

North Eastern Regional Power Committee

MINUTES OF THE 118th OPERATION COORDINATION

SUB-COMMITTEE MEETING OF NERPC

Date : 11/02/2016 (Thursday)
Time : 10:00 hrs
Venue : "Hotel Nandan", Guwahati.

The List of Participants in the 118th OCC Meeting is attached at **Annexure - I**

Shri P.K. Mishra, Member Secretary, NERPC welcomed all the participants to the 118th OCC meeting. He highlighted about the outcome of the 16th TCC/RPC meetings and intimated that some of the important resolutions adopted in the forum would be sent shortly to Ministry of Power/Petroleum for the benefit of NER. He once again noted the absence of members of P&E Dept. Mizoram & Tripura and mentioned that in-spite of assurance in the NERPC meeting, the same was not adhered to and mentioned that NERPC will take up the matter seriously with competent authorities of these constituents. He then requested all the members to actively participate in the meeting.

Thereafter, Member Secretary requested Shri B. Lyngkhai, Director/SE(O) to take up the agenda items for discussion.

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 117th MEETING OF OPERATION SUB-COMMITTEE OF NERPC.

SE (O) informed that minutes of 117th meeting of Operation Sub-committee held on 07th January, 2016 at Guwahati were circulated vide letter No. NERPC/SE (O)/OCC/2015/4556-4591 dated 15th January, 2016.

OTPC requested Operation sub-committee to amend deliberation of the sub-committee of the **Item Nos. D.3, D.11 & D.18 of 117th OCC** meeting and to incorporate views of OTPC as below:-

Item No D.3

"Furnishing Reactive Power Absorption Data for last one year":

Recorded:

DGM (SO-II), NERLDC requested all generating utilities of NER to furnish at least hourly unit-wise active power in MW, reactive power in MVAR & terminal voltage in kV of the previous month by 10th of the month as per format at **Annexure -D.3**

The Sub-Committee requested all generating utilities of NER to furnish the data of previous month to NERLDC/NERPC on monthly basis by 10th of the month.

Amendment to be Recorded:

During 116th OCC, DGM, OTPC informed that they have submitted the required data as per the prescribed format of NERDC. Further, he informed that the format is not capturing all relevant parameters. OTPC suggested to submit detailed data printout (automatically generated from the system) in 117th OCC for review and finalizing the format.

During 117th OCCM, OTPC submitted the sample data in format of 15 minutes average and hourly average comprising GT-MW, GT-MVAR, ST-MW, ST-MVAR, Grid Frequency and 400 KV Bus Voltage.

The format for furnishing Reactive Power Absorption data by generators of NER Grid was circulated by NERLDC alongwith minutes of 117th OCCM of NER, with generator terminal voltage included in the format.

Item No D.11

“400kV, 80 MVAR Bus Reactor at OTPC Pallatana”:

Recorded:

DGM(O&M), OTPC informed the forum that OTPC would apply to NERLDC for necessary charging instruction since all other formalities have been completed.

DGM (SO-II), NERLDC informed that application of charging of new element is to be furnished to NERLDC as per format of Procedure for Integration of New Transmission Element into the Grid.

Amendment to be Recorded:

Necessary clearances (Hard Copies) are being forwarded to NERPC for review and approval. NERPC also informed OTPC to get CTU clearance for charging the bus reactor. OTPC will write a letter to CTU for necessary clearance.

Item No D.18

“Consent for URS Scheduling”:

Recorded:

Honourable CERC order dated 05.10.2015 against Petition No. 310/MP/2014, regarding scheduling Un-requisitioned Power of Sasan Ultra Mega Power Project and direction to Load Despatch Centres to schedule Un-requisitioned Power was discussed.

As per the order consent of the original beneficiary and the new beneficiary shall be submitted by the ISGS intending to avail revision of schedule to the concerned RLDC by mail.

After detailed deliberation, it was agreed that all beneficiary going for under-requisition can give month wise standing consent to the respective ISGS (AGBPP, AGTPP & OTPC) with a copy to NERLDC for rescheduling the URS power to the other beneficiaries for reducing the time taken for implementing the schedule.

The forum also requested NEEPCO that it may please operate NEEPCO control room 24x7.

Amendment to be Recorded:

Matter was discussed and constituents agreed to adopt better system.

With the above Amendment(s), the Sub-committee may confirm the minutes of 117th OCCM of NERPC as no other comments/observations were received from the constituents.

ITEMS FOR DISCUSSION

B. OPERATIONAL PERFORMANCE AND GRID DISCIPLINE DURING JANUARY, 2016

As per the data made available by NERLDC, the grid performance parameters for January, 2016 are given below:

NER PERFORMANCE DURING JANUARY, 2016

| States | Energy Met (MU) | | w.r.t. Dec,15 % inc (+) /dec (-) | Energy Reqr. (MU) | | w.r.t. Dec,15 % inc (+) /dec (-) | % inc (+) /dec (-) of energy reqr vs met. In Jan, 16 |
|-------------|-----------------|----------------|---|-------------------|----------------|---|--|
| | Jan-16 | Dec-15 | | Jan-16 | Dec-15 | | |
| Ar. Pradesh | 59.6 | 54.16 | 10.04 | 60.7 | 55.78 | 8.82 | -1.85 |
| Assam | 669.1 | 643.05 | 4.05 | 682.5 | 655.70 | 4.09 | -2.00 |
| Manipur | 77.8 | 74.49 | 4.44 | 79.5 | 75.66 | 5.08 | -2.19 |
| Meghalaya | 166.6 | 157.91 | 5.50 | 184.8 | 167.42 | 10.38 | -10.92 |
| Mizoram | 44.9 | 42.11 | 6.63 | 46.0 | 43.14 | 6.63 | -2.45 |
| Nagaland | 65.2 | 62.42 | 4.45 | 66.6 | 63.67 | 4.60 | -2.15 |
| Tripura | 52.3 | 77.43 | -32.46 | 53.3 | 78.85 | -32.40 | -1.91 |
| Region | 1135.4 | 1111.58 | 2.14 | 1173.3 | 1140.21 | 2.90 | -3.34 |

| States | Demand Met (MW) | | w.r.t. Dec,15 % inc (+) /dec (-) | Demand in (MW) | | w.r.t. Dec,15 % inc (+) /dec (-) | % inc (+) /dec (-) of Demand vs met. In Jan, 16 |
|-------------|-----------------|-------------|---|----------------|-------------|---|---|
| | Jan-16 | Dec-15 | | Jan-16 | Dec-15 | | |
| Ar. Pradesh | 116.8 | 132 | -11.52 | 117.6 | 133 | -11.58 | -0.68 |
| Assam | 1330.0 | 1314 | 1.22 | 1338.6 | 1312 | 2.03 | -0.65 |
| Manipur | 166.0 | 167 | -0.60 | 168.1 | 167 | 0.66 | -1.27 |
| Meghalaya | 377.0 | 348 | 8.33 | 377.8 | 349 | 8.25 | -0.21 |
| Mizoram | 101.0 | 96 | 5.21 | 102.4 | 97 | 5.57 | -1.39 |
| Nagaland | 122.0 | 138 | -11.59 | 122.3 | 140 | -12.64 | -0.25 |
| Tripura | 220.0 | 221 | -0.45 | 219.1 | 221 | -0.86 | 0.41 |
| Region | 2331.7 | 2320 | 0.50 | 2367.3 | 2355 | 0.52 | -1.53 |

REGIONAL GENERATION & INTER-REGIONAL EXCHANGE IN MU

| Month----> | Jan-16 | Dec-15 |
|---|--------|--------|
| Total Generation in NER (Gross) | 898.40 | 924.69 |
| Total Central Sector Generation (Gross) | 649.80 | 662.96 |
| Total State Sector Generation (Gross) | 248.60 | 261.73 |
| Inter-Regional Energy Exchange | | |
| (a) NER-ER | 228.50 | 90.66 |
| (b) ER-NER | 421.80 | 17.34 |
| (c)NER-NR | 201.50 | 0.00 |
| (d)NR-NER | 91.60 | 333.85 |
| © Net Import | 83.40 | 260.53 |

AVERAGE FREQUENCY (Hz)

| Month----> | Jan-16 | Dec-15 |
|--------------------------|-----------|-----------|
| | % of Time | % of Time |
| Below 49.9 Hz | 9.19 | 16.23 |
| Between 49.9 to 50.05 Hz | 67.96 | 66.32 |
| Above 50.05 Hz | 22.85 | 17.45 |
| Average | 50.00 | 49.98 |
| Maximum | 50.39 | 50.32 |
| Minimum | 49.70 | 49.59 |

The Sub-committee noted as above.

FOLLOW UP ACTION

C.1 Status of Generating Units, Transmission Lines in NER:

During 118th OCC meeting, the status as informed by NTPC, NEEPCO, POWERGRID and DOP, Nagaland is as follows:

| SN | Items | Status as given in 118 th OCC Meeting | Status as on 117 th OCC |
|----|--|--|---|
| 1 | Trial operation and CoD of Unit -I of Bongaigoan TPS of NTPC | Same as 117 th OCC Status | Unit #1 by March, 2016 First infirm injection in January, 2016. NERLDC requested NTPC to furnish quantum of block-wise infirm injection in MW on day ahead basis |
| 2 | 400/220kV, 2x315 MVA ICT of NTPC at Bongaigaon | 31.03.2016. | 31.03.2016 |
| 3 | Trial operation and CoD of Monarchak GBPP of NEEPCO | Same as 117 th OCC Status | Trial run of STG not done COD on 31.03.2016 |
| 4 | Kameng HEP of NEEPCO two units (2 x 150 MW) Next two units (2x150 MW) | November, 2016 March, 2017 | November, 2016 March, 2017 |
| 5 | Pare HEP of NEEPCO (2 x 55 MW) | March, 2017 | June, 2016 |
| 6 | 400 kV D/C Silchar - Melriat line of PGCIL | September, 2016 | Retendering done. September, 2016 |
| 7 | 220kV Rangia - Salakati of AEGCL | June, 2016 | June, 2016. 4 Piles out of 13 Piles completed. |
| 8 | 132kV Monarchak – Surjamaninagar D/C of TSECL | No representative | No representative |
| 9 | 400/132 kV, 2nd 125 MVA ICT at Pallatana | June, 2016 | June, 2016 |
| 10 | 132kV Pasighat – Aalong of Ar. Pradesh | No representative | March, 2016 |
| 11 | 132kV Doyang- Wokha | No representative | February, 2016 |

| | | | |
|----|---|---|---|
| 12 | 220 kV, 20 MVAR Bus Reactor at AGBPP | March, 2016 | February, 2016 |
| 13 | 132kV Surjamaninagar Bay at OTPC | June, 2016 | June, 2016 |
| 14 | 63MVAR Reactor at Byrnihat of Me.PTCL | SE, SLDC informed he will inform the status to NERPC soon | SE, SLDC informed that Estimated Cost approval from Board is awaited. The status will be intimated in next OCC meeting. |
| 15 | Up-gradation of 132 kV Lumshnong-Panchgram line | Assam will furnish the DPR to Meghalaya by February, 2016 | DPR preparation stage |
| 16 | Biswanath Chariali 80 MVAR Bus Reactor | Ready for charging apply for shutdown | January,2016 |
| 17 | RHEP 80 MVAR Bus Reactor | The DPR was furnished by NEEPCO and matter was referred to next SCM of CEA. | The status will be intimated in next OCC meeting. |
| 18 | Switchable line Reactors at 400kV Balipara & Bongaigoan | March 2016 | March 2016 |
| 19 | PLCC Panels at Loktak end of Loktak – Ningthoukhong 132 kV feeder and Loktak - Rengpang 132 kV feeder | March 2016 | March 2016 |
| 20 | 400kV D/C Balipara – Kameng of Ar. Pradesh | No representative | - |
| 21 | LILO of 132kV Ranganadi – Nirjuli at Pare of NEEPCO | | |
| 22 | LILO of 132kV Ranganadi – Itanagar (Chimpu) at Pare of NEEPCO | | |
| 23 | LILO of 132kV Jiribam – Aizawl at Tuirial of DoP, Mizoram/NEEPCO | | |

The Sub-committee noted as above.

Action: All concerned Utilities above.

C.2 CT Ratio of Transmission Lines & Enhancement of Loadability of lines in NER:

During 117th OCC meeting, NERTS, POWERGRID informed that 15 nos. 600/1 A CTs will be arranged for dynamic rating of the lines listed in Annexure C.2. NERLDC requested to other utilities to change CT for dynamic rating of the lines listed in Annexure C.2.

Deliberation of the Sub-Committee

The latest status as informed in the 118th OCC is given in **Annexure - C.2**. As indicated by DGM, NERTS, procurement of 21 nos. CTs for all lines up-gradation of CT ratios of NERTS, including 132 kV Doyang – Dimapur D/C, will take at least 6 months time.

The Sub-Committee noted as above.

C.3 Finalization of Operating Procedures of State Grid of NER:

As per clause no 5.1.g of IEGC, detailed operating procedures for each state grid shall be developed and maintained by the respective SLDC.

Deliberation of the sub-Committee:

Status as intimated during 118th OCC forum of NERPC is as follow:-

| SI No | Description | Status of approval from OCC forum of NERPC |
|-------|---|--|
| 1 | Operating Procedure of Ar. Pradesh 2015 | Not submitted |
| 2 | Operating Procedure of Assam 2015 | Submitted |
| 3 | Operating Procedure of Manipur 2015 | By 31.03.2016 |
| 4 | Operating Procedure of Meghalaya 2015 | Submitted |
| 5 | Operating Procedure of Mizoram 2015 | By 31.03.2016 |
| 6 | Operating Procedure of Nagaland 2015 | By 31.03.2016 |
| 7 | Operating Procedure of Tripura 2015 | Not submitted |

SLDC, Meghalaya informed that Draft Operating Procedure had been submitted by them and is expected to be finalized soon. The forum requested SLDC, Meghalaya to finalize the operating Procedure of Meghalaya at the earliest.

The forum also requested SLDC, Manipur to submit their operating procedure

The Sub-committee noted as above.

Action: All constituents as above.

C.4 Monthly MU requirement & availability of each state of NER as per format:

The following figures of state wise MU requirement and availability were taken from draft LGBR 2015-16 of NERPC. State wise MU requirement and availability for these months are to be checked. Constituents may kindly verify if the above data are correct.

Requirement:

| Name of State | Jan16 | Feb16 | Mar16 | Apr16 | May16 | Jun16 |
|---------------|-------------|-------------|-------------|-------|-------|-------|
| Ar. Pradesh | 67 | 57 | 70 | | | |
| Assam | 680 | 650 | 700 | | | |
| Manipur | 80 | 70 | 75 | | | |
| Meghalaya | 215 | 185 | 190 | | | |
| Mizoram | 47 | 40 | 45 | | | |
| Nagaland | 65 | 65 | 70 | | | |
| Tripura | 125 | 100 | 125 | | | |
| NER | 1279 | 1167 | 1275 | | | |

Availability:

| Name of State | Jan16 | Feb16 | Mar16 | Apr16 | May16 | Jun16 |
|---------------|-------------|-------------|-------------|-------|-------|-------|
| Ar. Pradesh | 48 | 40 | 50 | | | |
| Assam | 590 | 550 | 600 | | | |
| Manipur | 70 | 60 | 65 | | | |
| Meghalaya | 180 | 145 | 140 | | | |
| Mizoram | 42 | 40 | 45 | | | |
| Nagaland | 55 | 50 | 50 | | | |
| Tripura | 200 | 150 | 170 | | | |
| NER | 1185 | 1035 | 1120 | | | |

The Sub-Committee noted as above.

