


NTPC Koldam


NTPC Kayamkulam


NTPC Rojmal

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RGMO Response

Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9
06-08-20 13:50:17	13-08-20 07:03:05	12-10-20 10:05:04	29-11-20 13:16:30	26-12-20 10:18:09	19-02-21 15:26:52	10-03-21 19:35:34	24-03-20 12:16:19	08-04-21 03:31:34
U-4: 69 % U-5: 41 %	U-4: 44 % U-5: 20 %	U-4: 35 % U-5:116 %	U-4: 66% U-5: -	U-4: U-5: S/D	U-4: U-5:	U-4: U-5:	U-4: U-5:	U-4: S/D U-5: 50%

Implemented logics are providing adequate RGMO response, but during this process parameter is deviating beyond expected limits and load correction is implemented by the control system. Further tuning of control loops required.

Testing/Simulation of RGMO Logic

In-house developed RGMO logics as provided by CC/Other NTPC Station in consultation with OEMs were tested in both Units

Unit-4: 17-Jul-20 & 04-Feb-21
Unit-5: 05-Feb-21

The response of the Units were analyzed and it was concluded that further modification is to be done in logic. Also to limit the process parameter deviation during RGMO response, further tuning of process control system is required.

Logics can be uploaded into the system when the Unit is under shutdown. During last RSD logic already implemented at NTPC Mouda has been uploaded in both Units of NTPC Barh. Their performance will be analyzed during opportunity.


NTPC Barh

Thank You


NTPC Barh

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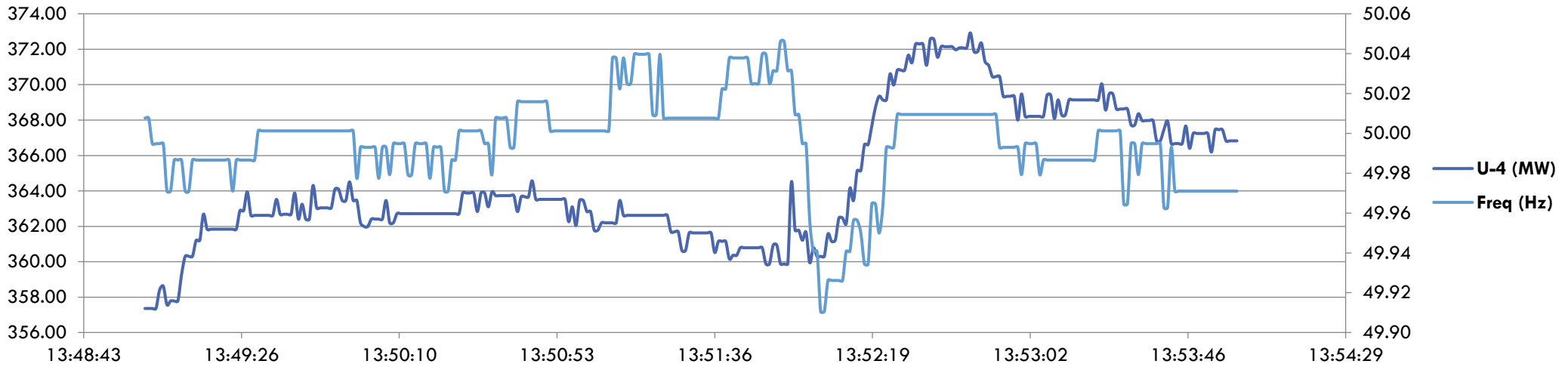
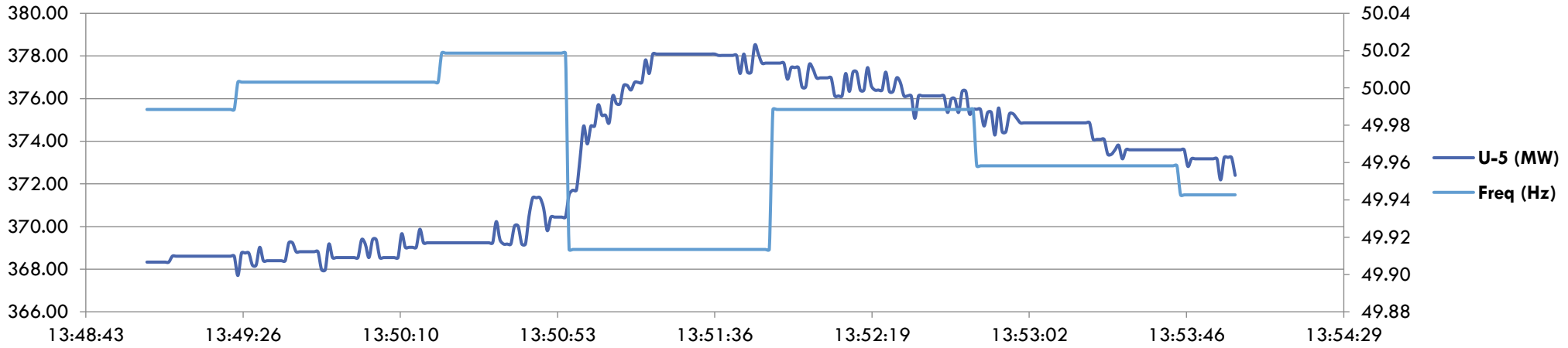
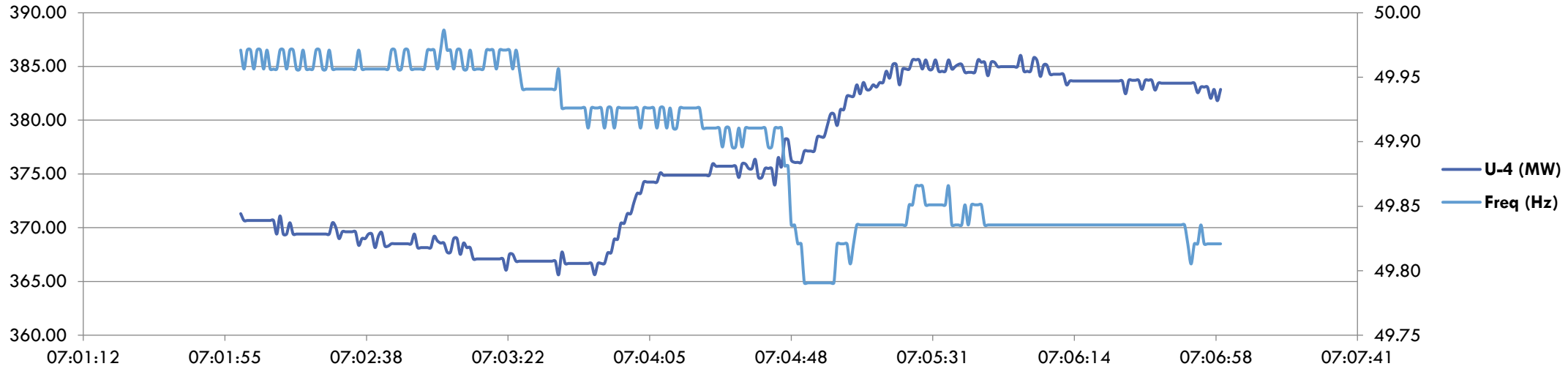
RGMO Response Dated 06.08.2020

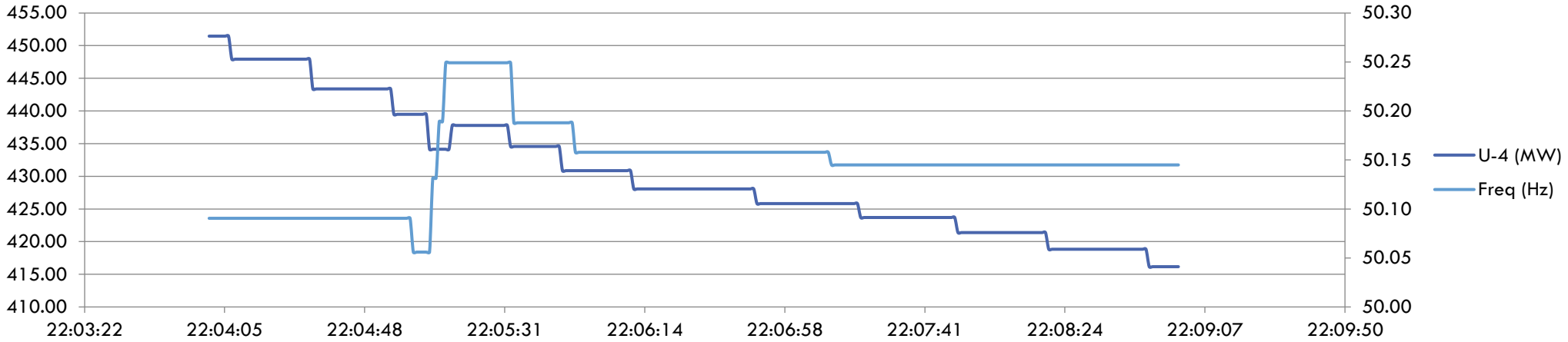


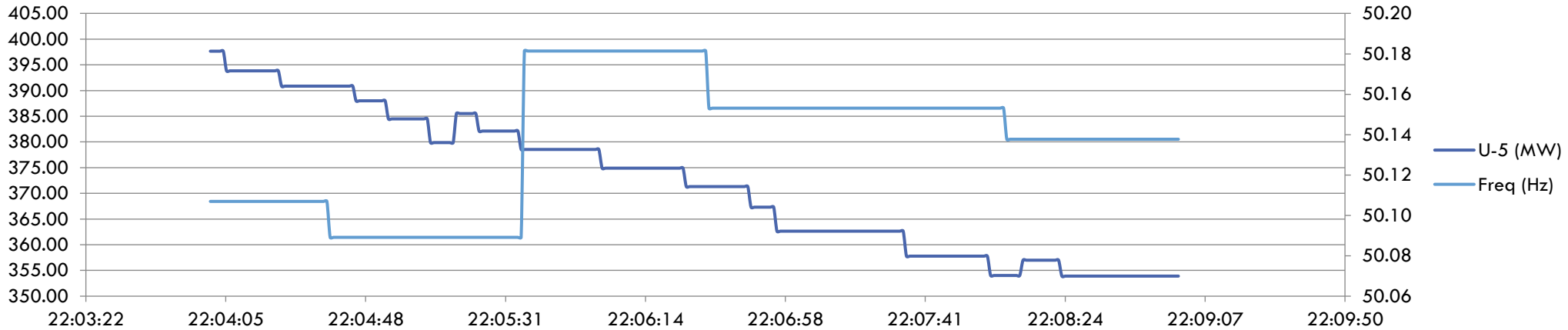


RGMO Response Dated 13.08.2020

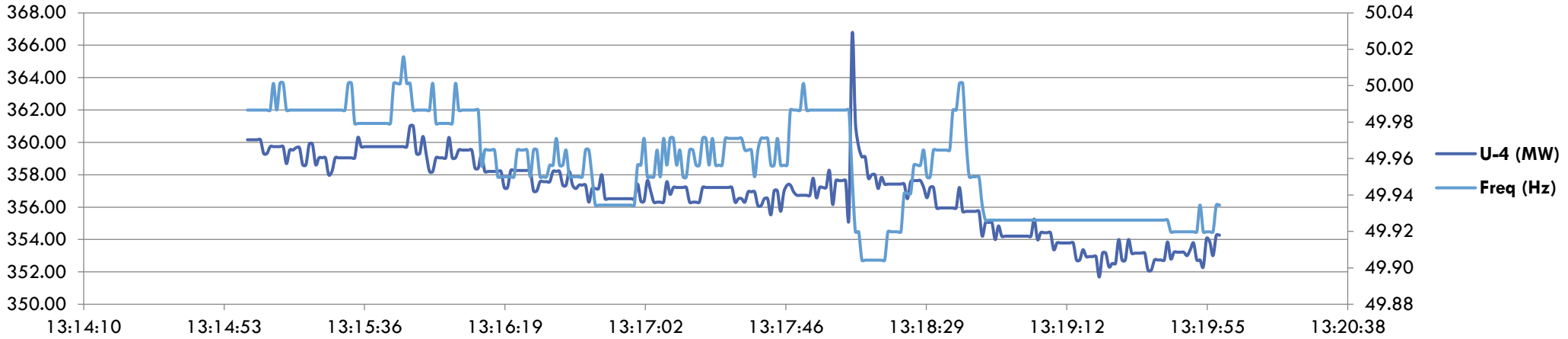


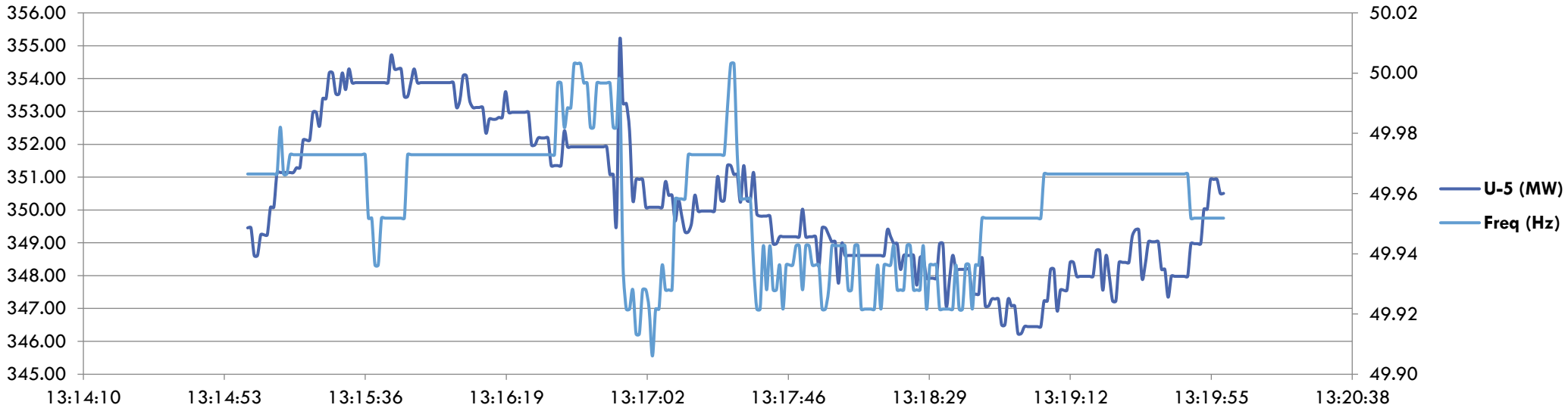
RGMO Response Dated 12.10.2020 at 22.05.04



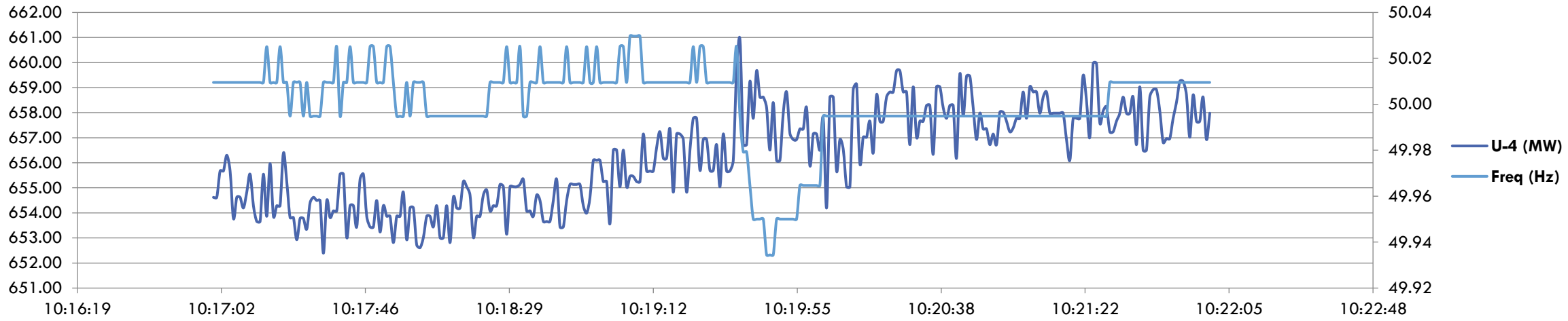


RGMO Response Dated 29.11.2020 at 13.16.30



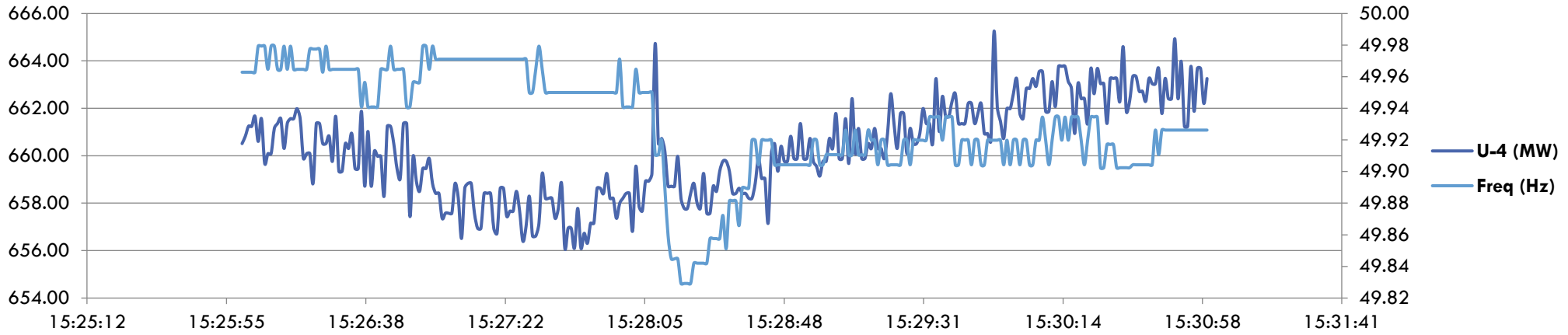


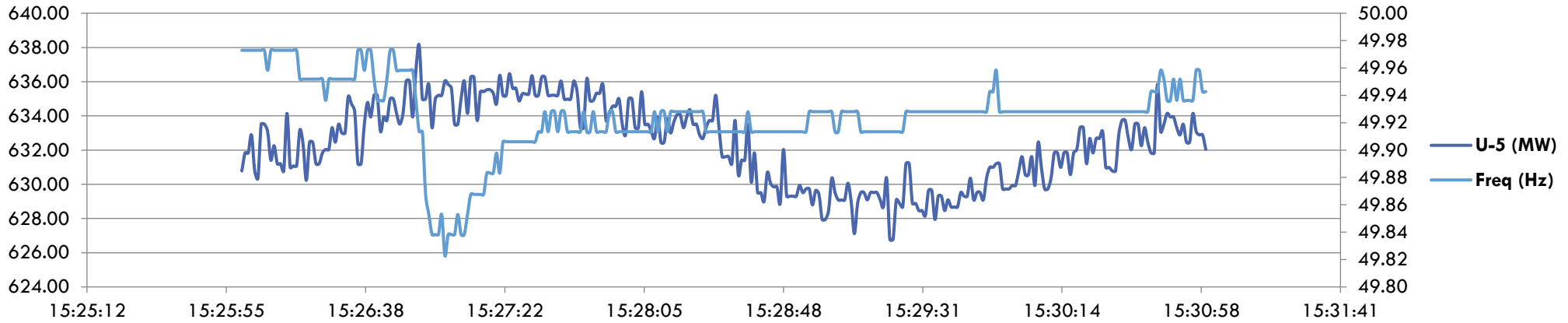
RGMO Response Dated 26.12.2020 at 10.18.09



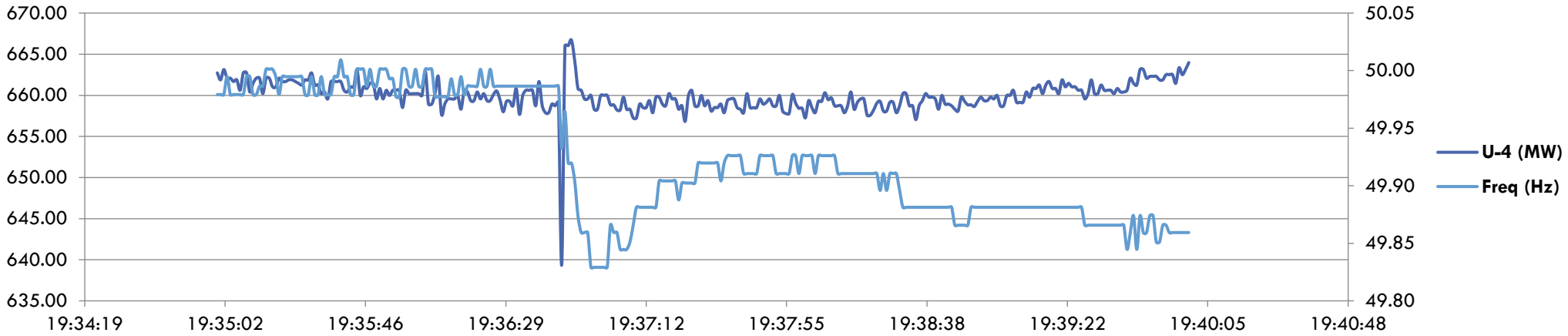
Unit5: Under Shut Down

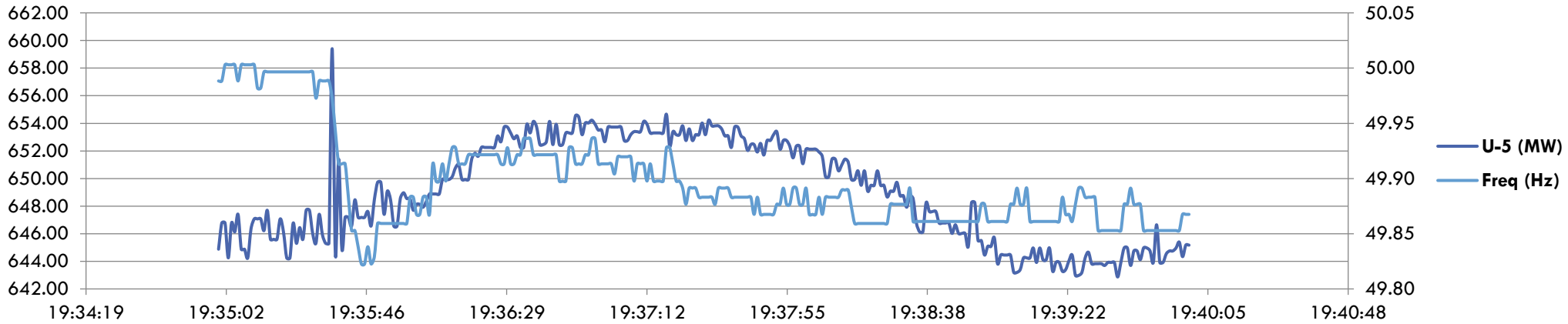
RGMO Response Dated 19.02.21 at 15.26.52 Hr



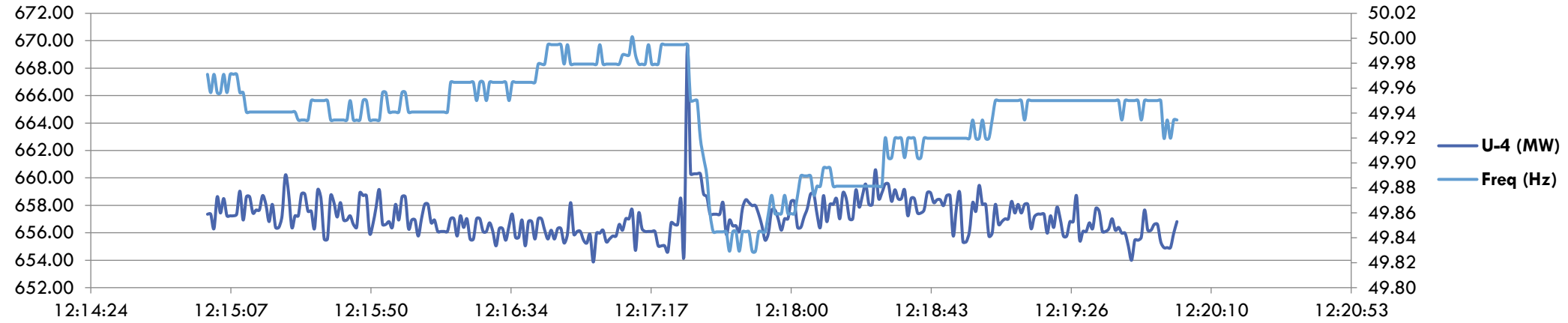


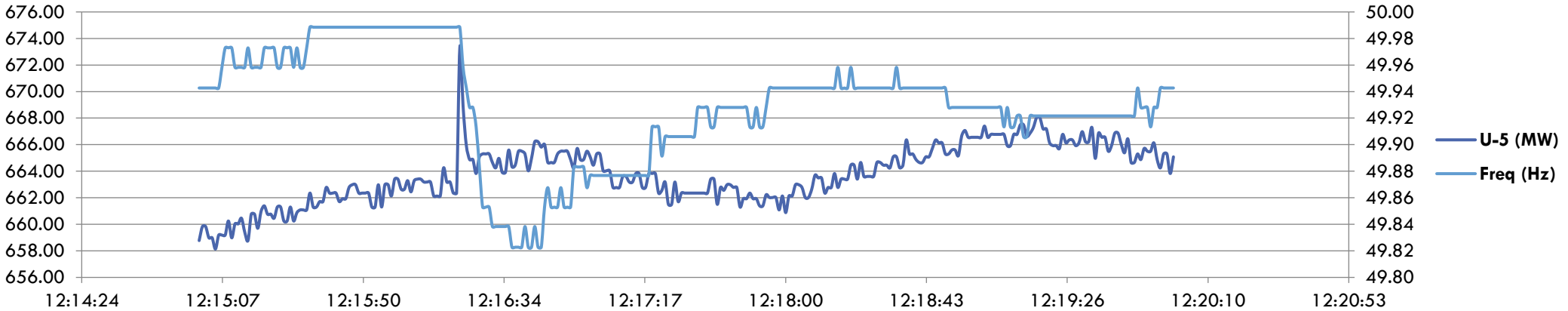
RGMO Response Dated 10.03.21 at 19.35.34



