भारत सरकार Government of India
विद्युत मंत्रालय Ministry of Power
उत्तर पूर्वी क्षेत्रीय विद्युत समिति
North Eastern Regional Power Committee
एन ई आर पी सी कॉम्प्लेक्स, डोंग पारमाओ, लापालाङ, शिल्लोंग-७९३००६, मेघालय
NERPC Complex, Dong Parmaw, Lapalang, Shillong - 793006, Meghalaya

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No. NERPC/SE (O)/NETeST/2018/***71-108*** Dated: April 27, 2018

To,

1. Managing Director, AEGCL, Bijuli Bhawan, Guwahati – 781 001
2. Managing Director, APDCL, Bijuli Bhawan, Guwahati – 781 001
3. Managing Director, APGCL, Bijuli Bhawan, Guwahati – 781 001
4. Director (Generation), Me. PGCL, Lumjingshai, Short Round Road, Shillong – 793 001
5. Director (Distribution), Me. ECL, Lumjingshai, Short Round Road, Shillong – 793 001
6. Director(Transmission), Me. PTCL, Lumjingshai, Short Round Road, Shillong – 793 001
7. Managing Director, MSPDCL, Secure Office Bldg. Complex, South Block, Imphal – 795 001
8. Managing Director, MSPCL, Electricity Complex, Keishampat, Imphal – 795 001
9. Director (Tech.), TSECL, Banamalipur, Agartala -799 001.
10. Director (Generation), TPGCL, Banamalipur, Agartala -799 001.
11. Chief Engineer (WE Zone),Department of Power ,Govt. of Arunachal Pradesh, Itanagar- 791111
12. Chief Engineer (EE Zone),Department of Power, Govt. of Arunachal Pradesh, Itanagar- 791111
13. Chief Engineer (TP&MZ),Department of Power, Govt. of Arunachal Pradesh, Itanagar- 791111
14. Engineer-in-Chief (P&E), Department of Power, Govt. of Mizoram, Aizawl – 796 001
15. Chief Engineer (P), Department of Power, Govt. of Nagaland, Kohima – 797 001
16. CGM, (LDC), SLDC Complex, AEGCL, Kahilipara, Guwahati-781 019
17. Group General Manager, NTPC, Bongaigoan Thermal Power Project, P.O. Salakati, Kokrajhar- 783369
18. ED, NERTS, PGCIL, Dongtieh-Lower Nongrah, Lapalang, Shillong -793 006
19. ED (O&M), NEEPCO Ltd., Brookland Compound, Lower New Colony, Shillong-793003
20. ED (Commercial), NEEPCO Ltd., Brookland Compound, Lower New Colony, Shillong-793003
21. ED (O&M), NHPC, NHPC Office Complex, Sector-33, Faridabad,Haryana-121003
22. Vice President (Plant), OTPC, Badarghat Complex, Agartala, Tripura - 799014
23. GM, NERLDC, Dongtieh, Lower Nongrah, Lapalang, Shillong -793 006
24. Member Secretary, ERPC, 14 Golf Club Road, Tollygunge, Kolkata-700033
25. Chief Engineer, GM Division, Central Electricity Authority, New Delhi – 110066
26. Chief Engineer (NPC), NRPC Complex, Katwaria Sarai, SJSS Marg., New Delhi - 110016

Sub: Minutes of 9th NETeST Meeting.

Sir/Madam,

Please find enclosed herewith the minutes of 9th NETeST Meeting held at Guwahati on the **11th April, 2018** for your kind information and necessary action. The minute is also available on the website of NERPC, **www.nerpc.nic.in**.

Any comments/observations may kindly be communicated to NERPC Secretariat at the earliest.

Encl: As above

भवदीय/Yours faithfully,

बि. लिंगखोइ / B. Lyngkhoi
निदेशक / **Director/ SE**

Copy to:

1. CGM, AEGCL, Bijuli Bhavan, Guwahati - 781001
2. CGM, APGCL, Bijuli Bhavan, Guwahati - 781001
3. CGM, DISCOM, Bijuli Bhavan, Guwahati - 781001
4. Head of SLDC, Me.ECL, Lumjingshai, Short Round Road, Umjarain, Shillong – 793 022
5. Head of SLDC, Department of Power, Govt. of Arunachal Pradesh, Itanagar- 791 111
6. Head of SLDC, Department of Power, Dimapur, Nagaland
7. Head of SLDC, Electricity Department, Govt. of Manipur, Keishampat, Imphal – 795 001
8. Head of SLDC, Department of Power, Govt. of Mizoram, Aizawl – 796 001
9. Head of SLDC, TSECL, Agartala – 799 001
10. Chief Engineer(Elect), Loktak HEP,Vidyut Vihar, Kom Keirap, Manipur- 795124
11. Addl. GM (EED), NTPC Ltd., Bongaigoan Thermal Power Project, P.O. Salakati, Kokrajhar- 783369
12. DGM (C&M), OTPC, 6th Floor, A-Wing, IFCI Tower -61, Nehru Place, New Delhi – 110019.

निदेशक / **Director/ SE**

North Eastern Regional Power Committee

MINUTES OF THE 9th NER Telecommunication, SCADA & Telemetry (NE-TeST) COORDINATION SUB-COMMITTEE MEETING OF NERPC

Date : 11/04/2018 (Wednesday)

Time : 10:00 hrs

Venue : "Hotel Nandan", Guwahati.

The List of Participants in the 9th NE-TeST Meeting is attached at **Annexure – I**

Shri P.K. Mishra, Member Secretary, NERPC welcomed all the participants to the 9th North Eastern Telecommunication, SCADA & Telemetry meeting. He expressed with great satisfaction that a good number of participants from constituents along with team from KEC, have attended the meeting and expected that the same trend should be continued in future for fruitful deliberation and resolving the important issues. He hoped that the pending communication SLD would be completed very soon and requested NERLDC to expedite the process. He appreciated the efforts of all concerned for the near completion of commissioning of SLDCs for all seven states. Further he requested that henceforth the forum should focus on improving grid visibility.

He then requested Shri B. Lyngkhoi, Director/SE(O&P) to take up the agenda items for discussion.

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF THE 8th MEETING OF "NORTH EASTERN TELECOMMUNICATION, SCADA & TELEMETRY (NETeST)" SUB COMMITTEE OF NERPC.

SE(O&P) informed that minutes of the 8th NETeST Meeting held on 18th January, 2018 at Guwahati were circulated by NERPC vide letter No. NERPC/SE(O)/TeST/2018/ dated 01st February, 2018.

The Sub-committee confirmed the minutes of the 8th NETeST Meeting as no comments/observations were received from the constituents.

SE(O&P),NERPC requested DGM, NERLDC to give a presentation on URTDSM project.

DGM(SL),NERLDC broadly explained the URTDSM project and ramifications:

- Currently 31% RTU data is available.
- Conception of URTDSM project.
- Objective of URTDSM project.
- Chronological order of URTDSM
- Package I was offered for NER Stg-I & II
- Package II for SR,WR.
- Architecture of URTDSM
- Integration in SCADA SLD
- Various features of URTDSM like: trend visualization, contours, PMU Analytics.

He also presented a Case Study of Doyang Oscillation incident. He explained that the source of the oscillation i.e. Doyang could only be identified after analysis of PMU data. Members appreciated the presentation(attached at **Annexure-II**) and requested implementing agency to expedite.

The forum appreciated the presentation of DGM(SL), NERLDC and assured that full cooperation would be extended for completion the project for better visibility of the grid.

The Sub-committee noted as above.