C.8 Monthly MW requirement & availability of each state of NER:

The following figures were taken from LGBR 2015-16 of NERPC. These figures are to be reviewed.

A. Peak Demand in MW

| Name of State | Jan16 | Feb16 | Mar16 | Apr16 | May16 | Jun16 |
|---------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Ar. Pradesh | 133 | 130 | 135 | 117 | 117 | 115 |
| Assam | 1400 | 1260 | 1410 | 1487 | 1487 | 1495 |
| Manipur | 165 | 148 | 155 | 154 | 155 | 160 |
| Meghalaya | 375 | 350 | 400 | 279 | 268 | 248 |
| Mizoram | 90 | 85 | 90 | 88 | 88 | 83 |
| Nagaland | 125 | 120 | 130 | 175 | 182 | 195 |
| Tripura | 250 | 240 | 275 | 240 | 246 | 250 |
| NER | 2538 | 2333 | 2595 | 2540 | 2543 | 2546 |

B. Peak Availability in MW

| Name of State | Jan16 | Feb16 | Mar16 | Apr16 | May16 | Jun16 |
|---------------|-------------|-------------|-------------|-------|-------|-------|
| Ar. Pradesh | 118 | 110 | 130 | | | |
| Assam | 1195 | 1150 | 1170 | | | |
| Manipur | 145 | 128 | 140 | | | |
| Meghalaya | 325 | 280 | 250 | | | |
| Mizoram | 85 | 85 | 80 | | | |
| Nagaland | 95 | 90 | 95 | | | |
| Tripura | 403/230 | 403/230 | 403/230 | | | |
| NER | 2375 | 2243 | 2268 | | | |

*Tripura indicates 400/230 if Pallatana available/if not available

B.1. Off Peak Demand in MW (08:00 Hrs)

| Name of State | Jan16 | Feb16 | Mar16 | Apr16 | May16 | Jun16 |
|---------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Ar. Pradesh | 73 | 70 | 80 | 92 | 92 | 90 |
| Assam | 1030 | 1020 | 1050 | 1091 | 1091 | 1194 |
| Manipur | 95 | 90 | 95 | 76 | 76 | 120 |
| Meghalaya | 230 | 220 | 220 | 193 | 186 | 185 |
| Mizoram | 60 | 55 | 55 | 66 | 66 | 52 |
| Nagaland | 85 | 75 | 80 | 116 | 122 | 139 |
| Tripura | 190 | 170 | 180 | 149 | 157 | 156 |
| NER | 1638 | 1700 | 1760 | 1783 | 1790 | 1936 |

B.2. Off Peak Availability in MW (08:00 Hrs)

| Name of State | Jan16 | Feb16 | Mar16 | Apr16 | May16 | Jun16 |
|---------------|-------------|-------------|-------------|-------|-------|-------|
| Ar. Pradesh | 65 | 60 | 70 | | | |
| Assam | 850 | 900 | 950 | | | |
| Manipur | 90 | 80 | 85 | | | |
| Meghalaya | 275 | 245 | 230 | | | |
| Mizoram | 60 | 60 | 55 | | | |
| Nagaland | 70 | 60 | 65 | | | |
| Tripura | 240 | 240 | 240 | | | |
| NER | 1650 | 1645 | 1695 | | | |

Deliberation of the sub-Committee:

SE(O), NERPC informed that since LGBR for 2016-2017 is under preparation, the data for April, 2016 onwards will be furnished once the above LGBR is finalized.

DGM (SO-I), NERLDC stated that since data is required for first quarter i.e. till June, 2016, hence the data as prepared by NERLDC will be incorporated upto June, 2016 above till LGBR of NERPC is finalized.

The Sub-Committee noted as above.

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|---------------------|
| D. NEW ITEMS |
|---------------------|

D.1 Generation Planning (ongoing and planned outages)

NEEPCO/NHPC may kindly intimate the availability for hydro stations:

| Generating Station | Units running | MW | MU | Reservoir |
|--------------------|---------------|-----|-------------------|-----------|
| Khandong | 2 | 38 | 0.117 | 711.45 |
| Kopili | 2 | 96 | 1.512 | 597 |
| Kopili-II | 1 | 18 | 0.054 | 711.45 |
| Ranganadi | 3 | 401 | Subject to inflow | |
| Doyang | 2 | 33 | 0.099 | 309.8 |
| Loktak | 3 | 105 | 0.502 | 767.54 |
| AGBPP | - | - | - | - |
| AGTPP | - | - | - | - |

Hydro planning

In view of outage of Kopili units, proper planning is essential for utilization of available water of other reservoir based stations so that adequate generation can be maintained upto April/May, 2016.

Since water level at Loktak HEP is in comfort position, the plant will be utilized in the peak hours during complete shutdown of Kopili HEP.

The Committee discussed and approved the proposed shutdown by Generating Stations and the same is given in Annexure - D.2 (along with trans-element).

D.2 Outage Planning Transmission elements

It was agreed in the 99th OCC meeting that shutdown will be availed only after approval is given by the OCC forum. It was also agreed that deferment/revision of outages elements other than already approved in OCC will be henceforth put/displayed in the website of NERPC (**under Operational Activities/OCC Approved shutdown**) as per CERC regulations/ CEA guidelines etc for ensuring smooth & secure grid operation.

Furnishing request of shut down of the element, which was approved by NERPC, by Indenting Agency (ISTS licensees/STUs/Generating Companies) to NERLDC: Planned shutdown approved by NERPC shall be considered for implementation by

NERLDC on D-3 basis. If an outage is to be availed on say 10th of the month, the shutdown availing agency would reconfirm to NERLDC on 7th of the month by 10:00 Hr. This practice is necessary to ensure optimal capacity utilization and the time required for associated system study/coordination by/amongst RLDC/NLDC.

Deliberation in the meeting

The sub-Committee discussed and approved the proposals received from the constituents regarding transmission elements for February, 2016 – March, 2016 and the same has already been uploaded in website of NERPC.

D.3 Furnishing Reactive Power Absorption Data for last one year:

As per Para no. 9.9.1 of Recommendations of Enquiry Committee on Grid Disturbance, the regulatory provisions regarding absorption of reactive power by generating units needs to be implemented.

It is requested that you may please furnish instances when Reactive Power support was provided by Generators for last one year.

DGM (SO-II), NERLDC requested all generating utilities of NER to furnish at least hourly unit-wise active power in MW, reactive power in MVAR & terminal voltage in kV of the previous month by 10th of the month as per format at **Annexure –D.3**.

The Sub-Committee requested all generating utilities of NER to furnish the data of previous month to NERLDC/NERPC on monthly basis by 10th of the month.

The latest Capability Curve of each generator in Soft Copy may also be provided.

NERLDC requested NEEPCO to furnish reactive power absorption data of their generators as per format circulated by NERLDC, centrally from NEEPCO Control Room, Shillong, for ease of co-ordination between NERLDC and ISGS generators of NEEPCO. NEEPCO agreed to the same.

NERLDC also requested NHPC to furnish the reactive power absorption data of Loktak HEP as per format. NHPC agreed to start furnishing data from March 2016 onwards.

Action: NEEPCO & NHPC.

D.4 Furnishing of Technical & Commercial Data for Computation of PoC Charges & Losses for 1st Quarter of 2016-17(April'16 – June'16):

As per provisions of the CERC (Sharing of Inter State Transmission Charges and Losses) Regulations, 2010 as amended from time to time, the following data are required for Computation of PoC Charges & Losses for **1st Quarter of 2016-17 (April'16- May'16)**

1. Technical details of new transmission elements and generating units which are expected to commence commercial operation during **April'16- May'16**
2. Yearly Transmission Charges
3. Nodal Generation information and forecast withdrawal data

As per provisions of the CERC (Sharing of Inter State Transmission Charges and Losses) (Third Amendment), Regulations, 2015, the Designated ISTS Customers (DICs) are required to submit node-wise forecast injection/withdrawal information and maximum injection/withdrawal data for corresponding quarter of last three years to the Implementing Agency for computation of PoC Charges & Losses for **1st Quarter of 2016-17 (April'16- May'16)**.

As discussed in 4th Validation Committee Meeting following dates were finalized for submission of data for **1st Quarter of 2016-17 (April'16- May'16)**

| Sl. No. | Timeline | Remarks |
|---------|---------------------------------|---|
| 1 | 31 st January, 2016 | Data to be provided by DICs to IA |
| 2 | 10 th February, 2016 | Data to be sent by IA to RPC |
| 3 | 25 th February, 2016 | RPC to rectify the data through a meeting at RPC level and then send to IA by 25 th February, 2016 |
| 4 | 30 th February, 2016 | Validation Committee meeting |

During 116th OCC all the utilities agreed to submit the data as per formats for Quarter 1 of 2016-17 (April- June, 2016) by 31st January, 2016.

In 117th OCC NERLDC requested DICs & transmission utilities to furnish Technical & Commercial Data for Computation of PoC Charges & Losses for 1st Quarter of 2016-17 (Apr'16- Jun'16) as per format by 15th January, 2016.

All Utilities agreed to submit the data as per formats for Quarter 1 of 2016-17 (April- June, 2016) by 15th January, 2016.

DGM(SO-II), NERLDC once again reiterated that necessary Forms are already available in NLDC website and constituents may kindly download from there.

In line with the decision in the Validation Committee meeting, Demand and Generation projections w.r.t North Eastern Region constituents as given by Implementing Agency is attached in **Annexure D.4** for ratification in 118th OCC Meeting of NERPC.

Deliberation in the meeting

Members deliberated and reviewed the data as furnished by NERLDC and the same is attached at **Annexure – D.4**.

Figures to be discussed and modifications as follows:

- a) Ranganadi => Restrict to 401 MW (Installed – Auxiliary Consumption)
- b) Palatana => Due to uncertainty in gas supply, figure kept at 478 MW.
- c) AGTPP => To be taken as 78 MW. And 44 MW for AGTPP Extension.
- d) Meghalaya => Generation is very high (271 MW given). Meghalaya to give their final generation figures.
- f) Assam => Demand of Assam to be changed to 1250 MW. (As per comments from AEGCL representative)
- g) Kopili => Generation to be kept as 90 MW
- h) Tripura => Demand to be taken as 230 MW
- i) Loktak => Generation to be taken as 103 MW (As per comments from NHPC representative).

Senior Engineer (SO-II) informed the forum that some lines owned by AEGCL, MePTCL and TSECL have been approved by CERC for inclusion in calculation of PoC Charges and Losses. Accordingly, YTC (Yearly Transmission Charges) information from AEGCL, MePTCL and TSECL are required by the Implementing Agency (NLDC) for inclusion in PoC Charges and Losses calculation for Q4 of 2015-16 and Q1 of 2016-17. He requested AEGCL, MePTCL and TSECL to furnish the requisite information at the earliest to NLDC with a copy to NERLDC. AEGCL and MePTCL agreed.

NERLDC also expressed the need to include generation figures of Monarchak GT-1 in generation figures of Tripura. Due to presence of no representative from Tripura and in absence of confirmation regarding adequate gas supply to Palatana and Monarchak, the matter was kept for further discussion.

The Sub-committee noted as above.

D.5 Shutdown of Block- #2 of OTPC:

OTPC intimated that Pallatana Block-2 will undergo shutdown from 25th January, 2016 to 7th February, 2016 for CI & HRSG License renewal.

During 116th OCC meeting, the issue was discussed in detailed and the forum requested OTPC to keep in mind that any maintenance schedule should not be taken during lean hydro season. The forum requested OTPC to take up the matter with the concerned agency so that in future no shutdown will be granted to them during lean hydro season. The comfort period granted by the forum is **July to September**.

DGM, OTPC mentioned that he will take the matter with Competent Authority of OTPC so that the solution can be finalized in this regard.

The forum however approved the above shutdown since no sufficient gas is available to OTPC to run both the units.

Members raised the issue regarding reduction of gas supply to Pallatana and requested NERPC to take up the matter with highest authority of ONGC.

SE(O), NERPC informed that during 27th CC meeting, the issue of reducing of gas supply to Pallatana to accommodate Monarchak is a very serious concern for NER beneficiaries as till now it is understood that Monarchak is a state project and he requested the house to take up the matter in the next NERPC meeting. Further, he stated that full gas supply should be made available to Pallatana first then to Monarchak Plant to avoid deprivation of all other NER states.

The forum unanimously reiterated that thermal power plant (gas based & coal based) shutdown may be taken only during the high hydro period i.e. **July to September**. Regarding non-availability of gas to OTPC, SE(O) requested utilities to propose this as an agenda item for 16th TCC/RPC.

Deliberation in the meeting

The forum once again reiterated that thermal power plant (gas based & coal based) shutdown may be taken only during the high hydro period i.e. **July to September**.

Regarding non availability of gas, SE(O) informed that the matter had been deliberated in detailed during 16th TCC/NERPC meeting and it was decided that till the full quantum of gas can be supplied to all the above GBPPs, required quantum of gas should be given to Regional project of Palatana to run both the units.

The Sub-Committee noted as above.

D.6 Early Restoration of 63 MVAR line Reactor at Balipara:

The 63 MVAR line Reactor of 400 kV Bongaigaon – Balipara line –II at Balipara end is under outage since 19.07.2015. Early restoration of the reactor is very essential for containing over voltage problem which is very much on higher side after commissioning of Agra- BNC HVDC pole-I especially during operation of the pole. Presently the problem is being managed by opening 400 kV lines thereby system security is compromised.

Early commissioning of 80 MVAR 2nd Bus reactor at BNC is also very much essential in this connection.

During 117th OCC meeting, DGM (AM), NERTS informed the forum that EI of RIO (NE) will inspect on 12.01.16 and then reactor would be commissioned once the clearance is obtained.

Deliberation in the meeting

DGM (AM), NERTS informed the forum that the above restoration will be completed by February, 2016.

The Sub-Committee noted as above.

D.7 Estimated Transmission Availability Certificate (TAC) for the month of December, 2015.

NETC and POWERGRID, NERTS have submitted TAC data of December, 2015 in the first/second week of January, 2016. This will enable issuance of verification by NERLDC and certification by NERPC on monthly basis within stipulated time frame. Both NETC and NERTS are advised to follow the agreed time schedule in future to avoid accumulation of reports and corresponding delay.

The Sub-Committee noted as above.