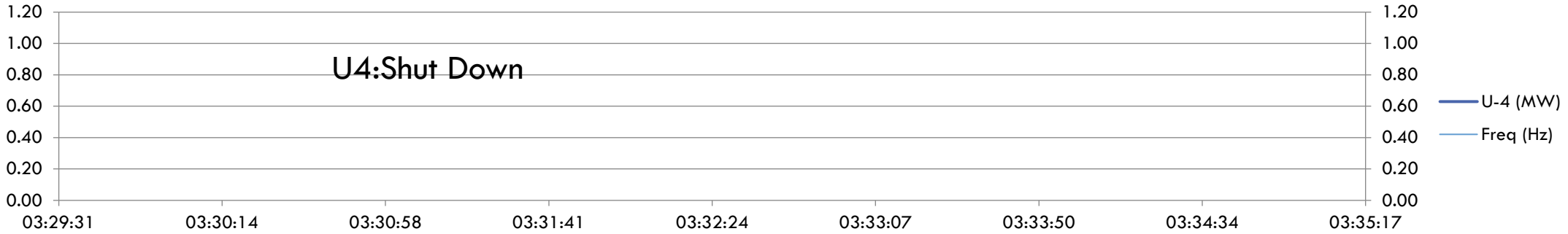


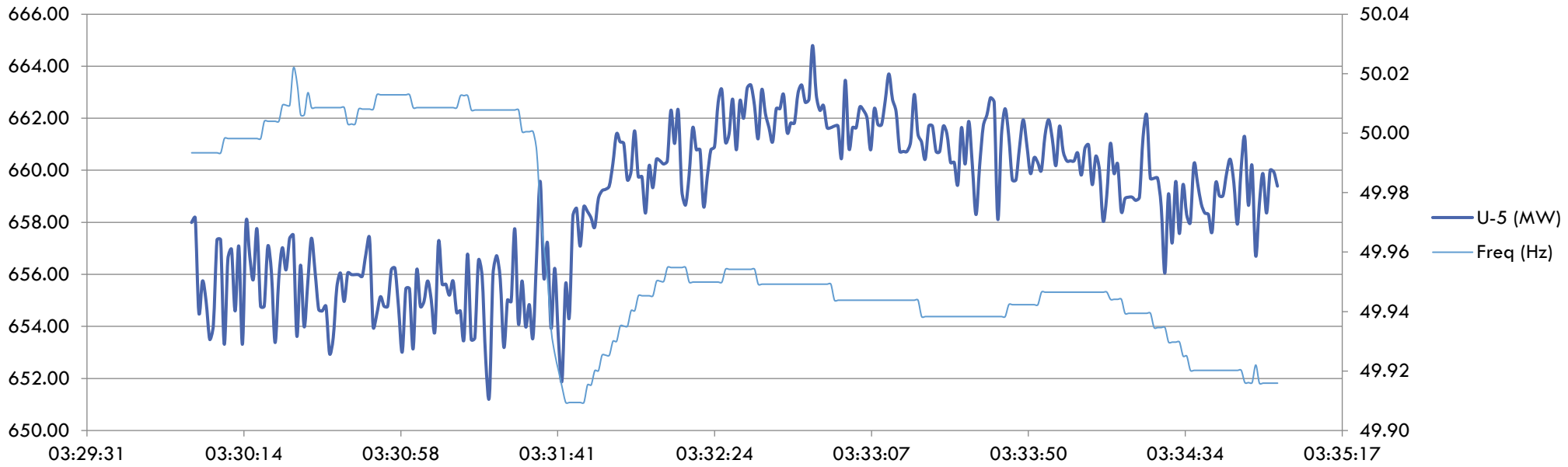
RGMO Response Dated 24.03.2021 at 12.16.19





RGMO Response Dated 08.04.21 at 03.31.34

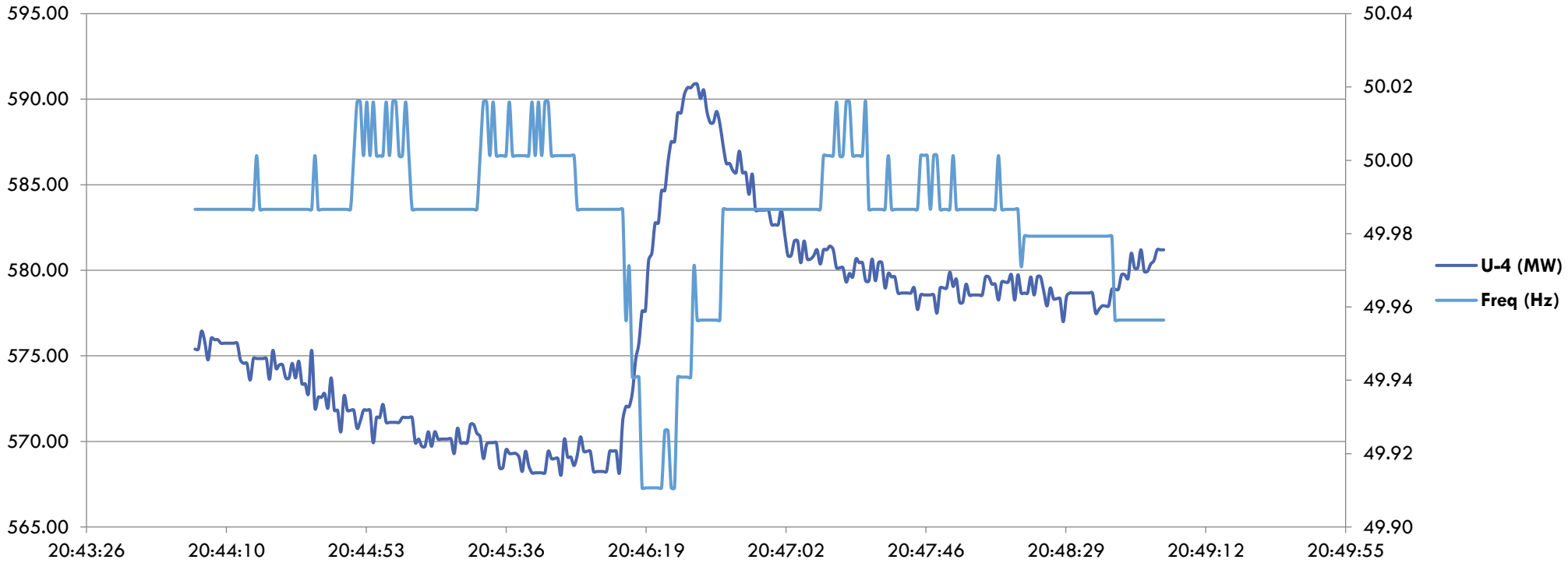




DCS Data Issue Resolved

Data required for RGMO response analysis/calculation of specified resolution was not available and OEM intervention was required.

The issue has been resolved:





BRBCL RGMO Response & Action Plan for Improvement (ERLDC Meeting dtd 31.05.2021)

BRBCL Nabinagar



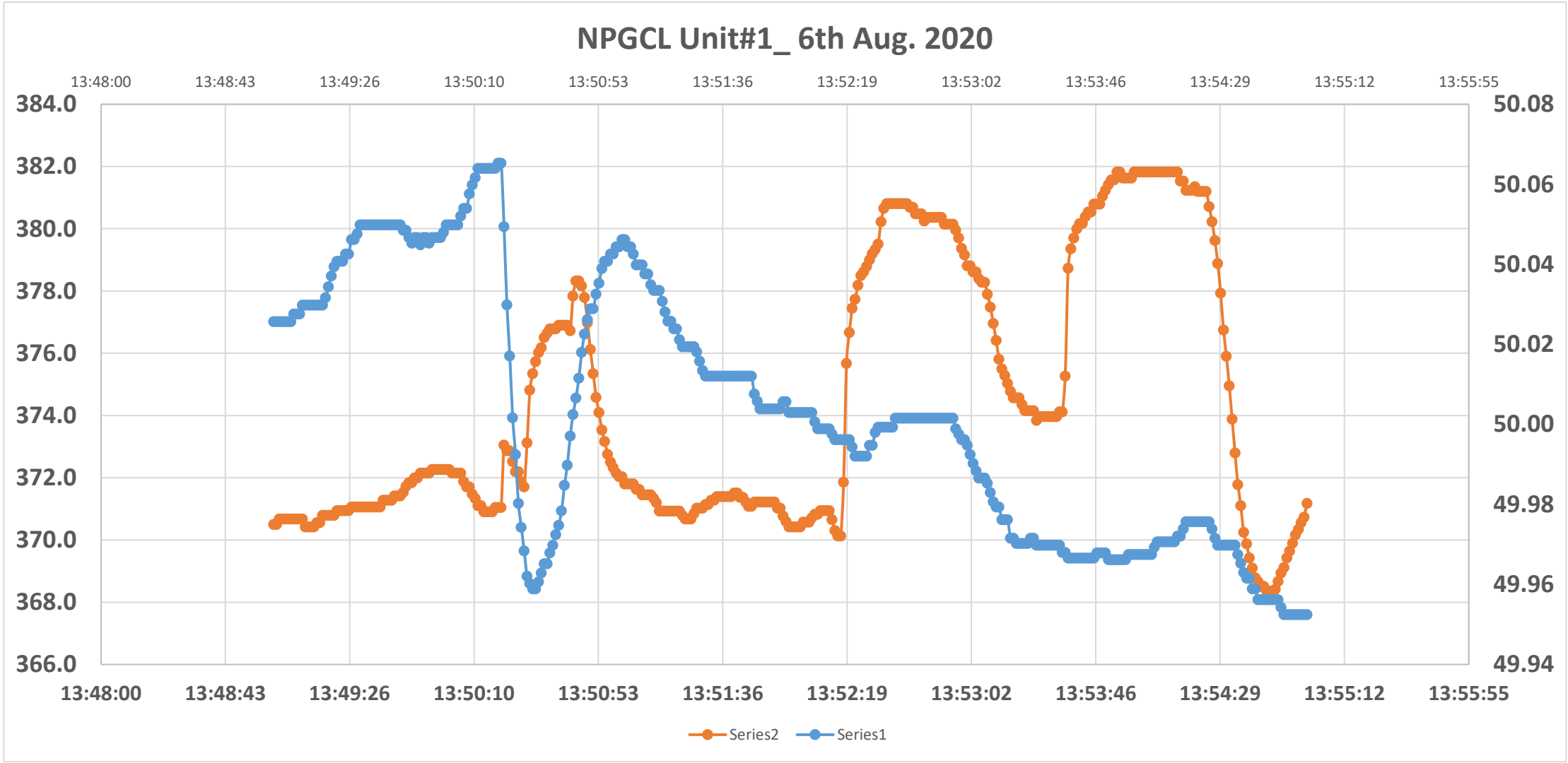
BRBCL RGMO Response Aug'20 – April'21

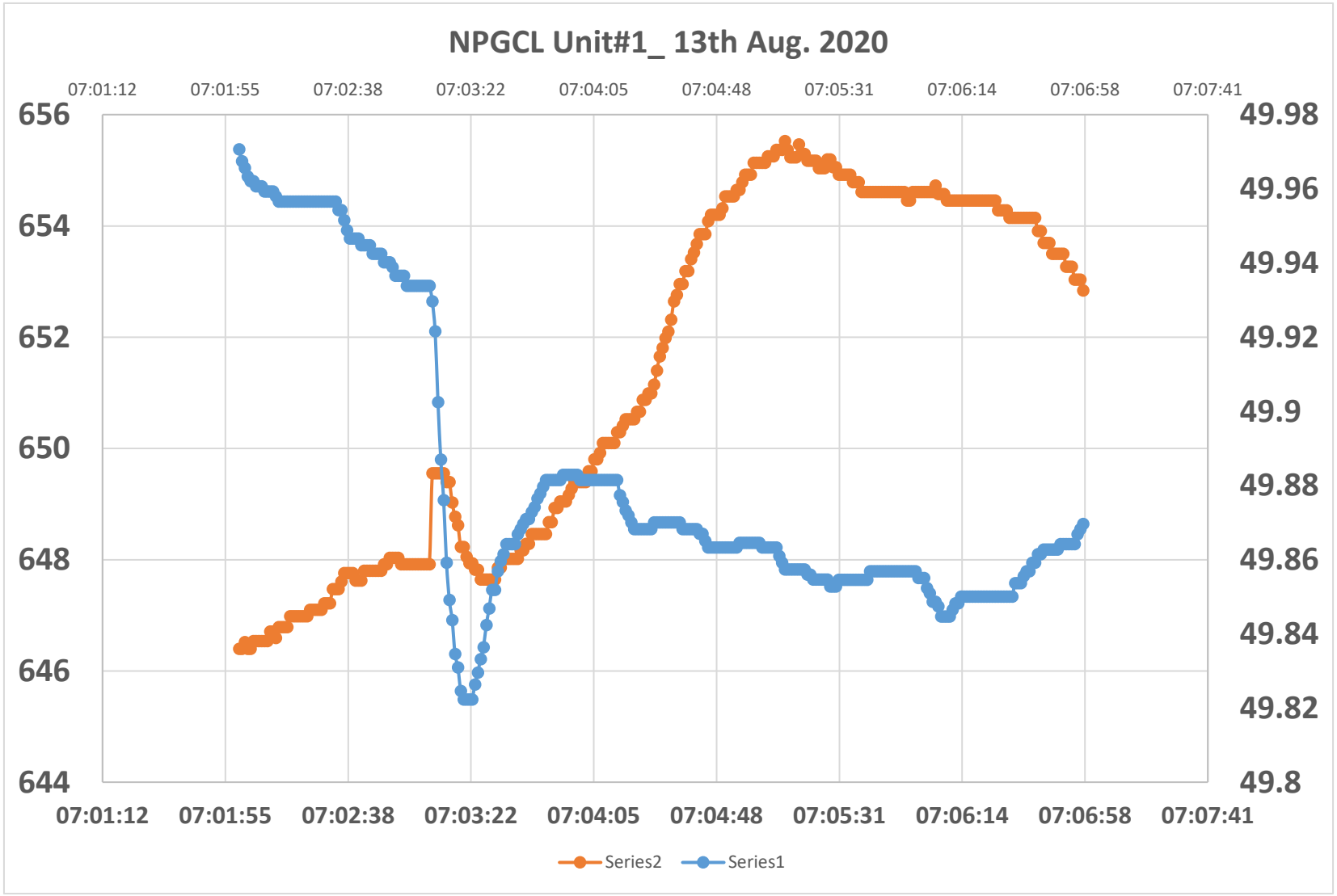
Event No	Date and Time	Change in Frequency	Unit#1	Unit#2	Unit#3
1	06-08-2020 at 13:50:17 Hrs	50.07 Hz to 49.96 Hz. Later stabilized at 50.03 Hz	**Unit Under S/d**	**% Response: 75.85% Satisfactory**	**% Response: 75.85% Satisfactory**
2	13-08-2020 at 07:03:05 Hrs	49.93 Hz to 49.82 Hz. Later stabilized at 49.88 Hz.	No response, Unit running at Load> I/C	**Unit Under S/d**	**% Response: 12% Unsatisfactory**
3	12-10-2020 at 10:05:04 hrs	50.054 Hz to 50.277 Hz. Later stabilized at 50.155 Hz.	**% Response: 35.30% Unsatisfactory**	**Unit Under S/d**	**% Response: 63.63% Unsatisfactory**
4	29-11-2020 at 13:16:30 hr	50.016 Hz to 49.927 Hz. Later stabilized at 50.001Hz followed by another dip of 0.05Hz in frequency.	**% Response: 50.14% Unsatisfactory**	**% Response: 36.21 % Unsatisfactory**	**Unit Under S/d**
5	26-12-2020 at 10:18:09 hrs	50.042 Hz to 49.962 Hz. Later stabilized at 50.019 Hz	**% Response: 35.53% Unsatisfactory**	**% Response: 70.25% Unsatisfactory**	**Unit Under S/d**
6	19-02-2021 at 15:26:52 Hrs	49.985 Hz to 49.854 Hz. Later stabilized at 49.938 Hz	**% Response: 5% Unsatisfactory**	**% Response: 65.11% Unsatisfactory**	**% Response: 65.29% Unsatisfactory**
7	10-03-2021 at 19:35:34 Hrs	50.01 Hz to 49.87 Hz. Later stabilized at 49.94 Hz	No response, Unit running at Load> I/C	**% Response: 33.25% Unsatisfactory**	**% Response: 58.33% Unsatisfactory**
8	24-03-2021 at 12:16:19 Hrs	50.022 Hz to 49.856 Hz. Later stabilized at 49.907 Hz	RGMO Triggered but CMC Load S/P reduced by 10 MW before the RGMO response, hence Load Ref+ RGMO : -ve Change	**% Response: 43.65% Unsatisfactory**	**% Response: 34.95% Unsatisfactory**
9	08-04-2021 at 03:31:34 Hrs	49.994Hz to 49.903 Hz. Later stabilized at 49.95 Hz	Unit running at 265 MW load (105% MCR)	**Unit Under S/d**	**% Response: 64.37% Unsatisfactory**

BRBCL Action Plan and Target Dates

Unit	Action Plan	Target Date
Unit#1	Tuning of HPCV and EHTC Governor Characteristics, to be done in next scheduled Overhauling	Aug'21
Unit#2 Unit#3	• The RGMO Responses being obtained are in Range of 60-70 % w.rt. Ideal Response. (Ideal Response based on difference b/w RGMO triggering frequency and Nadir Point) • Response generated as per implemented RGMO Logics 80-90% (RGMO command based on difference b/w Moving Avg. Frequency(preceding the GD event) and Nadir Point) • Methodology to be discussed and decided upon for reducing/eliminating gap between Ideal Response and Response as per implemented logic.	To be implemented in next available opportunity, after decision on calculation methodology.

NPGCL
RGMO RESPONSE
PPT


NPGCL Unit#1_ 6th Aug. 2020
13:48:00
13:48:43
13:49:26
13:50:10
13:50:53
13:51:36
13:52:19
13:53:02
13:53:46
13:54:29
13:55:12
13:55:55
384.0
382.0
380.0
378.0
376.0
374.0
372.0
370.0
368.0
366.0
50.08
50.06
50.04
50.02
50.00
49.98
49.96
49.94
Series2
Series1


NPGCL Unit#1_ 13th Aug. 2020
07:01:12
07:01:55
07:02:38
07:03:22
07:04:05
07:04:48
07:05:31
07:06:14
07:06:58
07:07:41
656
654
652
650
648
646
644
49.98
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49.94
49.92
49.9
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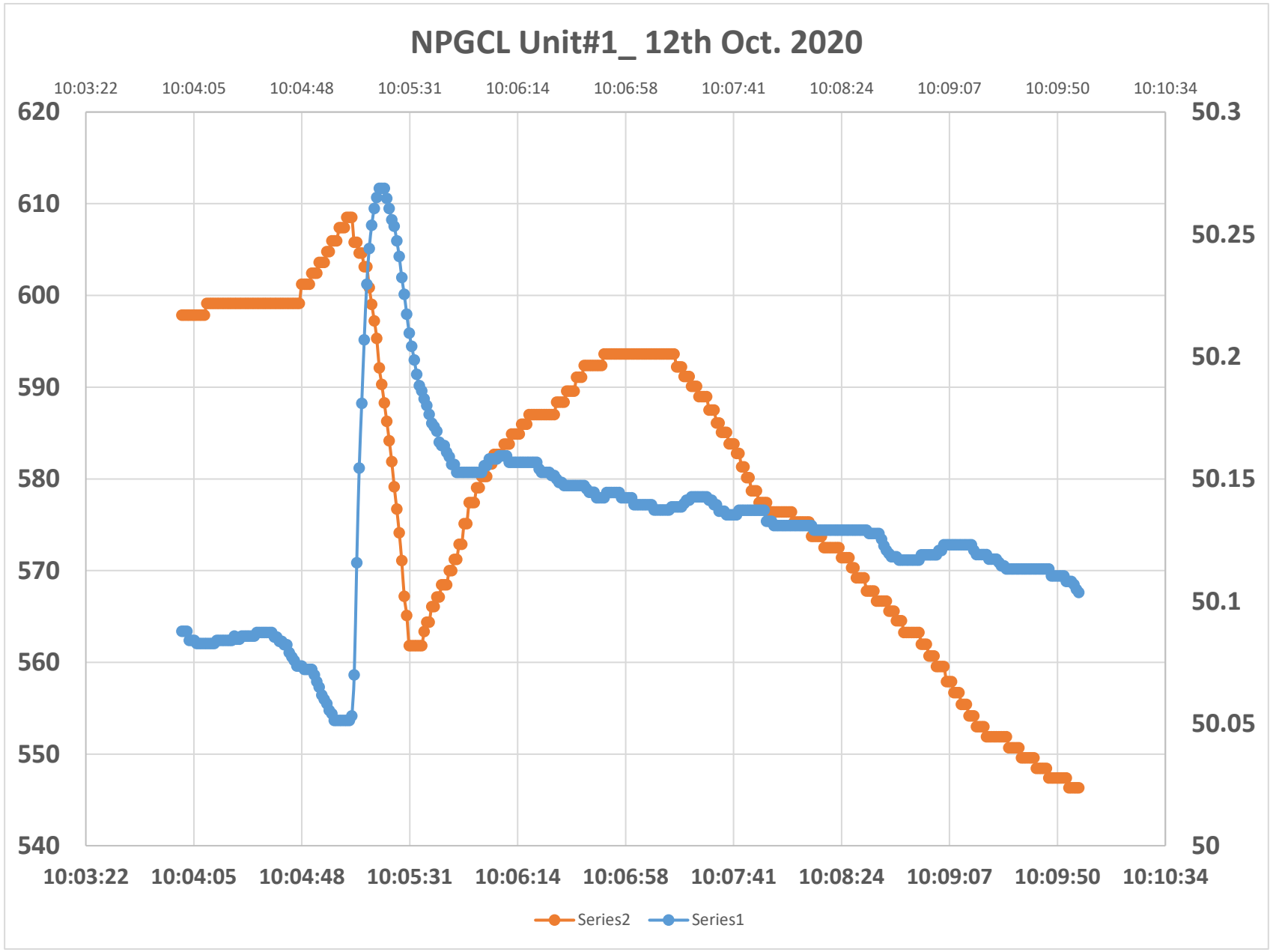
49.86
49.84
49.82
49.8
Series2
Series1


NPGCL Unit#1_ 12th Oct. 2020
10:03:22
10:04:05
10:04:48
10:05:31
10:06:14
10:06:58
10:07:41
10:08:24
10:09:07
10:09:50
10:10:34
620
610
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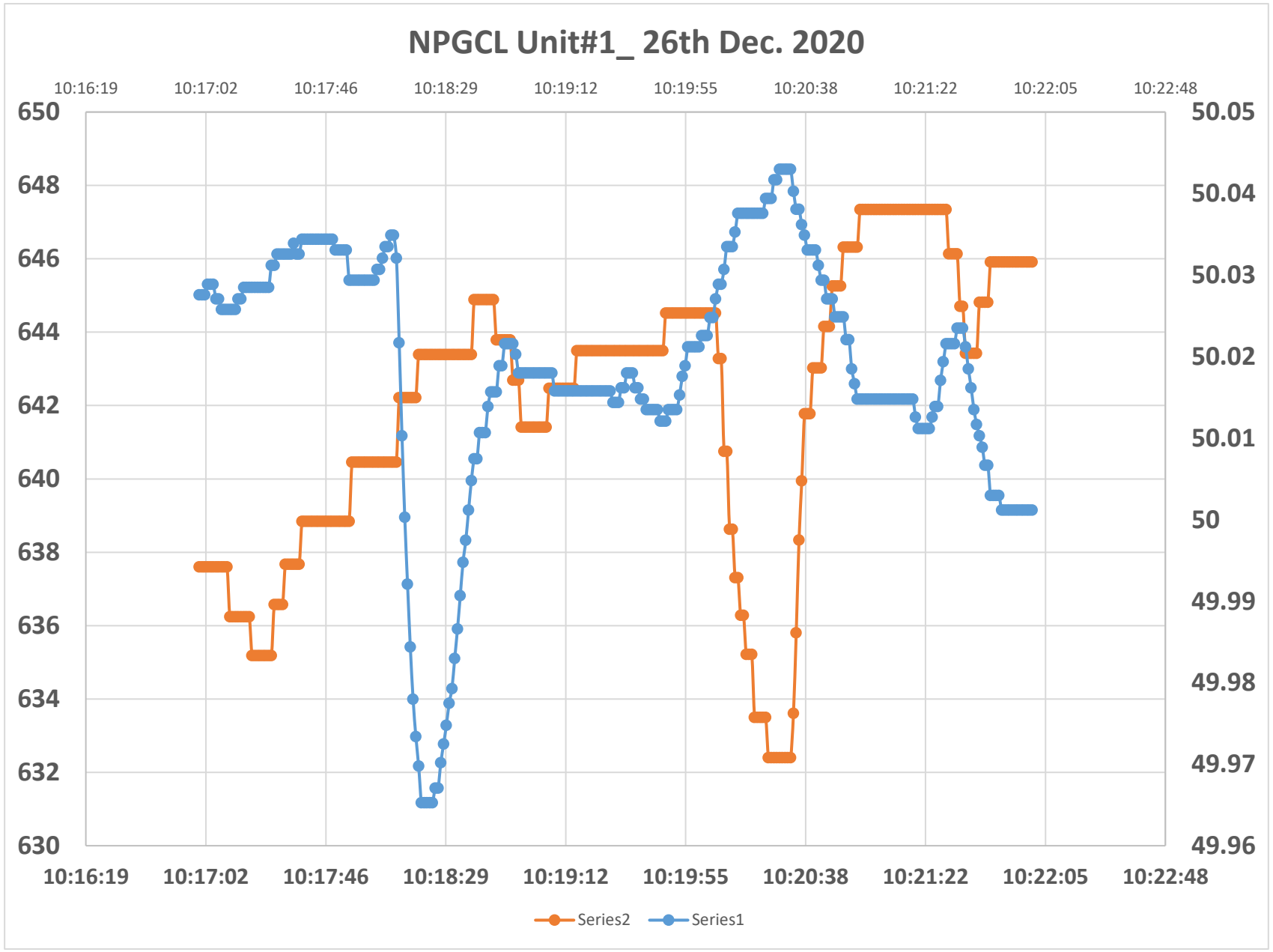
50.15
50.1
50.05
50
Series2
Series1


NPGCL Unit#1_ 26th Dec. 2020
10:16:19
10:17:02
10:17:46
10:18:29
10:19:12
10:19:55
10:20:38
10:21:22
10:22:05
10:22:48
650
648
646
644
642
640
638
636
634
632
630
50.05
50.04
50.03
50.02
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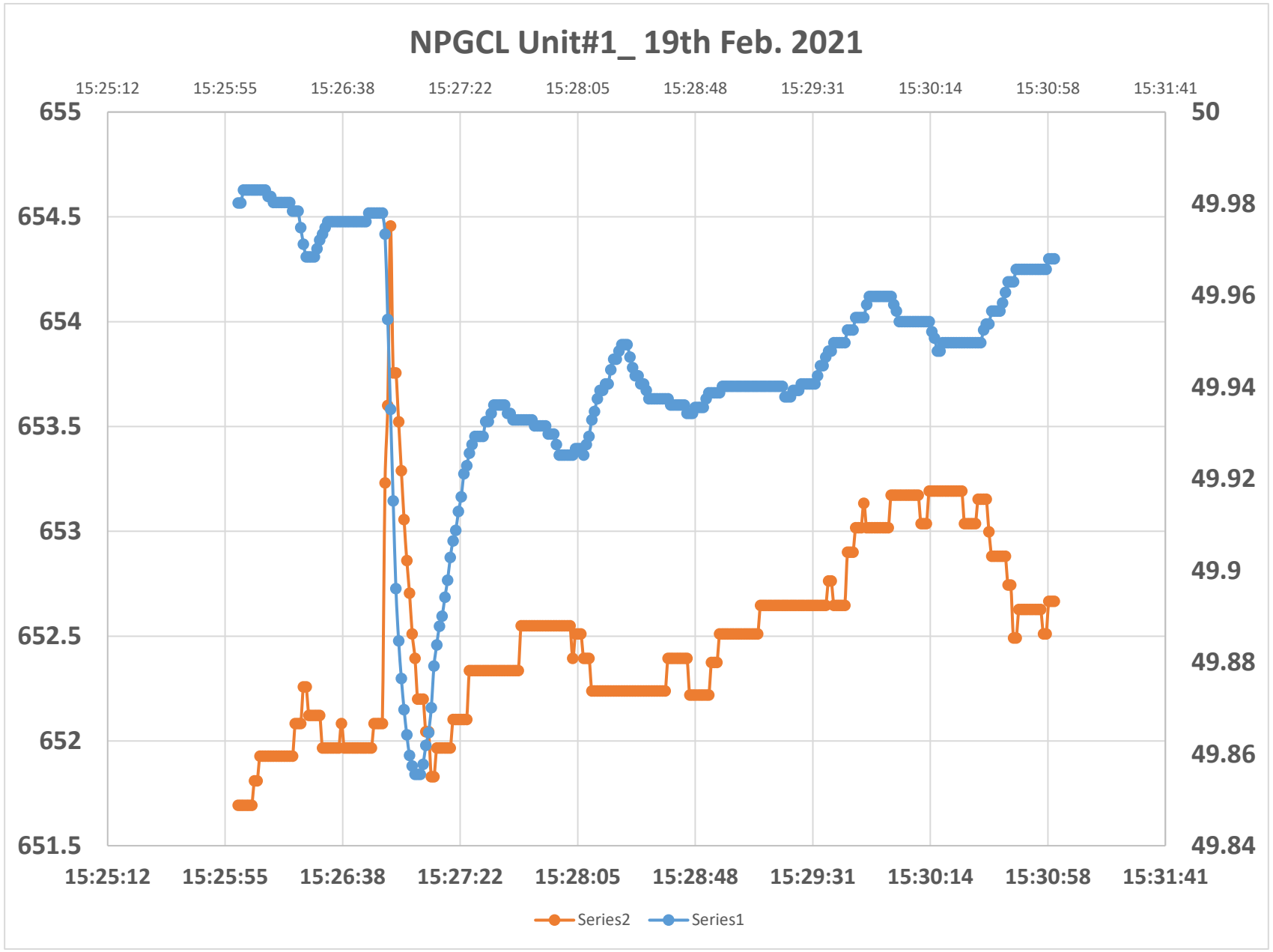
49.97
49.96
Series2
Series1