Action: NERTS, State Utility, GE, NERLDC

A.1 Status of SLDCs in NER:

The status of setting-up of SLDC as informed by POWERGRID during 8th NETeST meeting is given below:

SN	Utility	Status as informed in 8th NETeST	Status as informed in 9th NETeST	Target Completion
UPGRADATION OF SLDCs				
1	Assam	Completed. RTU scope removed	Completed.	Assam intimated DG Pad ready Completed. DG set-Target May-18.
2	Tripura	Main SLDC Completed DG set work under progress. RTU SAT pending	4 RTUs tested. 3 RTU ready for testing. DG set-Installed. Foundation & earthing readiness confirmed by TSECL on 09.12.17. Alstom had some	Completed. DG set-Target April-18. Spare hand over July18

			contract issue. Team will be deputed by 15days.	
3	Meghalaya	Completed DG set commissioning pending	Completed.	Completed. DG set-Target June-18. Spare hand over July18
4	NERLDC	Completed DG set Pending	Completed.	Completed. DG set-Target April-18.
5	Manipur	Main SLDC Completed. DG set pending	Completed.	Completed. DG set-Target 1st week June-18
6	Nagaland	Main SLDC Completed 15.01.18. DG set pad apx. ready.2nos. RTU pending	Out of 12, 10 RTUs are installed and six tested. DG set space yet not ready.	Completed. DG set-Target May-18.
7	Mizoram	Completed. AMC is still not signed.	Completed. AMC is still not signed. DG set space yet not ready.	Completed. DG set-Target May-18.
8	Ar. Pradesh	Main SLDC Completed 15.01.18 One RTU(Passi) left as site front was not ready. DG set work started.	8 RTU installed and tested. Only one left.	Completed. DG set-Target May-18.
9	Backup NERLDC	Completed	Completed.	Completed. DG set-Target April-18..

Over telephonic conversation, GE intimated that all DG set commissioning works and balance works of RTU(as are already delivered) will be completed by June'18 in totality. Spares will be handed over by July'2018. However, for new amendment (Sanis, Kolasib) it would take some time.

It was again emphasized that states opting for GPRS scheme should provide data SIMs(3G) GPRS {For any RTU location, such service provider's SIM to be provided whose Internet data service is OK} to PMAs. Because of difficulties above, commissioning using GPRS scheme was getting delayed. Further lease line with static IP & server rack space to be provided at SLDCs for installation. NER States assured that they will look into the matter soon.

DoP Ar. Pradesh has expressed that it is difficult to get SIM in one person's name & service providers don't give SIM. Forum opined that Letter from Head of utilities may be sent to MD/CEO of service provider emphasizing need of good service & requirement of SIM. A copy of the letter may be given to NERPC.

The Sub-committee noted as above.

Action: State Utilities, GE

A.2 Non-reporting of RTUs of Constituents on Existing SCADA:

POWERGRID: 4 RTUs not reporting out of 22 RTUs & data of 1 RTU is wrong.

a. KOPEX SAS line flow is OK but BUS data suspect.
b. Roing and Tezu RTUs do not report.
c. Kolasib out since 22.05.2017
d. Status of CS RTUs on single link & requirement of 2nd link back up/redundant channel. Lists as on 09/08/2017:

1. 800 kV HVDC BNC (Only one channel made)
2. 400 kV Misa (2 channels made but only 1 available)
3. 400 kV Bongaigaon (Only one channel made)
4. 400 kV Silchar (2 channels made but only 1 available)
5. 220 kV Dimapur (two channels but only 1 available)
6. 220 kV Salakati (Only one channel made)
7. 132 kV Imphal (Only one channel made)
8. 220 kV Mokokchung (Only one channel made)
9. Ranganadi ISGS (2 channels but Only one available)
10. 132 kV Itanagar (Only one channel made)
11. Kathalguri, ISGS (only one channel available)
12. Palatana, ISGS (Only one channel made)
13. 132 kV Kumarghat (2 channels made but only 1 available)
14. Loktak ISGS (2 channels made but only 1 available)
15. Khandong, ISGS (2 channels made but only 1 available)
16. Jiribam (2 channels made but only 1 available)
17. Aizawl (only 1 available)
18. Badarpur (2 channels made but only 1 available)
19. Mariani (Only one channel made)

e. CB status of the following RTUs are not reporting:

1. Biswanath Chariali

2. Kolasib

Deliberation in the meeting

Name of RTU/link	Status
KOPEX	Bus data to be taken. Database to be updated at NERLDC.
Roing & Tezu	Permanent solution will be made after Additional communication & NERPSSIP of Arunachal Pradesh scheme is in place. However, new equipment of GPRS dual SIM modem is already in place. The same will be installed within 30days. It is found that service providers at Roing & Tezu areas are very erratic. Forum requested NERPC to write to DOT with a copy to TRAI so that service providers near power stations should provide requisite services. It was also noted by forum that when original power system scheme for Roing Tezu Namsai was approved without simultaneously viable communication scheme. PLCC hops are more through multiple states & not feasible. Hence, for these stations, GPRS scheme is only viable & so opted till Reliable/additional communication of NER is in place as approved in 18th RPC.
Kolasib	Communication Link is now through. ECI link is in place since 31.03.18 under MW Vacation project OPGW Badarpur-Kolasib-Aizawl link.
800kV HVDC BNC	Two channels made available. NERTS has to share port details.
400 kV Misa	Two channels made available (ECI link, old ABB link) NERTS has to share port details.
400 kV Bongaigaon	Two channels made available (ECI link, old ABB/Siemens link NERTS has to share port details.
400 kV Silchar	Two channels made available (ECI link, old ABB/Siemens link via Badarpur) NERTS has to

	share port details.
220 kV Dimapur	Will be restored by 30.05.2018-with two links
220 kV Salakati	Two channels made available (ECI link, old ABB/Siemens link NERTS has to share Port details
132 kV Imphal	2nd link by 30.05.2018
220 kV Mokokchung	New channel by August 2018
Ranganadi ISGS	New channel by August 2018
132 kV Itanagar	Nov2018 Sep'18
Kathalguri, ISGS	Nov2018
Palatana, ISGS	Nov2018
132 kV Kumarghat	New channel by August 2018
Loktak ISGS	Nov-Dec2018
Khandong, ISGS	New ECI channel by July18
Jiribam	2nd Channel will be made available through FO ECI link in Nov'18
Aizawl	2nd Channel will be made available through FO ECI link in Nov'18
Badarpur	2nd Channel will be made available through FO ECI link in Nov'18
Mariani	New Link by July2018
BNC CB status	Already tested with tool ,CB status OK
Kolasib CB status	RTU issue, will be resolved in 15 days.

The Sub-committee noted as above.

Action: NERTS, NEEPCO & NERLDC.

B). NEEPCO

a. Ranganadi HEP is not reporting constantly and RTU needs to be restarted every day to get data.

b. CB status of the following RTUs are not reporting:

1. Ranganadi

2. Kopili

In the last meeting, NEEPCO confirmed to solve the issues along with links in line with grid codes at the earliest.

Deliberation in the meeting

Sr. Manager, NEEPCO informed that the new C264 has been integrated with the old S900 RTU, which may have caused the non-reporting of data. Manager, NERTS clarified that MFTs may have to be purchased by NEEPCO. After detailed deliberation the forum decided that a joint visit of NERLDC & NERTS be carried out to RHEP on 27.04.2018 to estimate the material/service requirement etc.

For Kopili station NEEPCO and NERLDC will sit together and resolve the issue.

The Sub-committee noted as above.

Action: NEEPCO.

C). AEGCL:

In the new system, only 30 RTUs are reporting partially against 62 RTUs. This creates loss of observability of NER Grid specifically during grid problems. Restoration of all the non-reporting RTUs needs urgent action. The same also highlighted in the weekly telemetry status reports but tangible solution is yet to be achieved.

Deliberation in the meeting

AEGCL intimated that 32 RTUs data are reporting out of 58 RTUs. More no. of RTUs will start reporting once the microwave vacation project is complete.

For others, AEGCL will take necessary action & action has been taken to make sure that all important substations and generating stations are reporting.

The Sub-committee noted as above.

Action: AEGCL.

D). MePTCL/MeECL: 14 RTUs are reporting out of 23 RTUs.

Generating Stations: Dedicated voice communication is yet to be established for Leshka HEP.

Sub-Stations Not Reporting: Umiam , EPIP-I , Lumshnong , Cherrapunji.

Deliberation in the meeting

The latest status given by Meghalaya is as given below:

Leshka HEP	Voice communication established

Cherrapunji	Re Engineering works of Transmission line is under progress and expected to be completed on 20.04.2018. Restoration of communication will be taken up after the Re Engineering works is completed.
Umiam	Data Card faulty. GE to rectify. By May'18
EPIP-II	By April'18
Lumshnong	By April'18

The Sub-committee noted as above.

Action: MePTCL.

E). TSECL: 7 RTUs are reporting out of 25 RTUs.

Non-reporting RTUs are given below:-

Generating Stations: Gumti (since Jan, 2011).

Sub-Stations: Amarpur, Badharghat, Belonia, Bokafa, Boxanagar, Dharmanagar, Dhalabil, Gamaitila, Gournagar, Kamalpur, OMPI, Rabindranagar, Sabroom, Satchand, Agartala , Ambassa , Budhjungnagar.