D.8 400kV, 80 MVAR Bus Reactor at OTPC Pallatana

During the 117th OCC Meeting, OTPC informed that the 400kV, 80 MVAR Bus Reactor at OTPC Pallatana is ready for recharging and sought clearance for charging of the same. NERLDC informed that the same can be taken into service subject to real time condition.

However, now after checking the relevant records at NERLDC it is seen that the reactor was never successfully put into service and the matter has to be look into considering that the element was out for a prolong period.

In this connection it is pertinent to mention that, as per Clause No. 43 of Measures Relating to Safety & Electric Supply Regulation 2010 by CEA, the electrical installations/line, before commencement of supply or recommencement after shutdown for six months and above shall not be charged/ energized without the approval of the Electrical Inspector in writing to ensure safety measures specified under the said regulations in the electrical installations.

OTPC may take action accordingly and certify fulfillment of other statutory requirements while permission for charging the reactor is sought.

DGM(O&M), OTPC informed the forum that OTPC would apply to NERLDC for necessary charging instruction since all other formalities have been completed.

DGM (SO-II), NERLDC informed that application of charging of new element is to be furnished to NERLDC as per format of Procedure for Integration of New Transmission Element into the Grid.

Deliberation in the meeting

NERLDC informed that charging clearance for the reactor will be issued once OTPC applies for the same and requested OTPC to bring the reactor into service to address the persistent high voltage problem at Palatana 400 kV bus.

The Sub-Committee noted as above.

Action: OTPC/NERLDC.

D.9 Modification of existing 132kV S/C Nirjuli –Ranganadi Transmission Line on account of Railway Track Construction:

The newly constructed Harmuti-Naharlagun Railway Track infringes with the 132KV Nirjuli-Ranganadi line between existing location 02 to loc.14 & crosses the track at 3 (three) locations. In order to do away with this infringement & at the behest of the District Administration, POWERGRID has carried out detailed survey for re-alignment of the complete line section from loc.134 to loc.23. The proposed line section shall now pass through Emchinallah-Lekhi village in Papumpare District.

Further, the contract for diversion of the line section from loc.134 to loc.23 has also been awarded by POWERGRID & erection work is expected for commencement very shortly. Subsequent to completion of the re-aligned section of the line(which is expected by April'2016), the existing line section passing through Doimukh area in Papumpare District shall be required to be disconnected & dismantled. It may be mentioned that the 132KV Nirjuli-Ranganadi line has been looped in & looped out at 132KV Lekhi Substation of DoP, AP at tower loc.11. Therefore, with disconnection of the existing line section from loc.134 to loc.23 as a result of its re-alignment, connection of Lekhi Substation(DoP, AP) with Ranganadi & Nirjuli through the LILO portion shall be no longer available.

It is learnt that action has been taken by DoP, AP simultaneously for modification of the LILO line so as to ensure connectivity with 132KV Nirjuli-Ranganadi line after re-alignment is carried out by POWERGRID. Therefore, DoP, AP may look into for completion of this modification of LILO portion of the line matching with re-alignment of the line from loc.134 to loc.23(under execution by POWERGRID) in case it is felt necessary to maintain the existing configuration of LILO of line at Lekhi S/s(DoP, AP).

During 116th OCC meeting, the Sub-committee unanimously agreed to the proposal of NERTS.

During 117th OCC, DGM (AM), NERTS informed the forum that erection works related to Ar. Pradesh i.e. LILO point for connectivity to Lekhi should match that of POWERGRID.

EE, SLDC, Ar. Pradesh informed the forum that Railways have not yet transferred the funds to DoP, Ar. Pradesh. He assured to take up the matter with their concerned authority to match the construction.

DGM(AM), NERTS informed the forum that erection works related to Ar. Pradesh i.e. LILO point for connectivity to Lekhi should match that of POWERGRID.

EE, SLDC, Ar. Pradesh informed the forum that Railways have not yet transferred the funds to DoP, Ar. Pradesh. He requested that the matter may be referred to next TCC/RPC meeting keeping in mind the sensitivity of the issue.

The Sub-committee instructed that DoP, Ar. Pradesh should carry out the above work in line with PPOWERGRID so that the power supply to Nirjuli does not hamper.

Deliberation in the meeting

Since no representative from Ar. Pradesh was present, portion pertaining to Ar. Pradesh could not be updated.

Action: NERTS & Ar. Pradesh.

D.10 Assessment of Total Transfer Capability (TTC), Transmission Reliability Margin (TRM) and Available Transfer Capability (ATC) by SLDC on respective Inter-State Transmission Corridor

SLDCs of NER are requested to assess the above on monthly basis, 5 months in advance (eg: TTC/TRM/ATC for the month of November to be calculated by 15th of July), for further assessment of TTC, ATC and TRM of NER-ER corridor, group of control areas, individual control areas with the region and state-control-area to state-control-area by NERLDC, if required.

SLDCs are also requested to send study results for Peak (Export & Import) & Off Peak (Export & Import) along with assumptions in details and 6 nos ".sav" case files (Base Case for Peak & Off Peak, Off Peak & Peak Export & Off Peak & Peak Import) to NERLDC by 15th of the month for the fifth month. All India ".sav" case files have been sent to SLDCs. SLDCs are requested to use this ".sav" case files while computing TTC, ATC & TRM for their state control area.

As decided in 4th Meeting of NPC held on 10.12.2015, monthly TTC/ATC figures are to be uploaded by SLDCs at their respective website and also communicate the same to respective RLDC & NLDC subsequently.

The study results for assessment of Total Transfer Capability (TTC), Transmission Reliability Margin (TRM) and Available Transfer Capability (ATC) have not been received from any SLDC of NER. Updated Base Cases have been already mailed to all the SLDCs on 08.02.16. All the SLDCs are requested to assess the Total Transfer Capability (TTC), Transmission Reliability Margin (TRM) and Available Transfer Capability (ATC) and submit the cases to NERLDC for the month of June'16 by 15th February, 2016.

The state-wise Transfer Capability as assessed by NERLDC for the month of Jun'16 based on available information is as below.

Import Capability.

| SN | State | Off Peak Case | | Peak Case | |
|----|-------------|---|---------------------------|---|---------------------------|
| | | Contingency | Total Transfer Capability | Contingency | Total Transfer Capability |
| 1 | Ar. Pradesh | N-1 of 132/33 kV, 1x20 MVA Transformer at Naharlagun | 165 | N-1 of 132/33 kV, 1x20 MVA Transformer at Naharlagun | 165 |
| 2 | Assam | N-1 of 220/132 kV, 3x100 MVA transformers at Sarusajai | 1410 | N-1 of 220/132 kV, 3x100 MVA transformers at Sarusajai | 1370 |
| 3 | Manipur | N-1 of 132/33 kV, 2x50 MVA Transformers at Imphal (PG) | 285 | N-1 of 132/33 kV, 2x50 MVA Transformers at Imphal (PG) | 285 |
| 4 | Meghalaya | N-1 of 132 kV Killing-Epip II D/C | 270 | N-1 of 132 kV Killing-Epip II D/C | 275 |
| 5 | Mizoram | N-1 of 132/33kV, 12.5 MVA transformer at Luangmual/Zimabawk/Serchip/Lunglei | 110 | N-1 of 132/33kV, 12.5 MVA transformer at Luangmual/Zimabawk/Serchip/Lunglei | 110 |
| 6 | Nagaland | N-1 of 132/66 kV, 100 MVA ICT at Dimapur (Nagaland) | 95 | N-1 of 132/66 kV, 100 MVA ICT at Dimapur (Nagaland) | 95 |
| 7 | Tripura | N-1 of 132 kV Palatana - Udaipur S/C | 190 | N-1 of 132 kV Palatana - Udaipur S/C | 150 |

States are requested to check the TTC of their control areas as computed by NERLDC and issue comments, if any by 20th February, 2016. If no comments received from any states TTC, ATC & TRM figures of States control area and group of control areas will be finalized and may be uploaded in NLDC website, if required.

Deliberation in the meeting

DGM(SO-I), NERLDC requested all utilities to kindly verify the ATC/TTC figures. The figures for state-wise TTC as above, would be considered as Final if no comments are received from any SLDCs of NER by 20.02.2016.

NERLDC re-iterated that as decided in 4th Meeting of NPC held on 10.12.2015, monthly TTC/ATC figures are to be uploaded by SLDCs at their respective website and also communicate the same to respective RLDC & NLDC subsequently.

Accordingly SLDCs were requested to host the TTC/ATC figures circulated by NERLDC on their respective website. The same was agreed by them.

After detailed deliberation it was decided to refer the issue related to system studies by SLDCs to System Study sub-group meeting.

The Sub-Committee requested constituents to send their consent officers who are involved in the above study to NERLDC Shillong so that necessary training and assistance can be given to them for acquaintances of the study.

D.11 Implementation of Automatic Demand Management Scheme (ADMS)

Hon'ble CERC directed vide order in Petition No. 113/MP/2014 on 31.12.15 to submit PERT charts & action plans for Implementation of Automatic Demand Management Scheme (ADMS) by SLDCs of NER and to implement ADMS by 30.06.16. Hon'ble CERC directed RLDCs to submit the report of status of implementation of Automatic Demand Management Scheme (ADMS) by SLDCs of NER by 31.08.16.

SLDCs of NER are requested to furnish monthly report of status of implementation of Automatic Demand Management Scheme (ADMS) by SLDCs of NER.

During 117th OCC meeting, AGM, SLDC, Assam suggested that since ADMS involves connectivity to 33kV substations, a separate meeting with the DISCOMS is required. The forum agreed and requested NERPC to kindly convene the meeting at a suitable date.

NERLDC requested SLDCs of NER to submit the report of status of implementation of Automatic Demand Management Scheme (ADMS) by SLDCs of NER by 15.08.16.

Deliberation in the meeting

SE(O) informed that during the recent workshop on RTUs, some of the firms have intimated that they can help the NER constituents related to implementation of Automatic Demand Management Scheme (ADMS) by giving some presentation on the issue.

The Sub-committee requested NERPC to conduct a workshop/seminar on ADMS by calling some of the reputed firms viz. ABB, ALSTOM, WIZIMAX, SCHENIDER etc. and also to request all the DISCOMS (dealing with R-APRDP), SLDCs for the benefit of the constituents.

The SLDCs of NER agreed to submit the report of status of implementation of ADMS to NERLDC by 15.08.2016.

Action: SLDCs & NERPC.

D.12 Consent for URS Scheduling:

At present URS of any ISGS is being scheduled to other beneficiaries after taking consent of the concerned ISGS. This is creating delay in scheduling process. A standing consent from the ISGS station can help in this respect.

The 117th OCC forum deliberated upon Honourable CERC order dated 05.10.2015 against Petition No. 310/MP/2014, regarding scheduling Un-requisitioned Power of Sasan Ultra Mega Power Project and direction to Load Despatch Centres to schedule Un-requisitioned Power was discussed.

As per the order consent of the original beneficiary and the new beneficiary shall be submitted by the ISGS intending to avail revision of schedule to the concerned RLDC by mail.

After detailed deliberation, it was agreed that all beneficiary going for under-requisition can give month wise standing consent to the respective ISGS (AGBPP, AGTPP & OTPC) with a copy to NERLDC for rescheduling the URS power to the other beneficiaries for reducing the time taken for implementing the schedule.

The forum also requested NEEPCO that it may please operate NEEPCO control room 24x7.

Deliberation in the meeting

After detail discussion it was decided-

1. All beneficiaries going for under requisition will give month wise standing consent to the respective ISGS (AGBPP, AGTPP & OTPC) with a copy to NERLDC for rescheduling the URS power to the other beneficiaries.
2. All URS power scheduling request by the beneficiary shall be applied to concern ISGS. After receiving the URS power scheduling request from the beneficiaries, the respective ISGS may give URS scheduling request to NERLDC.
3. ISGS (AGBPP,AGTPP,Palatan) will identify one coordinator for URS power scheduling related coordination with the beneficiaries for smooth and timely implementation.

4. After receiving the request from concern ISGS for scheduling of URS power, NERLDC shall implement the same after due consideration of Ramp up/Ramp down and technical minimum of plant.

The Sub-committee noted as above.

Action: All concerned utilities.

D.13 Rectification of phase notations in NER grid:

It has been found that PMUs are showing different phasors w.r.t different nodes of same grid. It is suspected that there are change in phase notations in NER grid & connectivity.

During 1st NETeST meeting, the forum advised that mixing of Phases (change in phase reference w.r.t. one utility is sometimes different from another) as reflected by PMU data in regional grid is to be corrected. Forum requested that the same may be taken up OCC forum of NERPC.

Deliberation in the meeting

DGM, NERTS informed that the problem is at Agartala end and the same will be rectified soon.

NERLDC informed that due to mismatch in phase notations, angles reported by PMUs are erroneous and Agartala PMU was reporting wrong at the time of the OCC meeting. Also, due to mismatch in phase markings in some places like 400 kV Azara, DR prints received from two ends of the 400 kV lines from Azara showed mismatch in phases. AEGCL was requested to take up correction in phase notations at the earliest.

The Sub-committee noted as above.

Action: NERTS.

D.14 Allocation for share from ISGS towards Auxiliary Energy Consumption for \pm 800kV HVDC Biswanath Chariali Substation of POWERGRID:

"CEA vide its letter No. 7/X/VIP(ER)/GM-2016/214 dtd. 01/02/2016 has stated that in other regions specific allocation of power is made from NTPC station's unallocated power from HVDC stations of POWERGRID. Since, NER does not have any coal based thermal station, the 2.5 MW specific allocation can be allocated from unallocated quota of any gas based NEEPCO station or any upcoming coal based station of NER. "

In this regard it may be noted that there is no unallocated quota from any gas based station in NER. OTPC has 13.498623% Merchant Power share from Palatana GBPP.

The allocation of power from Bongaigaon TPS of NTPC is as follows:

| Name of Beneficiary | Share Allocation (%) |
|---------------------|----------------------|
| Ar. Pradesh | 4.93 |
| Assam | 50.80 |
| Manipur | 6.27 |
| Meghalaya | 7.07 |
| Mizoram | 4.13 |
| Nagaland | 4.27 |
| Tripura | 7.47 |
| Unallocated | 15.06 |
| Total | 100.00 |

Deliberation in the meeting

After detailed deliberation, the Sub-committee agreed that 2.5MW power allocation to BNC Sub-station should be made available from coming Bongaigoan TPP. The Sub-committee requested NERPC to take the matter with MoP accordingly.

Action: NERPC.

D.15 Transformer Tap optimization

System study was conducted by NERLDC considering load, generation and network pattern of February, 2015 during Peak & Off Peak periods. Suggested taps position of important transformers in NER for maintaining bus voltages within permissible limit as well as to minimize system losses are attached at **Annexure –D.15**.