NPGCL Unit#1_ 19th Feb. 2021
15:25:12
15:25:55
15:26:38
15:27:22
15:28:05
15:28:48
15:29:31
15:30:14
15:30:58
15:31:41
655
654.5
654
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653
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651.5
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49.98
49.96
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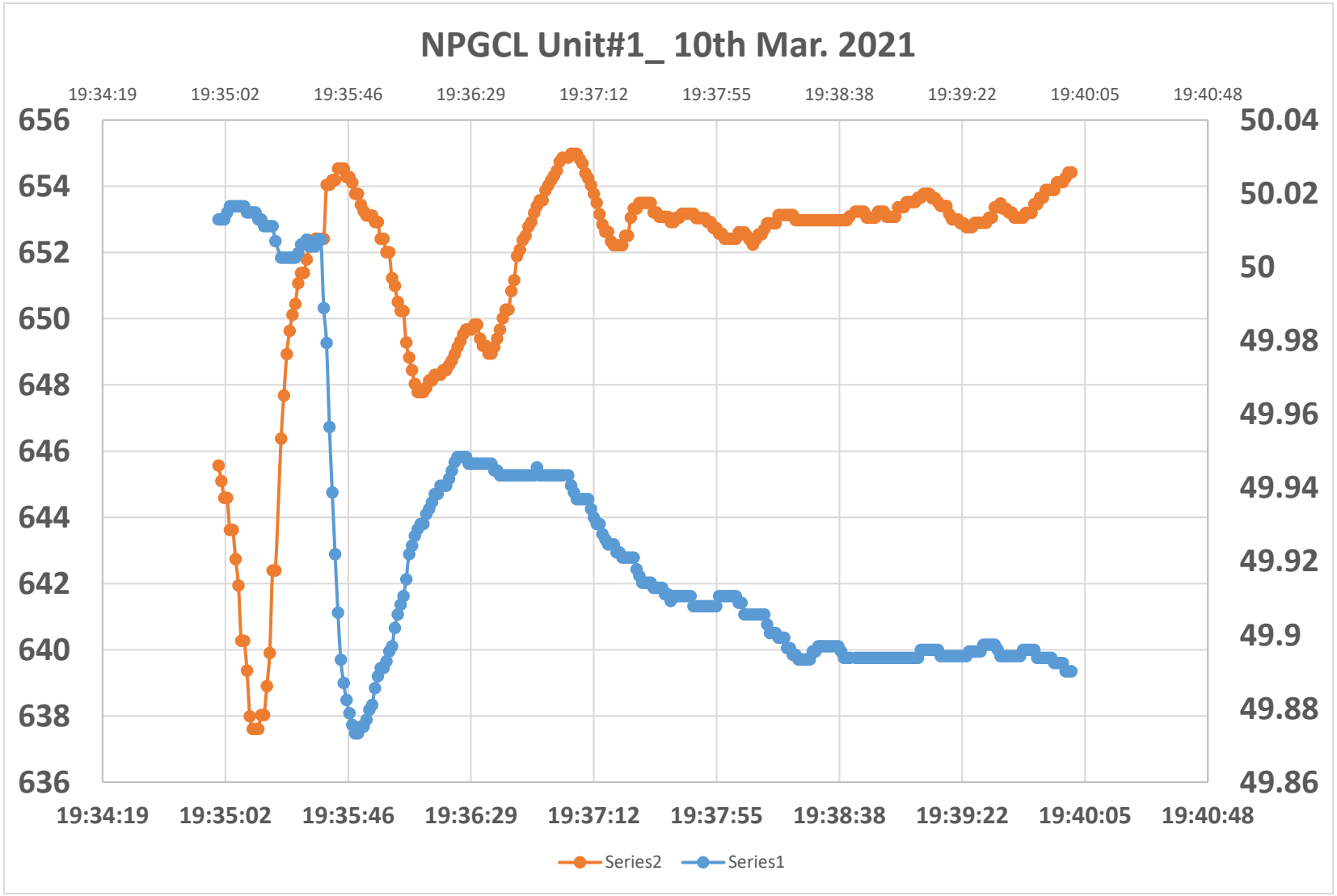
49.9
49.88
49.86
49.84
Series2
Series1


NPGCL Unit#1_ 10th Mar. 2021
19:34:19
19:35:02
19:35:46
19:36:29
19:37:12
19:37:55
19:38:38
19:39:22
19:40:05
19:40:48
656
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652
650
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640
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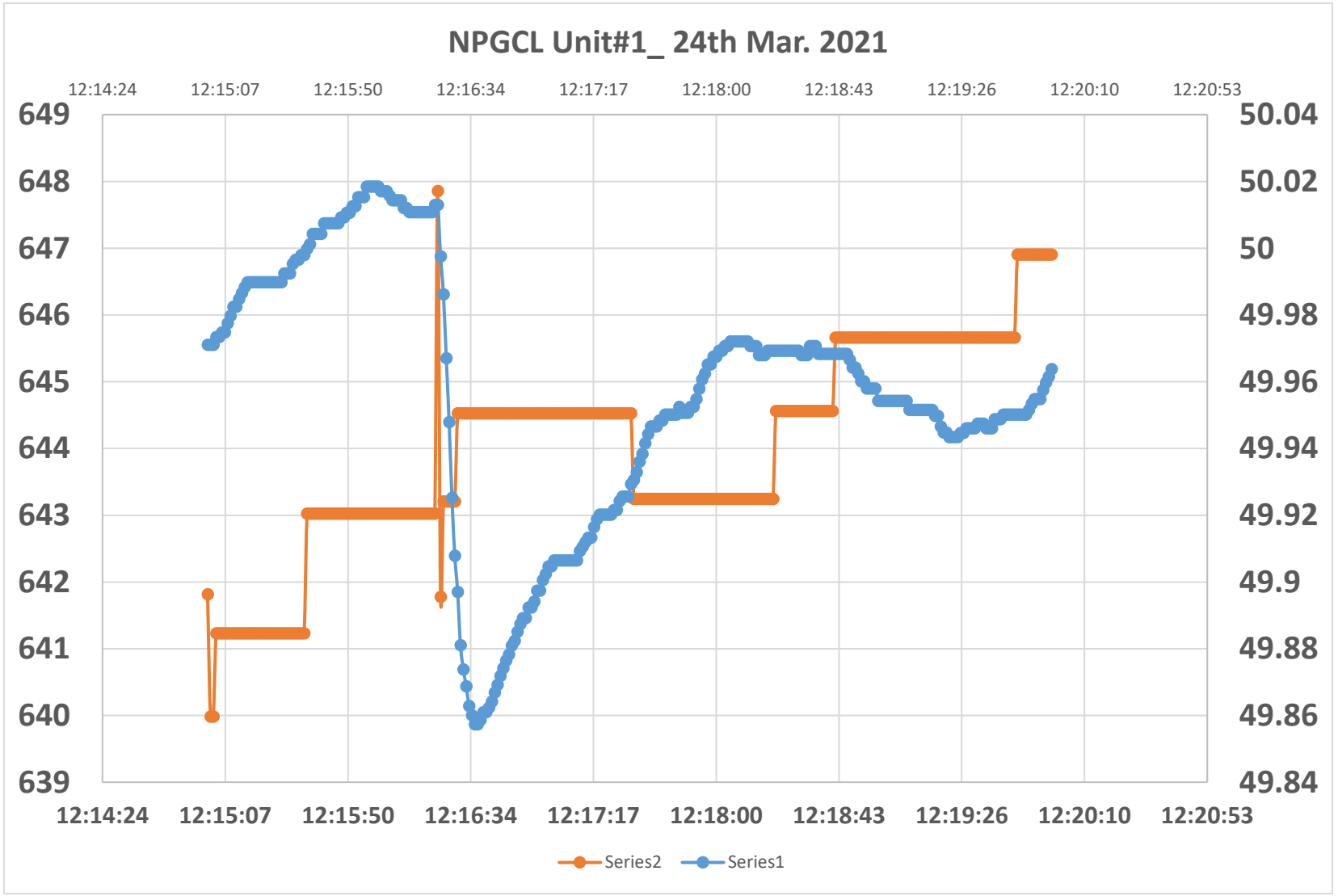
49.92
49.9
49.88
49.86
Series2
Series1


NPGCL Unit#1_ 24th Mar. 2021
12:14:24
12:15:07
12:15:50
12:16:34
12:17:17
12:18:00
12:18:43
12:19:26
12:20:10
12:20:53
649
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641
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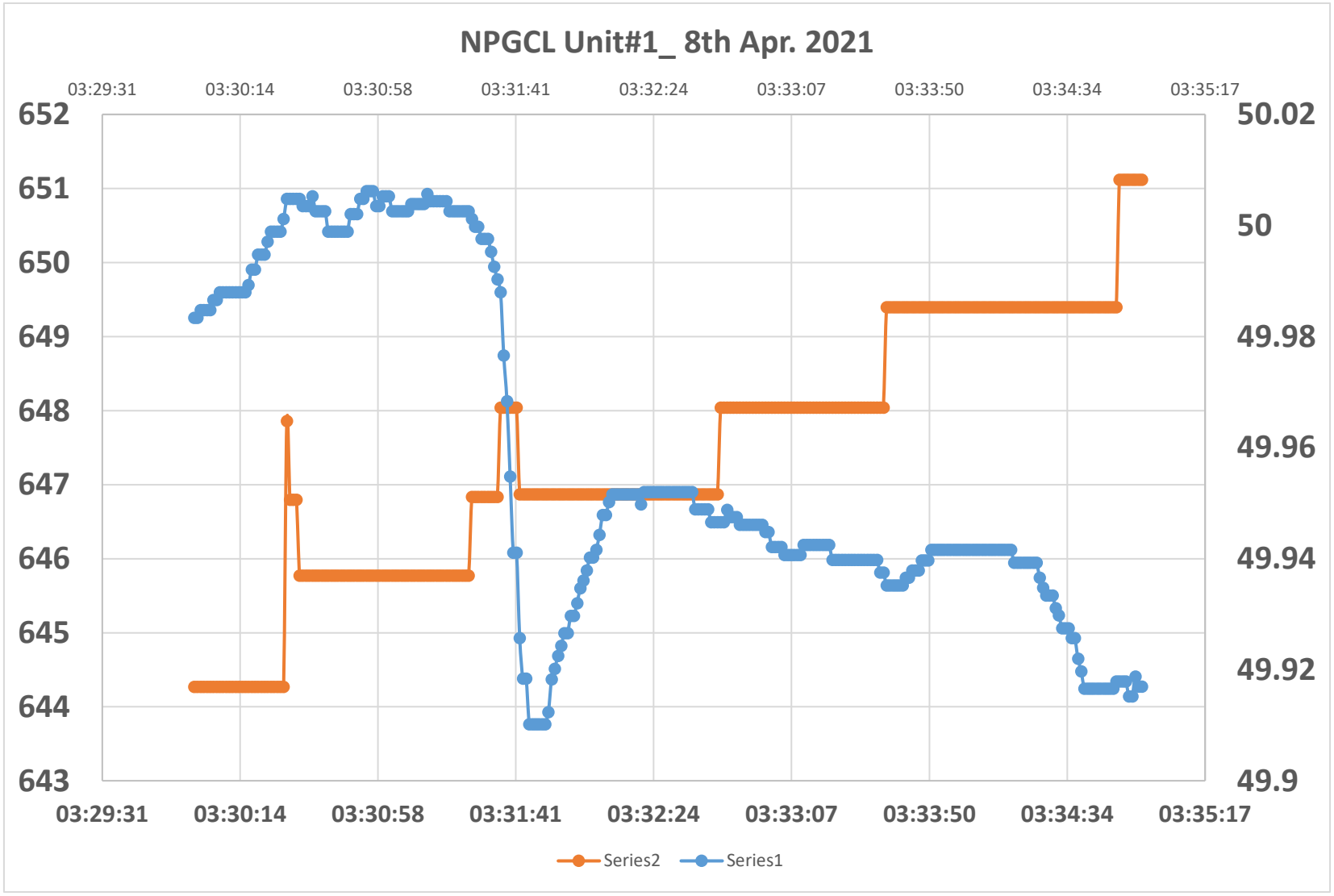
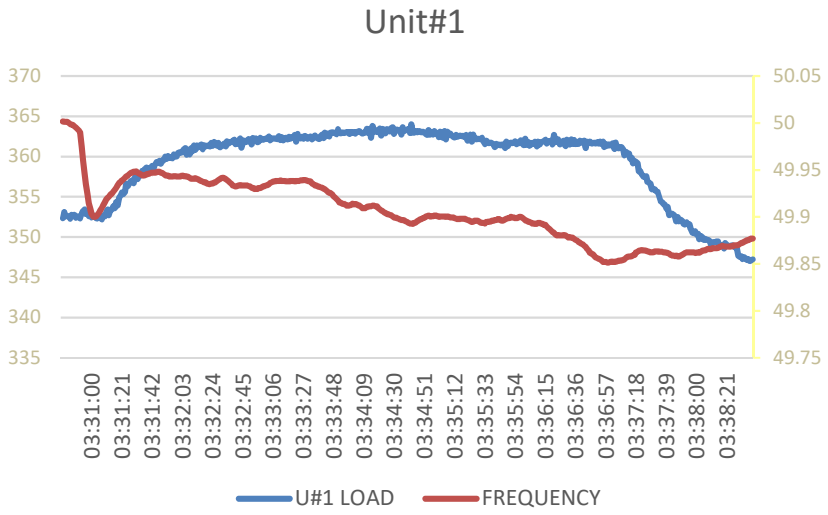
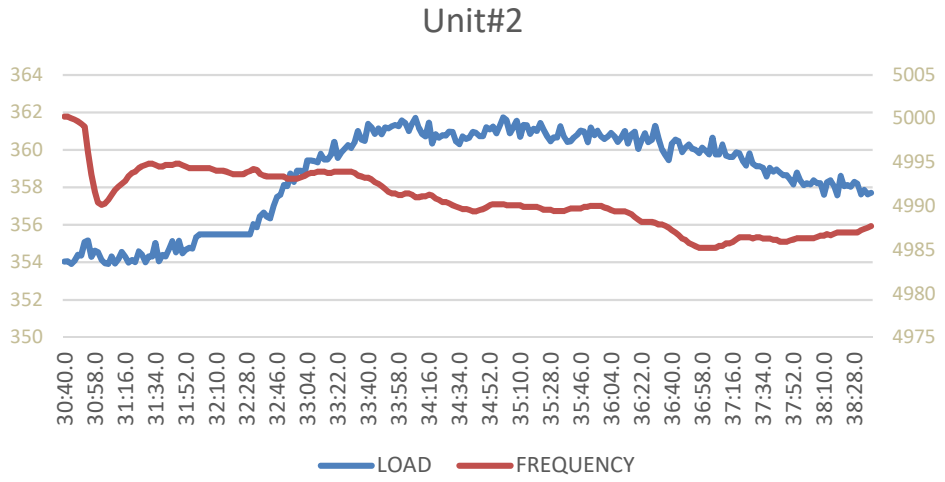
49.86
49.84
Series2
Series1

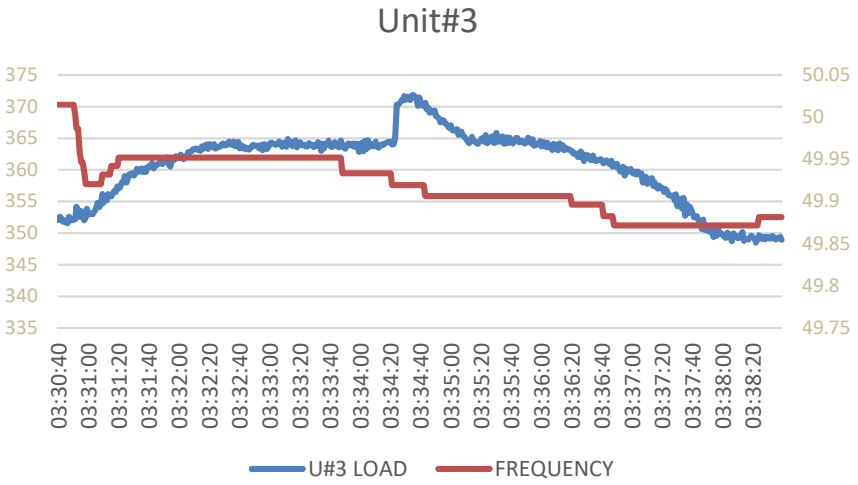

NPGCL Unit#1_ 8th Apr. 2021
03:29:31
03:30:14
03:30:58
03:31:41
03:32:24
03:33:07
03:33:50
03:34:34
03:35:17
652
651
650
649
648
647
646
645
644
643
50.02
50
49.98
49.96
49.94
49.92
49.9
Series2
Series1