Deliberation in the meeting

TSECL representative was not present in the meeting. Member Secretary, NERPC strongly noted the absence of Tripura representative in the meeting. It was decided that NERPC would write to CMD, TSECL with a copy to Power Minister, Tripura regarding the continued absenteeism of TSECL in various Sub-Committee meetings of NERPC.

The Sub-committee noted as above.

Action: NERPC/NERLDC.

F). Manipur: SLDC of Manipur was declared commission vide Ref No NERLDC/SL/SCADA-Upgrade-Vol-II/8566-68 dated 15.03.2017. However only 4 nos of RTUs are found to be reporting out of 11 RTUs as on 11/01/2018 and No ULDC Communication system is established till date.

Sub-Stations Not Reporting: Chandel, Churachandpur, Hundung, Karong, Kongba.

Deliberation in the meeting

Manager, MSPCL informed the forum that 4 RTUs out of 11 are reporting. On joint inspection with PG it was found that the PLCC card was burnt. On request by Manipur, POWERGRID will help in technical assistance.

The Sub-committee noted as above.

Action: NERTS/MSPCL.

G). Mizoram: SLDC is commissioned but VC, Voice Communication system yet to be established. SCADA/ EMS System commissioned on 10.04.2017. Status of RTUs included in the project needs to be updated.

Deliberation in the meeting

Asst. GM NERLDC informed the forum that only one RTU is reporting (Locally).

The Sub-committee noted as above.

Action: Mizoram.

H). AP and Nagaland: may kindly intimate the current status SLDC establishment & RTU Status.

Deliberation in the meeting

Manager, NERTS informed that for RTU to SLDC communication, GPRS SIMS to be handed over soon to vendor. Materials already supplied. SLDC SCADA EMS declared commissioned on 15.01.18. Joint Meeting held at SLDC AP with POWERGRID, DOP & NERPC & GE. AMC team deputed later by GE. However DG set & communication of some RTU pending will be completed by June18.

Actions: Respective States

The Sub-committee noted as above.

I) 132 KV BADARPUR-LUMSNONG telemetry LINK out:

Panchgram S/S (Assam) telemetry data is not coming.

Lumshnong S/S (Meghalaya) telemetry is not available.

Real time drawal for Assam and Meghalaya affected due to non-telemetry problem.

Real time Grid Management process hampered.

Deliberation in the meeting

AEGCL reported that Panchgram is reporting. MeECL will check and do needful soon.

Actions: Respective States

The Sub-committee noted as above.

A.3 Status of FO works under different projects:

Name of the Project	Status as in 9th NETeST
ULDC replacement	ULDC replacement & Others (Reliable Communication, Additional Communication as approved in 18th RPC. The same is under DPR stage Equipment: However replacement of old nodes/SDH equipment of ULDC project (by STM4 through M/s ECI) is started. The same would be completed by Oct18.
MW Vacation	**Central Sector:** 132KV Silchar (PG)-Badarpur (PG), 132kV Badarpur-Kolasib; 132kV Kolasib-Aizawl Completed on 31.03.18. Joint verification of Data at NERLDC will soon be conducted within 15days.. **AEGCL Sector:** Equipment for links 132KV Pailapool-Srikona 132kV Jiribam-Pailapool, 220kV Agia-Sarusujai (with LILO at Boko, Mirza), 220kV BTPS-Agia have been commissioned and data is reporting to SLDC from respective nodes. Recently Fiber breaks have been reported in Samaguri-Mariani, Matter have been jointly(POWERGRID &AEGCL) taken up with KEC for rectification. Target :2months Joint checking of Data reporting to SLDC with AEGCL completed except Gohpur after reconfiguration of equipment **Target**: Over; handover within 2-3months. Project suffered some delay due to ROW/compensation/local issue etc while fibre stringing/rectification done is in Srikona-Silchar-Badarpur---Pailapul-Jiribam area. The work was stopped for long time by some miscreants and with help of district administration same was resolved. Similarly, Assam-Manipur border area due to strikes, gang mobilization was stopped. Multiple Landslides/local issues in Arunachal delayed Nirjuli-Rnganadi –Ziro, PG Silchar-Srikona link

NER-FO Expansion	Details of List is given in Annexure-MOM-18th RPC. **Pkg III-C(Supply-Taihan, Stringing by M/s Sabari):** Supply and erection of 389 km of OPGW (CS). All completed **Pkg IA: Central Sector(Supply by SDGI, Installation by TCIL, Sabari):** Supply status: 414.14km (out of 740 km), Erection work completed is 174.287 km. balance supply and erection are targeted by Dec-18. Huge ROW & Constraints issues faced during OPGW stringing in Silchar-Pallatana, Badarpur-Jiribam which also delayed the work. Further PTW is not issued for good weather conditions **State Sector:** Supply Status: 768 km (out of 832 km). Erection works has also started (11 Km completed). Balance works are targeted by **Dec-18** **Equipment Pkg IVA(SDH-M/s Fibcom)**-Supply status: 19 out of 32 SDH in central sector & 28 out of 42 SDH in State sector. Balance supply part targeted by 31st May-18. **Equipment Pkg IVC(PDH-M/s TEJAS)**-Total supply is complete (50 nos PDH for Central Sector locations and 104 PDH for State sector locations) All State utilities are requested to ensure Air conditioning/Rodent free t Equipment rooms. Further One technician/Line man from respective utility(LinkTL owner) will be provided during installation /stringing works for smooth execution & Link identification & to avoid ROW . Further during installation in each utility, respective utility may depute engineer from inception for better familiarization

A.3 <u>EARLY COMPLETION OF OPGW BASED COMMUNICATION SYSTEM IN</u>

INTRASTATE GRID OF MANIPUR IN THE INTEREST OF NER GRID SECURITY AND SMOOTH POWER SUPPLY MANAGEMENT IN MANIPUR:

During the 18th TCC meeting, MD, MSPCL informed that Intra-state communication is under focus of government and it is being monitored very closely. He stated that though quantity modification was done in 17th TCC/RPC (held on 04.10.2016), work has not yet been completed.

ED(LD&C),POWERGRID informed that materials have been inspected at China and by end of Nov'17, materials would be delivered. GM, NERTS informed that target time for completion as per 6th NETeST meeting of NERPC is November, 2018.

During 8th NETeST meeting, DGM, NERTS informed the forum that the material for installation has already been dispatched. Stringing of fiber will start from February 2018.

Deliberation in the meeting

Manager, NERTS informed that all materials have been delivered at Manipur Imphal. M/s TCIL (PSU) has been entrusted with execution.

The Sub-Committee noted as above.

Action: NERTS

B. NEW ITEMS

B.1 Strengthening of PLCC System by NER States:

PLCC system works as a back-up path for telemetry of RTUs. It is proposed that each constituent may kindly revive/ install PLCC as per relevant norms for 132Kv & above T/Ls for data path connecting to respective SLDC.

Each state may discuss about their present status of connectivity & future plan PLCC connectivity.

During 8th NETeST meeting, Sr. Manager, NEEPCO informed that length of PLCC in the Kathalguri – Misa link is 380km approx. and due to this long distance the channel is intermitting.

DGM, NERTS informed the forum that stringing work of OPGW is already completed and the link will be through OPGW by March, 2018.

AGM, AEGCL informed the forum that most of communication channel is through with OPGW. The left out station will be connected through PLCC once NER SIP project is complete.

Deliberation in the meeting

DGM, NERLDC informed that MeECL has submitted their connectivity diagram including planned future expansion. The map for Manipur and Nagaland has also been prepared. The forum once again requested NERTS to submit requisite connectivity schemes planned under NERPSIP. Manager, NERTS requested NERPC to write to ED,NERPSIP for the same.

The Sub-Committee noted as above.

Action: All remaining utilities/NERPC.

B.2 OPGW link between RHEP Power house and Biswanath Chariali/ Nirjuli sub-station required.

The RTU of Ranganadi Power House is working properly at Ranganadi. The Link with SCADA at RLDC is disrupting many times due to weak link with Ranganadi. OPGW link may be established between Ranganadi and Biswanath Chariali/ Nirjuli.

During 8th NETeST meeting, DGM NERTS, informed that OPGW installation almost completed except 10km left due to ROW & administrative issue. The matter is being pursued with District administration and splicing under progress. The link will be through by March, 2018.