Deliberation in the meeting

NERLDC circulated the results of tap-optimisation study for discussion. NERLDC also circulated the scatter plots at 400/220 kV Bongaigaon (PG), 400/220 kV Balipara (PG), 400/220 kV Misa (PG), 400/132 kV Ranganadi (NEEPCO), 400/132

kV Silchar (PG) and 400/132 kV Palatana (OTPC) to depict the pattern of voltages for the months of October 2015 – January 2016, to aid in tap optimization. It was iterated that due to non-availability of correct data in SCADA system from 400/220 kV Azara, 400/220 kV Byrnihat, 132 kV Biswanath Chariali (PG), scatter plots could not be developed for these substations. NERLDC requested to ensure proper data from all 400 kV substations, considering their importance.

After detailed deliberation, the Sub-committee suggested that transformer tap position can be tested at Byrnihat sub-station first and the outcome can be monitored by NERLDC if the voltage will improve.

Action: NERLDC.

D.16 Rescheduling of Seminar on “Restoration procedure”

Like previous years this year also NERLDC will organize one day seminar on “Restoration Procedure of NER Grid”. It was proposed to organize the seminar in February’16. Now the same is rescheduled to March’16, the exact date & venue will be intimated later. We have received some nominations from some utilities. All the other Utilities are requested to please nominate 4/5 or more number of participants associated with operation of SLDCs, Generating stations and Sub-stations for the purpose.

Deliberation in the meeting

DGM(SO-I), NERLDC informed that the above seminar will be held in March, 2016 and requested all the constituents to send the nominations at the earliest. The exact date and venue will be intimated shortly.

The Sub-committee noted as above.

Action: NERLDC.

D.17 Restoration of 220/132 kV, 30 MVA ICT-I of Mokokchung

The 220/132 kV, 30 MVA ICT-I of Mokokchung is under outage since 18.10.2015 as a result of which the other ICT is getting overloaded and it is not possible to run the system in closed loop. Moreover it is also difficult to keep the 220 kV lines in charged condition due to over voltage problem. To avoid these problems 220 kV Mariani(New) – Mokokchung ckt-I& II are being kept in open condition most of the time and Mokokchung is radially fed from Doyang. Early restoration of the ICT-I is urgently required.

Deliberation in the meeting

DGM(AM), NERTS informed that the work is in progress and the ICT-I will be restored within February, 2016.

The Sub-committee noted as above.

Action: NERTS.

D.18 CERC Order on Petition no. 007/SM/2014

Hon'ble CERC has issued order against Petition no. 007/SM/2014 on 29.01.15 [Suo Motto]. Gist of the above order is as follows:

- a. PGCIL to undertake effective monitoring of telemeter data and to minimize the intermittency in telemetry in all regions within six months from the issue of the order. NLDC is directed to submit status of PGCIL's telemetry within one month thereafter.
- b. All the utilities/generating companies which have to still establish telemeter power system parameters as per details given in para11 of the Order to provide data to RLDCs/SLDCs as per the provisions of the Grid Code and CEA Grid Standards Regulations by 31.7.2016.
- c. Department of Power, Govt. of Arunachal Pradesh and Department of Power, Govt. of Nagaland to up-date status of telemetry in their system within one month of this order with an advance copy to NLDC, NERLDC and NERPC. Based on the replies, NERLDC will monitor the implementation of telemetry and in case of any difficulty, the matter may be discussed and sorted out in the NERPC meetings. If any of these entities does not submit the information, NERLDC may file application before the Commission against the said entities under Section 142 of the Act.
- d. NLDC and respective RLDC are directed to up-date the status of telemetry every month at their web-site and persistent non-availability of data from the generating stations/sub-stations be taken up in RPC meetings for appropriate direction and action.
- e. NLDC is directed to submit user- wise latest status of telemetry, by 31.8.2016.

Deliberation in the meeting

Members felt the important of putting in place the telemetry system for benefit of system operation, the forum requested to take up the matter in next TeST meeting of NERPC.

The Sub-committee noted as above.

Action: NERPC.

D.19 Furnishing of Variable & Fixed Cost of Generating stations

SLDCs & ISGS of NER are requested to furnish their Variable & Fixed Cost on monthly basis to NERLDC for calculation of loss incurred by utilities after grid disturbance & grid incident, implementation of ancillary service, preparation of various reports etc. The data can be emailed to nerldc@yahoo.co.in.

As on date, NEEPCO is furnishing the data on monthly basis except AGTPP extension. OTPC, Palatana is only furnishing the Variable Cost on monthly basis.

All other generation utilities are requested to furnish the data.

Deliberation in the meeting

NERLDC informed that only NEEPCO had given both the fixed and variable cost. OTPC have furnished only the variable cost but the Annual Fixed cost is yet to be given. NHPC has not furnished for both.

NERLDC also requested SLDCs of NER to furnish the Annual Fixed cost and variable cost details of generators owned by state utilities, to NERLDC on regular basis.

The Sub-committee requested NHPC & OTPC & states of NER to furnish the same at the earliest.

Action: NHPC & OTPC & SLDCs.

D.20 Shortfall data in respect of Demand met(MW) [0800hrs & 1900/2000 hrs] & Energy met(MU)

NERLDC is preparing various reports on daily basis, for sending to Ministry and other authorities, which contain Shortfall data in respect of Demand met & Energy met. Assam, Meghalaya & Tripura are furnishing the MW shortfall data on daily basis through their SLDCs. In respect of Energy shortfall for a day only Meghalaya is

furnishing the same. As a result we are computing the shortfall figures based on statistics. These are creating confusion on some occasions. To avoid this it is requested to the remaining beneficiaries to furnish the above data so that same can be directly entered in the reports.

Time line for furnishing is as follows-

Demand met (MW) shortfall figures - 0900 Hrs for 0800 hrs data, 2100 hrs for 1900/2000 hrs data.

Energy met (MU) shortfall data - 0100 hrs for previous day.

Deliberation in the meeting

NERLDC informed that various report on daily basis are prepared which are being send to Ministry and other authorities. These reports are also referred by many agency/authority to access the power position of NER constituents.

The reports prepared by NERLDC contains Shortfall of State at morning 08:00 Hrs & Evening 19:00/20:00 Hrs in respect of Demand met and Shortfall in respect of Energy met in a day. Assam/Tripura are furnishing the morning 08:00 Hrs & Evening 19:00/20:00 Hrs shortfall data and only Meghalaya SLDC is furnishing the Energy shortfall data on daily basis. Other States are not furnishing these operational data.

Due to non-furnishing of data by the States to NELRDC. NERLDC is calculating morning 08:00 Hrs & Evening 19:00/20:00 Hrs and Energy met shortfall based on statistics.

The Sub-committee requested all SLDCs to furnish Demand met (MW) shortfall figures by 0900 Hrs for 0800 hrs data & by 2100 hrs for 1900/2000 hrs data and Energy met (MU) shortfall data - 0100 hrs for previous day.

D.21 Monthly Progress Report of Ongoing Projects

In 115th OCC Meeting of NERPC held on 24th November, 2015, it was decided that furnishing of monthly progress report by utilities of NER would be reviewed on a quarterly basis.

Latest status of furnishing of Monthly Progress Report of Ongoing Projects is as follows:

| <i>Name of Constituent</i> | <i>Latest Status</i> | <i>Remarks</i> |
|-------------------------------|----------------------|----------------|
| <i>DoP, Ar. Pradesh</i> | Submitted for Nov'15 | |
| <i>AEGCL</i> | Submitted for Nov'15 | |
| <i>APGCL</i> | Submitted for Nov'15 | |
| <i>MSPCL</i> | Submitted for Jan'16 | |
| <i>MePTCL</i> | Submitted for Jun'15 | |
| <i>MePGCL</i> | Not submitted | |
| <i>P&E Dept., Mizoram</i> | Not submitted | |
| <i>DoP, Nagaland</i> | Submitted for Sep'15 | |
| <i>TSECL</i> | Submitted for Aug'15 | |
| <i>POWERGRID</i> | Submitted for Jan'16 | |
| <i>NEEPCO</i> | Submitted for Jan'16 | |
| <i>NTPC</i> | Submitted for Dec'15 | |
| <i>NHPC</i> | Not submitted | |

This is for information & necessary action please.

D.22 Up-loading of reports/information in NERLDC website as per regulations of CERC& CEA.

- a. As per Clause No. 29.2 of Fees and Charges of RLDC and other related matter, Regulations 2015, "Each RLDC shall submit its actual performance against each of the key performance indicators to the Commission on annual basis as per the format specified in Appendix V."

Hon'ble CERC has identified 12 numbers of Key Performance Indicators (KPI). Out of these, the following information related to KPI are to be periodically uploaded in NERLDC website.

1. Interconnection meter error (Weekly)
2. Voltage Deviation Index of all 400 kV & above substation (Daily, Weekly & Monthly)
3. Frequency Deviation Index (Daily, Weekly & Monthly)
4. Reporting of system reliability (Daily, Weekly & Monthly)

This reports/information will be uploaded in NERLDC website on daily, weekly, & monthly basis w.e.f Mar16.

It is requested to POWERGRID (Bongaigaon, Balipara, Misa, Silchar, Biswanath Chariali), AEGCL (Azara), OTPC (Palatana), NEEPCO (Ranganadi), NTPC (BgTPP) & MePTCL (Byrnihat) to furnish the hourly bus voltage data to NERLDC on daily basis for calculation of Voltage Deviation Index.

- b. As per Clause No. 5.5.1.b, 5.5.1.c & 5.5.2.a of Indian Electricity Grid Code Regulations, 2010 by CEA, Daily, Weekly & Quarterly Report covering the performance of NER is being uploaded in NERLDC website.
- c. As per Clause No. 13.3 of Grid Standard Regulations, 2010 by CEA, a brief preliminary grid disturbance report is being uploaded in NERLDC website.
- d. Other reports such as Load Crash Reports (Event based), Grid Disturbance analysis based on PMU (Monthly) is also being uploaded in NERLDC website.
- e. Weekly Event Reports are being mailed to all the utilities for furnishing information for root cause analysis & remedial measures to be taken.
- f. Weather Warnings from IMD are mailed by Real Time Security Desk of NERLDC in each shift to all the utilities.
- g. Power Supply Position Report, Unit-wise Generation Report, Performance Report, System Status Report are uploaded in NERLDC website on monthly basis.
- h. Quarterly Operational Feedback consisting of system constraint, performance of grid, grid disturbances etc are being sent to NLDC for submission to CTU, CEA & CERC. However, the same can be accessed from NLDC website.

Deliberation in the meeting

NERLDC informed that at present, SCADA data of 400 kV Azara (AEGCL) and 400 kV Byrnihat (MePTCL) are not reporting correctly. Due to intermittency of SCADA data from 400 kV substations of NER, it becomes difficult to prepare reports as per directives of CERC. The constituents of NER were requested to collect and submit the data of 400 kV substations to NERLDC as backup to SCADA data.

It was agreed upon.

The Sub-committee noted as above.

ADDITIONAL AGENDA:

A. Sale of power, under requisition, over drawal & shortfall –

The matter was also discussed in earlier meetings. It has been observed that contradictory actions are being taking place in the system creating real time problem on some occasions. Constituents are requested to please look into the matter to avoid complications. Moreover, breakup of shortfall figures which were requested may please be furnished so that the same can be appraised to concerned authorities, including MOP, accordingly.

Deliberation in the meeting

DGM(SO), NERLDC stated that the States mainly Assam has been overdrawing from the Grid on a sustained basis which needs to be corrected.

Assam and Meghalaya SLDCs informed that due to erratic real time data, SLDCs cannot get the correct drawal figure from grid and at times real time data shows underdrawal whereas it is overdrawal in actual practice.

It was decided that the matter should be discussed in NETST forum to address the issue of real time visibility in SLDCs.

On an enquiry from Meghalaya regarding their shortage figure being depicted in daily report, it was clarified that same was based on Meghalaya data only. Meghalaya was advised to look into it and submit data in accordance with the philosophy being followed.

The Sub-committee requested all constituents to furnish shortfall and breakup of the same on regular basis and also requested all to avoid overdrawal when they are either selling power or has gone for under requisition from ISGS.

The Sub-committee noted as above.

B. Technical minimum of Palatana-

OTPC representative requested that Technical minimum of Palatana should be agreed % of installed capacity of each unit (less normative auxiliary consumption) and not on percentage of declared capacity.

They highlighted issues with their machines as below:

1. Gas Turbine Fuel mode change over from PM mode to PPM mode require set of Gas Control valves position change over(not desirable).
- 2) NOX generation will be more than statutory environmental limit(50 PPM) in case OTPC gas Turbines are operated below technical minimum load.

After discussion it was clarified that methodology being followed will continue to be in line with deliberation.

Date & Venue of next OCC meeting

It is proposed to hold the 119th OCC meeting of NERPC on first week of March, 2016. However, the exact date and venue will be intimated in due course.

The meeting ended with thanks to the Chair.

Annexure-I

List of Participants in the 118th OCC Meetings held on 11/02/2016

| SN | Name & Designation | Organization | Contact No. |
|----|-------------------------------------|--------------------|-------------|
| | No Representative | Ar. Pradesh | |
| 1 | Sh. T.N. Sarma, DGM, SLDC | Assam | 09435007369 |
| 2 | Sh. J.K. Baishya, AGM | Assam | 09435041494 |
| 3 | Sh. B.C. Borah, AGM,SLDC | Assam | 09435119248 |
| 4 | Sh. K. Sarma, AGM, AEGCL | Assam | 09435013532 |
| 5 | Sh. A.N. Dev Choudhury, AGM, APDCL | Assam | 09954055295 |
| 6 | Sh. A. Kayina, MSPCL | Manipur | 08132823793 |
| 7 | Sh. D. Theingam Thangal, MSPCL | Manipur | 08731923972 |
| 8 | Sh. F.E Kharshiing, SE (SLDC) | Meghalaya | 09863066960 |
| 9 | Sh. T. Gidon, EE, SLDC | Meghalaya | 09774479956 |
| | No Representative | Mizoram | - |
| | No Representative | Nagaland | |
| | No Representative | Tripura | |
| 10 | Sh. P. Kanungo, DGM (AM) | PGCIL | 09436302823 |
| 11 | Sh. N.R. Paul, DGM | NERLDC | 09436302723 |
| 12 | Sh. Anupam Kumar, Sr. Engineer | NERLDC | 09436335379 |
| 13 | Sh. Rahul Chakrabarti, Sr. Manager | NERLDC | 09402507543 |
| 14 | Sh. Ankit Jain, Engineer | NERLDC | 09436335381 |
| | No Representative | NEEPCO | |
| 15 | Sh. Smarajit Chakraborty, Mgr (O&M) | NTPC | 09435322591 |
| | No Representative | ENICL | - |
| 16 | Sh. MD Sajid Akhter, Manager (O&M) | NHPC | 09436678603 |
| 17 | Sh. Thakor Prasad Pandey, DGM (O&M) | OTPC | 08794718423 |
| 18 | Sh. P.K. Mishra, MS | NERPC | - |
| 19 | Sh. B. Lyngkhai, Director/S.E (O) | NERPC | 09436163419 |
| 20 | Sh. S.M. Aimol, DD/Ex. Engineer | NERPC | 08974002106 |