GMR ENERGY
GMR

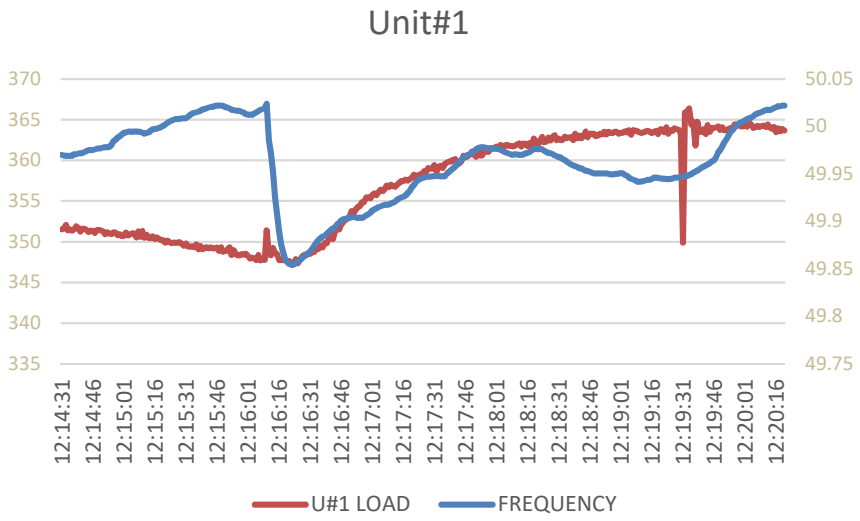
U#1,2,3 RGMO RESPONSE ON 08042021

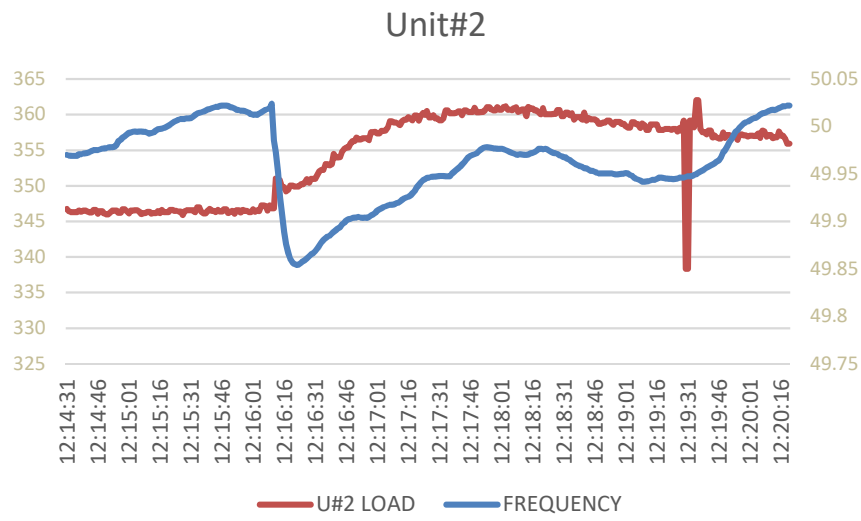


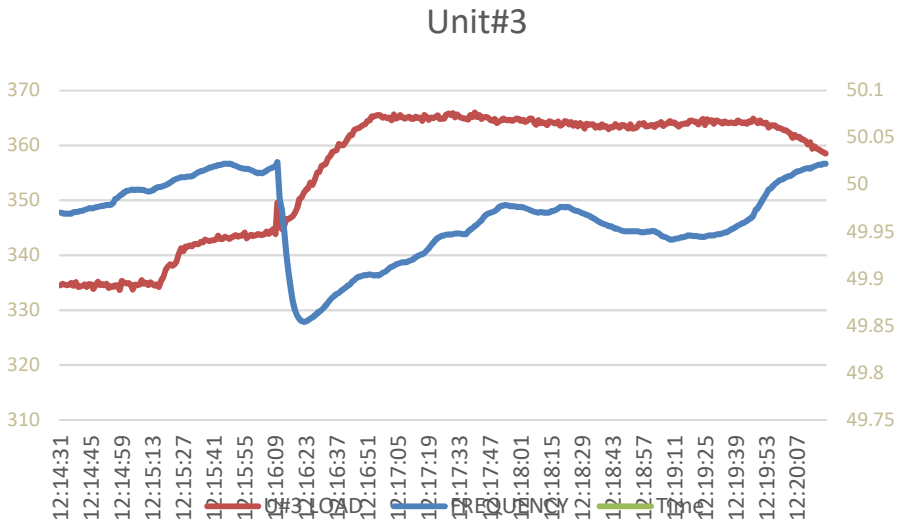




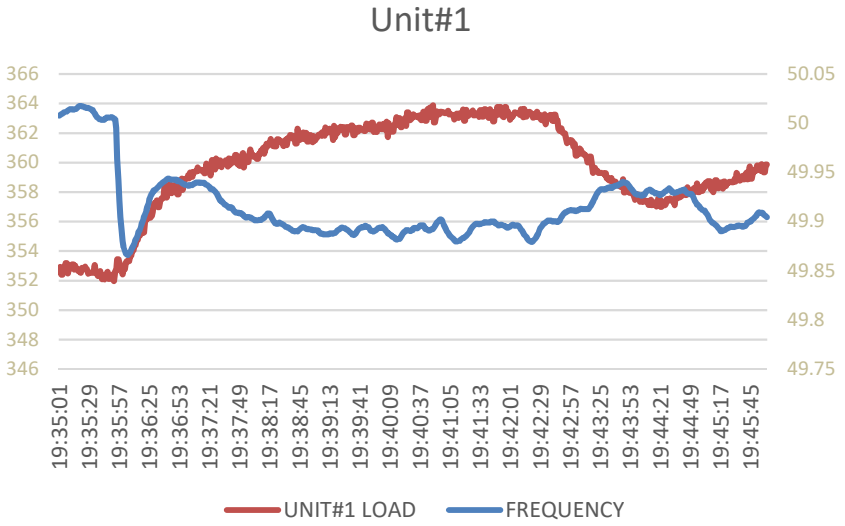
U#1,2,3 RGMO RESPONSE ON 24032021

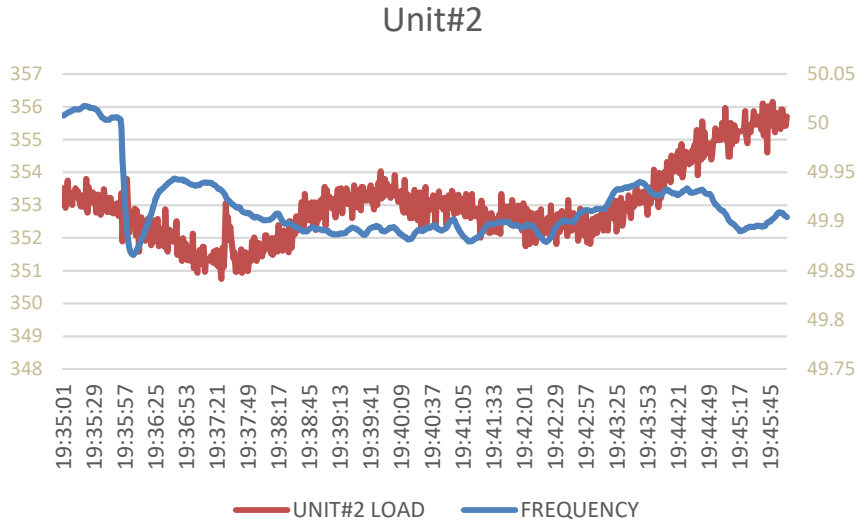


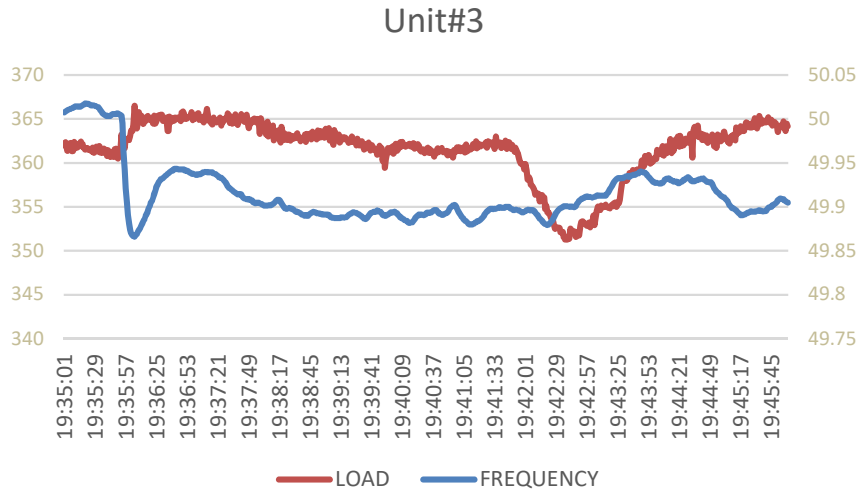




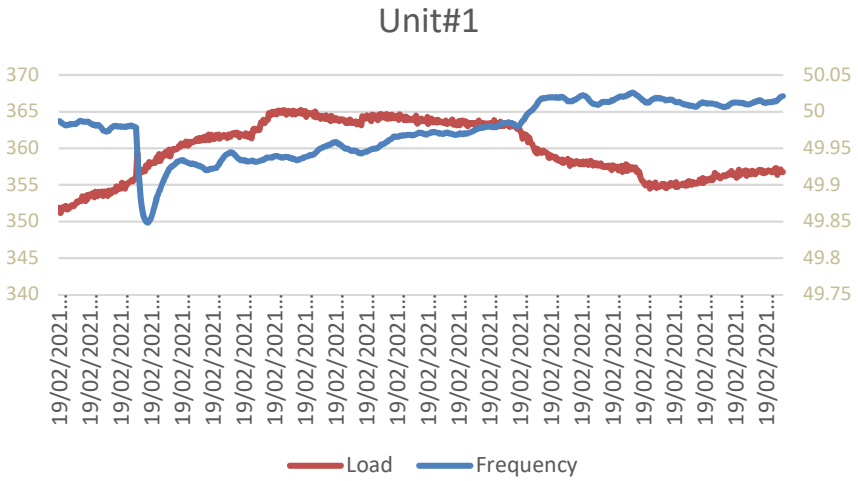
U#1,2,3 RGMO RESPONSE ON 10032021



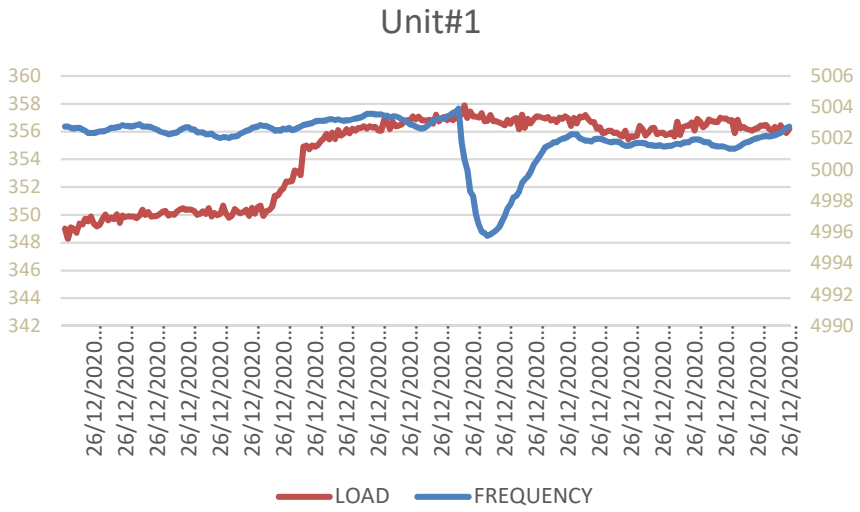


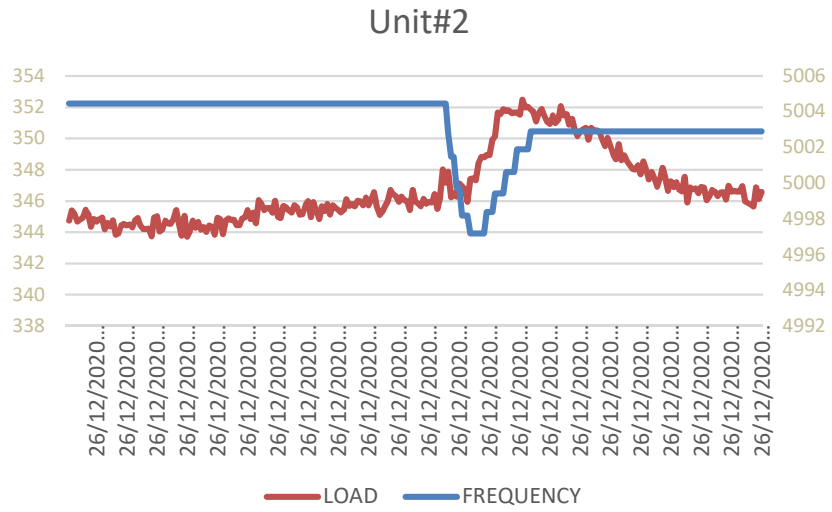


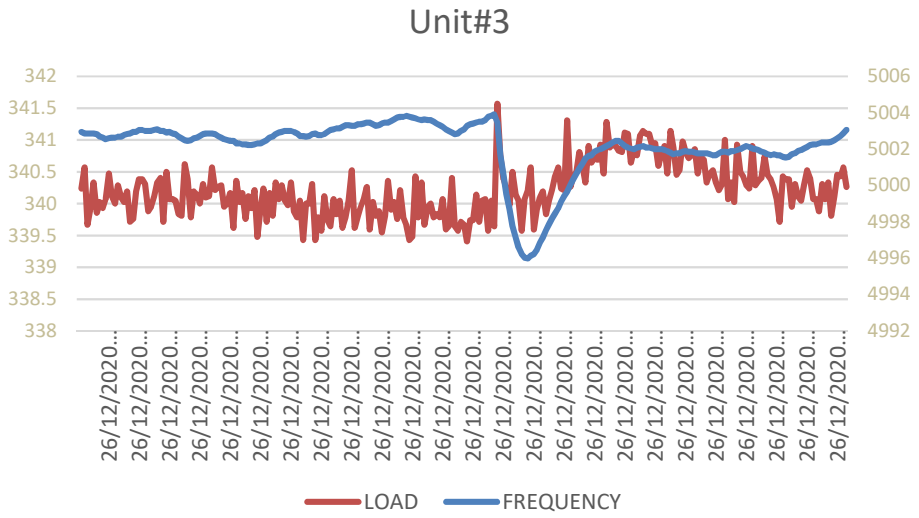
U#1 RGMO RESPONSE ON 19022021



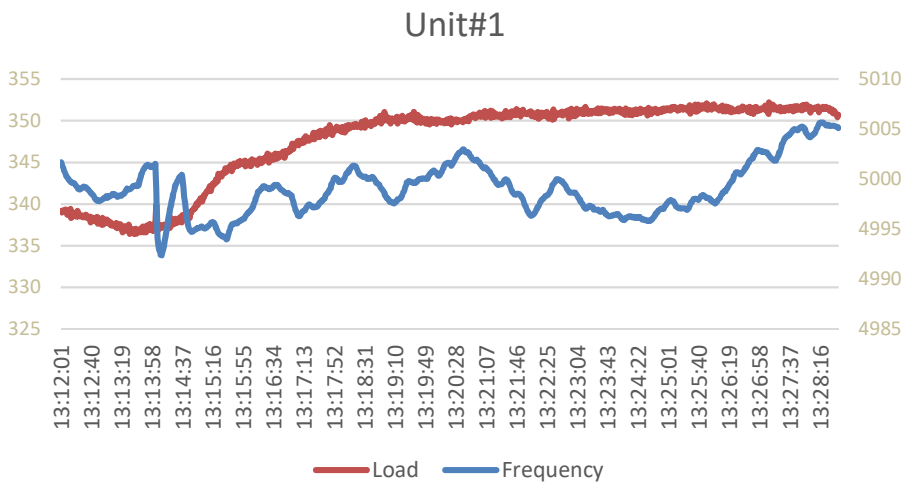
U#1,2,3 RGMO RESPONSE ON 26122020

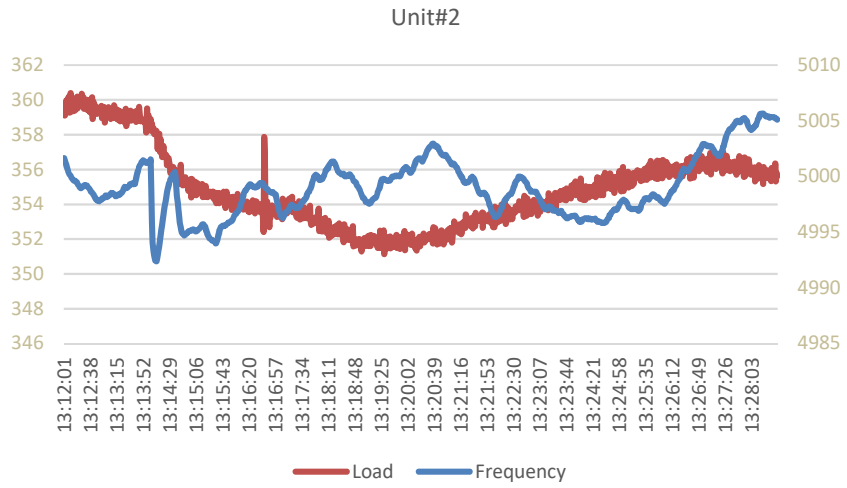


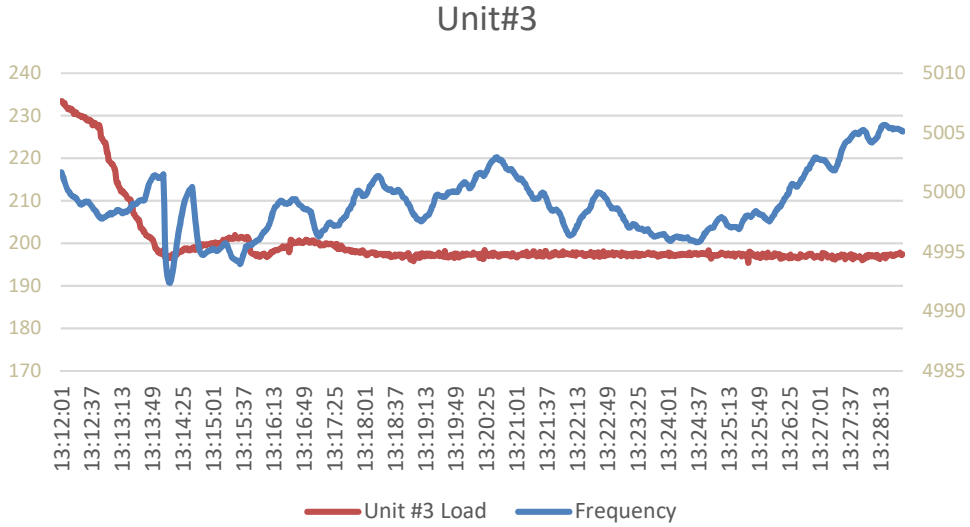




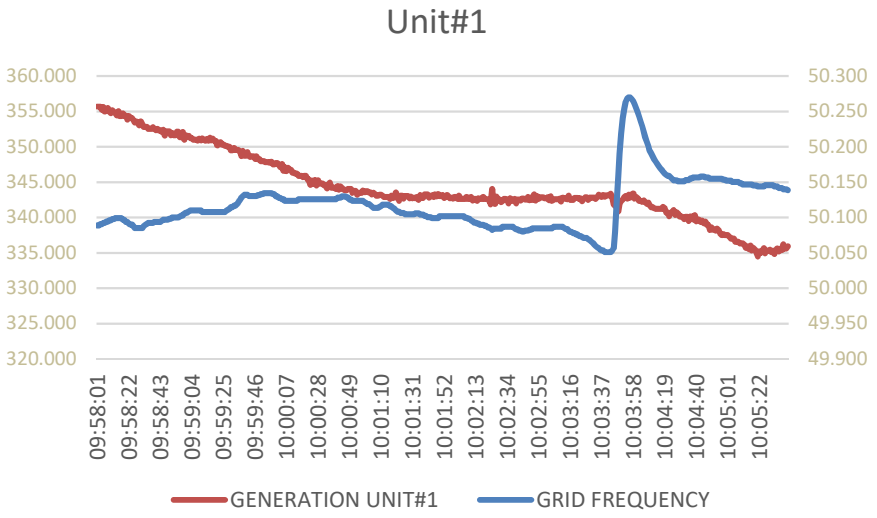
U#1,2,3 RGMO RESPONSE ON 29112020

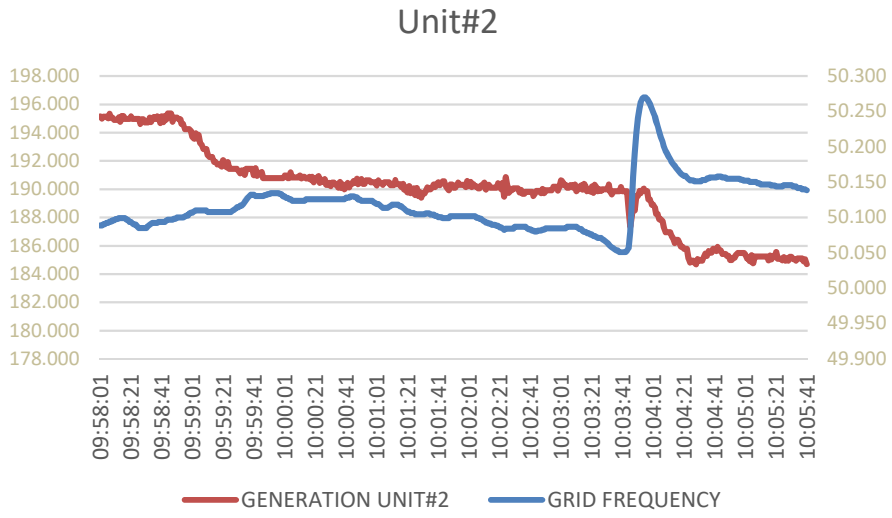


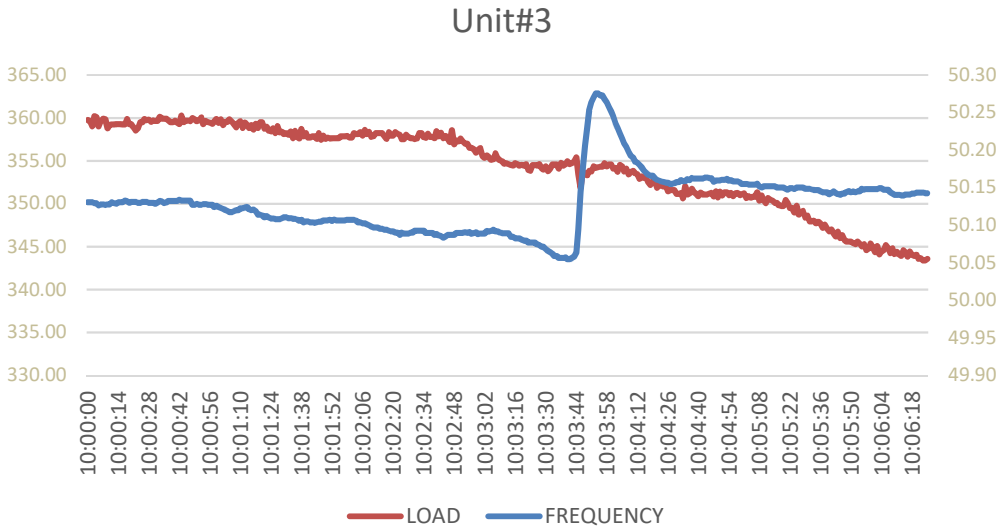




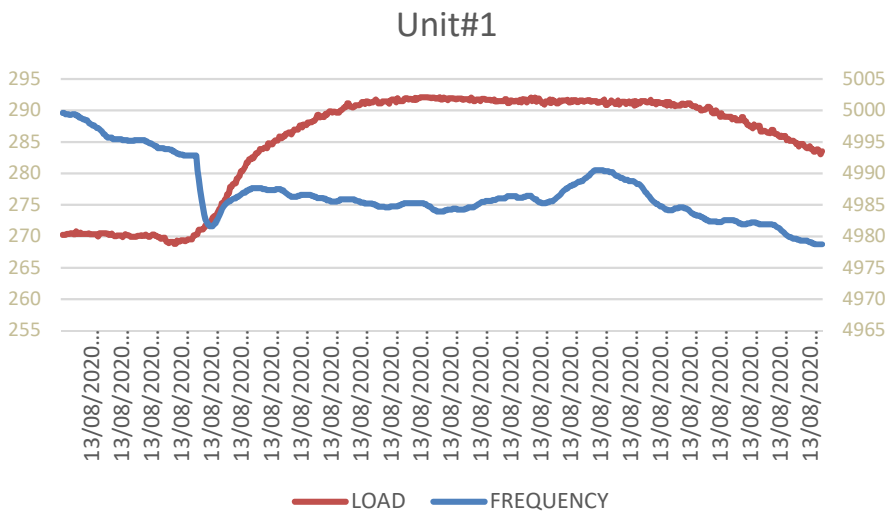
U#1,2,3 RGMO RESPONSE ON 12102020

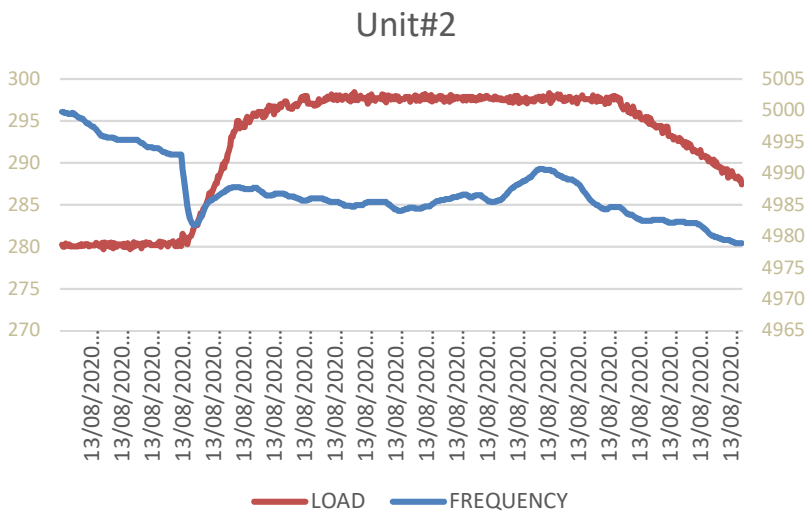




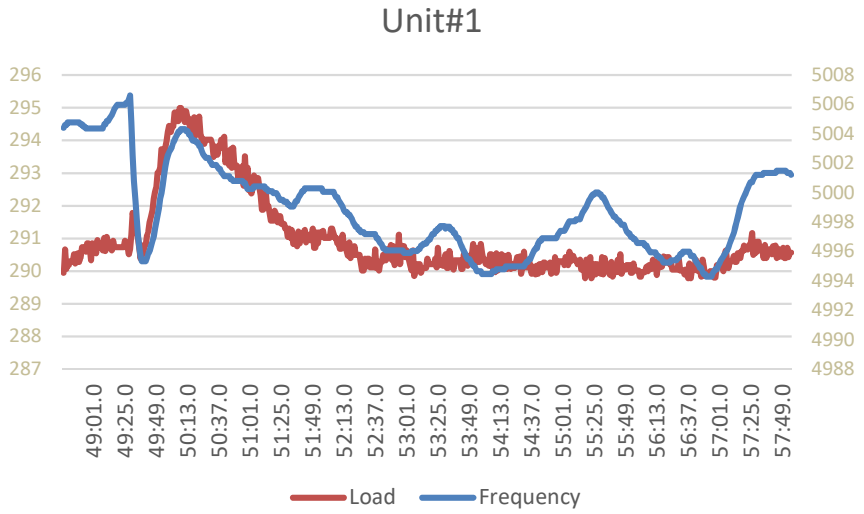


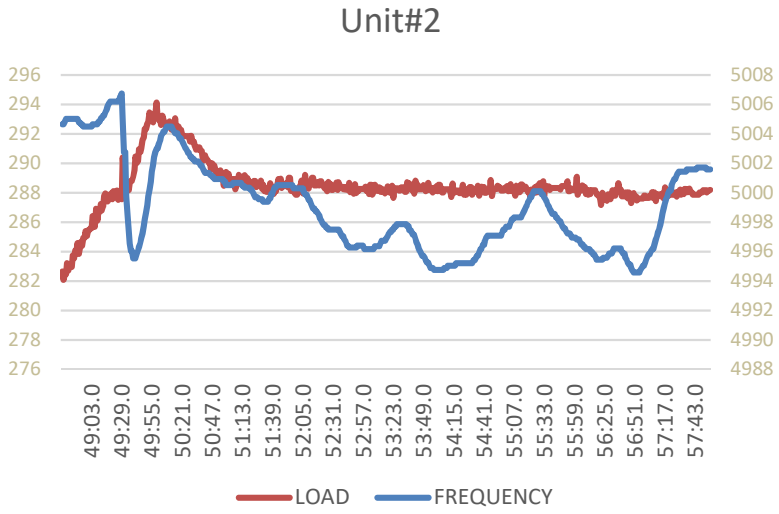
U#1,2 RGMO RESPONSE ON 13082020





U#1 & 2 RGMO RESPONSE ON 06082020





Summary and actions

Summary of Incident responses

During last 3-4 incidents ,The logic response has been satisfactory in all 3 units. Some shortfall of %age response in unit 2,3

1) At full load, unit 2,3 though did respond as per logic, load change %age affected due to one HPCV not available.

Corrective action planned.– OEM supply of HPCV spares have come. HPCV will be made available in any shutdown opportunity of 5-6 days.

2). In a couple of earlier incidents, The Unit was not in designated load control mode. As a corrective action, the logic has also been implemented in the other likely mode of Valve control. Also one incident load was at tech min.

RGMO RESPONSE

JITPL

OBSERVATIONS

- As per RGMO guidelines ideal response should be due to frequency change during the event/2.5*installed capacity limited to 5% of generation.

- Also a ripple filter of +/- 0.03 hz or 1.8 rpm is given for RGMO to respond.

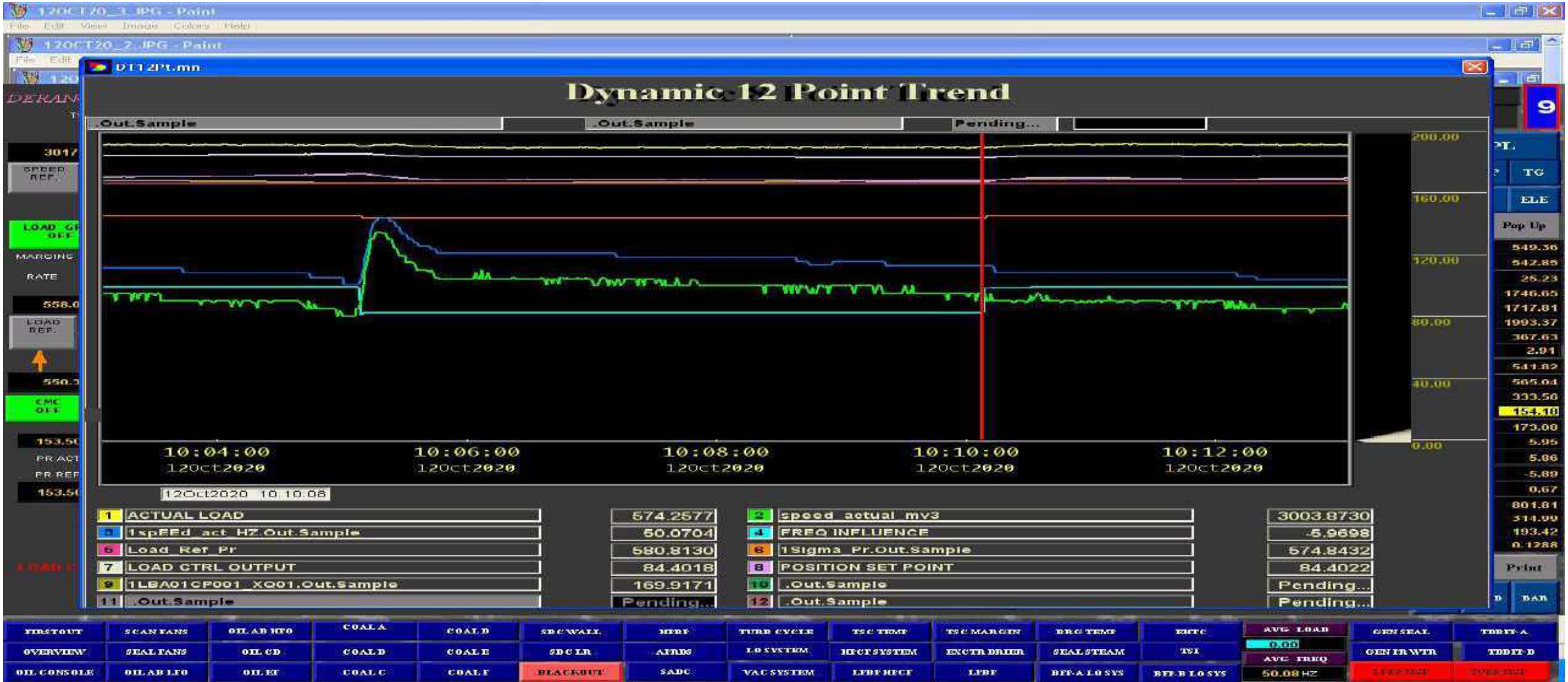
- Ideal response for a change of 0.03 hz is (0.03/2.5*600,600*0.05) 7.2 MW for a governing with 5% droop.

- JITPL units are having a droop of 5%

- We have implemented the RGMO logic with RPM signal which gives an ideal response of 7.2 MW for an instant change of 1.8 RPM and persist for 5 minutes. Next load response in reference to frequency will come in action only after 5 minutes and so on.

- Due to slow response of load with above calculations, we have increased the RGMO response to 9 MW from 7.2 MW, for a change of 1.8 RPM.