Deliberation in the meeting

Manager, NERTS informed that RHEP is to be connected via Nirjuli-Ranganadi Link. It may be noted that Nirjuli-Ranagandi (NDTL) is made LILO at Leikhi & Pare. Pare LILO has already been taken care in MW Vacation OPGW project & equipment in NER FO Expansion. However, for Lekhi LILO point connectivity, DOP-AP (transmission division) is constructing TL LILO part up to Lekhi from tower loc.134. The said work is yet to be completed. Further DOP, AP has been asked to provide the exact Tower schedule so that POWERGRID may arrange OPGW accordingly. Target for connectivity-by 2months w.e.f LILO part completion by DOP AP.

The Sub-Committee noted as above.

Action: DoP Ar. Pradesh/NERTS.

B.3 PMU Display availability at SLDC:

Due to non-availability of separate communication links, PMU Displays are not available at all the SLDCs. A workaround may be that of using one of the SCADA (ICCP) links for both ICCP a well as PMU display. In this case the Internal Firewall of RLDC & SLDC need to include one additional policy for making through the PMU display traffic. As such, no security violation is envisaged as only HTTP port of PMU Historian need to be forwarded.

During 8th NETeST meeting, after detailed deliberation it was decided that NERTS, NERLDC and AEGCL will sit together to explore the possibility of using old ULDC link for PMU display(After checking their healthiness). NERLDC will finalize a date for the meeting.

Deliberation in the meeting

Manager, NERTS informed that currently new PDC (Assam) installation is going on and the possibility of using existing ICCP link for PMU display is not recommended. He also informed that links for PMU have been subsumed under different FO projects and would be commissioned very soon. DGM, NERLDC also opined that it is not recommended from cyber security angle. After detailed deliberation the forum decided to **drop the agenda** item.

The Sub-Committee noted as above.

B.4 Security Arrangement for SCADA System:

Presently, the SCADA/EMS Upgrade Project is running through its final phase & all state SLDCs except Arunachal & Nagaland are integrated with NERLDC. This network is also connected to rest of the RLDCs via NLDC. In this scenario, any security incident/ intrusion in one system will affect other connected systems also. Therefore hardening of the security of SCADA/EMS system is a necessity. The requirement may be defined in Two Parts: Cyber Security & Physical Security.

Cyber Security may be implemented by proper configuration of the security features available in the SCADA/EMS system viz. a uniform and effective Cyber Security Policy across the SLDCs & NERLDC, Firewall policies allowing only necessary traffic & discarding others, disallowing Remote Access of the system unless authorized by the system owner, regular check of the system for Updates/ Patches, proper maintenance of Patch Management server etc.

Physical Security is necessary to prevent mishandling/ misconfiguration - intentional or accidental, unauthorized removal of asset from the system, connecting/ disconnecting external devices like laptop, pen drive, dongle and the likes unless unavoidable etc.. One effective way of implementation of physical security is Installation of CCTV Camera/ Surveillance System at strategic locations like Control Room Entry & Server Room Entry, Inside Control Room & Server Room, UPS/ Battery Room, DG Set etc.

During 8th NETeST meeting, SE(O), NERPC informed the forum that representative from CEA will be giving presentation regarding Cyber Security in next OCC meeting. The forum also requested NERPC to write letters to respective states of NER for declaring SLDCs as protected and prohibited area.

Deliberation in the meeting

Regarding Cyber Security, EE(SM),SLDC requested that Standard Operating Procedures (SoP) be devised in this regard. SE(O&P),NERPC assured that CE(IT), CEA would be invited to the next meeting to give presentation and share the roadmap. For Physical Security it was decided that SLDCs would explore installation of CCTVs independently.

The Sub-Committee noted as above.

Action: All SLDCs/NERPC

B.5 Status of non- reporting RTUs:

SCADA data from Kolasib are out since long (22.05.17) due to which Grid management activity is severely affected.

Dimapur and Doyang RTUs are not reporting since 22/01/2018.

Ranganadi RTU does not report continuously, RTU needs to be restarted every day to get data. Team needs to be formed involving PG and RHEP and solve the problem within fixed time.

Tezu, Roing and Melriat Data either does not report or fluctuate frequently due to unstable GPRS connection. Dual redundancy is to be implemented.

Status of RTU replacement and procurement of new RTUs may be intimated.

Deliberation in the meeting

Manager, NERTS informed that due to fire incident at Dimapur S/S, Doyang & Dimapur data are out. The same would be restored by 30.05.2018. Pls refer to item **A.2** for remaining status.

The Sub-Committee noted as above.

Action: NERTS

B.6 Implementation of Central Electricity Regulatory Commission (Communication System for inter-State transmission of electricity) Regulations, 2017:

As per section 10 of these regulations, all users of CTU, NLDC, RLDCs, SLDCs, STUs shall maintain the communication channel availability at 99.9% annually: Provided that with back up communication system, the availability of communication system should be 100%.

Further, as per clause 7.3(ii) of these regulations, The RPC Secretariat shall certify the availability of communication equipment for CTU, ISGS, RLDCs, NLDC, SLDCs based on the data furnished by RLDC.

In the above context followings are to be submitted by NERTS, POWERGRID and other STUs :

1. List of links for which CoD has been declared till date &
2. The links for which CoD is likely to be declared in near future.

In this regard a letter vide Ref: NERLDC/ SL/Telecom\9908 dtd. 29.08.17 and subsequent reminder letter vide Ref: NERLDC/SL/TELECOM/10823 dtd. 03.01.2017 was issued to NERTS, POWERGRID and NERLDC/ SL/Telecom\9928 dtd. 31.08.17 and subsequent reminder letter NERLDC/ SL/Telecom\11402-414 dtd. 13.03.18 to SLDCs for furnishing the list of communication links. POWERGRID has submitted a list of links (enclosed in Annexure-A) for Further details.

However, no data have been furnished by SLDCs till date. The details are required for making complete communication diagram and monitoring of availability of links.

Deliberation in the meeting

CE, NPC clarified that the CERC (Communication System for Inter-state transmission of electricity)Regulations, 2017 is meant to bifurcate the cost of transmission of power

and transmission of data, among other things. Since CERC has jurisdiction only over ISTS elements it is inferred that only links pertaining to ISTS elements/ nodes are under the purview of the current regulation. So, only ISTS links availability or commissioning may be monitored. DGM(SL),NERLDC opined that later on SERCs would adopt the CERC regulation in toto. Further if state links upto 132kV are not monitored it reduces grid visibility and deteriorates SE also. It was also emphasized by utilities in forum that keeping 99.9% availability is very difficult even for Central or state sector as sometimes in remote NER, time of restoration is delayed due to land slide/strike/local bandhs and spares are not readily available in NER market unlike other parts of India. CE, NPC welcomed the concerns from operators point of view and reiterated that only ISTS links/links upto ISTS nodes are to be monitored for the purpose of availability calculation. The forum thanked CE,NPC for clarifying in detail.

The Sub-Committee noted as above.

Action: NERLDC

B.7 <u>Furnishing of detail parameters for the On-going Projects likely to be commissioned within 6 months by Constituents:</u>

This is for kind information to constituents that before commissioning any new projects, the connectivity conditions pertaining to Telemetry Data/Voice communication systems in terms of clause 4.6.2 of IEGC 2010 read with Clause 6(3) of CEA (Technical Standards for connectivity to the Grid) Regulations, 2007 are to be fully met and the real time data of the station parameters be made available at the control centers along with voice communication systems at the time of commissioning. Moreover, it may also kindly be noted that as per recommendations of the Committee on Grid disturbance" Report on the Enquiry Committee on Grid Disturbance in Northern Region on 30th July 2012 and Northern, Eastern & North Eastern Region on 31st July 2012" dated 16.08.2012, clause (xiv) which is reproduced as follows - "Proper telemetry and communication should be ensured to Load Despatch Centers from various transmission elements and generating stations. No new transmission element/generation should be commissioned without the requisite telemetry facilities".

In view of the above, the following information/ parameters may kindly be furnished to NERLDC in advance for making the platform for Database in SCADA:

1. Single Line Diagram of the Power Station/Switchyards.
2. Data List of the Station (to check the signals of both Analog & Digital).