| Name of the line | Operating voltage (KV) | Tower Type | Length KM) | Type of Conductor | CT Ratio at either end (max) | | CT Ratio at either end (adopted) | | Maximum Loading Capacity | Present Loading Capacity) | Remarks |
|--------------------------------------|------------------------|----------------|------------|-------------------|------------------------------|-------|----------------------------------|-------|--------------------------|---------------------------|--|
| | | | | | Stn A | Stn B | Stn A | Stn B | | | |
| 132KV D/C RC Nagar-Agartala-I** | 132 | Double Circuit | 8.384 | ACSR PANTHER | 600/1 | 400/1 | 300/1 | 400/1 | 70 | 55 | Upgradation of conductors of these lines to HTLS conductors has been approved in 5th SCM of NER on 08.08.15. It is proposed to increase the CT ratios at both ends of this D/C to 800/1 each. (Total of 12 CTs will need to be replaced by POWERGRID). Replacement with higher capacity CTs will take at least 6 months. |
| 132KV D/C RC Nagar-Agartala-II** | 132 | Double Circuit | 8.384 | ACSR PANTHER | 600/1 | 400/1 | 300/1 | 400/1 | 70 | 55 | |
| 132KV S/C Badarpur-Kolasib | 132 | Single Circuit | 107.226 | AAAC PANTHER | 600/1 | 600/1 | 600/1 | 600/1 | 75 | 75 | No replacement of CTs required |
| 132KV S/C Kolasib-Aizwal | 132 | Single Circuit | 66.098 | AAAC PANTHER | 600/1 | 600/1 | 600/1 | 600/1 | 75 | 75 | No replacement of CTs required |
| 132 KV S/C Badarpur - Khliehriat | 132 | Single Circuit | 76.646 | AAAC PANTHER | 600/1 | 600/1 | 600/1 | 600/1 | 75 | 75 | No replacement of CTs required |
| 132 KV S/C Jiribam- Aizwal | 132 | Single Circuit | 172.315 | ACSR PANTHER | 400/1 | 400/1 | 400/1 | 400/1 | 70 | 70 | CT ratios need upgradation with 600/1 CTs at both ends of the line, in order to confirm to Dynamic Line ratings as per guidelines of NRCE (Total of 6 no. CTs will need to be replaced by POWERGRID). Replacement with higher capacity CTs will take at least 6 months. |
| 132 KV S/C Jiribam-Haflong | 132 | Single Circuit | 100.630 | ACSR PANTHER | 400/1 | 400/1 | 400/1 | 400/1 | 70 | 70 | CT ratios need upgradation with 600/1 CTs at both ends of the line, in order to confirm to Dynamic Line ratings as per guidelines of NRCE (Total of 6 no. CTs will need to be replaced by POWERGRID). Replacement with higher capacity CTs will take at least 6 more months. |
| 132KV S/C Khandong -Umrangso-Haflong | 132 | Single Circuit | 63.166 | ACSR PANTHER | 300/1 | 400/1 | 300/1 | 400/1 | 55 | 55 | CT ratios need upgradation with 600/1 CTs at Khandong and Umrangshu ends of 132 kV Khandong - Umrangshu lines and Umrangshu & Haflong ends of 132 kV Umrangshu - Haflong lines, in order to confirm to Dynamic Line ratings as per guidelines of NRCE (Total of 12 no. CTs will need to be replaced; 3 CTs at Khandong by NEEPCO; 3 CTs at Umrangshu end of 132 kV Umrangshu - Khandong by AEGCL; 3 CTs at Umrangshu end of 132 kV Umrangshu - Haflong line by AEGCL; 3 CTs a Haflong end of 132 kV Umrangshu - Haflong line by POWERGRID). AEGCL informed that LOA has been issued for CT ratio upgradation and replacement. AEGCL will further update status later. In Khandong side, tendering process is ongoing. |

| | | | | | | | | | | | |
|--------------------------------------|------------|-----------------------|---------------|---------------------|--------------|--------------|--------------|--------------|-----------|-----------|---|
| 132kV S/C Kumarghat-R.C.Nagar | 132 | Single Circuit | 104.020 | ACSR PANTHER | 600/1 | 600/1 | 600/1 | 600/1 | 75 | 75 | No replacement of CTs required |
| 132 KV S/C Loktak - Imphal-II | 132 | Single Circuit | 35.040 | ACSR PANTHER | 400/1 | 600/1 | 400/1 | 600/1 | 75 | 75 | CT ratios need upgradation with 600/1 CTs at Loktak end of the line, in order to confirm to Dynamic Line ratings as per guidelines of NRCE (Total of 3 no. CTs will need to be replaced by NHPC). NHPC has already procured the CTs for replacement. Expected to complete by April 2016. |
| 132KV S/C Nirjuli-Ranganadi | 132 | Single Circuit | 22.29 | ACSR PANTHER | 600/1 | 500/1 | 600/1 | 500/1 | 75 | 75 | No replacement of CTs required |
| 132kv Palatana-Surajmani Nagar | 132 | Double Circuit | 35.00 | Twin ACSR Moose | 600/1 | 600/1 | 600/1 | 600/1 | 120 | 120 | No replacement of CTs required |
| 132 kV Doyang -- Dimapur I | 132 | Double Circuit | 92.53 | ACSR PANTHER | 300/1 | 300/1 | 300/1 | 300/1 | | | Procurement and upgradation of CTs will take at least another 6 months. |
| 132 kV Doyang - Dimapur II | 132 | Double Circuit | 92.53 | ACSR PANTHER | 300/1 | 300/1 | 300/1 | 300/1 | | | |

| DEMAND FORECAST USING PAST 3 YEARS DATA (April 2016 - June 2016) | | | | | | | | | | | | | | Data given by DICs | Comments |
|--|--------------|--------------|--------------|--------------|--------------|--------------|--------------|--------------|-----------------|-----------------|-----------------|--|-------|--------------------|--|
| 2013-14 | | | 2014-15 | | | 2015-16 | | | 1 | 2 | 3 | 4 | | | |
| Apr-13 | May-13 | Jun-13 | Apr-14 | May-14 | Jun-14 | Apr-15 | May-15 | Jun-15 | 2013-14 Average | 2014-15 Average | 2015-16 Average | Projected Demand for (Apr 2016 to Jun 2016) before | | | |
| Arunachal Pradesh | 95 | 100 | 106 | 104 | 111 | 110 | 114 | 109 | 108 | 100 | 108 | 110 | 119 | | |
| Assam | 1,012 | 1,102 | 1,118 | 1,230 | 1,212 | 1,215 | 1,282 | 1,260 | 1,324 | 1,077 | 1,219 | 1,289 | 1,200 | 1250 | As per Data given by Assam and 118th OCC |
| Manipur | 98 | 113 | 116 | 112 | 109 | 117 | 148 | 153 | 147 | 109 | 113 | 149 | 164 | 164 | As per Data given by Manipur |
| Meghalaya | 273 | 286 | 271 | 272 | 296 | 289 | 312 | 295 | 295 | 277 | 286 | 301 | 278 | 278 | As per Data given by Meghalaya |
| Mizoram | 64 | 62 | 68 | 76 | 73 | 74 | 80 | 84 | 81 | 65 | 74 | 82 | 89 | 89 | As per Data given by Mizoram |
| Nagaland | 80 | 100 | 96 | 102 | 104 | 111 | 112 | 112 | 120 | 92 | 106 | 115 | 114 | 114 | As per Data given by Nagaland |
| Tripura | 206 | 212 | 220 | 246 | 233 | 230 | 238 | 254 | 249 | 213 | 236 | 247 | 258 | 258 | As per Data given by Tripura |
| N. Eastern Region | 1,718 | 1,810 | 1,900 | 2,045 | 1,986 | 1,998 | 2,114 | 2,185 | 2,190 | | | | | | |

Notes

1. Projections are based on the past 3 years' monthly Peak Demand Met data available on the website of CEA
2. The above projections are being done for financial year 2016-2017 (Q1) i.e April 2016 to June 2016
3. Projections are being done based on the forecast function available in MS Office Excel
4. In case of the re-organized states of Andhra Pradesh and Telangana Maximum Demand is divided in the ratio 53.89% for Telangana and 46.11% for Andhra Pradesh for FY 2012-13 and 2013-14. This is as per letter No.CE/COMML./APPCC/DE-COMML/POC-DATA-15-16/D.No/15 dtd. 09.10.15 as received from APTRANSCO.
4. CEA Reports can be accessed from the following links:

http://cea.nic.in/reports/monthly/powersupply/2013/psp_peak-04.pdf
http://cea.nic.in/reports/monthly/powersupply/2013/psp_peak-05.pdf
http://cea.nic.in/reports/monthly/powersupply/2013/psp_peak-06.pdf
http://cea.nic.in/reports/monthly/powersupply/2014/psp_peak-04.pdf
http://cea.nic.in/reports/monthly/powersupply/2014/psp_peak-05.pdf
http://cea.nic.in/reports/monthly/powersupply/2014/psp_peak-06.pdf
http://cea.nic.in/reports/monthly/powersupply/2015/psp_peak-04.pdf
http://cea.nic.in/reports/monthly/powersupply/2015/psp_peak-05.pdf
http://cea.nic.in/reports/monthly/powersupply/2015/psp_peak-06.pdf

Generation Projection (April'16 - June'16)

| | | | | Generation declared Commercial from 1st July '15 to 31st Decem | | | | | Generation declared/expected to be declared Commercial from 1st | | | | | | | | |
|---------|-------------------|--------|-----------------------------------|--|----------|--------------------|-----------------|-----------|---|----------|--------------------|-----------------|-----------|-------------|---|---------------------------------|---|
| | | | | '15 | | | | | Jan '16 to 31st Mar'16 | | | | | | | | |
| Sl. No. | Entities | Region | Projections based on 3 Years Data | Bus Name | Unit No. | Installed Capacity | Gen. considered | Sub Total | Bus Name | Unit No. | Installed Capacity | Gen. considered | Sub Total | TOTAL | Comments From DICS /Others (if any) | Figure as per Comments/PoC Data | Projected Generation before normalization w.r.t projected All In Peak Demand & 118th OCC Comments |
| | | | (MW) | | | | (MW) | (MW) | (MW) | | | | (MW) | (MW) | | | |
| 1 | AGTPP, NEEPCO | NER | 82 | | | | | | | | | | | 82 | As per forecasted generation given by NEEPCO | 107 | 78 |
| 2 | AGTPP Extn. | NER | | | | | | | | | | | | | | 46 | 44 |
| 3 | Doyang, NEEPCO | NER | 44 | | | | | | | | | | | 44 | | 42 | 42 |
| 4 | Kopili, NEEPCO | NER | 146 | | | | | | | | | | | 146 | | 120 | 90 |
| 5 | Khandong, NEEPCO | NER | 38 | | | | | | | | | | | 38 | | 30 | 30 |
| 6 | Ranganadi, NEEPCO | NER | 430 | | | | | | | | | | | 430 | | 407 | 401 |
| 7 | Kathalguri | NER | 224 | | | | | | | | | | | 224 | | 231 | 231 |
| 8 | Loktak, NHPC | NER | 98 | | | | | | | | | | | 98 | | 103 | |
| 9 | Palatana GBPP | NER | 478 | | | | | | | | | | | 478 | As per forecasted generation given by OTPC | 478 | 478 |
| 10 | Arunachal Pradesh | NER | 0 | | | | | | | | | | | 0 | | | 0 |
| 11 | Assam | NER | 356 | | | | | | | | | | | 356 | Forecasted generation as given by Assam | 246 | 246 |
| 12 | Manipur | NER | 0 | | | | | | | | | | | 0 | | | 0 |
| 13 | Meghalaya | NER | 158 | Meghalaya Power Limited | 2 | 45 | 20 | 20 | | | | | | 178 | Forecasted generation as given by Meghalaya | 271 | 271 |
| 14 | Nagaland | NER | 16 | | | | | | | | | | | 16 | Forecasted Maximum injection as given by Nagaland | 21 | 21 |
| 15 | Tripura | NER | 107 | | | | | | | | | | | 107 | Forecasted Maximum injection as given by Tripura | 98 | 98 |
| 16 | Mizoram | NER | 3 | | | | | | | | | | | 3 | Forecasted generation as given by Mizoram | 6 | 6 |
| | TOTAL | | 2180 | | | | | 20 | | | | | 0 | 2200 | | | 2201 |

Note:

1. Projections are based on monthly maximum injection in the last 3 years from actual metered data.

2. Generation forecast has been done based on the following criteria

(i) If there is an increasing trend then last year average generation has been considered

(ii) Otherwise average of past three year average generation has been considered

3. In case of new generators where past data was not available following has been assumed

(i) 1 plf for hydro generators

(ii) 0.7 plf for thermal generators.

(iii) 0.3 plf for gas stations

4. In case of the re-organized states of Andhra Pradesh and Telangana Generation is divided in the ratio 53.89% for Telangana and 46.11% for Andhra Pradesh for FY 2012-13 and 2013-14.

This is as per letter No.CE/COMML./APPCC/DE-COMML/POC-DATA-15-16/D.No/15 dtd. 09.10.15 as received from APTRANSCO.