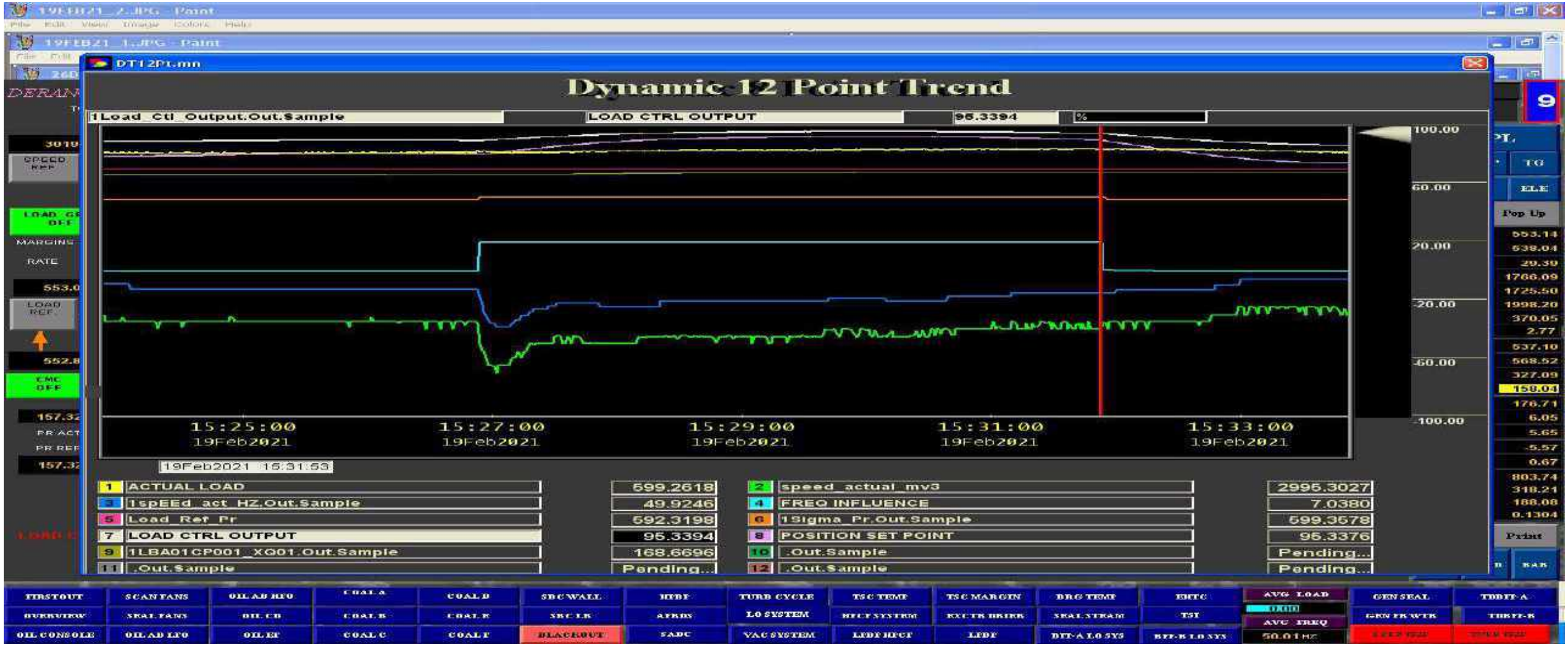
U#1 12 OCTOBER 2020 : RGMO responded -6 MW for 5 minutes



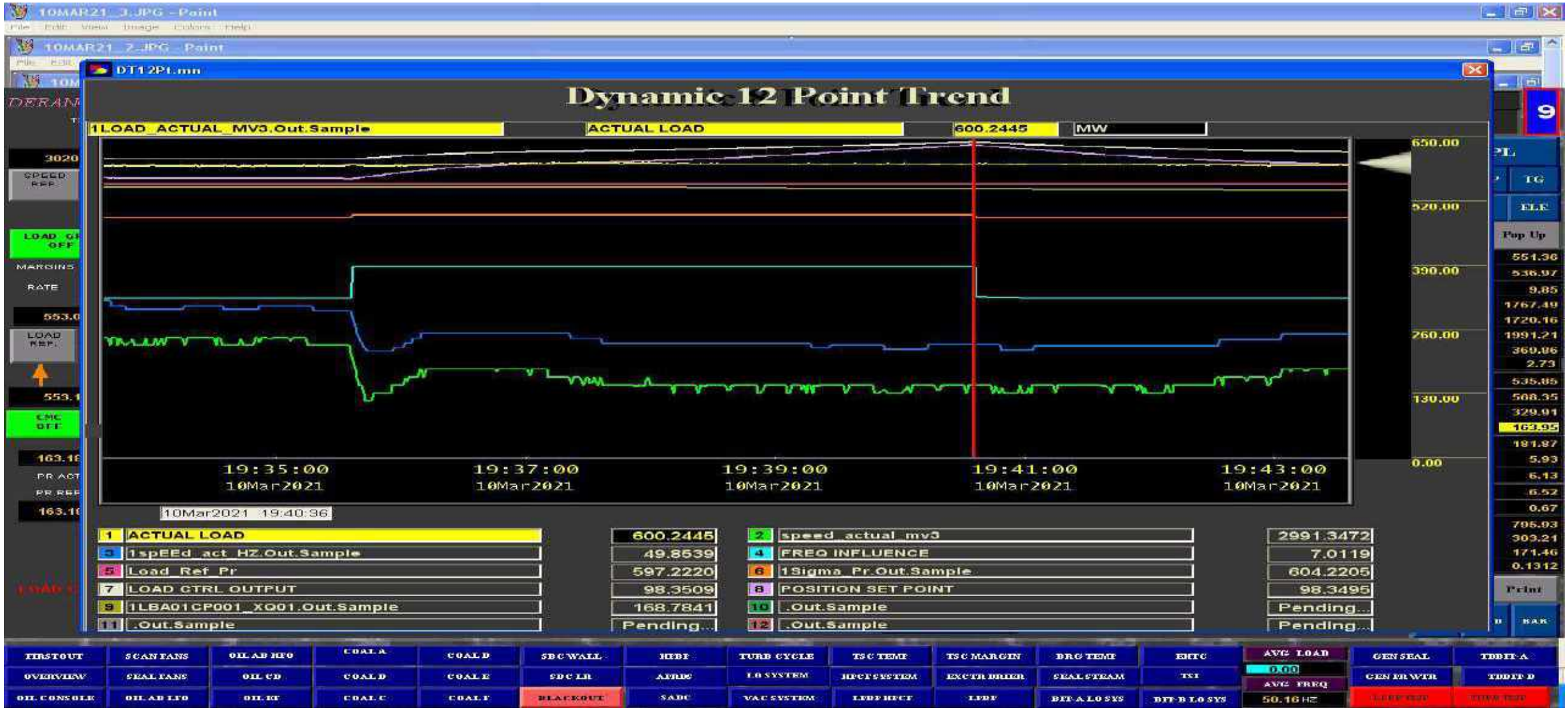
U#1 29 NOV 2020 : RGMO responded 11.3 MW for 5 minutes, load increase was not observed as load control output at 100%

U#1 26 DEC 2020 : RGMO responded 5.8 MW for 2 minutes(as rpm came to normal range after 2 minutes), load increase was not observed as load control output at 100%

U#1 19 FEB 2021 : RGMO responded 7 MW for 5 minutes, load increased from 592 to 599



U#1 10 MARCH 2021 : RGMO responded 7 MW for 5 minutes but load control output was already at 98% , load increase was not observed



U#1 24 MARCH 2021 : RGMO responded 16.2 MW for 5 minutes but load control output was already at 100% so load increase was not observed

U#1 8 APRIL 2021 : RGMO responded 8.7 MW for 5 minutes but load control output was already at 100% so load increase was not observed

U#2 19 FEB 2021 : RGMO responded 6.6 MW for 5 minutes but load control output was already at 100% so load increase was not observed

U#2 24 MARCH 2021 : RGMO responded 11.5 MW for 5 minutes but unit was just synchronized, load at 160 MW and RGMO was not in service

U#2 24 MARCH 2021 : RGMO responded -8 MW for 5 minutes but unit was in CMC mode, CMC increased load to maintain load CMC reference

Action Plan

- Already increased RGMO response to 9 MW from 7.2 MW for an instant change of 1.8 RPM.

- During CMC mode operations, delta pressure is influencing final load control output to maintain CMC reference. Action has been taken to implement RGMO through CMC also.

- We are working on governor response along with control valve response to work faster than present condition to meet the RGMO response as per grid demand.

MPL
MAITHON POWER LIMITED

RGMO Response of MPL Unit-1 and 2

Time Frame: **August 2020 to April 2021**

Date: 31st May-2021

Lighting up Lives!

RGMO Response Data along with Reasons

Sl. No	Date and Time	Event	Unit-1 response	% of ideal response	Unit-2 response	% of ideal response	Reasons for non-compliance of Unit-1	Reasons for non-compliance of Unit-2
01	6th August -20 at 13:50 hrs	1348 MW wind generation loss in Rajasthan	Unit -1 was running at 280 MW, when RGMO influence of 9.08 MW was initiated at 13:49:08 hrs. Unit-1 load increased to 288.1 MW at 13:50:43 hrs upon perceiving the response. Against a RGMO influence of 9.08 MW, actual influence was 8.1 MW.	(Ideal response =14.0 MW) **57.3 % of ideal response (89.2 %)**	Unit -2 was running at 296 MW, when RGMO influence of 8.94 MW was initiated at 13:49:08 hrs. Unit-2 load increased to 303.4 MW at 13:51:43 hrs upon perceiving the response. Against a RGMO influence of 8.94 MW, actual influence was 7.4 MW.	(Ideal response =14.8 MW) **50 % of ideal response (82.7 %)**	Actual RGMO response was less than the ideal response. Need to check it during third party trial by SIEMENS which shall be conducted shortly.	Actual RGMO response was less than the ideal response. Need to check it during third party trial by SIEMENS which shall be conducted shortly.
02	13th August -20 at 07:03 hrs	1200 MW hydro generation loss at Jhakri, Karcham and Rampur in NR	Unit -1 was running at 290 MW, when RGMO influence of 12.20 MW was initiated at 07:03:16 hrs. Unit-1 load increased to 301.9 MW at 07:03:35 hrs upon perceiving the response. Against a RGMO influence of 12.20 MW, actual influence was 11.9 MW.	(Ideal response= 14.5 MW) **82.06 % of ideal response (97.5 %)**	Unit -2 was running at 292.4 MW, when RGMO influence of 11.54 MW was initiated at 07:03:16 hrs. Unit-2 load increased to 303.9 MW at 07:03:59 hrs upon perceiving the response. Against a RGMO influence of 11.54 MW, actual influence was 11.3 MW.	(Ideal response= 14.6 MW) **77.29 % of ideal response (97.9 %)**	Results were satisfactory	Results were satisfactory

RGMO Response Data along with Reasons

Sl. No	Date and Time	Event	Unit-1 response	% of ideal response	Unit-2 response	% of ideal response	Reasons for non-compliance of Unit-1	Reasons for non-compliance of Unit-2
03	12th Oct-20 at 10:05 hrs	2600 MW load loss and 840 MW generation loss (Net load loss 1540) at Mumbai	Unit -1 was running at 350 MW. No response was perceived.	(Ideal response =17.5 MW) **0 % of ideal response**	Unit -2 was running at 285 MW. No response was perceived.	Not applicable	Unit-1 was synchronized on 11th Oct-2020 and there was restriction in Drum pressure rise due to high Silica content. Unit operation was in VWO mode.	Unit-2 was running in MTL condition so there was no RGMO response or Load reduction beyond MTL condition
04	29th Nov-20 at 13:16 hrs	Tripping of generating Units at Bellary TPS (906 MW) and Jindal TPS (780 MW)	Unit -1 was running at 406 MW, when RGMO influence of 13.24 MW was initiated at 13:16:40 hrs. Unit-1 load increased to 415.4 MW at 13:17:00 hrs upon perceiving the response. Against a RGMO influence of 13.24 MW, actual influence was 9.4 MW.	(Ideal response= 20.3 MW) **46 % of ideal response (70.9 %)**	Unit -2 was running at 356 MW, when RGMO influence of 8.34 MW was initiated at 13:16:40 hrs. Unit-2 load increased to 361.1 MW at 13:17:08 hrs upon perceiving the response. Against a RGMO influence of 8.34 MW, actual influence was 5.1 MW.	(Ideal response= 17.8 MW) **28.6 % of ideal response (61.1 %)**	Actual RGMO response was less than the ideal response. Need to check it during third party trial by SIEMENS which shall be conducted shortly.	Actual RGMO response was less than the ideal response. Need to check it during third party trial by SIEMENS which shall be conducted shortly.

RGMO Response Data along with Reasons

Sl. No	Date and Time	Event	Unit-1 response	% of ideal response	Unit-2 response	% of ideal response	Reasons for non-compliance of Unit-1	Reasons for non-compliance of Unit-2
05	26th Dec-20 at 10:18 hrs	Tripping of generating units in Wanakbori S/S	Unit -1 was running at 523 MW, when RGMO influence of 9.59 MW was initiated at 10:18:35 hrs	(Ideal response =17.22 MW) **0 % of ideal response**	Unit -2 was running at 511 MW, when RGMO influence of 9.70 MW was initiated at 10:18:35 hrs. Unit-2 load increased to 520.5.1 MW at 10:19:27 hrs upon perceiving the response. Against a RGMO influence of 9.70 MW, actual influence was 9.5 MW.	(Ideal response =17.22 MW) **55 % of ideal response (97.93 %)**	Unit-1 was running at full load in VWO condition and there was no margin available to cater the MW demand.	RGMO response for Unit-2 was only 9.7 MW.
06	19th Feb-21 at 15:26 hrs	Tripping of generating units in Bhadla S/S	Unit -1 was under capital overhauling, so no response was recorded.	Not applicable	Unit -2 was running at 520.3 MW, when RGMO influence of 22.3 MW was initiated at 15:27:00 hrs. Unit-2 remained at 520 MW.	(Ideal response= 26 MW) **0 % of ideal response**	Unit -1 was under capital overhauling, so no response was recorded.	Unit-2 was running in VWO condition due to poor Vacuum and Higher SCC > 0.66

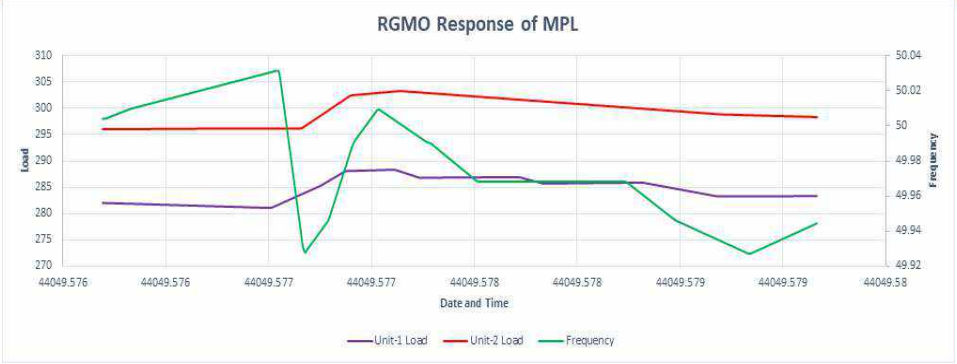
RGMO Response Data along with Reasons

Sl. No	Date and Time	Event	Unit-1 response	% of ideal response	Unit-2 response	% of ideal response	Reasons for non-compliance of Unit-1	Reasons for non-compliance of Unit-2
07	10th Mar-21 at 19:35 hrs	Generation loss at Bhadla S/S	Unit -1 was running at 520.3 MW, when RGMO influence of 24 MW was initiated at 19:35:50 hrs. Unit-1 remained at 520 MW	(Ideal response =17.22 MW) **0 % of ideal response**	Unit -2 was running at 514 MW, when RGMO influence of 23 MW was initiated at 19:35:30 hrs. Unit-2 Load increased to 522.2 MW.	(Ideal response =17.22 MW) **55 % of ideal response**	Unit-1 was running at full load in VWO condition due to poor Vacuum and Higher SCC > 0.66	RGMO response for Unit-2 was 9.7 MW and after reaching 522.2 there was negative pressure deviation owing to VWO mode of operation.
08	24th Mar-21 at 12:16 hrs	Solar generation loss at Bhadla S/S	Unit -1 was running at 516.6 MW, when RGMO influence of 24.6 MW was initiated at 12:16:30 hrs. Unit-1 remained at 516.6 MW.	(Ideal response= 19.11 MW) **0 % of ideal response**	Unit -2 was running at 524.6 MW, when RGMO influence of 22.6 MW was initiated at 12:16:30 hrs. Unit-2 load increased to 534.6.	(Ideal response= 26.25 MW) **38.09 % of ideal response (44.24 %)**	Unit-1 was running at full load in VWO condition due to poor Vacuum and Higher SCC > 0.66	RGMO response for Unit-2 was 10 MW and after reaching 534.6 there was negative pressure deviation owing to VWO mode of operation.

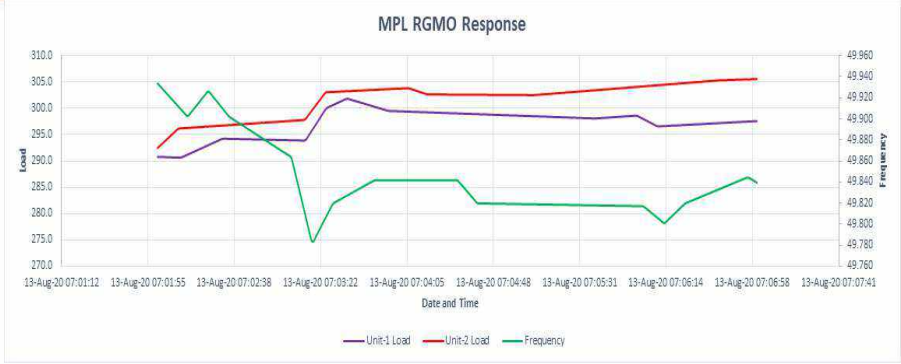
RGMO Response Data along with Reasons

Sl. No	Date and Time	Event	Unit-1 response	% of ideal response	Unit-2 response	% of ideal response	Reasons for non-compliance of Unit-1	Reasons for non-compliance of Unit-2
09	8th Apr-21 at 3:31 hrs	Generation loss in Tuticorin	Unit -1 was running at 522.8 MW, when RGMO influence of 13.78 MW was initiated at 03:31:50 hrs. Unit-1 remained at 522.8 MW.	(Ideal response =19.08 MW) **0 % of ideal response**	Unit -2 was running at 530.6 MW, when RGMO influence of 13.8 MW was initiated at 03:31:50 hrs. Unit-2 remained at 530.8 MW.	(Ideal response =19.29 MW) **0 % of ideal response**	Unit-1 was running at full load in VWO condition due to poor Vacuum and Higher SCC > 0.66	As Unit-2 was already running 5.8 MW more than its design MW rating and being in VWO condition no such response was perceived..

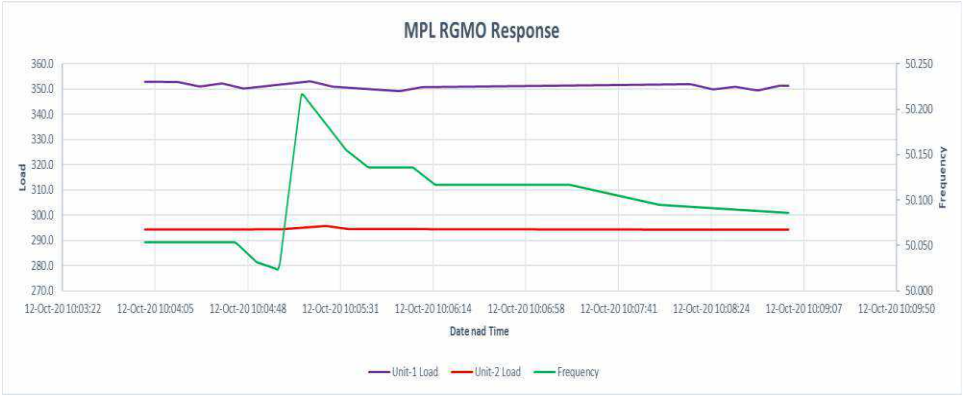
RGMO Response Data along with Reasons



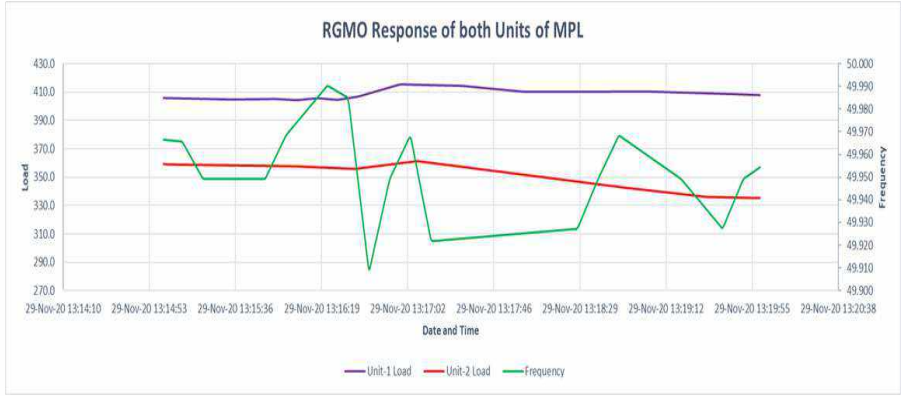
6th August-20 at 13:50 hrs



13th August-20 at 07:03 hrs

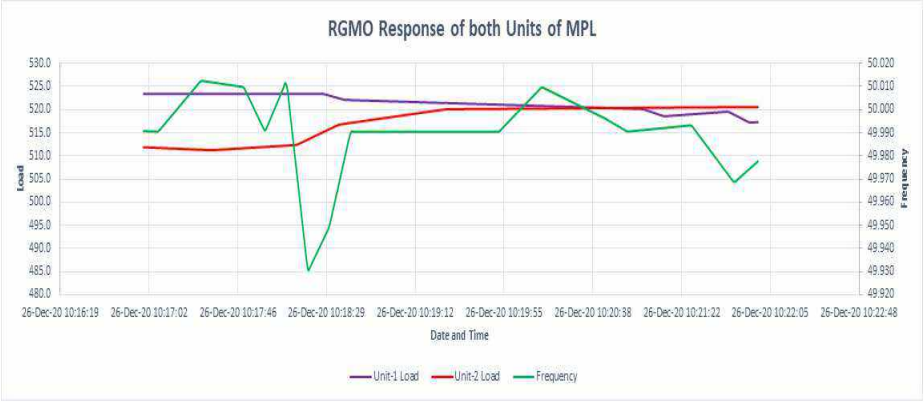


12th Oct-20 at 10:05 hrs

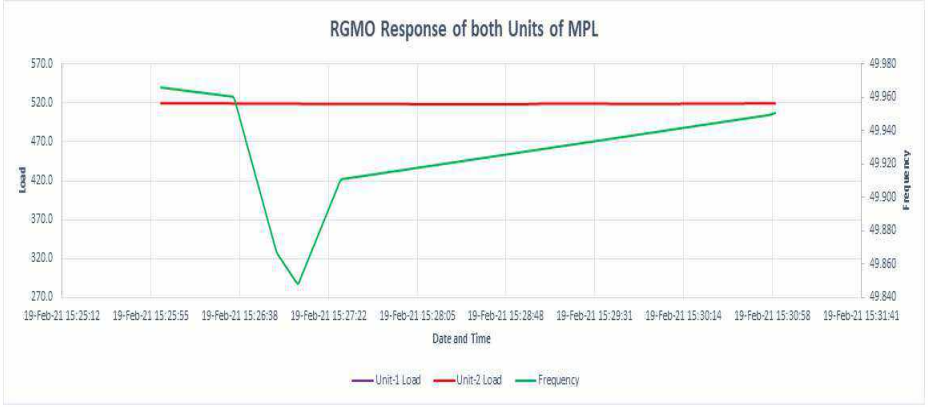


29th Nov-20 at 13:16 hrs

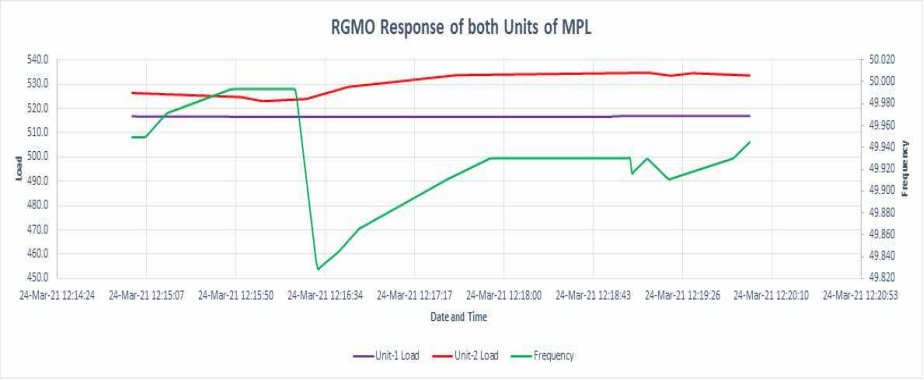
RGMO Response Data along with Reasons



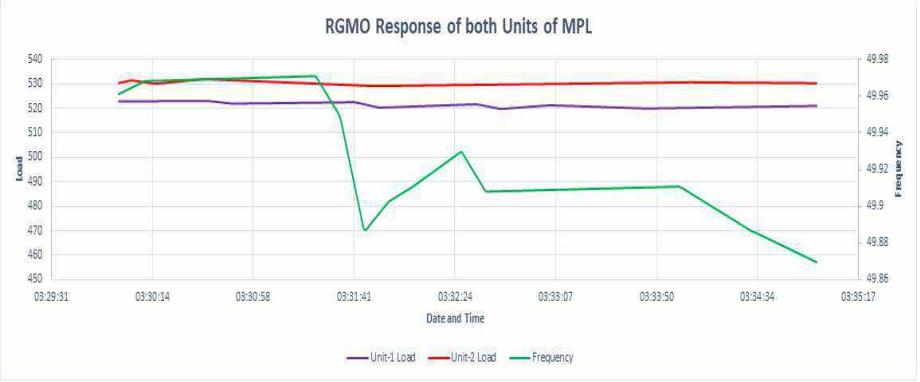
26th Dec-20 at 10:18 hrs



19th Feb-21 at 15:26 hrs



24th Mar-21 at 12:16 hrs



8th Apr-21 at 3:31 hrs

Thank You!

Website: www.tatapower.com

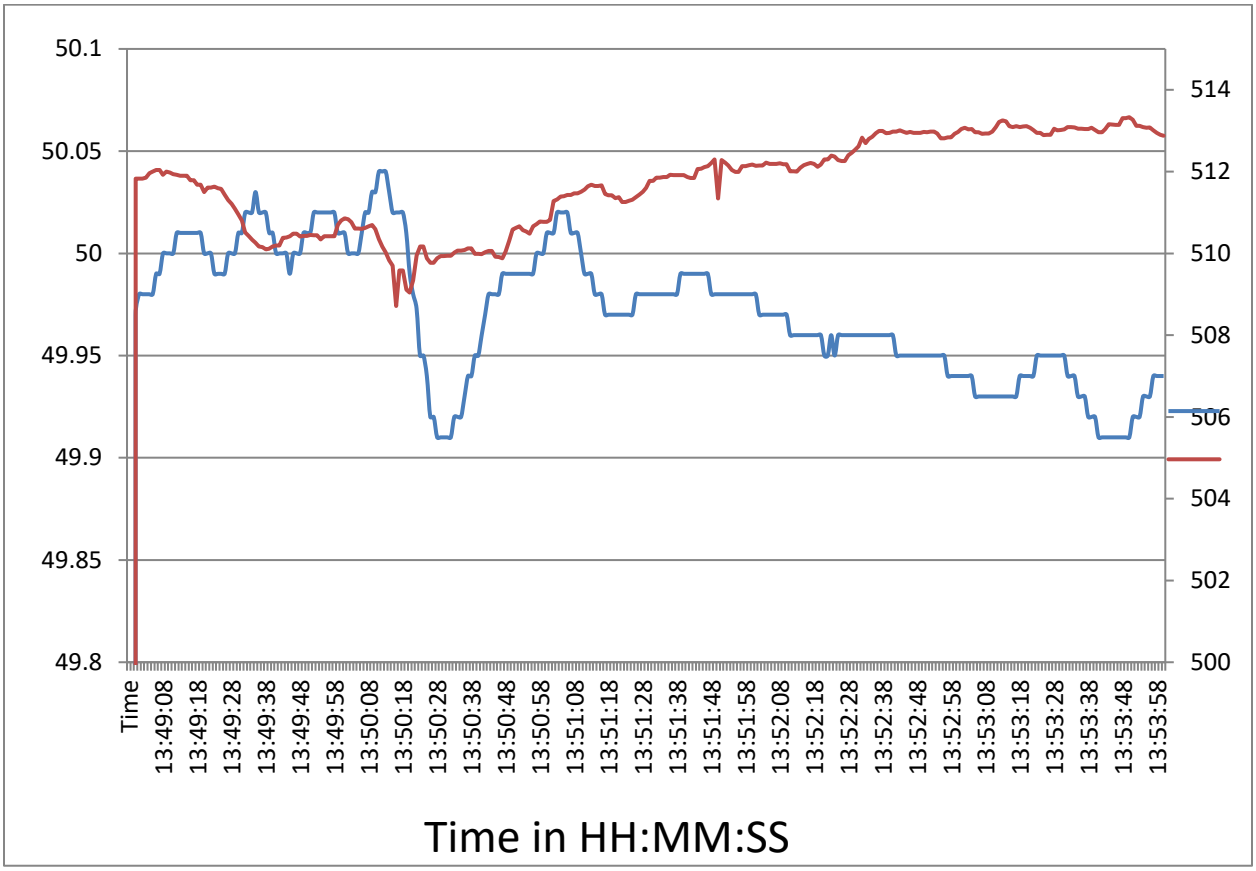
Email Id: soumyadip.baral@tatapower.com

Contact: (+91) 9204857090

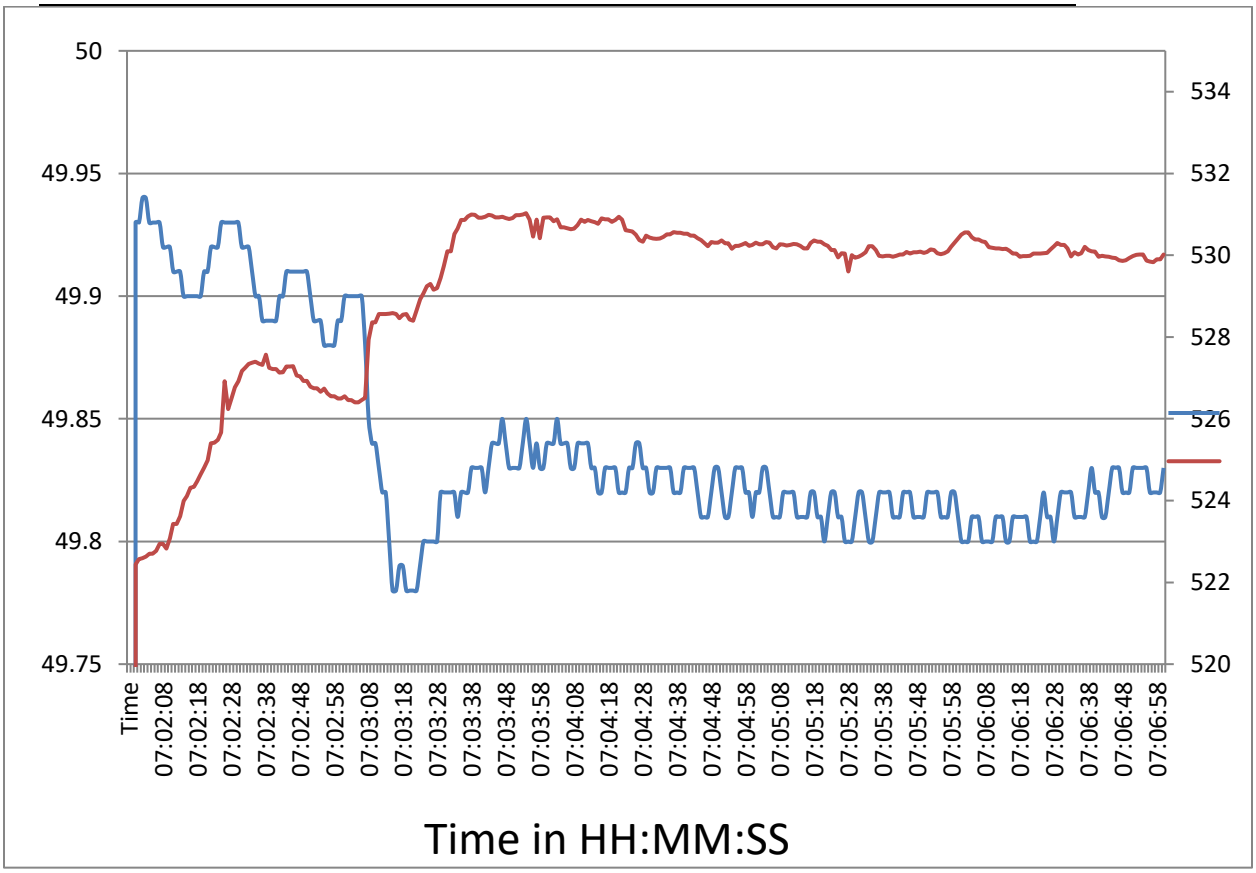
Teesta-V Power Station

The date wise frequency response of Generating Units at Teesta-V Power Station are as belwo:

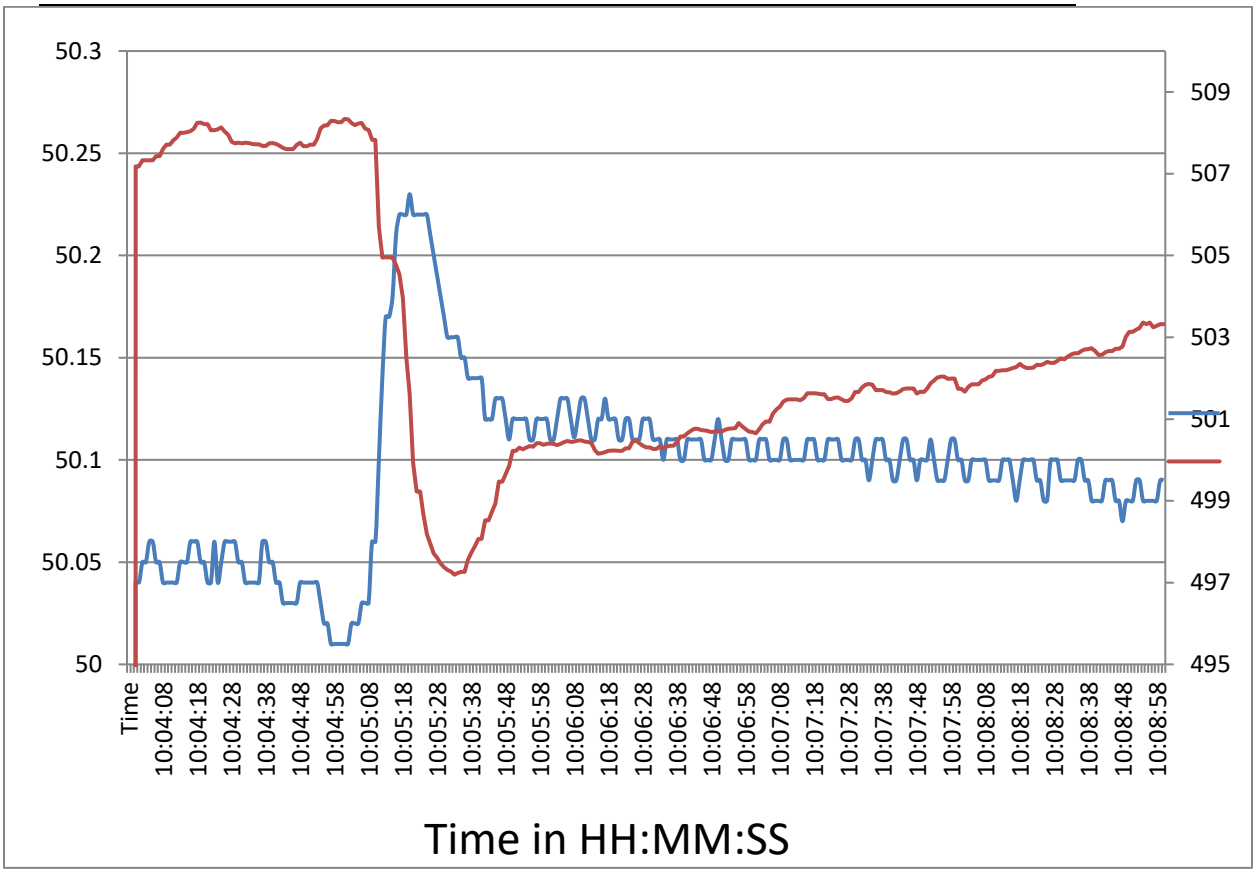
Event No	Date and Time	Change in Frequency	NHPC Remarks
1	06-08-2020 at 13:50:17 Hrs	**50.07 Hz to 49.96 Hz**. Later stabilized at 50.03 Hz.	Frequecy Respone attached herewith and it is found satisfactory.
2	13-08-2020 at 07:03:05 Hrs	**49.93 Hz to 49.82 Hz**. Later stabilized at 49.88 Hz.	
3	12-10-2020 at 10:05:04 hrs	**50.054 Hz to 50.277 Hz**. Later stabilized at 50.155 Hz.	
4	29-11-2020 at 13:16:30 hrs	**50.016 Hz to 49.927 Hz**. Later stabilized at 50.001Hz followed by **another dip of 0.05Hz** in frequency.	Zero Schedule during these periods.
5	26-12-2020 at 10:18:09 hrs	**50.042 Hz to 49.962 Hz**. Later stabilized at 50.019 Hz	
6	19-02-2021 at 15:26:52 Hrs	**49.985 Hz to 49.854 Hz**. Later stabilized at 49.938 Hz	
7	10-03-2021 at 19:35:34 Hrs	**50.01 Hz to 49.87 Hz**. Later stabilized at 49.94 Hz	Unit tripped due to no power evacuation from Rangpo Sub-station.
8	24-03-2021 at 12:16:19 Hrs	**50.022 Hz to 49.856 Hz**. Later stabilized at 49.907 Hz	Zero Schedule during these periods.
9	08-04-2021 at 03:31:34 Hrs	**49.994Hz to 49.903 Hz**. Later stabilized at 49.95 Hz	



Event-1: 06-08-2020 at 13:50:17 Hrs



Event-2: 13-08-2020 at 07:03:05 Hrs



Event-3: 12-10-2020 at 10:05:04 hrs

PRIMARY FREQUENCY RESPONSE OF GENERATORS

TEESTA–III(6x200MW) HEP , SIKKIM

DATE- 31/05/2021

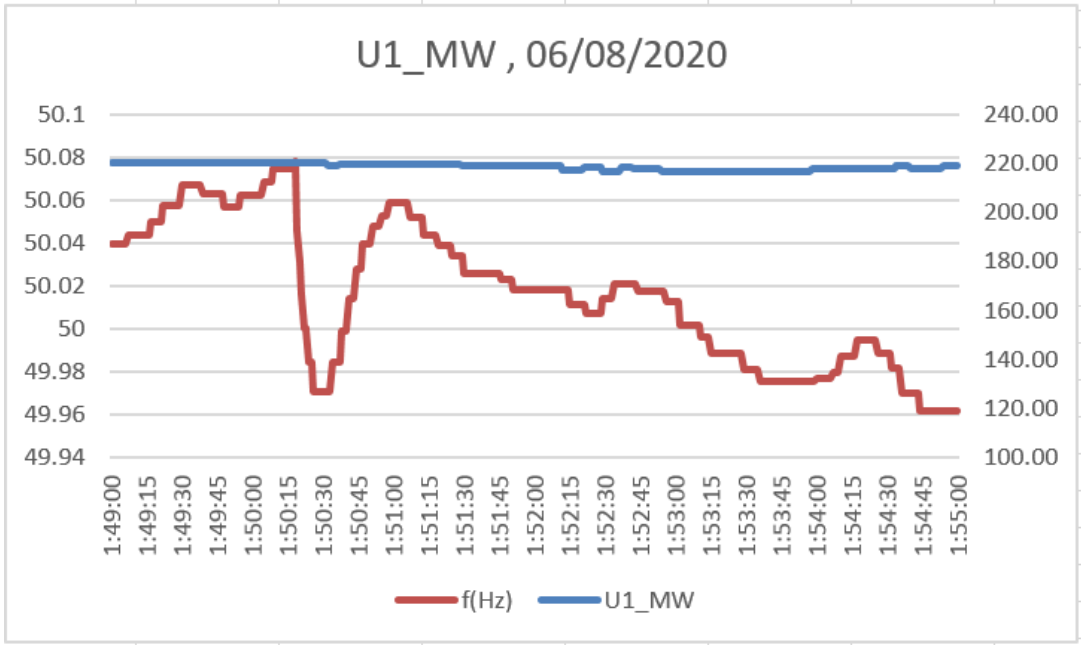
EVENT DETAILS

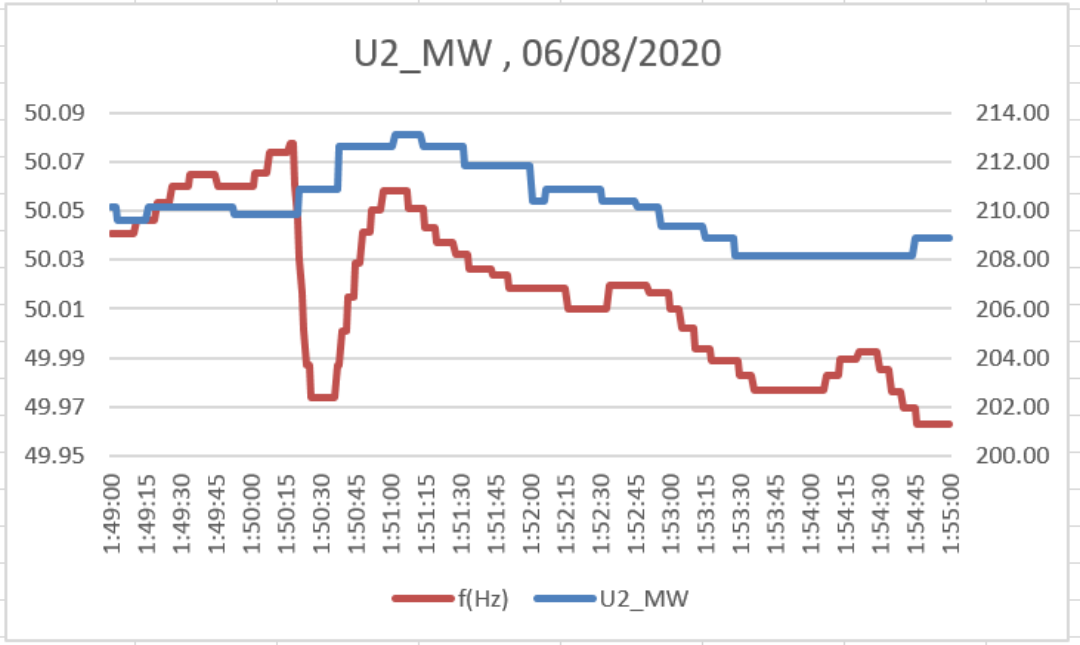
Generating Station/ SLDC	Event 1	Event 2	Event 3	Event 4	Event 5	Event 6	Event 7	Event 8	Event 9
Date & Time	06-08-2020 at 13:50:17 Hrs	13-08-2020 at 07:03:05 Hrs	12-10-2020 at 10:05:04 hrs	29-11-2020 at 13:16:30 hrs	26-12-2020 at 10:18:09 hrs	19-02-2021 at 15:26:52 Hrs	10-03-2021 at 19:35:34 Hrs	24-03-2021 at 12:16:19 Hrs	08-04-2021 at 03:31:34 Hrs
Frequency change	**50.07 Hz to 49.96 Hz.** Later stabilized at 50.03 Hz.	**49.93 Hz to 49.82 Hz.** Later stabilized at 49.88 Hz.	**50.054 Hz to 50.277 Hz.** Later stabilized at 50.155 Hz.	**50.016 Hz to 49.927 Hz.** Later stabilized at 50.001Hz followed by **another dip of 0.05Hz** in frequency.	**50.042 Hz to 49.962 Hz.** Later stabilized at 50.019 Hz	**49.985 Hz to 49.854 Hz.** Later stabilized at 49.938 Hz	**50.01 Hz to 49.87 Hz.** Later stabilized at 49.94 Hz	**50.022 Hz to 49.856 Hz.** Later stabilized at 49.907 Hz	**49.994Hz to 49.903 Hz.** Later stabilized at 49.95 Hz

EVENT-1 : 06/08/2020 , 13:50 Hrs

Prefault Generation :

Unit-1 : 220MW (110%)
Unit-2 : 210MW (105%)
Unit-3 : 210MW (105%)
Unit-4 : 210MW (105%)
Unit-5 : 210MW (105%)
Unit-6 : 220MW (110%)



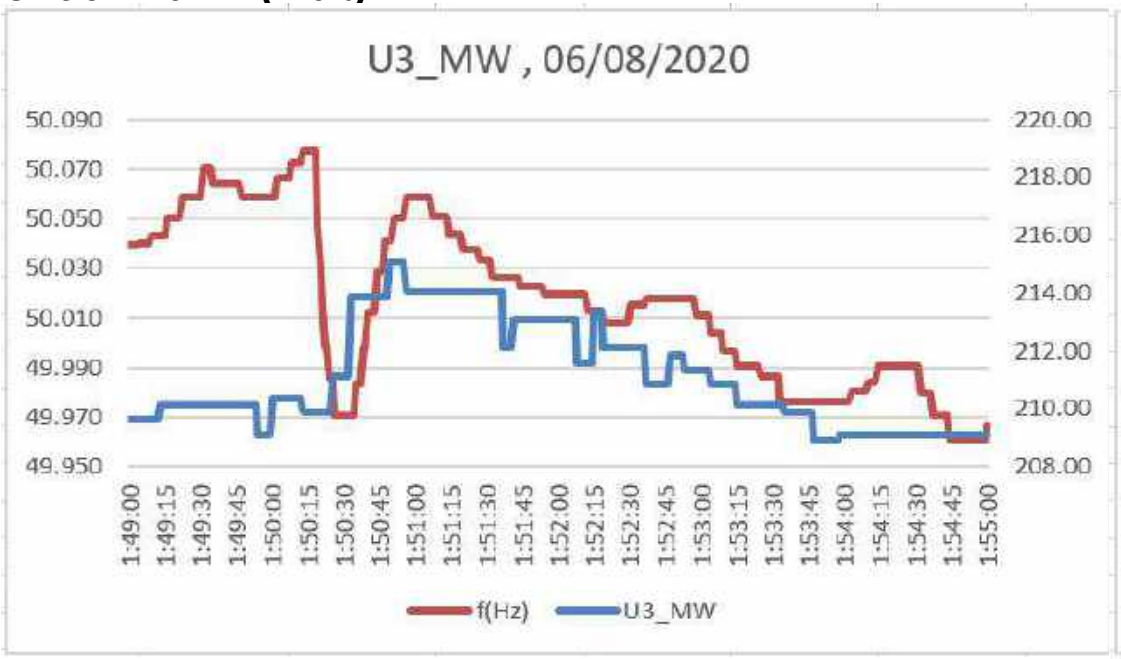


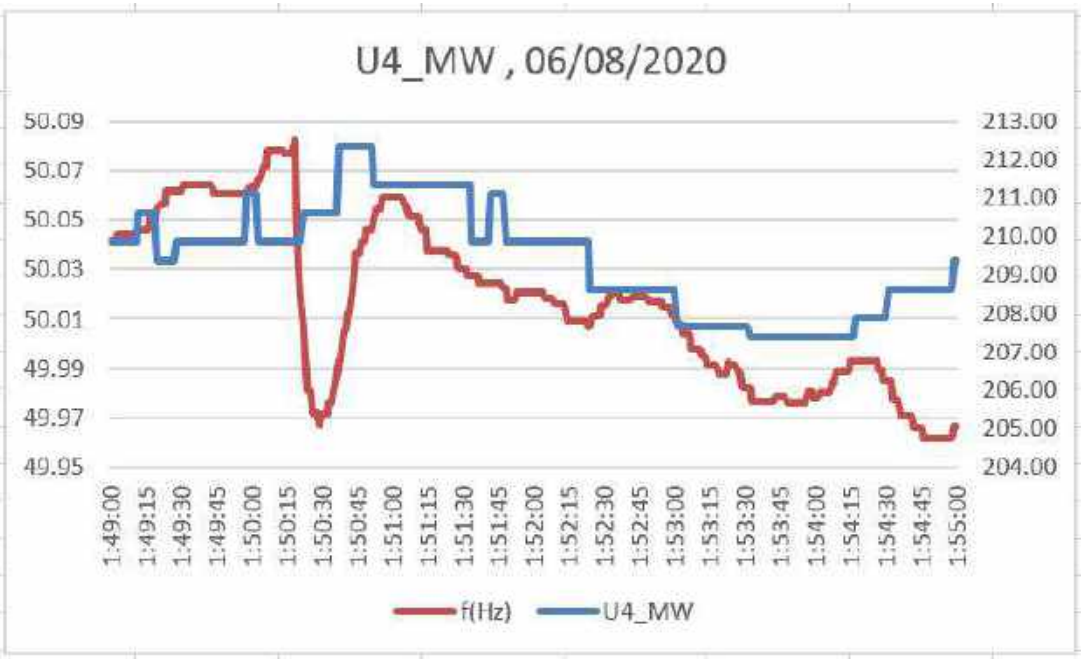
Remark :
Unit-1 : No margin available
Unit-2 : After some time of the fault , frequency increased above 50Hz

EVENT-1 : 06/08/2020 , 13:50 Hrs

Prefault Generation :

Unit-1 : 220MW (110%)
Unit-2 : 210MW (105%)
Unit-3 : 210MW (105%)
Unit-4 : 210MW (105%)
Unit-5 : 210MW (105%)
Unit-6 : 220MW (110%)



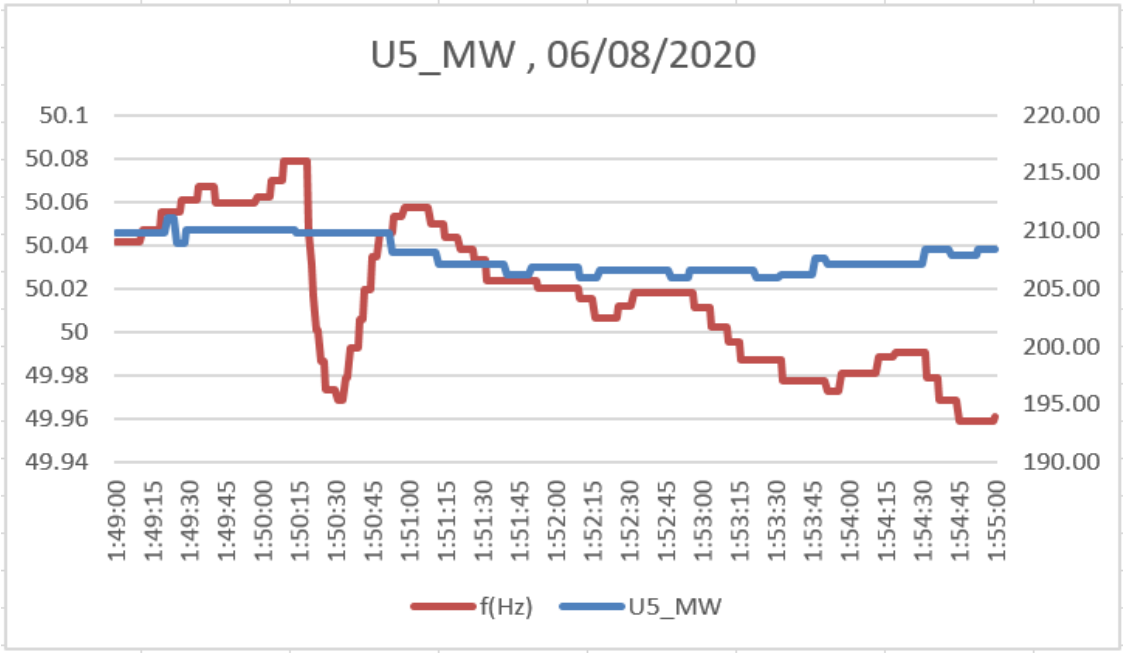


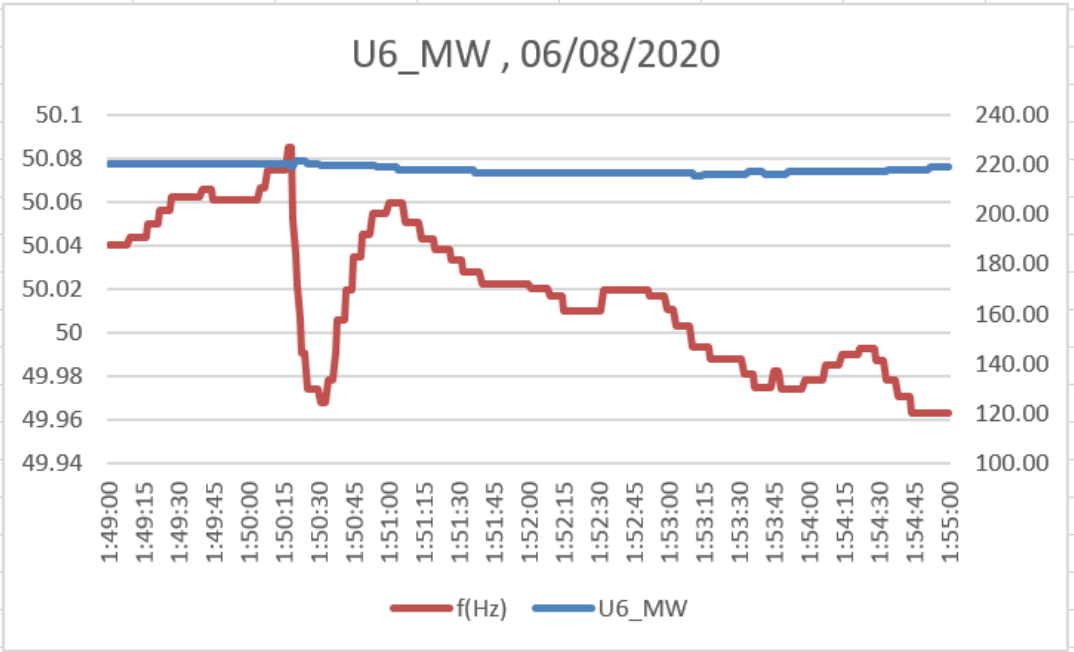
Remark :
After some time of the fault , frequency increased above 50Hz

EVENT-1 : 06/08/2020 , 13:50 Hrs

Prefault Generation :

Unit-1 : 220MW (110%)
Unit-2 : 210MW (105%)
Unit-3 : 210MW (105%)
Unit-4 : 210MW (105%)
Unit-5 : 210MW (105%)
Unit-6 : 220MW (110%)



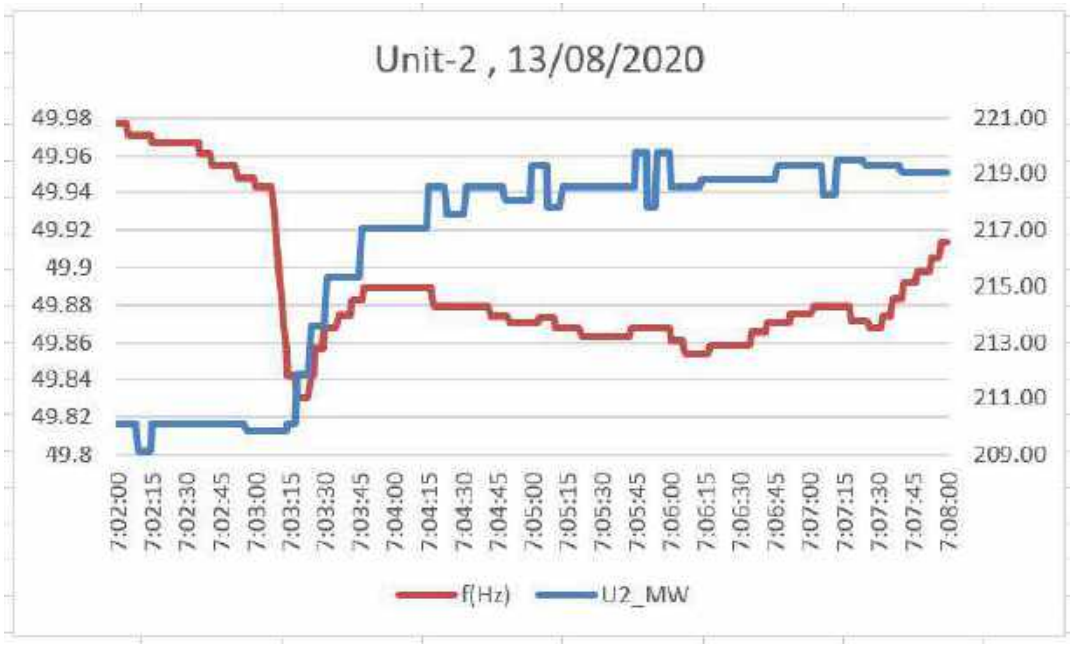


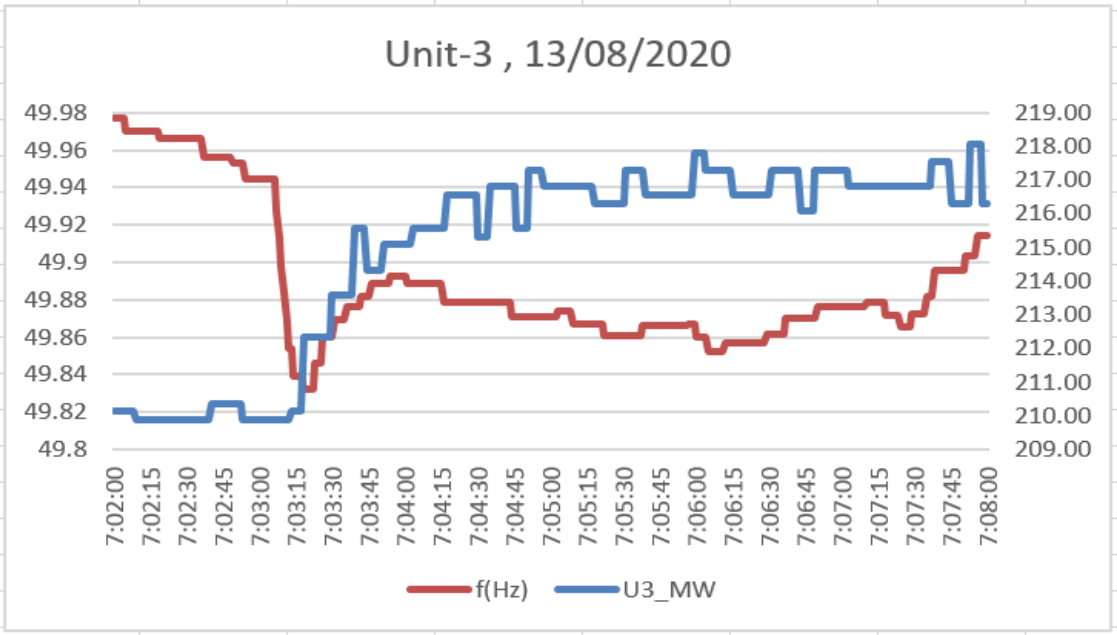
Remark :
Unit-5 : After some time of the fault , frequency increased above 50Hz
Unit-6 : No margin available