3. Wiring diagram of the Station (to check the wiring done at RTU end).
4. Generator Parameter details, Generator Transformer parameters.
5. Line and ICT details. Any additional requirement to be intimated

Deliberation in the meeting

SE(O&P),NERPC informed that the commissioning status of ongoing projects are being monitored under item No.**C.1.** of OCC. He suggested that a separate column may be added for monitoring the status of submission of detail members. The forum approved the suggestion and decided to drop the agenda item.

The Sub-Committee noted as above.

Action: NERPC.

B.8 Optical Fiber connectivity for AGC project expansion:

NTPC Dadri Stg-II was selected for the first project of Automatic Generation Control (AGC) in India. A mock test was conducted on 29th June 2017 from 1730 Hrs to 1910 Hrs and the mock test yielded desired/expected results.

Now, as a part of the AGC project expansion, a report needs to be filed with CERC, for which actual distance between the nearest communication node (equipment where the existing fiber optical cable terminates) and the unit control room (approximate distance from CR Panel) needs to be ascertained.

As per instruction from NLDC, NERLDC requested all ISGS to furnish the mentioned data. It is observed that optical fiber connectivity is there with few ISGS and details of those stations are as follows:

Sl. No.	Name of ISGS	Nearest Available Optical Node	Distance
1	AGBPP	Misa (PG)	383.4 km
2	AGTCCPP GTG Control Room	AGTPP (NEEPCO)	50 m
3	AGTCCPP STG Control Room	AGTPP (NEEPCO)	200 m
4	Ranganadi HEP	Balipara (PG)	191 km
5	Kopili HEP	Kopili (NEEPCO)	30 m
6	Kopili Stage 2 HEP	Khandong (NEEPCO)	15-20 m
7	Khandong HEP	Khandong (NEEPCO)	15-20 m
8	Palatana	Silchar (PG)	247 km
9	Loktak HEP	Imphal (PG)	35 km
10	Doyang HEP	Dimapur (PG)	92.5 km
11	BTPS (NTPC)	Salakati (PG)	3.5 km

During 8th NETeST meeting, DGM, NERTS gave assurance to the forum that OPGW link of BTPS(NTPC)- Salakati (400KV) will be completed by March, 2018 to facilitate AGC pilot project.

The following is the current status of the link under Powergrid.

4.Ranganadi HEP to Balipara(PG)- Under Work in progress

8. Palatana- Silchar(PG)- Work Under Progress. Delay due to ROW issue. Target December, 18.

9. Loktak HEP- Imphal (PG)-By December, 2018.

10.Doyang HEP- Dimapur (PG)- OPGW completed. By June 2018.

11. BTPS (NTPC)-Salakati (PG-400kv)- 3.5 km completed. New equipment by April, 2018.

Deliberation in the meeting

NERLDC informed that the list has been given only for monitoring purpose.

CE, NPC suggested that FO is not always required for AGC, the present PLCC may be used. He stated that this has been the prevalent practice in developed countries where AGC has long since been implemented. It was discussed in forum that NERLDC may also explore data of SCADA for SPS, AGC purpose by modifying the signal list & protocol from specific RTU/Gateway Generating stations/Stations. This will optimize channel requirements. After detailed deliberation the forum decided that for pilot AGC implementation BTPS-Salakati link be commissioned at the earliest. NERLDC to provide exact channel requirement (point to point) from BTPS & Salakati. However for NTPC, one Ethernet channel (2MB) will be provided up to NERLDC (4th floor) soon which may be used by NERLDC. For the remaining the forum decided that a sub-group would be formed by NERPC headed by SE(O&P), NERPC to discuss the various possibilities. The Sub-group would revert back with its report by August,2018.

The Sub-Committee noted as above.

Action: NERPC.

B.9 Optical Fibre connectivity for installation of Line Differential Protection:

Optical Fibre connectivity of a line is essential for functioning of Line Differential Protection.

In 47th PCCM, it was decided that all utilities shall identify the short lines for installation of Line Differential Protection by 31st Jul'17.

Utilities shall furnish the list of short lines identified for installation of Line Differential Protection to NERPC/NERLDC along with availability of OPGW in the identified short lines (as per Annexure-I). Forum agreed that funding for installation of Line Differential Protection & OPGW can be awarded from PSDF for state utilities and PSUs may include these expenses in PoC Charges.

The list of lines along with availability of OPGW link not yet furnished by any utilities.

During 8th NETeST meeting, DGM, NERTS informed the forum that Power Grid has already installed line differential for short lines as per relevant approved scheme of POWERGRID Engg. Dept. (Like Bong-NTPC, Mokokchung -Mokokchung).

EE, MePTCL informed the forum that they have identified 17 lines for installation of line differential. The DPR of the same has already been sent to CEA/NLDC for funding from PSDF.

The list of lines along with availability of OPGW link not yet furnished by any utilities.

Deliberation in the meeting

Pls refer to discussion in the 143rd OCC meeting.

The Sub-Committee noted as above.

B.10 Dedicated voice communication:

Dedicated voice communication and availability is one of the key requirements for efficient grid management. But it is observed that whenever we try to talk to SLDCs always it shows busy. We have intimated POWERGRID to resolve this problem but still it is not solved but still it is pending.

Most of the PG stations are connected through only one dedicated voice communication. Minimum two no of dedicated link needs to be done at the earliest. Forum may discuss and time bound target may be fixed to fulfil the above requirement. Also 400 KV stations, HVDC station, SLDCs need 4 no of dedicated voice communication.

Following S/S either does not have link or links are not working.

a. PALATANA (Biggest Gen in NER)-No dedicated voice link.
b. 400 kV SILCHAR PG Station -No dedicated voice link.
c. SM Nagar (International link)-No dedicated voice communication with RLDC.
d. MONARCHAK Gen: No dedicated voice link with RLDC.

e. SALAKATI (Inter Regional PG station) - No dedicated voice link.

f. 400 kV BYRNIHAT/KILLING: No dedicated voice link with RLDC/SLDC.

g. 400 kV Azara: No dedicated voice link with RLDC.

h. NTPC, BgTPP - Even no BSNL or Mobile

i. Zero,Roing,Tezu and Pasighat

Following S/S VOIPs are not working.

1. Kathalguri-23640154
2. Ranganadi-23640119
3. Kolasib-23640111
4. Doyang – 23640120
5. Kohima

Long outage of SLDC Assam VOIP numbers: 23610000/23610001

Long outage of SLDC Aizawl VOIP numbers: 23890002/23890003

Deliberation in the meeting

The latest status as updated is given below:

Palatana	2nd channel upto 79Tilla details required by OTPC. NERTS to provide. Dedicated link via PLCC to Silchar. To be tested by April'18
400kV Silchar	Dedicated voice link provided
132kV SMNagar	NERTS requested TSECL to arrange.
Monarchak	By April'18
Salakati	No dedicated voice link. No shift person sitting at Salakati control room to call. Communication is to be made with Bongaiagaon
Byrnihat	Voice link provided. Tested at SLDC.
Azara	Dedicated voice link provided. Tested at SLDC.
BgTPP	With NTPC-dedicated link has been provided
Zero, Roing, Tezu & Pasighat	Only Mobile phone working. For Ziro, dedicated Link will be provided by 3 months
VOIPs not working: Kathalguri, Ranganadi, Kolasib, Doyang, Kohima	Completion of NER FO Expansion by Nov'2018- all nodes will be on FO
SLDC Assam VOIP not working	Restored/RAT issue/Party rectified 4 times. AEGCL is to implement anti-rodent/rat sealant

	system
SLDC Aizawl VOIP outage	All In service/Restored

VOIP exchange by M/s Orange is commissioned 31.03.2018 in all SLDCs & NERLDC. The delay occurred are mostly in new SLDC as the party could do complete wiring etc only after handing over of front of building. Minor works like rewiring/reconfiguration/cable dressing left in some cases as there was change/shifting of space. Scope of contractor is limited to Supply & installation in SLDCs complex only.

The Sub-Committee noted as above.

Action: NERTS, OTPC,AEGCL.

B.11 ISTS/ISGS CB status out and SOE Problem:

CB status of ISTS and ISGS are out or wrong since long and due to which Sequence of Events report is not indicating correct picture of the Grid. In case of any tripping/disturbance SOE is the main report through which we can analyse any event but as CB status is not updating correctly SOE is not giving correct picture. So POWERGRID/NEEPCO/LOKTAK is requested to look into it and restore all CB status at the earliest.