Transformer Tap Optimisation Study

Senario : February 2016

09-Feb-16

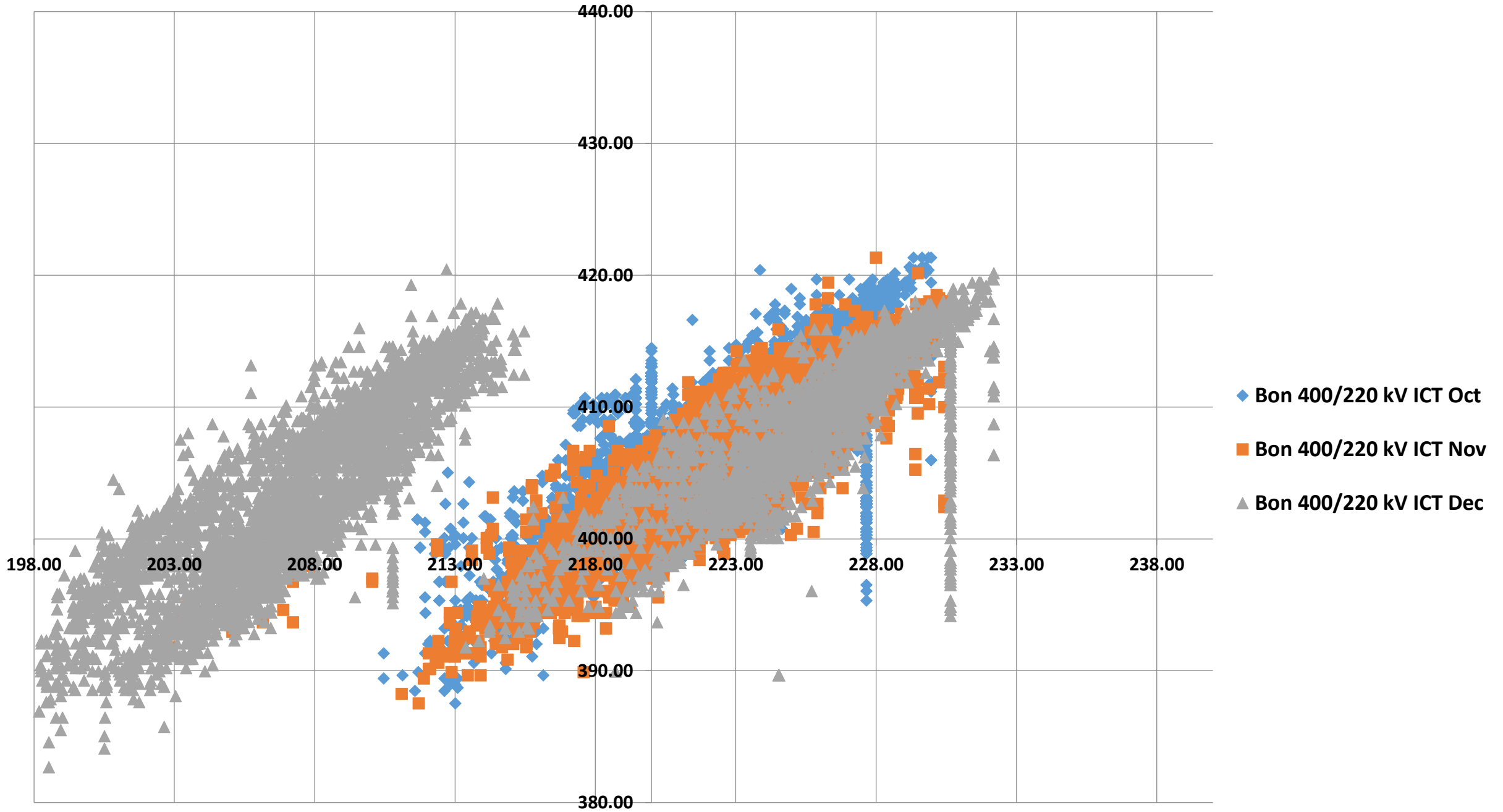
| Sl. No. | Substation | Voltage Ratio (kV) | Transformer No. | Capacity in MVA | Controlled Bus | Tap Step (%) | Total Tap Positions | Nominal Tap | Present Tap | Voltage Profile | | | | Optimised Tap Changer Position |
|---------|-------------------------|--------------------|-----------------|-----------------|----------------|--------------|---------------------|-------------|-------------|-----------------|---------------------|-------------------|-------------------|--------------------------------|
| | | | | | | | | | | Off-Peak | | | Peak | |
| | | | | | | | | | | Nominal Taps | Present Tap setting | After Optimisaton | After Optimisaton | |
| 1 | Balipara | 400/220 | 1 | 315 | 400kV | 1.25 | 17 | 9 | 9 | 422 | 417 | 413 | 407 | NO+1 (10) |
| | | 220/132 | 2 | 50 | 132kV | 1.25 | 17 | 9 | 9 | 140 | 140 | 136 | 133 | NO+2 (11) |
| | | 220/132 | 3 | 50 | 132kV | 1.25 | 17 | 9 | 9 | | | | | NO+2 (11) |
| 2 | Bongaigaon | 400/220 | 1 | 315 | 400kV | 1.25 | 17 | 9 | 12 | 419 | 419 | 416 | 412 | NO+3 (12) |
| 3 | Salakati | 220/132 | 1 | 50 | 132 kV | 1.25 | 17 | 13 | 13 | 142 | 138 | 137 | 133 | NO (13) |
| | | 220/132 | 2 | 50 | 132 kV | 1.25 | 17 | 13 | 16 | | | | | NO+3 (16) |
| 4 | Misa | 400/220 | 1 | 315 | 400kV | 1.25 | 17 | 9 | 5 | 423 | 417 | 410 | 404 | NO-4 (5) |
| | | 400/220 | 2 | 315 | 400kV | 1.25 | 17 | 9 | 5 | | | | | NO-4 (5) |
| 5 | RHEP | 400/132 | 1 | 360 | 400 kV | 2.5 | 17 | 9 | 9 | 424 | 419 | 414 | 409 | NO+2 (11) |
| | | 400/132 | 2 | 360 | 400 kV | 2.5 | 17 | 9 | 9 | | | | | NO+2 (11) |
| 6 | Azara | 400/220 | 1 | 315 | 400kV | 1.25 | 17 | 9 | 8 | 421 | 419 | 416 | 410 | NO-1 (8) |
| | | 400/220 | 2 | 315 | 400kV | 1.25 | 17 | 9 | 8 | | | | | NO-1 (8) |
| 7 | Biswanath Chariali (PG) | 400/132 | 1 | 200 | 400 kV | 1.25 | 17 | 9 | 8 | 425 | 420 | 415 | 410 | NO-1 (8) |
| | | 400/132 | 2 | 200 | 400 kV | 1.25 | 17 | 9 | 8 | | | | | NO-1 (8) |
| 8 | Silchar | 400/132 | 1 | 200 | 400 kV | 1.25 | 17 | 9 | 9 | 419 | 421 | 417 | 409 | NO (9) |
| | | 400/132 | 2 | 200 | 400 kV | 1.25 | 17 | 9 | 9 | | | | | NO (9) |
| 9 | Byrnihat | 400/220 | 1 | 315 | 400 kV | 1.25 | 17 | 9 | 9 | 426 | 428 | 426 | 420 | NO+2 (11) |
| | | 400/220 | 2 | 315 | 400 kV | 1.25 | 17 | 9 | 9 | | | | | NO+2 (11) |
| 10 | Palatana | 220/132 | 5083/1 | 160 | 132 kV | 1.25 | 17 | 9 | 9 | 140 | 141 | 141 | 141 | NO-1 (8) |
| | | 220/133 | 5083/1 | 160 | 132 kV | 1.25 | 17 | 9 | 9 | | | | | NO-1 (8) |
| | | 400/132 | 1 | 125 | 132 kV | 1.25 | 17 | 9 | 9 | 140 | 141 | 137 | 134 | NO+2 (11) |
| | | | | | | | | | | | | | | |

Note : a) NO indicates Nominal Tap position, b) NO-1 when HV bus is controlled bus, indicates transferring MVAR from HV bus to LV bus to reduce voltage of the HV bus and increase voltage of LV bus

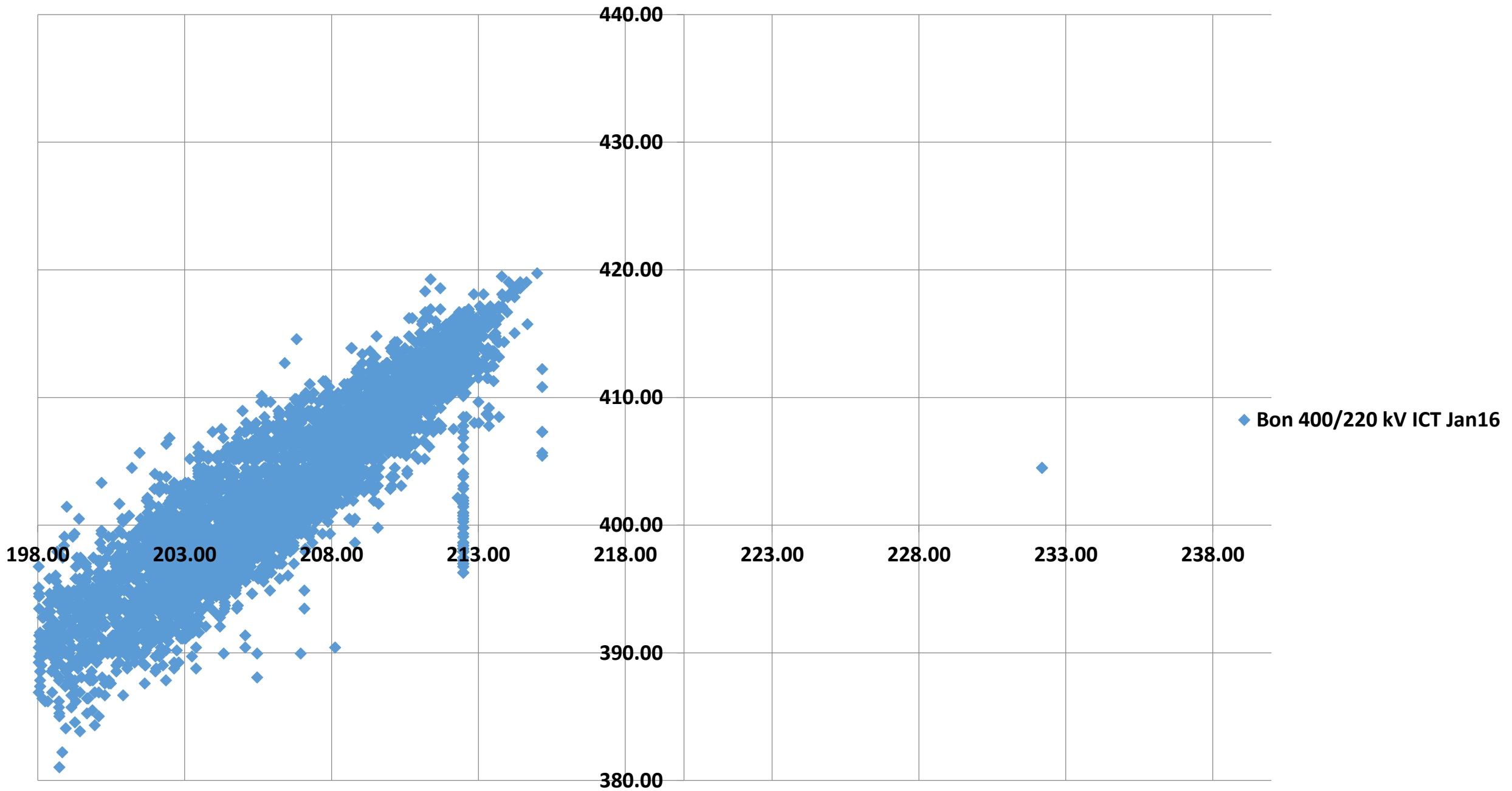
Scatter Plots

(October 2015 to January 2016)

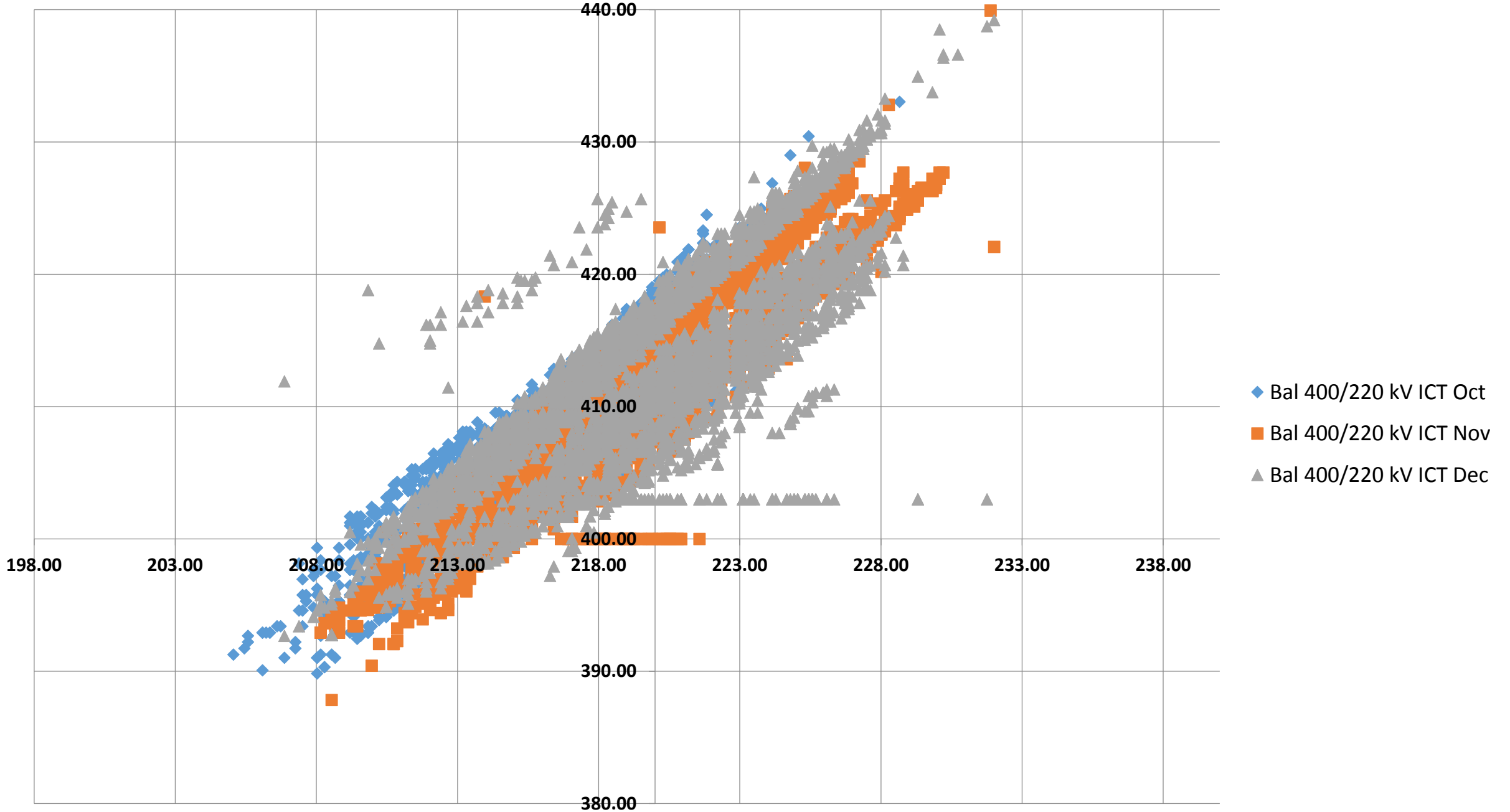
400/220 kV Bongaigaon (Oct-Dec 2015)