EVENT-2 : 16/08/2020 , 07:03 Hrs

Prefault Generation :

Unit-1 : 220MW (110%)
Unit-2 : 210MW (105%)
Unit-3 : 210MW (105%)
Unit-4 : 210MW (105%)
Unit-5 : 200MW (100%)
Unit-6 : 220MW (110%)

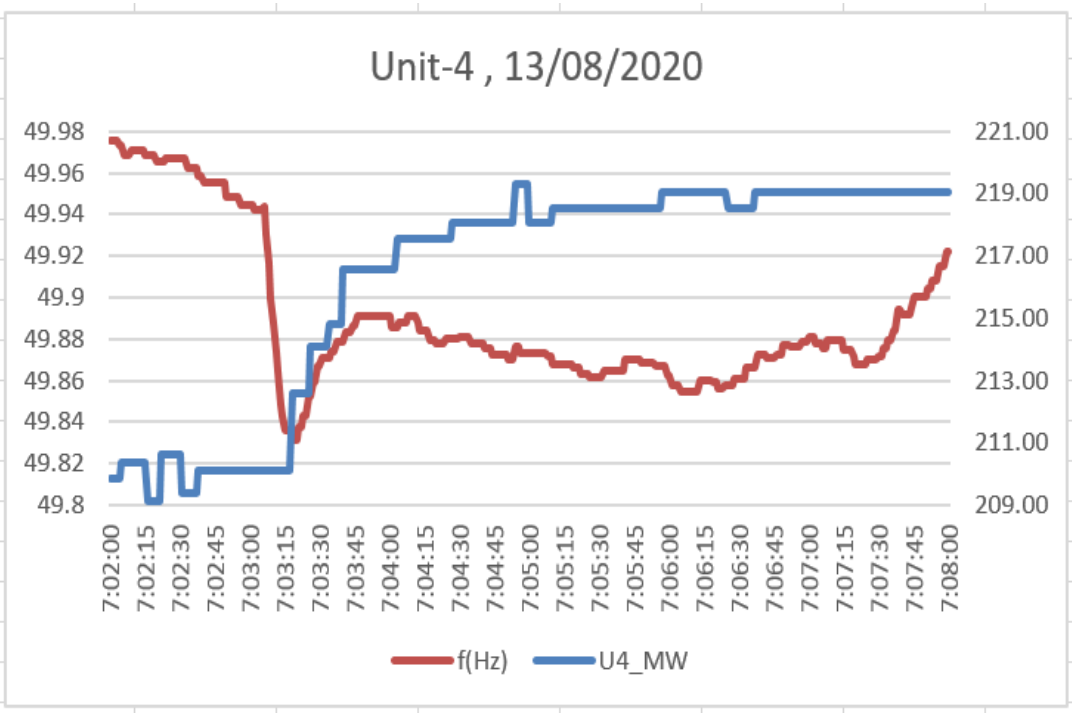


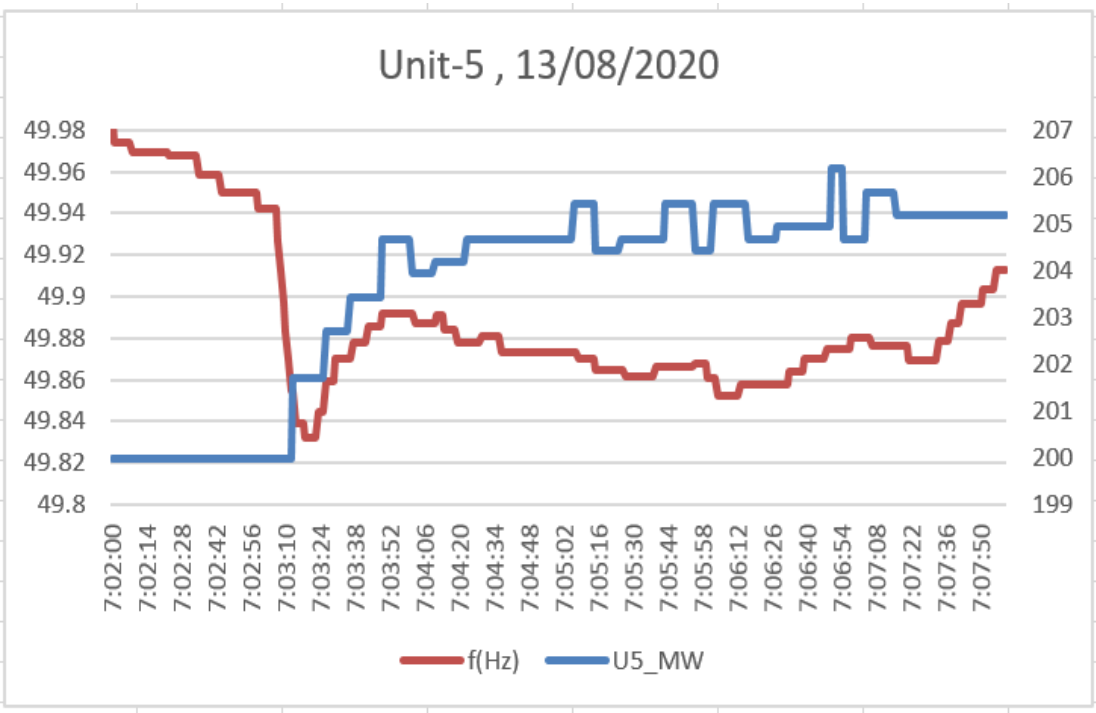


EVENT-2 : 16/08/2020 , 07:03 Hrs

Prefault Generation :

Unit-1 : 220MW (110%)
Unit-2 : 210MW (105%)
Unit-3 : 210MW (105%)
Unit-4 : 210MW (105%)
Unit-5 : 200MW (100%)
Unit-6 : 220MW (110%)

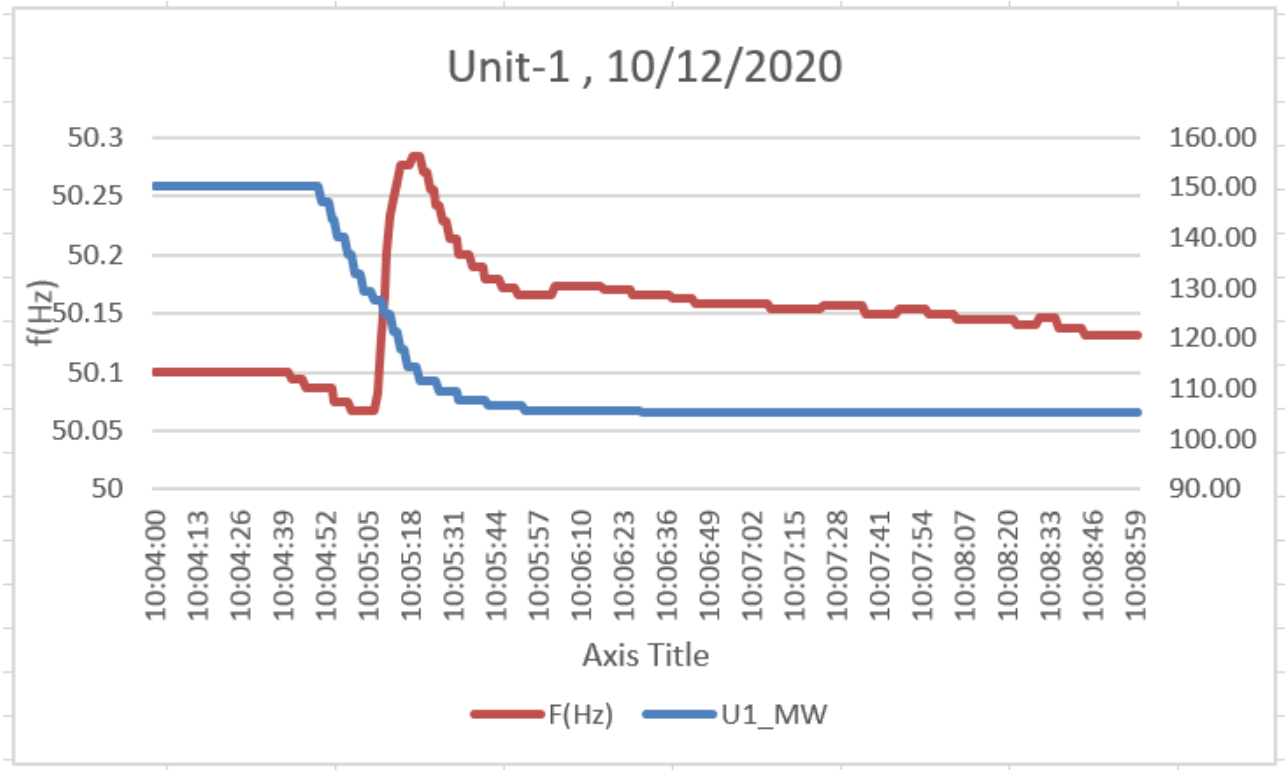




EVENT-3 : 12/10/2020 , 10:05 Hrs

Prefault Generation :

Unit-1 : 150MW (110%)
Unit-2 : 150MW (105%)
Unit-3 : 0
Unit-4 : 160MW (105%)
Unit-5 : 160MW (100%)
Unit-6 : 165MW (110%)

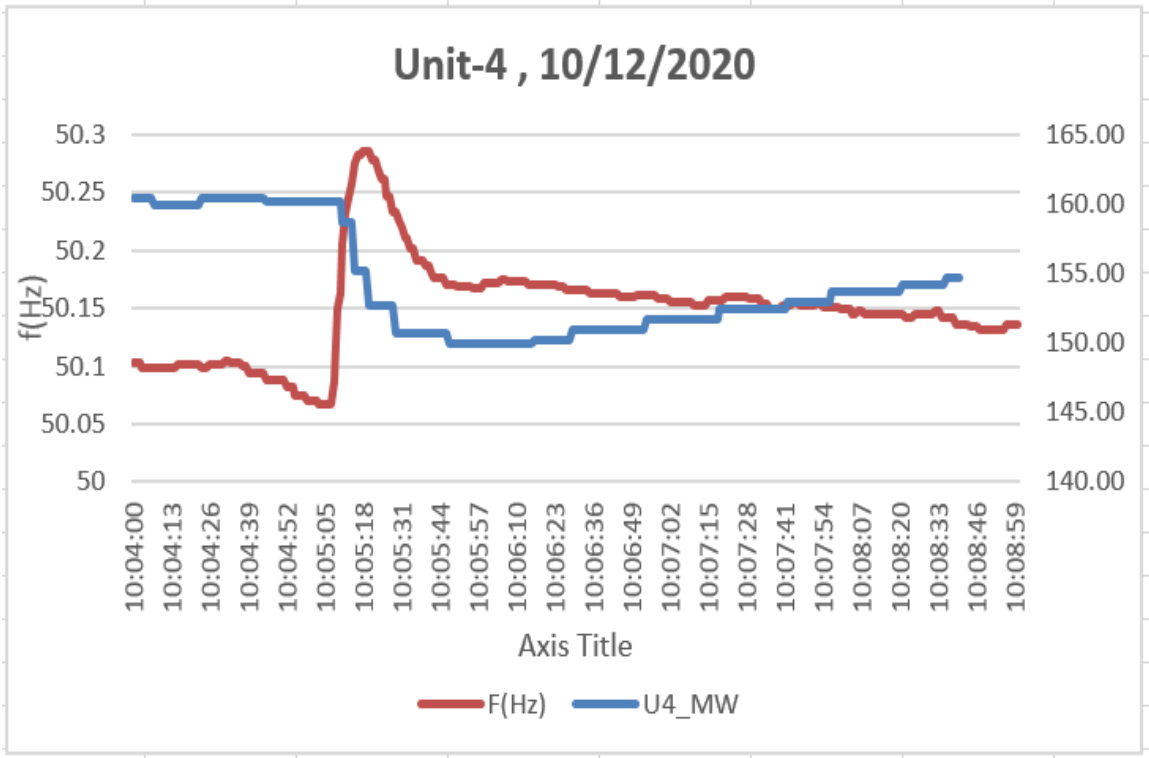


Remark : During Unit-1 load reduction , 105MW set point was given by control room engineer

EVENT-3 : 12/10/2020 , 10:05 Hrs

Prefault Generation :

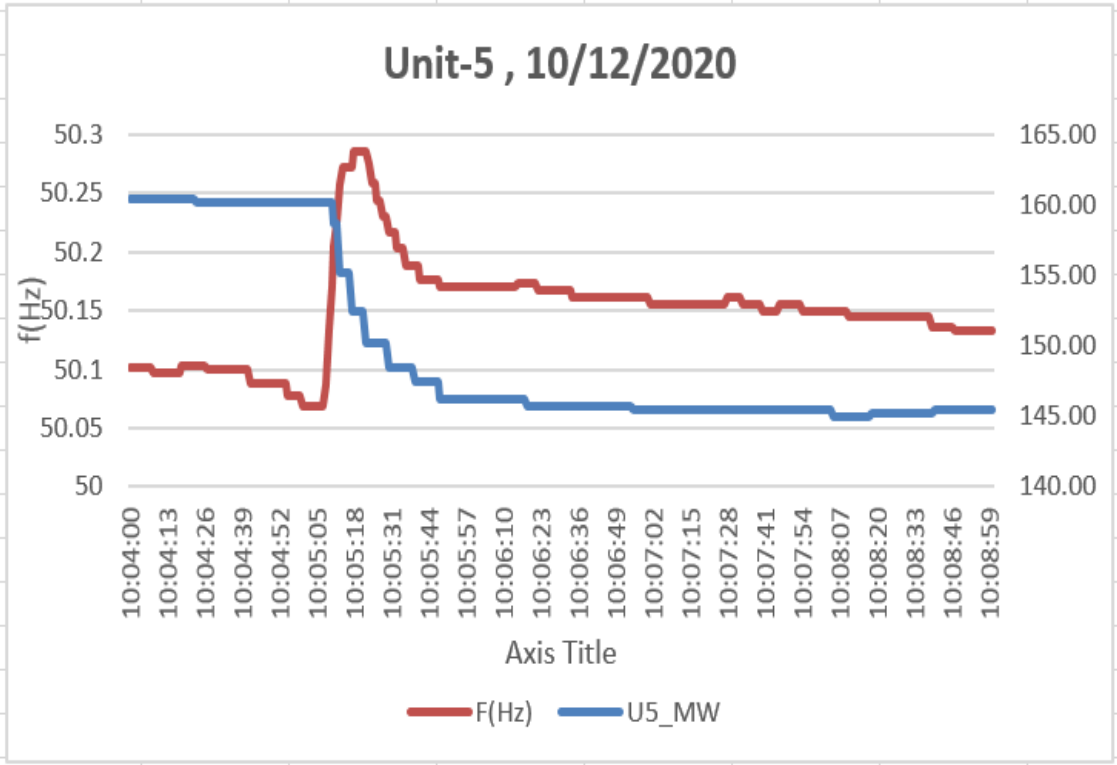
Unit-1 : 150MW
Unit-2 : 150MW
Unit-3 : 0
Unit-4 : 160MW
Unit-5 : 160MW
Unit-6 : 165MW

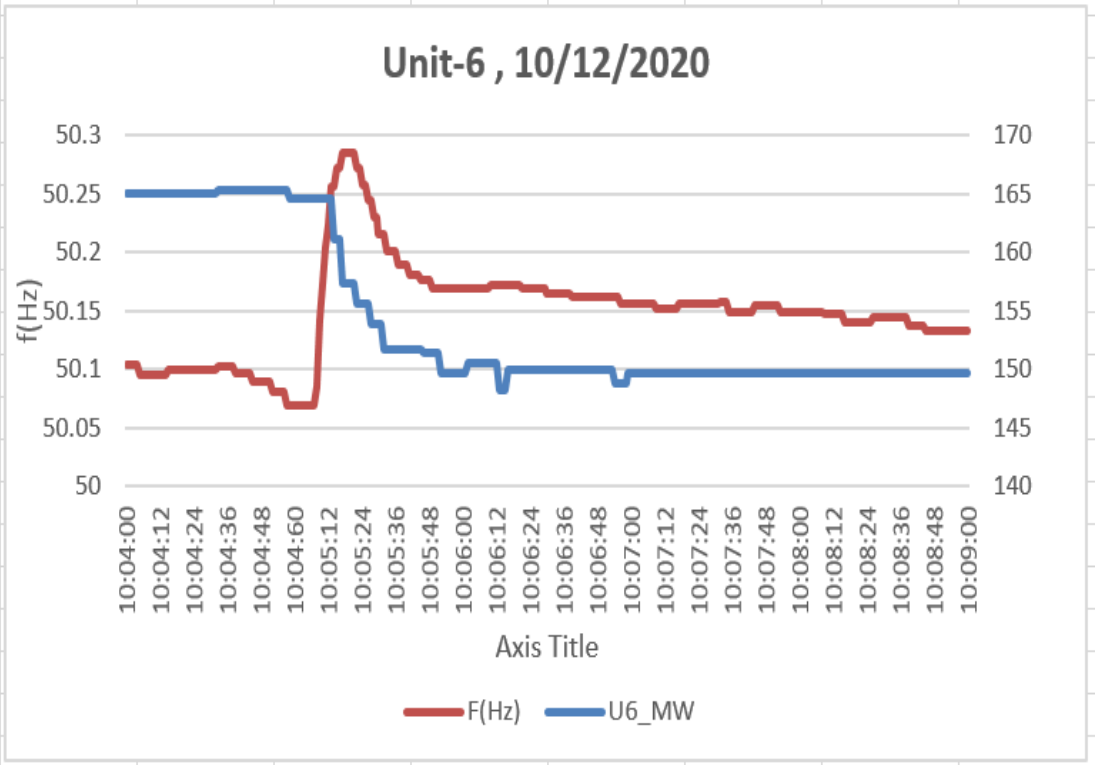


EVENT-3 : 12/10/2020 , 10:05 Hrs

Prefault Generation :

Unit-1 : 150MW
Unit-2 : 150MW
Unit-3 : 0
Unit-4 : 160MW
Unit-5 : 160MW
Unit-6 : 165MW

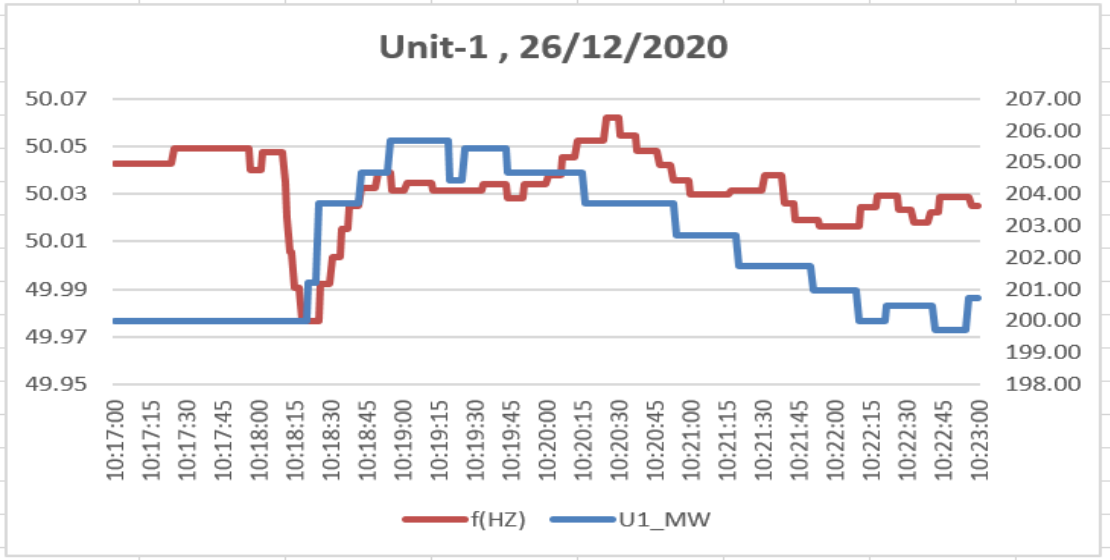


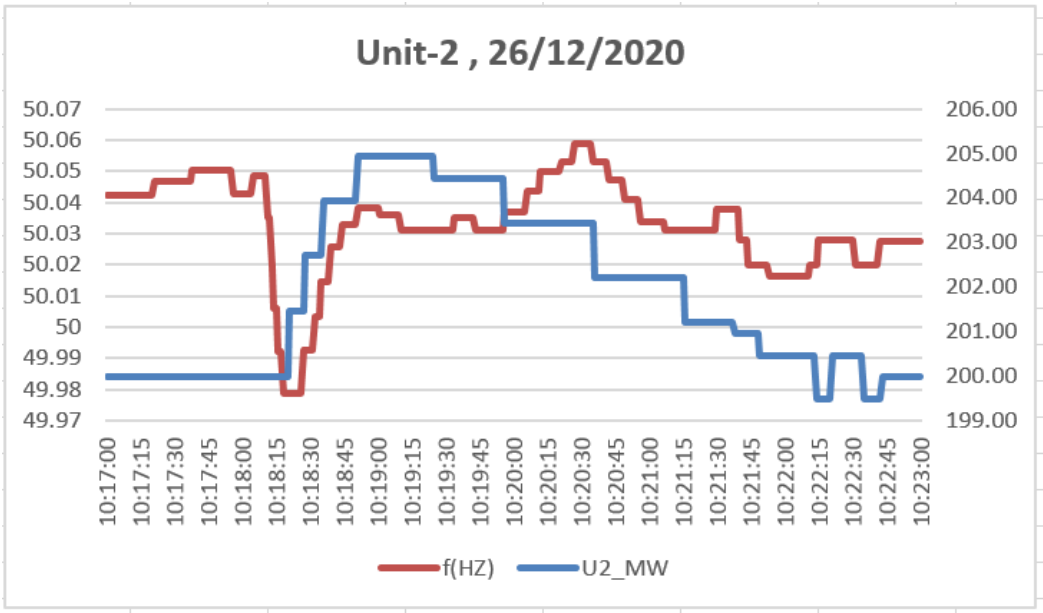


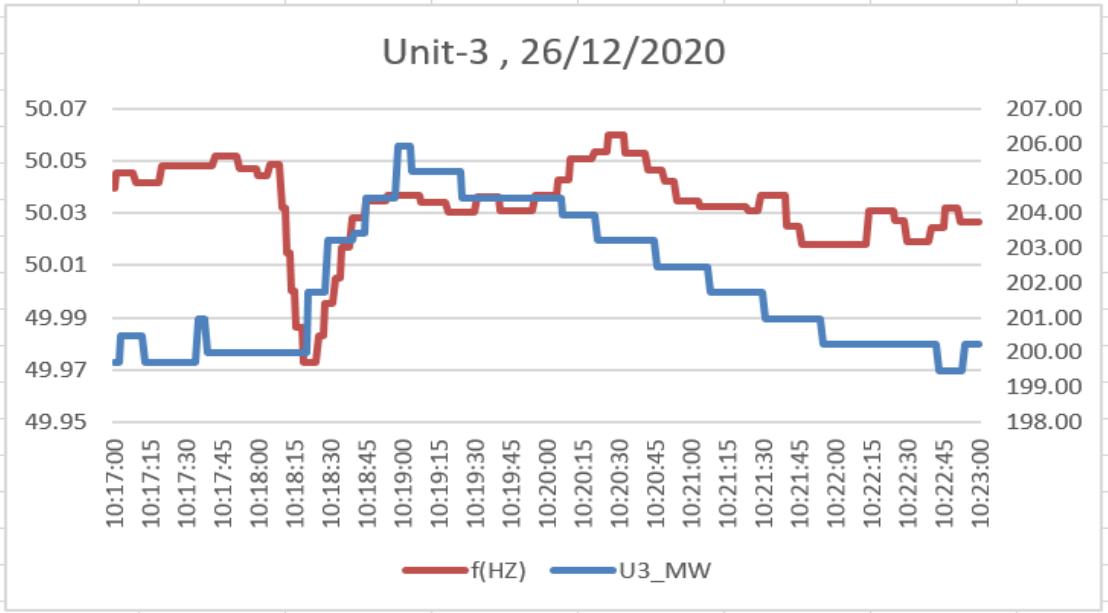
EVENT-5 : 26/12/2020 , 10:18 Hrs

Prefault Generation :

Unit-1 : 200MW (100%)
Unit-2 : 200MW (100%)
Unit-3 : 200MW (100%)
Unit-4 : 0
Unit-5 : 200MW (100%)
Unit-6 : 200MW (100%)