It is very important to update SOE for proper grid visualization but most of unit outage or line tripping SOE are not updating. Most importantly disturbance/incidence analysis from SOE is not currently possible due to so much misleading information. In some cases misleading information are coming in SOE (say RCN unit 3 is coming as U1 out, same in Salakati , Ranganadi and Balipara element outage). So all element outages, SOE needs to be checked. For an example one disturbance may be taken as example and may be matched with SOE available to know the mismatch available.

During 8th NETeST meeting, DGM, NERTS informed that with NTAMC all data are made OK (Badarpur, Silchar, Balipara, Kumarghat, BNC, Misa, Khliehriat.etc., -others will also be completed with NTAMC project.

Project Manager, GE informed the forum that the RTMC/NTAMC operated stations have 100-1000s of IOs available for each station and only few data is required at RLDC. NERLDC is requested to provide IO list details be mapped to RLDC for displayas specifically required for grid operation. NERLDC may directly provide the same to POWERGRID.

Deliberation in the meeting

For SOE of PG stations, SOE is already available for SAS based stations. However additionally, for ICCP, NERLDC intimated that existing IO list as used in NERLDC SCADA would be used for ICCP integration with RTAMC/NTAMC. NERLDC informed that IO list in totality (in excel format with addresses & eqpt descriptions & screen shot of SLDs-for all stations at one go) for NERTS-PG substation will soon provided to NERTS. As GE is common to both SLDC/NERLDC project & NTAMC project, M/s GE may do the necessary integration at the earliest. POWERGRID assured that the same would be mapped latest by 30.05.2018 after by 2months on receipt for stations where NTAMC/RTAMC already implemented.

For Other states/Utilities/ISGS, respective state SLDC & Owner(ISGS) of RTU/Gateway station will do needful. NERLDC will do needful coordination

The Sub-Committee noted as above.

Action: All utilities, NERTS, NERLDC

B.12 MW and MVAR data validation:

For correctness of real time data ie MW/MVAR/KV/FREQUENCY validation is required between the real time system and site in every quarter and report has to be maintained for verification. But in absence of this validation process, MW data, MVAR data, Voltage data are not getting reported correctly and ultimately misleading real time grid managers.

During 8th NETeST meeting, SE(O), NERPC requested NERLDC to sit together with Constituents one by one each and validate the date. The process may be started with Assam first.

AGM, AEGCL informed the forum that their state SLDC has started validating data by jointly visiting site one by one.

Deliberation in the meeting

DM,AEGCL informed that Assam data has been validated. The forum requested Meghalaya SLDC to do likewise.

The Sub-Committee noted as above.

Action: MeECL.

B.13 Maintenance & Support Service under "Replacement / Up-Gradation of existing SCADA/ EMS System of NERLDC and SLDCs of North-Eastern Region" project by GE T&D India:

As per Technical specification of 'Maintenance & Support services' clause 4.2.1: "At least one software engineer & one hardware engineer having expertise in SCADA/EMS system shall be available during the standard hours of service at each main control centre. The timings for emergency support would be 24 hours a day, 7days a week throughout the year.

The support personnel so deployed shall be qualified personnel having at least 5 years of experience in the delivered SCADA/EMS system. The owner can ask the contractor to replace the personnel deployed for maintenance support if his performance is not found to be satisfactory."

Performances of the personnel presently deployed in NER are not satisfactory.

During 8th NETeST meeting, AGM, NERLDC informed the forum that the performance of the AMC personnel posted in SLDC and RLDC is not satisfactory. The posted person is not able to handle most of the issues and always refers to the back office. This takes very long time in resolving day to day issues.

Project Manager, GE informed the forum that he is aware of the issues and will be arranging for appropriate man power and training. He requested for 2-3 months' time for resolving the issues.

Deliberation in the meeting

NERTS informed the forum that AMC has been signed by GE with DoP Ar. Pradesh. He requested P&ED Mizoram to sign the AMC as early as possible. EE,SLDC, Ar. Pradesh requested NERTS to impress upon GE that atleast 2 personnel must be deputed by them at SLDC at the earliest. This would enable inauguration of Ar. Pradesh SLDC.

The Sub-Committee noted as above.

Action: NERTS & P&ED Mizoram.

B.14 Communication of Pare HEP:

You are kindly aware that 110 MW Pare HEP of NEEPCO is in the last stage of commissioning and it is expected that 1st unit shall be ready for test synchronization by 1st week of March '2018. The LILO of existing Nirjuli-Ranganadi 132 kV line at Pare is part of the approve evacuation scheme for the Project. The LILO part is

expected to be ready for charging by mid of February 2018. In this context, following is placed before you for kind perusal:

a. Shut program of the Nirjuli-Ranganadi 132 kV line for conversion shall be intimated to you shortly.

b. As per decision of the meeting held on 10.05.2016 at NERTS, two nos. new PLCC panels have been procured and one installed at Pare for Pare-Ranganadi line and other panel shall be installed at Ranganadi end immediately after shifting of existing panel of Nirjuli-Ranganadi 132 kV line. The existing PLCC panel at Ranganadi end of Nirjuli-Ranganadi 132 kV line shall be shifted to Pare for Pare-Nirjuli line.

c. During the process of shifting and re-installation of PLCC panel from Ranganadi to Pare as mentioned at (b), the communication & data link between Ranganadi and Nirjuli shall be disturbed and the entire process is expected to be completed within 5-6 days' time. It is expected that shifting of PLCC panels work shall be taken up during 2nd week of February '2018.

In view of the above, I would like to request you to kindly advise your concern Officer to finalize the modalities how to proceed to complete the work without much disturbance to avoid inconvenience for real time grid operation. Completion of the shifting and re-installation of PLCC panel works is highly solicited.

During 8th NETeST meeting MS, NERPC gave a strong view in regard to non-compliance viz. telemetry & communication. He stressed that all utilities should plan in advance and put these links in place before commissioning of their units. He urged upon NEEPCO to comply at the earliest.

Sr. Manager, NEEPCO assured the forum that the communication channel will be ready before the commissioning of the project.

Deliberation in the meeting

Manager, NERTS informed that the Ranganadi-Lekhi section of the erstwhile 132kV RHEP-NDTL line has been LILO'd at 132kV Pare. The panel shifting works & RTU commissioning has also been completed by NEEPCO & NERTS. However for 132kV RHEP-Pare some integration issues are there. He requested that personnel be sent by NEEPCO to Nirjuli S/S to resolve the issues. Sr. Manager, NEEPCO informed that U#I of Pare HEP is slated for commissioning by 25.04.18, and all existing requisites would be fulfilled before that. For Pare HEP necessary communication scheme has already been prepared by NERTS & shared with NERLDC,NEEPCO. NEEPCO may bring the data up to nearest wideband (Nirjuli) and connect for onward telemetry up to NERLDC

The Sub-Committee noted as above.

Action: NEEPCO, NERTS.

B.15 Non-Reporting of Agartala PMU:

As per report of enquiry committee on Grid Disturbance in NR on 30th Jul'12 & in NR, ER & NER on 31st Jul'18, it is recommended that functioning of existing PMUs and availability of their output to RLDCs and accuracy of time synchronization should be monitored on daily basis and, if required, corrective actions should be taken on priority basis.

In North Eastern Region, 8 PMUs have been installed in 400 kV Bongaigaon, 400 kV Balipara, 220 kV Sarusajai, 220 kV Misa, 132 kV Badarpur, 132 kV Agartala, 132 kV Imphal and 132 kV NEHU.

NERLDC on daily basis is monitoring, the availability of PMU data and issues relating to non-availability of PMUs are highlighted.

It has been observed that during recent disturbances, PMU data are not available in some of the locations. 132 kV Agartala PMU is not reporting since 11:40 Hrs of 22.03.18 and after 22nd March'18 there were 4 number of grid disturbances in Tripura Power System. Due to non- availability of PMU data, the disturbances could not be analyzed properly.As per information from SEL,the problem lies with CABLE in between FO media converter from PMU panel to FO media converter at Communication panel in the Control Room Building.

Deliberation in the meeting

The item could not be discussed due to absence of TSECL representative.

The Sub-Committee noted as above.