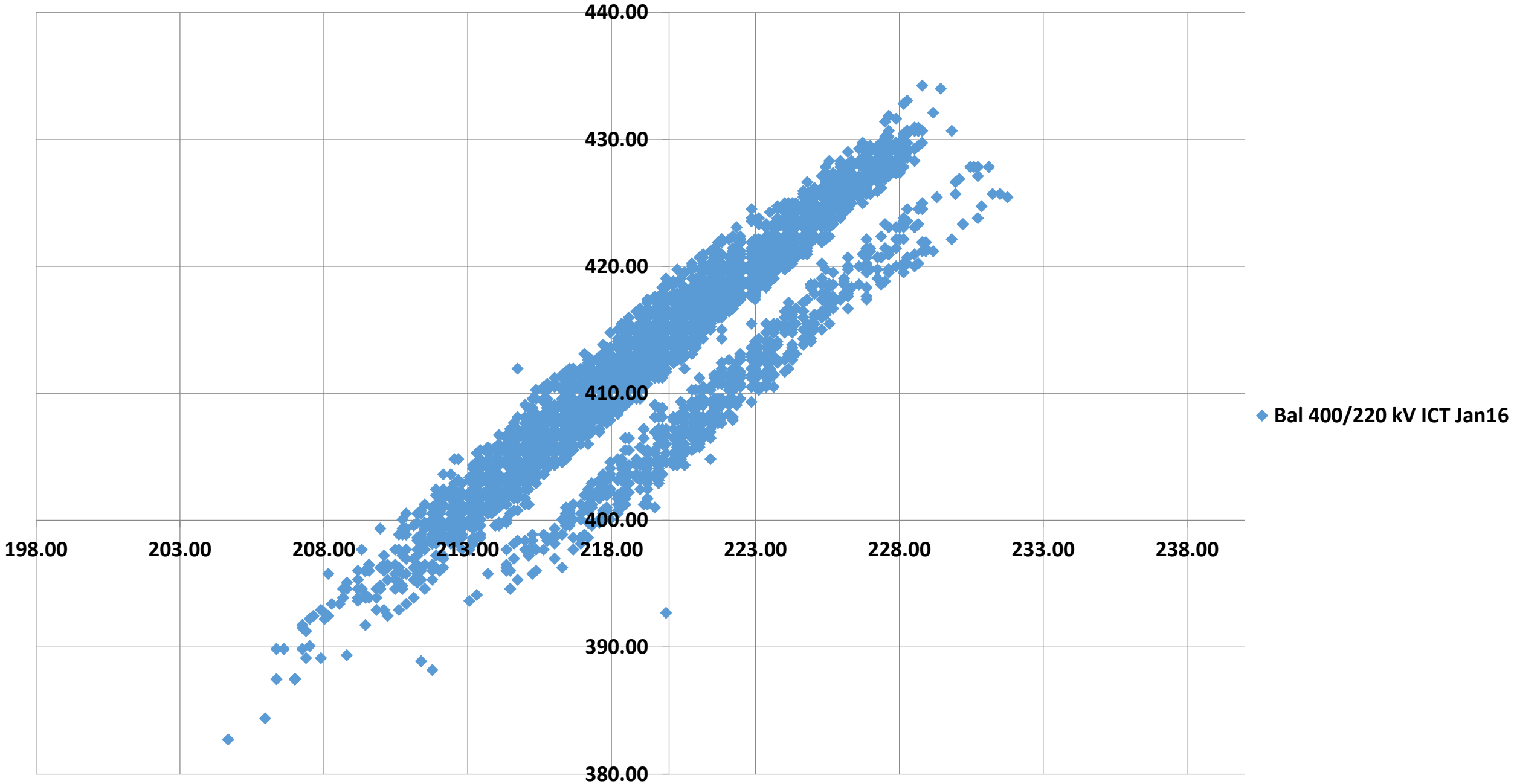
400/220 kV Bongaigaon (Jan 2016)



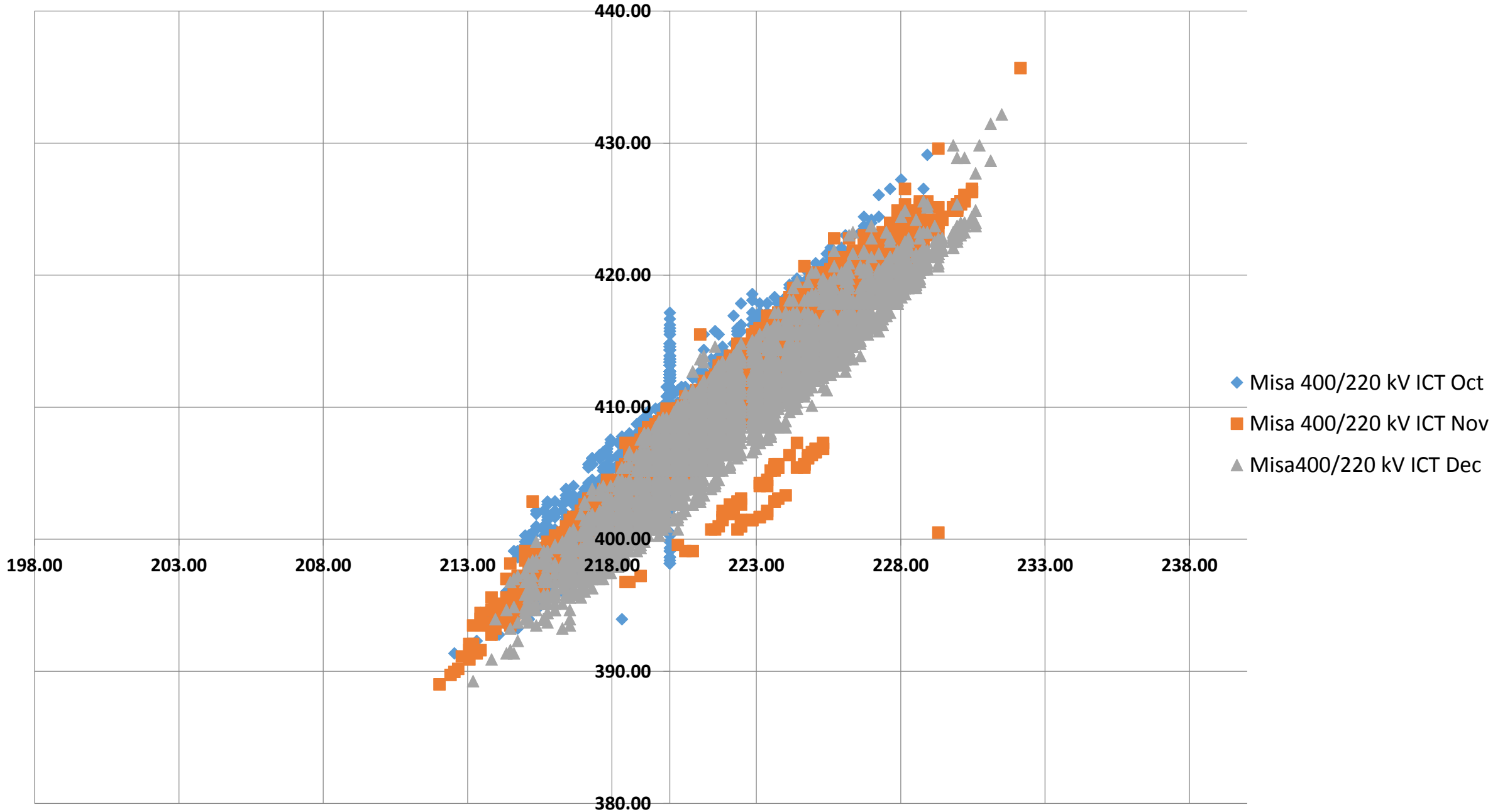
400/220 kV Balipara (Oct-Dec 2015)



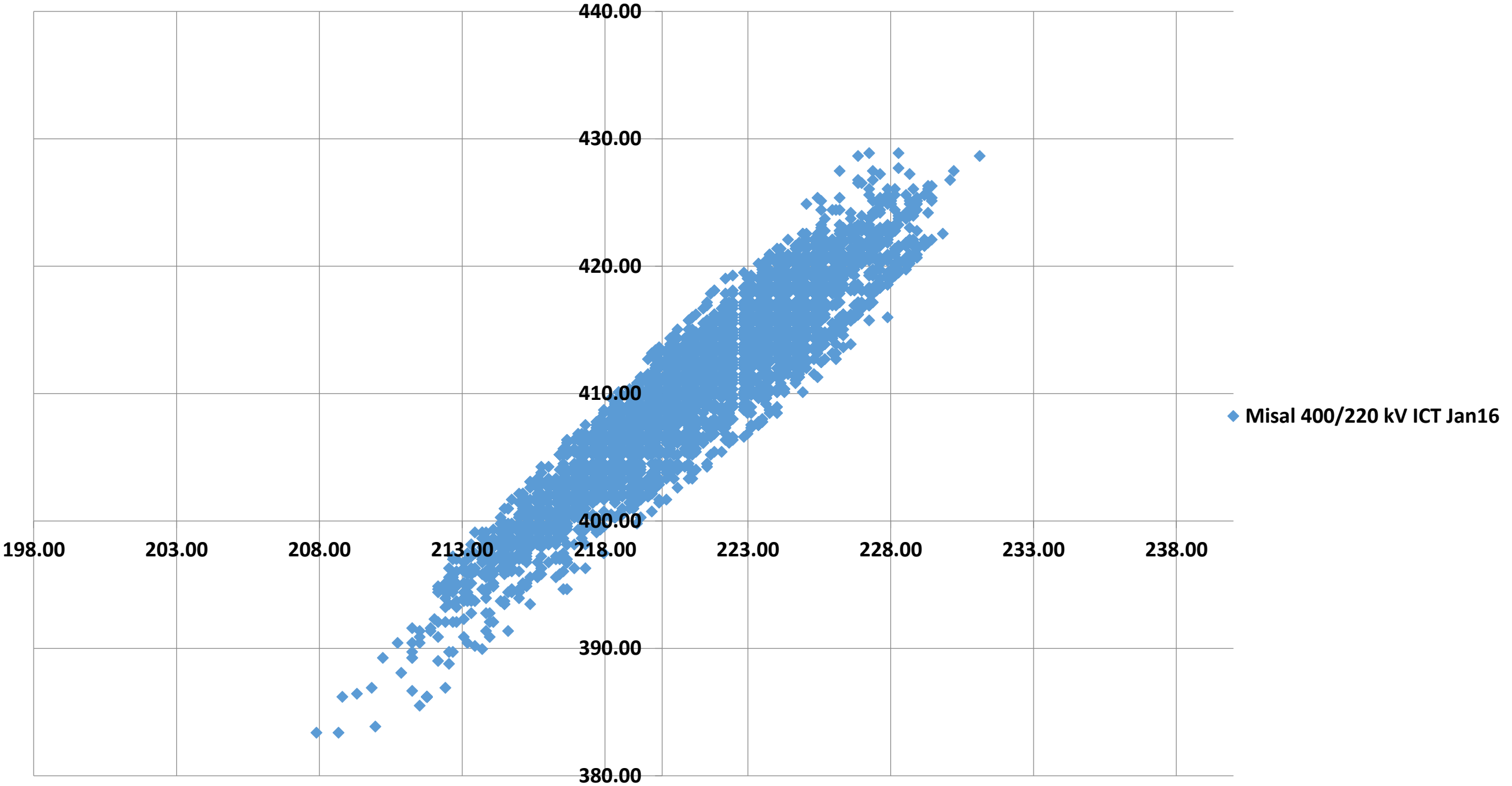
400/220 kV Balipara (Jan 2016)



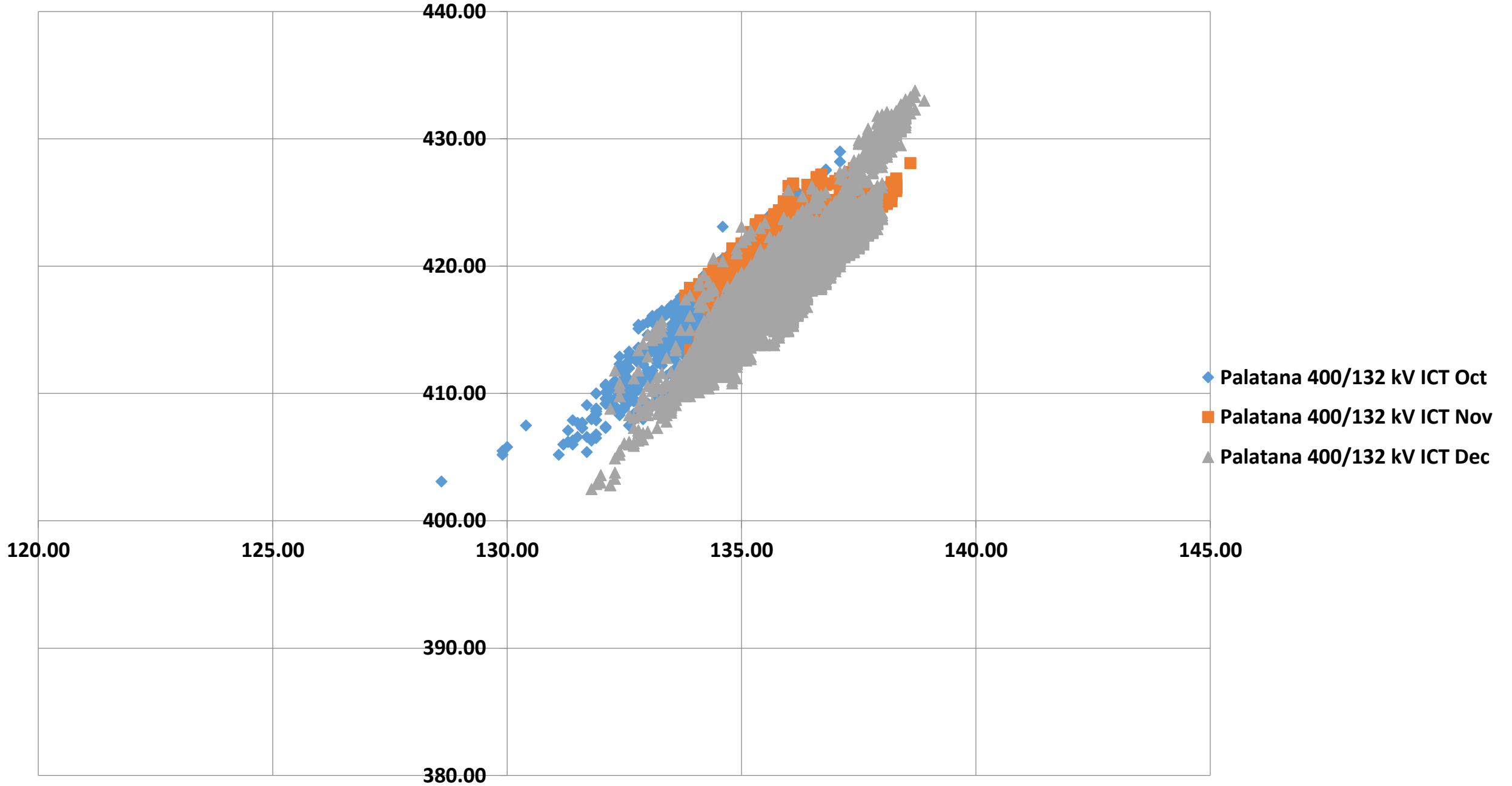
400/220 kV Misa (Oct-Dec 2015)