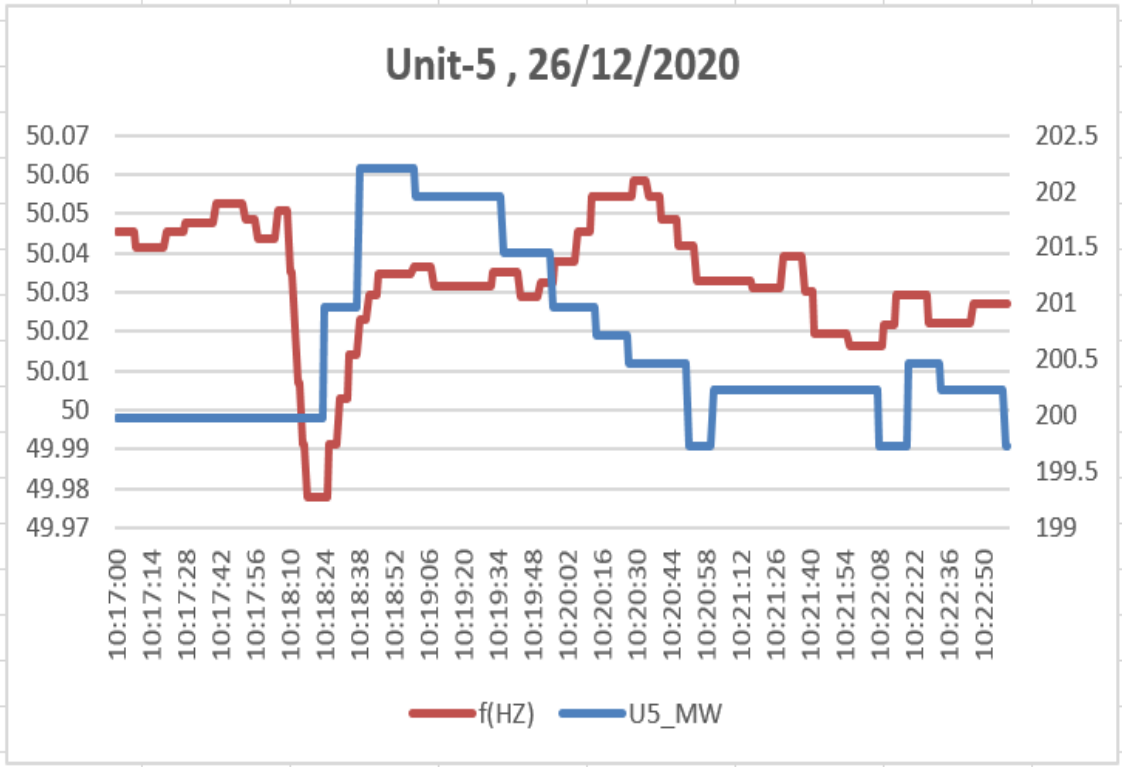


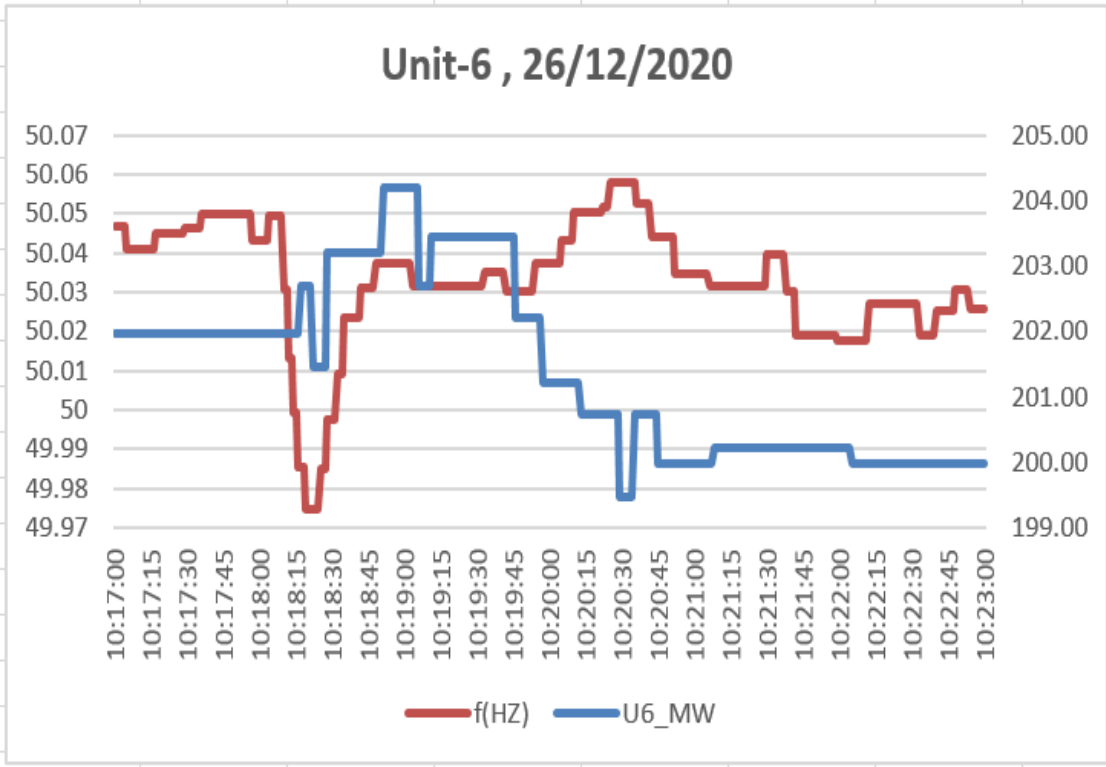


EVENT-5 : 26/12/2020 , 10:18 Hrs

Prefault Generation :

Unit-1 : 200MW (100%)
Unit-2 : 200MW (100%)
Unit-3 : 200MW (100%)
Unit-4 : 0
Unit-5 : 200MW (100%)
Unit-6 : 200MW (100%)





EVENT -4	29/11/2020 , 13:16 Hrs	Teesta-III HEP units were not running
EVENT -6	19/02/2021 , 15:26 Hrs	
EVENT -7	10/03/2021 , 19:35 Hrs	Teesta-III HEP units tripped during the event
EVENT -8	24/03/2021 , 12:16 Hrs	Teesta-III HEP units were not running
EVENT -9	08/04/2021 , 03:31 Hrs	


THANK YOU

Greenko

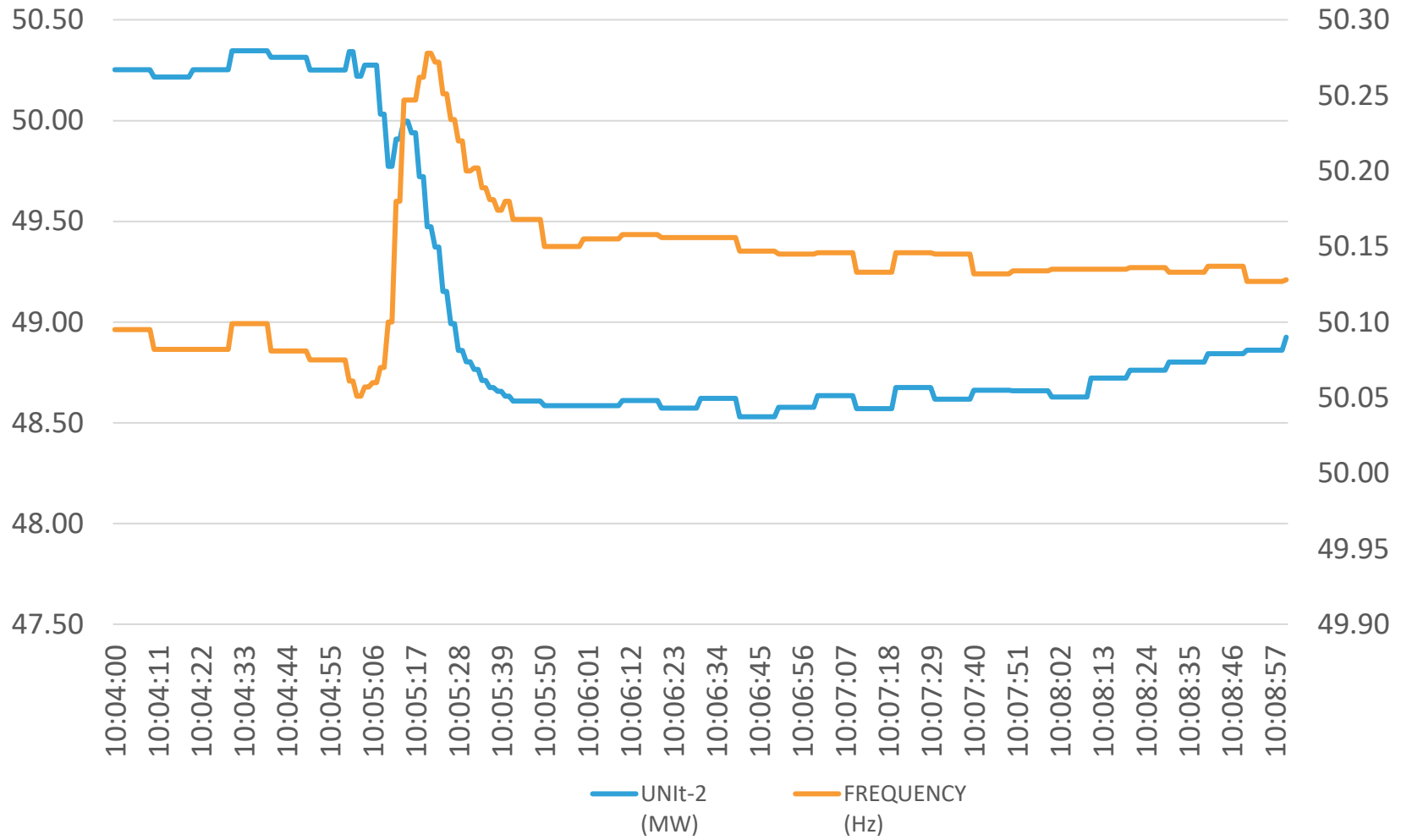
PRIMARY FREQUENCY RESPONSE OF DIKCHU H.E.P GENERATORS

(From August’ 20 to April’ 21)

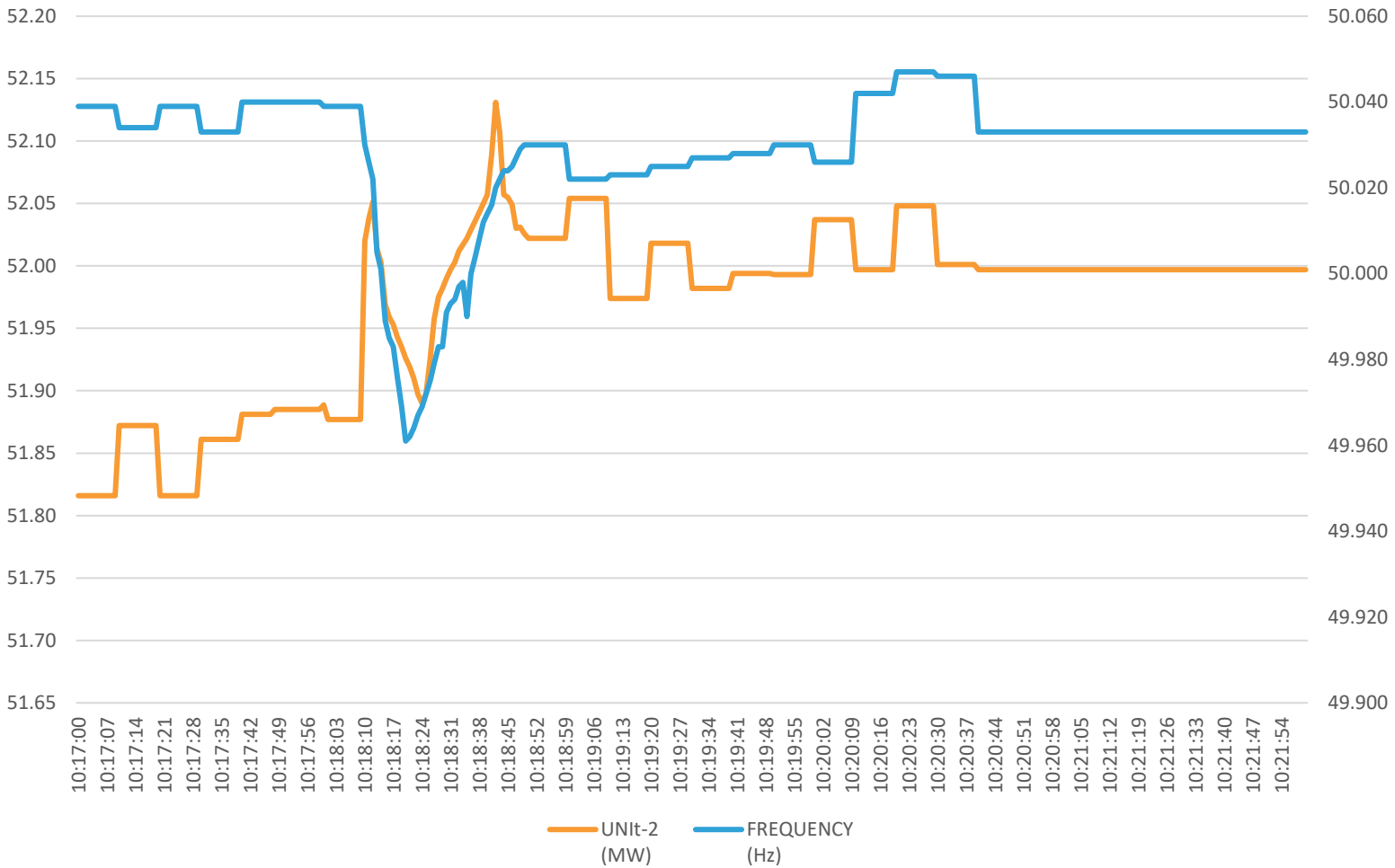
PRIMARY FREQUENCY RESPONSE OF DIKCHU H.E.P GENERATORS

Event No.	Date and Time	Change in Frequency	Dikchu Response
1	06-08-2020 at 13:50:17 Hrs	**50.07 Hz to 49.96 Hz**. Later stabilized at 50.03 Hz.	Both Units operating at 110% capacity (As per NOC taken during peak season). No margin left for FRC.
2	13-08-2020 at 07:03:05 Hrs	**49.93 Hz to 49.82 Hz**. Later stabilized at 49.88 Hz.	Both Units operating at 110% capacity (As per NOC taken during peak season). No margin left for FRC.
3	12-10-2020 at 10:05:04 hrs	**50.054 Hz to 50.277 Hz**. Later stabilized at 50.155 Hz.	**Unit#2 was running**
4	29-11-2020 at 13:16:30 hrs	**50.016 Hz to 49.927 Hz**. Later stabilized at 50.001Hz followed by **another dip of 0.05Hz** in frequency.	Units were not in service
5	26-12-2020 at 10:18:09 hrs	**50.042 Hz to 49.962 Hz**. Later stabilized at 50.019 Hz	**Unit#2 was running**
6	19-02-2021 at 15:26:52 Hrs	**49.985 Hz to 49.854 Hz**. Later stabilized at 49.938 Hz	Units were not in service
7	10-03-2021 at 19:35:34 Hrs	**50.01 Hz to 49.87 Hz**. Later stabilized at 49.94 Hz	Dikchu H.E.P unit tripped during the event due to loss of evacuation path.
8	24-03-2021 at 12:16:19 Hrs	**50.022 Hz to 49.856 Hz**. Later stabilized at 49.907 Hz	Units were not in service
9	08-04-2021 at 03:31:34 Hrs	**49.994Hz to 49.903 Hz**. Later stabilized at 49.95 Hz	Units were not in service

Dikchu Unit-2 response during the event on 12.Oct.2020 at 10:05 hrs



Dikchu Unit-2 response during the event on 26.Dec.2020 at18hrs



Observations on response

1. The primary frequency response was found satisfactory for the event on 12th Oct' 20.
2. The primary frequency response was found unsatisfactory for the event on 26th Dec' 21.
3. Dikchu H.E.P has generators have FGMO only & RGMO is not present in the system.
4. Primary frequency response testing & tuning is planned to be carried out in Oct' 21.

Greenko

Thank You

Annexure-C3

Date of PFR testing scheduled /completed for generating stations in ER

Sr. No	Station	Generating Unit	Test schedule	Remarks
1	TALCHER STAGE 2	3	Unit 3 - 5: 23-11-2020 to 28-11-2020	Testing for unit 6 yet to be conducted
2		4		
3		5		
4		6		
5	Farakka	2	01-02-2021 to 10-01-2021	Testing completed
6		3		
7		4		
8		5		
9		6		
10	Kahalgaon	1	23-02-2021 to 02-03-2021	Scheduled
11		5		
12		6		
13		7		
14	Barh	4	18-02-2021 to 21-02-2021	Scheduled
15		5		
16	Teesta V	1	07-01-2021 - 08-01-2021	Testing completed
17	Teesta III	1	30-01-2021 - 10-02-2021	Testing completed
18		2		
19		3		
20		4		
21		5		
22		6		
23	Dikchu	1	Unit#1: 6th & 7th April' 21 Unit#2: 8th & 9th April' 21	Scheduled
24		2		
25	MPL	1		Scheduled
26		2		
27	GMR	1	August'21	Scheduled
28		2		
29		3		
30	JITPL	1	August'21	Scheduled
31		2		
32		3		

Power Plant	Unit No	PSS tuned (Yes/No)	PSS in Service (Yes/No)	Last PSS Tuning Date	Whether Done in Last 3 Years	Whether Next to be planned	Planned Next PSS Tuning
West Bengal							
Kolaghat-WBPDCL	1	No	Yes	Long Back	No	Yes	Under retirement
Kolaghat-WBPDCL	2	No	Yes	Long Back	No	Yes	Under retirement
Kolaghat-WBPDCL	3	No	Yes	Long Back	No	Yes	When Unit will be on Bar
Sagardighi-WBPDCL	2	No	No	Long Back	No	Yes	When Unit will be on Bar
Bakreshwar-WBPDCL	2	Yes	Yes	2019	Yes	Yes	Retuning to be done as from plot response is not good
Bakreshwar-WBPDCL	3	Yes	Yes	2019	Yes	Yes	Retuning to be done as from plot response is not good
Bakreshwar-WBPDCL	4	Yes	Yes	2019	Yes	Yes	Retuning to be done as from plot response is not good
Bakreshwar-WBPDCL	5	Yes	Yes	2019	Yes	Yes	Retuning to be done as from plot response is not good
DPL	7	No	No	N.A	No	Yes	Planned in March 2021
DPL	8	No	Yes	No	No Detail	Yes	To be updated by WBPDCL/DPL
PPSP	1	No	Yes	2009	No	Yes	To be updated by WBSEDCL
PPSP	2	No	Yes	2009	No	Yes	To be updated by WBSEDCL
PPSP	3	No	Yes	2009	No	Yes	To be updated by WBSEDCL
PPSP	4	No	Yes	2009	No	Yes	To be updated by WBSEDCL
TLDP III	4 x 33			No Detail	No Detail	Yes	To be updated by WBSEDCL
TLDP IV	4 X 44			No Detail	No Detail	Yes	To be updated by WBSEDCL
CESC							
Budge Budge-CESC	1	Yes	Yes	2015	No	Yes	2021-22
Budge Budge-CESC	2	Yes	Yes	2015	No	Yes	2021-22
DVC							
Bokaro B 210 MW	3				No Detail	Yes	Unit Is out of Service
Mejia-DVC	4	Yes	Yes	2009	No	Yes	Jun-21
Raghunathpur-DVC	1	No	No		No Detail	Yes	Will be done after AOH
Raghunathpur-DVC	2	No	No		No Detail	Yes	Jun-21
Koderma-DVC	1	Yes	Yes	2013	No	Yes	Sep-21
Waria	4	Yes	Yes	2008	No	Yes	Unit Is out of Service
ISGS							
Kahalgaon NTPC	1	Yes	Yes	2017	Yes	Yes	Apr-21
Kahalgaon NTPC	2	Yes	Yes	2018	Yes	Yes	April 2021 (During AOH)
Kahalgaon NTPC	3	Yes	Yes	2016	Yes	Yes	Jul-21
Kahalgaon NTPC	4	Yes	Yes	2015	No	Yes	Mar-21
Kahalgaon NTPC	6	Yes	Yes	2009	No	Yes	Mar-21
Talcher Stage 2	3	Yes	Yes	2016	Yes	Yes	July 2021 (As per SRPC decision)

Talcher Stage 2	4	Yes	Yes	No Details	No Details	Yes	July 2021 (As per SRPC decision)
Talcher Stage 2	5	Yes	Yes	No Details	No Details	Yes	July 2021 (As per SRPC decision)
Talcher Stage 2	6	Yes	Yes	2016	Yes	Yes	July 2021 (As per SRPC decision)
Barh NTPC	4			2015		Yes	In Next AOH
Barh NTPC	5			During Unit commissioning		Yes	June 2021 (AOH)
Teesta V	1	Yes	Yes	2008	No	Yes	Jun-21
Teesta V	2	Yes	Yes	2008	No	Yes	Jun-21
Teesta V	3	Yes	Yes	2008	No	Yes	Jun-21
BRBCL	1	No	Yes	Vendor to Do	No	Yes	Jun-21
BRBCL	2	Yes	Yes	2019	Yes	Yes	Jun-21
BRBCL	3	No	Yes	Vendor to Do	No	Yes	Jun-21
KBUNL	1	Yes	Yes	2014	No	Yes	2021-22
KBUNL	2	Yes	Yes	2014	No	Yes	2021-22
KBUNL	3	Yes	Yes	Not Available	No	Yes	2021-22
KBUNL	4	Yes	Yes	Not Available	No	Yes	2021-22
Rangit	3 x 20			Not Available	No	Yes	To be updated by NHPC
IPP							
Jorethang	1	Yes	Yes	2015	No	Yes	Apr-21
Jorethang	2	Yes	Yes	2015	No	Yes	Apr-21
ADHUNIK	1	Yes	YES	2013	No	Yes	Mar-21
ADHUNIK	2	Yes	YES	2013	No	Yes	Mar-21
JITPL	1	Yes	Yes	2016	Yes	Yes	Jul-21
JITPL	2	Yes	Yes	2016	Yes	Yes	Jul-21
GMR	1	Yes	Yes	2013	No	Yes	May-21
GMR	2	Yes	Yes	2013	No	Yes	May-21
GMR	3	Yes	Yes	2013	No	Yes	May-21
Orissa							
IB TPS	1	Yes	Yes	2011	No	Yes	Mar'2021
IB TPS	2	Yes	Yes	2012	No	Yes	Mar'2021
Upper Indravati	1	Yes	No	2015	No	Yes	To be updated by OHPC
Upper Indravati	2	Yes	No	2015	No	Yes	To be updated by OHPC
Upper Indravati	3	Yes	No	2000	No	Yes	To be updated by OHPC
Upper Indravati	4	Yes	No	2001	No	Yes	To be updated by OHPC
Balimela	1 (60 MW)			No detail		Yes	To be updated by OHPC
Balimela	2 (60 MW)			No detail		Yes	To be updated by OHPC
Balimela	3 (60 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Balimela	4 (60 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Balimela	5 (60 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Balimela	6 (60 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Balimela	7 (75 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC

Balimela	8 (75 MW)	No	No	Not tuned	No	Yes	To be updated by OHPC
Upper Kolab	1	Yes	Yes	2007	No	Yes	To be updated by OHPC
Upper Kolab	2	Yes	Yes	2007	No	Yes	To be updated by OHPC
Upper Kolab	3	Yes	Yes	2007	No	Yes	To be updated by OHPC
Upper Kolab	4	Yes	Yes	2007	No	Yes	To be updated by OHPC
Rengali	1	Yes	Yes	Not tuned	No	Yes	To be updated by OHPC
Rengali	2	Yes	Yes	Not tuned	No	Yes	To be updated by OHPC
Rengali	3	Yes	Yes	Not tuned	No	Yes	To be updated by OHPC
Rengali	4	Yes	Yes	Not tuned	No	Yes	To be updated by OHPC
Rengali	5	No	Yes	Not tuned	No	Yes	To be updated by OHPC
Sterlite	4 X 600			No detail		Yes	To be updated by SLDC Orissa
Jharkhand							
Tenughat	1	Yes	Yes	2017	Yes	Yes	No report has been submitted. So tuning to be planned
Tenughat	2	Yes	Yes	2017	Yes	Yes	No report has been submitted. So tuning to be planned
Subarnrekha	2 X 65					Yes	To be updated
Bihar							
BTPS	6 (110)					Yes	To be updated by BSPGCL
BTPS	7 (110)					Yes	To be updated by BSPGCL
BTPS	8					Yes	To be updated by BSPGCL
BTPS	9					Yes	To be updated by BSPGCL
Bhutan							
Tala	1	No	Yes			Yes	To be updated by BPC
Tala	2	No	Yes			Yes	To be updated by BPC
Tala	3	No	Yes			Yes	To be updated by BPC
Tala	4	No	Yes			Yes	To be updated by BPC
Tala	5	No	Yes			Yes	To be updated by BPC
Tala	6	No	Yes			Yes	To be updated by BPC
Chukha	1	No	Yes	2005	No	Yes	To be updated by BPC
Chukha	2	No	Yes	2005	No	Yes	To be updated by BPC
Chukha	3	No	Yes	2005	No	Yes	To be updated by BPC
Chukha	4	No	Yes	2005	No	Yes	To be updated by BPC
Mangdechu	1	No	Yes			Yes	To be updated by BPC
Mangdechu	2	No	Yes			Yes	To be updated by BPC
Mangdechu	3	No	Yes			Yes	To be updated by BPC
Mangdechu	4	No	Yes			Yes	To be updated by BPC

Annexure-D1

Jul-21

1	BIHAR	Demand (MW)	Energy (MU)
	NET MAX DEMAND	6050	3605
	NET POWER AVAILABILITY- Own Sources	523	192
	Central Sector+Bi-Lateral	5400	3060
	SURPLUS(+)/DEFICIT(-)	-127	-353
2	**JHARKHAND**		
	NET MAXIMUM DEMAND	1480	943
	NET POWER AVAILABILITY- Own Source	308	131
	Central Sector+Bi-Lateral+IPP	1100	665
	SURPLUS(+)/DEFICIT(-)	-72	-147
3	**DVC**		
	NET MAXIMUM DEMAND	2900	2045
	NET POWER AVAILABILITY- Own Source	5200	3096
	Central Sector+MPL	375	313
	Bi- lateral export by DVC	2250	1646
	SURPLUS(+)/DEFICIT(-) AFTER EXPORT	425	-283
4	**ODISHA**		
	NET MAXIMUM DEMAND (OWN)	4500	2723
	NET MAXIMUM DEMAND (In Case,600 MW CPP Drawal)	5100	2795
	NET POWER AVAILABILITY- Own Source	3475	2429
	Central Sector	1350	843
	SURPLUS(+)/DEFICIT(-) (OWN)	325	549
	SURPLUS(+)/DEFICIT(-) (In Case, 600 MW CPP Drawal)	-275	477
5	**WEST BENGAL**		
5.1	**WBSEDCL**		
	NET MAXIMUM DEMAND	6700	4525
	NET MAXIMUM DEMAND (Incl. B'Desh+Sikkim)	6710	4616
	NET POWER AVAILABILITY- Own Source (Incl. DPL)	4907	2477
	Central Sector+Bi-lateral+IPP&CPP+TLDP	2585	1608
	EXPORT (TO B'DESH & SIKKIM)	10	7
	SURPLUS(+)/DEFICIT(-) AFTER EXPORT	782	-531
5.2	**IPCL**		
	IPCL Demand	130	84
	IPCL Import	130	84
	SURPLUS(+)/DEFICIT(-)	0	0
5.3	**CESC**		
	NET MAXIMUM DEMAND	2140	1110
	NET POWER AVAILABILITY- Own Source	820	552
	FROM OTHER SOURCE (INCL. IPP/CPP-29-30 MU/M)	780	164
	IMPORT FROM HEL	540	394
	TOTAL AVAILABILITY OF CESC	2140	1110
	SURPLUS(+)/DEFICIT(-)	0	0
	WEST BENGAL (WBSEDCL+CESC+IPCL)		
	(excluding DVC's supply to WBSEDCL's command area)		
	NET MAXIMUM DEMAND	8980	5719
	NET POWER AVAILABILITY- Own Source	5727	3029
	CS SHARE+BILATERAL+IPP/CPP+TLDP+HEL	4035	2166
	SURPLUS(+)/DEFICIT(-) BEFORE WBSEDCL'S EXPORT	782	-524
	SURPLUS(+)/DEFICIT(-) AFTER WBSEDCL'S EXPORT	772	-531
6	**SIKKIM**		
	NET MAXIMUM DEMAND	102	48
	NET POWER AVAILABILITY- Own Source	8	3
	Central Sector	184	119
	SURPLUS(+)/DEFICIT(-)	90	74
	EASTERN REGION		
	NET MAXIMUM DEMAND	23541	15084
	NET MAXIMUM DEMAND (In Case, 600 MW CPP Drawal of Odisha)	24129	15156
	BILATERAL EXPORT BY DVC	2258	1646
	EXPORT BY WBSEDCL TO SIKKIM & Bdesh	10	7
	EXPORT TO B'DESH & NEPAL OTHER THAN DVC	642	787
	NET TOTAL POWER AVAILABILITY OF ER	27685	16045
	(INCLUDING CS ALLOCATION +BILATERAL+IPP/CPP+HEL)		
	SURPLUS(+)/DEFICIT(-)	1234	-1479
	SURPLUS(+)/DEFICIT(-) (In Case, 600 MW CPP Drawal of Odisha)	646	-1551