B.16 Identification of one CS link as approved in 18th NERPC:

(Ref: Fiber Optic Communication Requirement for Redundancy and Replacement of ULDC OPGW links under Central Sector after useful life: *Reliable Communication Scheme –Central Sector Part*/MOM Item A.14-18th NERPC; Earlier Ref: MOM Item A.12/17th NERPC)

Vide Cl.A.14 : APPROVAL OF RELIABLE COMMUNICATION SCHEME -CENTRAL SECTOR was approved . One link was mentioned as CS1-CS2(58km-future) but name of link was not mentioned in Annexure-A.14 of MOM. This link may be identified as Aizawl –Jiribam (175km) as this link is not covered in any project.

Further it may be noted that OPGW replacement as already approved in 18TH NERPC for central sector owned TLs (Either Replacement or new project; A.7 & A.14) , cost Recovery mechanism will be same as old ULDC scheme.

Deliberation in the meeting

After detailed deliberation the forum approved the nomenclature of link CS1-CS2 as Aizawl- Jiribam (175km revised).

A. Details of Background :

OPGW replacement approved in 18TH NERPC for central sector owned TLs (A.14) , (816+1158=1974km) are as follows:

a. 816km. of OPGW along with communication equipment for replacement of OPGW/Communication Equipment under Central Sector by POWERGRID
b. 1158kms. of OPGW along with communication equipment for redundant and additional links under Central Sector POWERGRID

Now with this addition of Aizawl- Jiribam (175km), OPGW Communication Network for redundant and additional links(under Central Sector becomes 1238 kms (c*=1158-95+175=1238km) instead of earlier1158km

Accordingly, overall total OPGW Communication Network (a+c*) for Central Sector comes to 2054 (=816+1238) kms. Along with communication equipment to be implemented by POWERGRID (816 kms. for old ULDC replacement and 1238 kms. for redundant and additional links for central sector) under Reliable Communication Scheme-CS Part. The scheme will be implemented by POWERGRID on cost plus basis. Tariff for the investment made is to be shared by all constituents as per CERC notification. The scheme shall become part of existing Commercial Agreement signed for ULDC Project for Central sector.

The Sub-Committee noted as above.

B.17 Optimization of equipment for old OPGW replacement:

For OPGW replacement projects of old links (ULDC- of central sectors/PGCI owned TL OPGW), necessary measures may be taken so that equipment qtty may be optimized. If equipment already considered in NER FO EXPANSION Project or ULDC upgradation and Main1&2 Protection/Ring formation is achieved for network, then only optical directional cards may be considered in the existing equipment of NER FO expansion/ULDC upgradation scheme. This will avoid additional cost & space requirement will be reduced as replaced OPGW's link direction may be accommodated in same equipment

Deliberation in the meeting

After detailed deliberation the forum approved the measures for optimization of equipments as far as possible.

The Sub-Committee noted as above.

B.18 Shut Down Procedure for Optical Links:

In 134th OCCM it was decided that communication related shutdown would be approved in OCC forum alongwith generation and transmission element(s) shutdown. However, in absence of list of important links, equipments etc. utilities risk affecting the ICCP system. In 142nd OCCM, the unforeseen outage of ICCP on 10.03.18 was highlighted.

The forum may deliberate on the list of links, equipments and detailed modus operandi for availing communication related shutdown.

Deliberation in the meeting

SE(O&P), NERPC highlighted the backdrop and requirement of a specified shutdown procedure/modalities along with finalization of list of links for which shutdown has to be approved in OCC forum. DGM(SL), NERLDC informed that in SR shutdown of all links related to ICCP and PMU data are approved in OCC forum. After detailed deliberation the forum requested NERLDC to prepare a list of important links in consultation with NERTS. SE(O&P),NERPC also requested that the list should contain the path in detail from ISGS/ISTS node/SLDC to NERLDC with name of owner and maintaining utility. During meeting, NERTS had provided the main lists pertaining to ICCP connectivity route etc.

The Sub-Committee noted as above.

Action: NERLDC.

B.19 Finalization of Remote Consoles for State SLDCs under URTDSM WAMS project.

Deliberation in the meeting

After detailed deliberation it was decided that all SLDCs(where PDC/Remote Consoles are not available) & executing Utility (POWERGRID-for supervision) would be provided with one RC under URTDSM WAMS project Phase1/2 for min data viewing subject to technical feasibility.

All above quantities may be considered by NERTS POWERGRID under BOQ-RLDC head. The revised total distribution of installation is as follows:

1. Tripura, Manipur, Nagaland, Mizoram—1no. each -Total 4nos.
2. B/U NERLDC, NERLDC-3nos;
3. RTAMC/NERTS-1no.

4. NERPC-1no

For connecting remote consoles through permanent communication link, the same will be covered under NER FO Expansion scheme link. Further, for new requirements POWERGRID may explore amendment of existing contract or phase2 whichever is earlier. However as priority 5nos. may be arranged (B/U NERLDC & NERLDC-3nos., RTAMC-1no. Tripura/NERPC-1 no.)

Note: SLDC-Assam, Meghalaya, Arunachal Pradesh- PDC already provided. So remote console from RLDC is not considered.

The Sub-Committee noted as above.

B.20 Handing over of GPRS SIMs/ Racks/ for commissioning.

Deliberation in the meeting

After detailed deliberation it was decided that all SLDCs would hand over GPRS SIMs/Racks for commissioning as GPRS scheme implementation getting delayed due to same.

The Sub-Committee noted as above.

Action: All Constituents.

B.21 Discontinuity in links for MW vacation project.

In the MW replacement OPGW project there was discontinuity observed in many links. The same has been intimated to PGCIL. Discontinuity in the fibers will hamper ongoing telemetry status and also upcoming projects if not rectified at the earliest.

The *.sor files taken by OTDR has been submitted to PGCIL for BTPS-Agia, Agia-Boko,Sarusajai-Mirza,Sarusajai-Agia,Samaguri_Mariani and Samaguri-Misa.

Deliberation in the meeting

After detailed deliberation the forum requested NERTS to check the discontinuity in links in consonance with AEGCL at the earliest.

The Sub-Committee noted as above.

Action: NERTS/AEGCL

Date & Venue of next NETeST meeting

It is proposed to hold the 9th NETeST meeting of NERPC on second week of March, 2018. However, the exact date and venue will be intimated in due course.

The meeting ended with thanks to the Chair.

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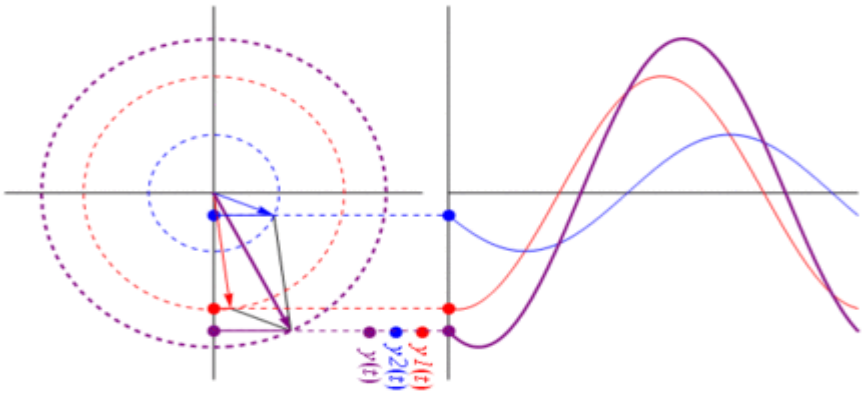
Annexure-I