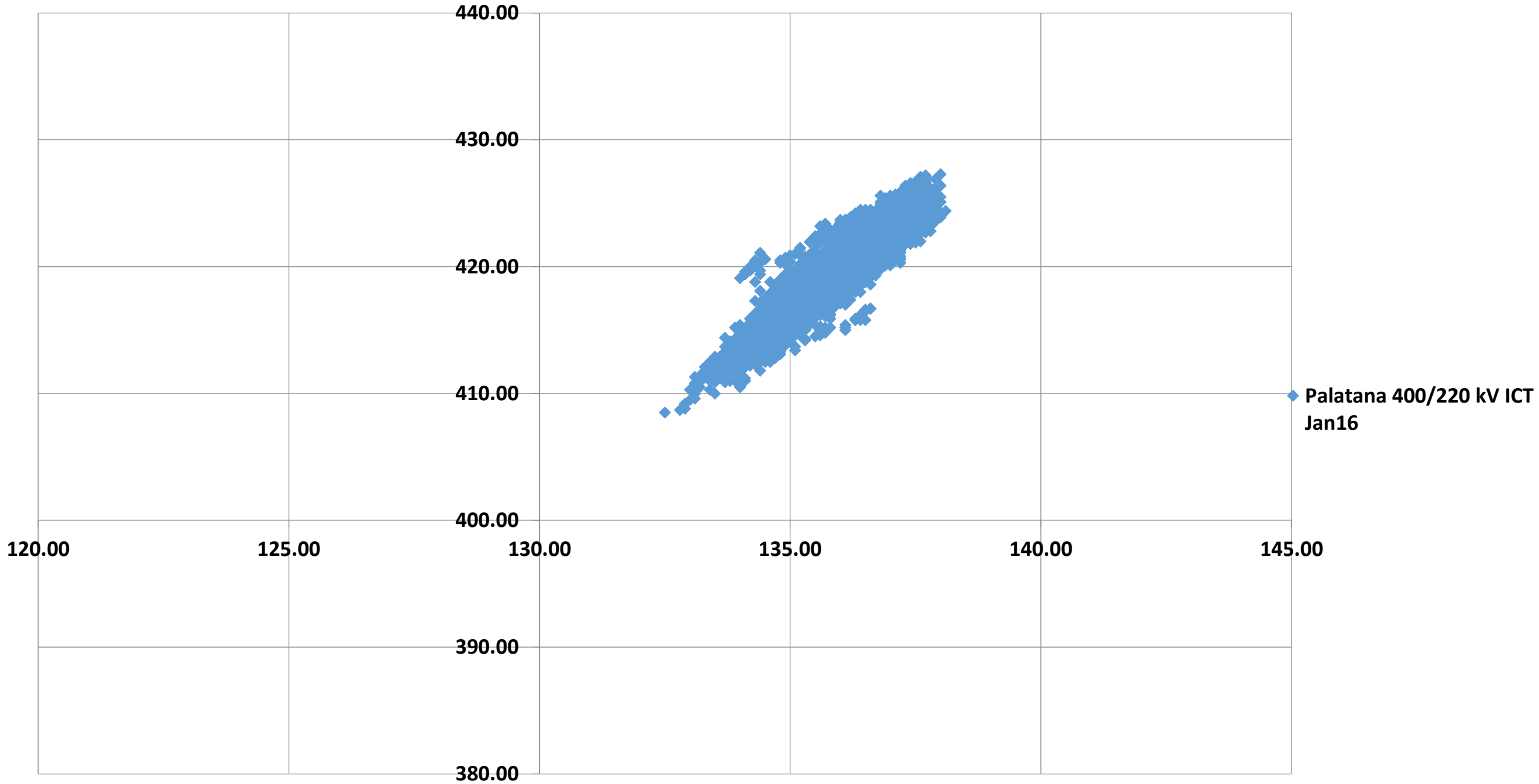
400/220 kV Misa (Jan 2016)



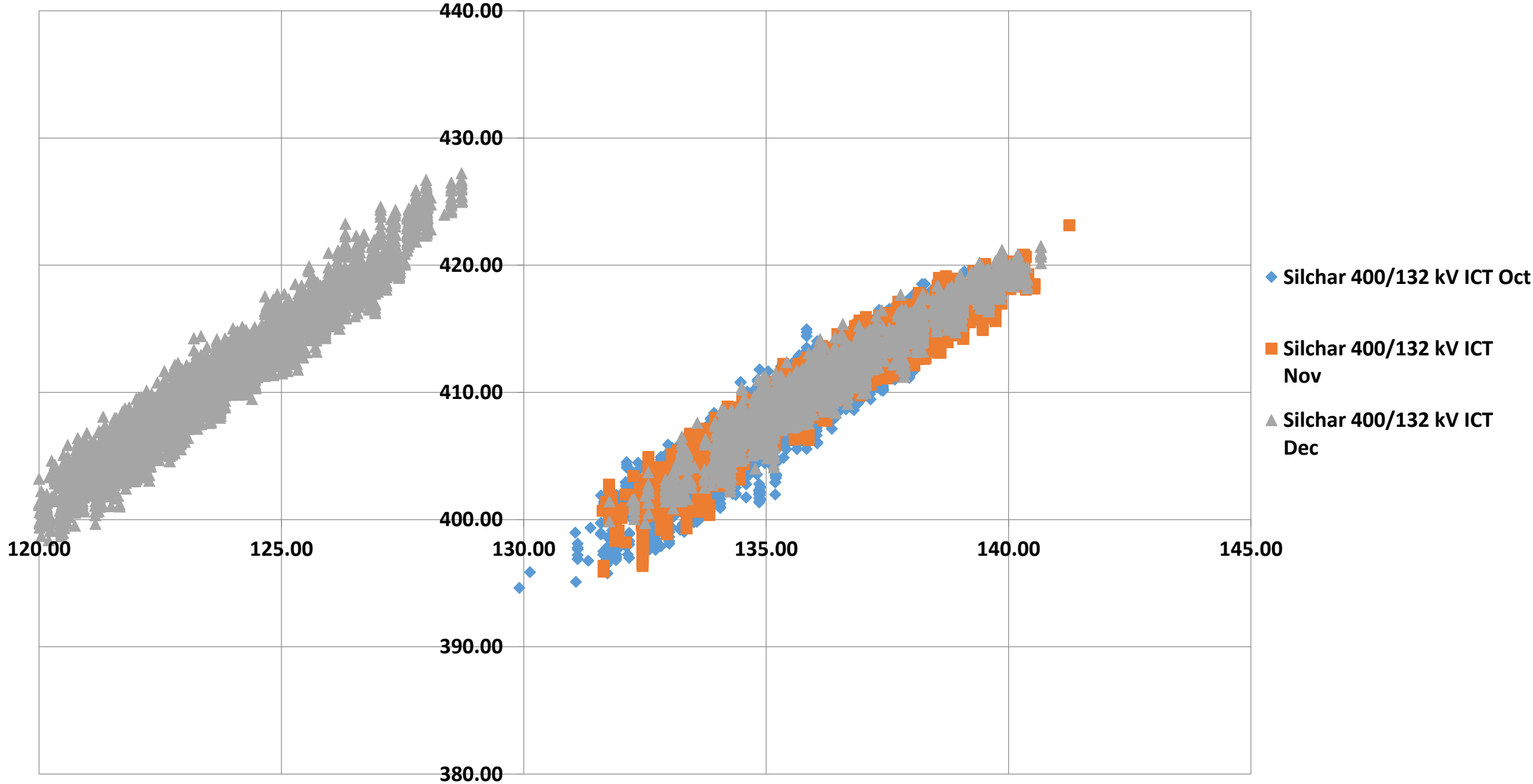
400/220 kV Palatana (Oct-Dec 2015)



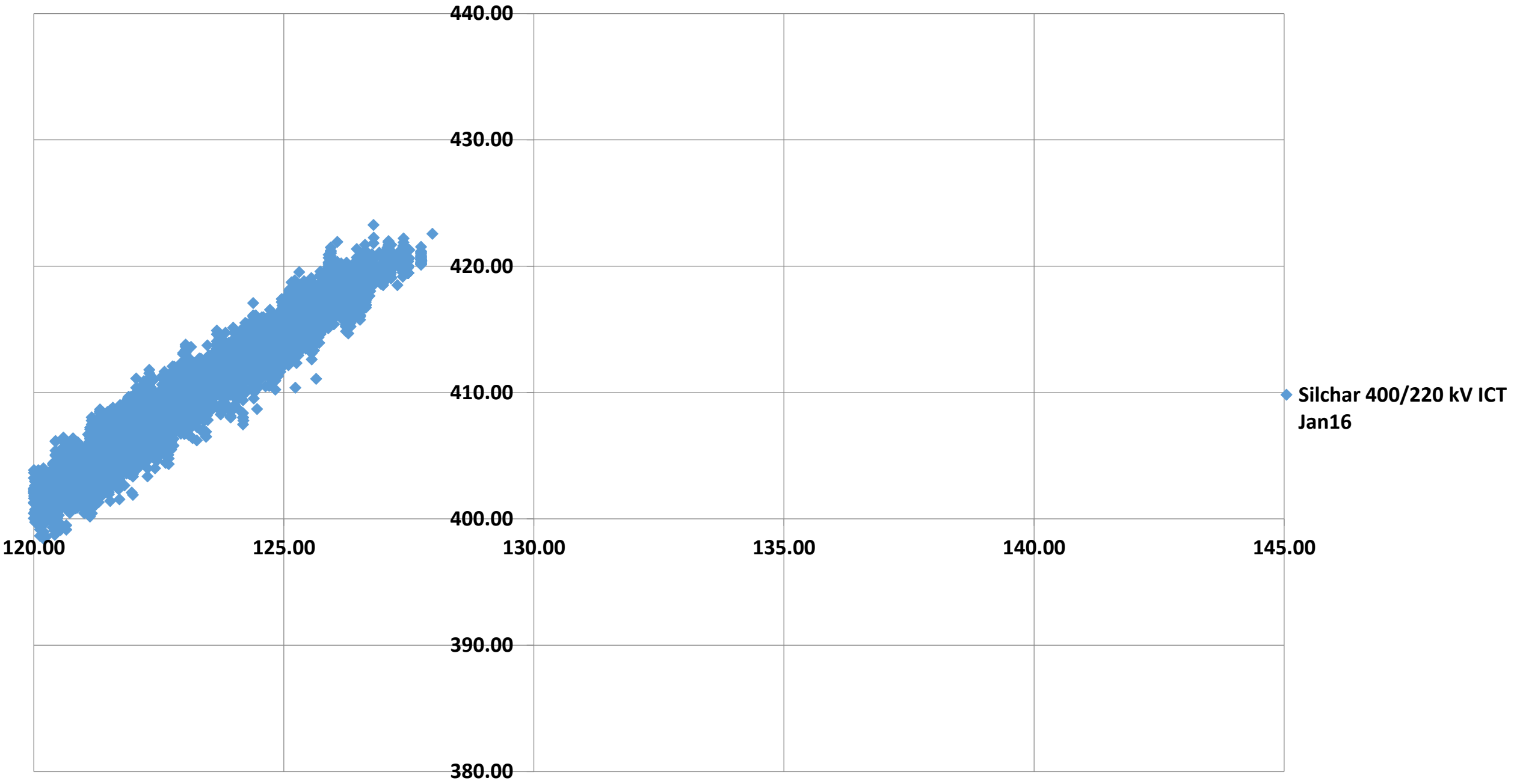
400/220 kV Palatana (Jan 2016)



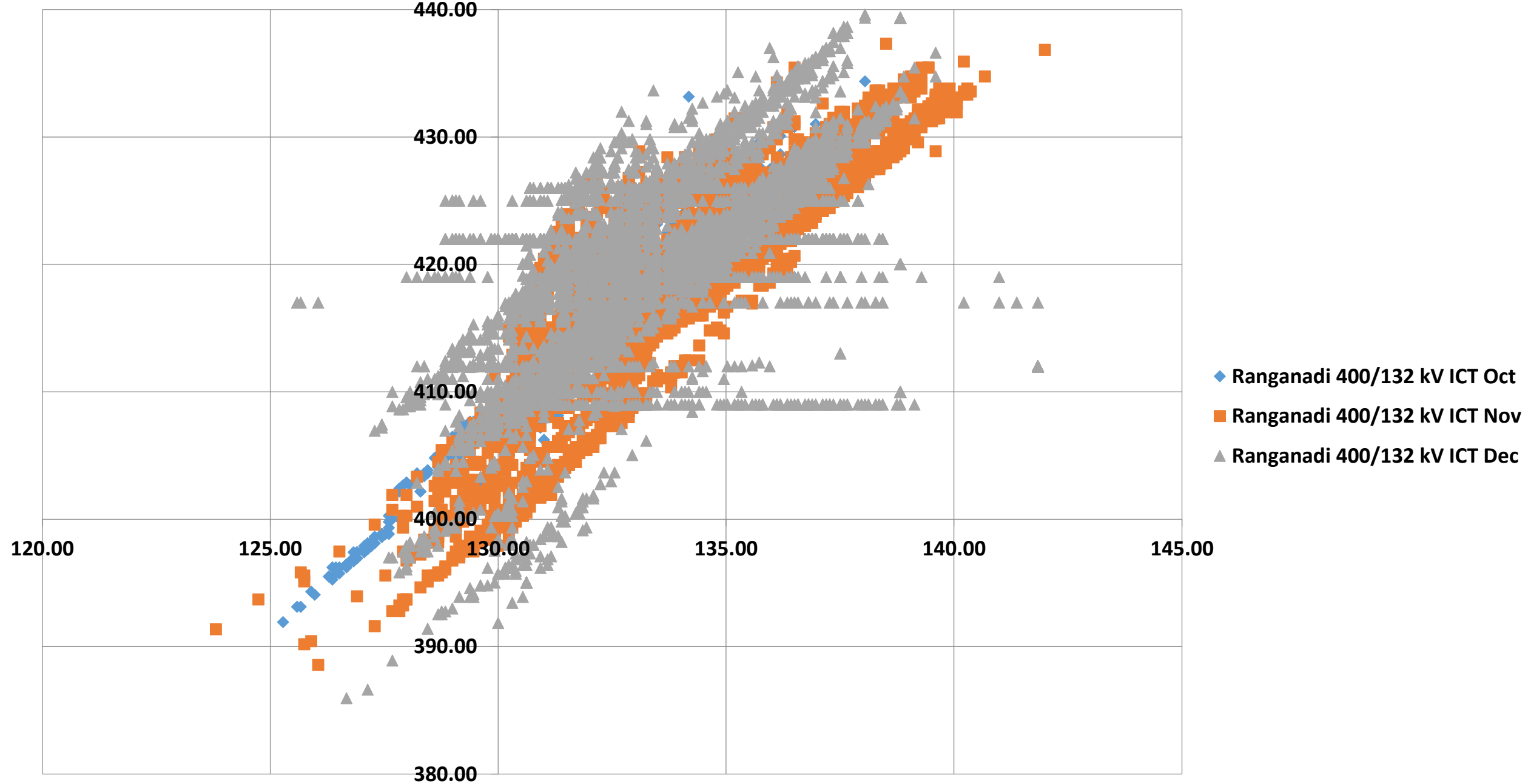
400/220 kV Silchar (Oct-Dec 2015)



400/220 kV Silchar (Jan 2016)



400/132 kV Ranganadi (Oct-Dec 2015)



400/132 kV Ranganadi (Jan 2016)