List of Participants in the 9th NETeST Meetings held on 11/04/2018

SN	Name & Designation	Organization	Contact No.
1.	Sh. Nangkong Perme, EE, SLDC	Ar. Pradesh	09436288643
2.	Sh. Arup Sarmah, DM	Assam	09864267325
3.	Sh. Dipesh Ch. Das, AGM(LD-Com)	Assam	09954110254
4.	Sh. Narayan Sarma, DGM	Assam	09435040035
5.	Sh. S. Priyananda Singh, DGM/TD-I	Manipur	09612152014
6.	Sh. Th. Sushanta Singh, DM, SLDC	Manipur	09402404857
7.	Sh. B. Wankhar, EE (MOD)	Meghalaya	-
8.	Sh. B. Narry, AEE, PLCC, MePTCL	Meghalaya	09089000911
9.	Sh. D. J. Lyngdoh, E.E (S.M), SLDC	Meghalaya	09774285158
10.	Sh. C. W. Chen, AE, SLDC, MePTCL	Meghalaya	09863093311
11.	Sh. N. Iakai, AE	Meghalaya	09402133552
	No Representatives	**Mizoram**	**-**
	No Representatives	**Nagaland**	**-**
12.	Sh. Suranjan Sarkar, Sr. Manager (E/M)	NEEPCO	08974009294
13.	Sh. Joypal Roy, Sr. Manager (E/M)	NEEPCO	09435577726
14.	Sh. V. Kaikhochin, DGM	NERLDC	09436302712
15.	Sh. Tapobrata Paul, Engg.	NERLDC	08585066236
16.	Sh. M.K. Ramesh, DGM (SL)	NERLDC	09449599174
17.	Sh. M.K. Baruah, DGM (AM)	PGCIL	09401459830
18.	Sh. Supriya Paul, Manager, AM	PGCIL	09436302995
19.	Sh. Rohitesh Kumar, Engineer (AM)	PGCIL	09402184618
20.	Sh. Mahd. Faroque, Manager (Mech.)	NHPC	09871992115
21.	Sh. Pawan Tigga, Engineer (E)	NHPC	09402769593
22.	Sh. Alokesh Hazarika, Sr. Executive (O&M)	OTPC	08787606131
23.	Sh. P. Jindal, Chief Engineer	NPC	-
24.	Sh. R.K. Bansal, Consultant	NLDC	-
25.	Sh. Mayank Porwal , Manager Projects	KEC	09971020676
26.	Sh. Kr. Kush Gupta, Project Incharge	KEC	08876524025
27.	Sh. P.K. Mishra, MS	NERPC	-
28.	Sh. B. Lyngkhoi, Director/S.E (C&O)	NERPC	09436163419
29.	Sh. Srijit Mukherjee	NERPC	08794277306



Unified Real Time Dynamic State Measurement(URTDSM)

By

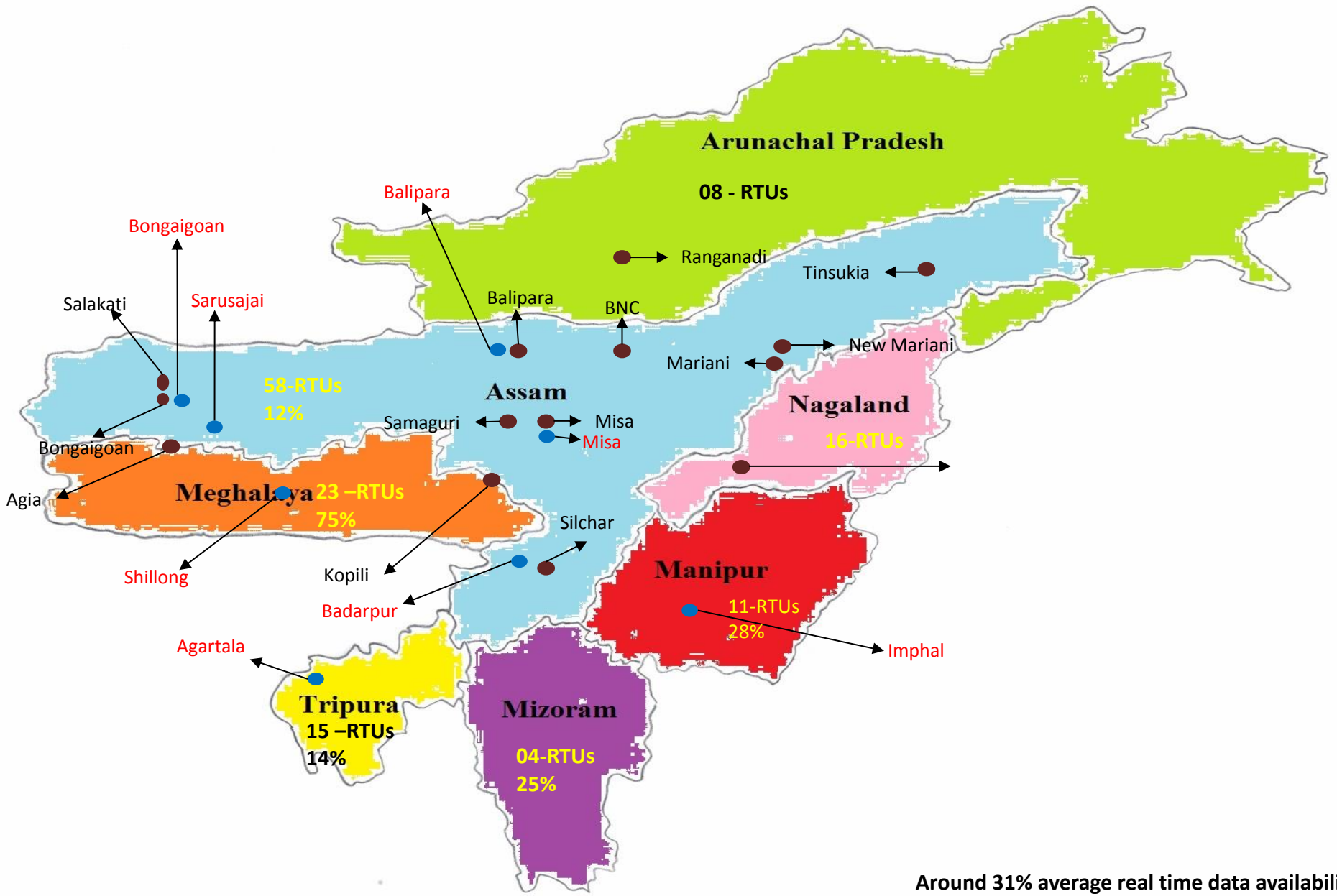
MK RAMESH

Dy.General Manager,NERLDC

Organisation

- Real time data in NER Grid
- Conception of URTDSM Project
- Over View of Project
- Pilot Project
- Analytics & Visualisation Features
- Case studies with the help of WAMS.
- Status of URTDSM Project in NER

Real Time Data (%)Availability at NERLDC



Around 31% average real time data availability

Conception of URTDSM Project

- POWERGRID appointed a Panel of Experts under the Chairmanship of Dr. Arun G. Phadke, Virginia Tech, USA for advice and guidance in development and deployment of synchro-phasor based WAMS system in Indian Power Sector.

- After the successful deployment of PMUs through Pilot projects, implementation of WAMS technology on Large scale across the entire Indian Power System has been taken up by POWERGRID.

- This project is identified as Unified Real Time Dynamic State Measurement (URTDSM) project.

- URTDSM Project aimed to provide planners and operators and other stake holders the tools to handle the upcoming challenges of power sector.

Objective of URTDSM

- For improving system visibility and operation.
- To monitor the dynamic behavior of the power system to handle the alert/emergency states of the Power System
- To Monitor the phase angle of voltage & currents, frequency, change in frequency, and power, etc.
- The phase angle differences allow abnormal power system conditions to be detected at an early stage.
- To Monitor power system oscillation modes.
- To Monitor power system stability.
- Post Disturbance Analysis.

Over View of Project

Chronological Order of URTDSM Project

- Joint Standing Committee meeting held on 05-03-2012
- CERC Order 129/MP/2012 with IA 18/2012 dated 6/9/2013
- Placement of Notice of Award from POWERGRID to M/s Alstom 15-01-2014

URTDSM Project consists of Two Packages:

- **LOA: 15.01.2014 to M/s Alstom**
- **Completion Schedule: - 24 Months from date of LOA (schedule to be completed Jan 2016)**
- **Project being implemented in Two Stages**
- **Stage – I**
- **Stage - II**
- **Scope in Stage I:- Installation & Commissioning of PDCs at 34 Control Centres**
  Installation & Commissioning of 1186 PMUs across 351 Substations
- **Scope in Stage II:- Installation & Commissioning of 483 PMUs.**
- **Package-I: NR, ER, NER, NTAMC & NLDC**
- **Package-II: SR, WR**
- **In NER Stage I - 14 Substations, 51PMUs**

Stage-I(Tentative)

Region	Sub-stations		No of Transmission line		PMU		Nodal PDC	MPDC	SPDC	Main & B/U NLDC
	ISTS	STU	ISTS	STU	ISTS	STU				
NR	74	42	394	224	206	120	6	9	1	
WR	49	18	456	135	234	71	11	4	1	
ER	51	31	395	149	202	79	4	5	1	
SR	57	16	338	90	178	47	6	4	1	
NER	9	5	69	24	36	13	0	3	1	
Total	240	111	1652	622	856	330	27	25	5	
	351		***2274***		***1186***		***57***			***2***

Stage-II(Tentative)

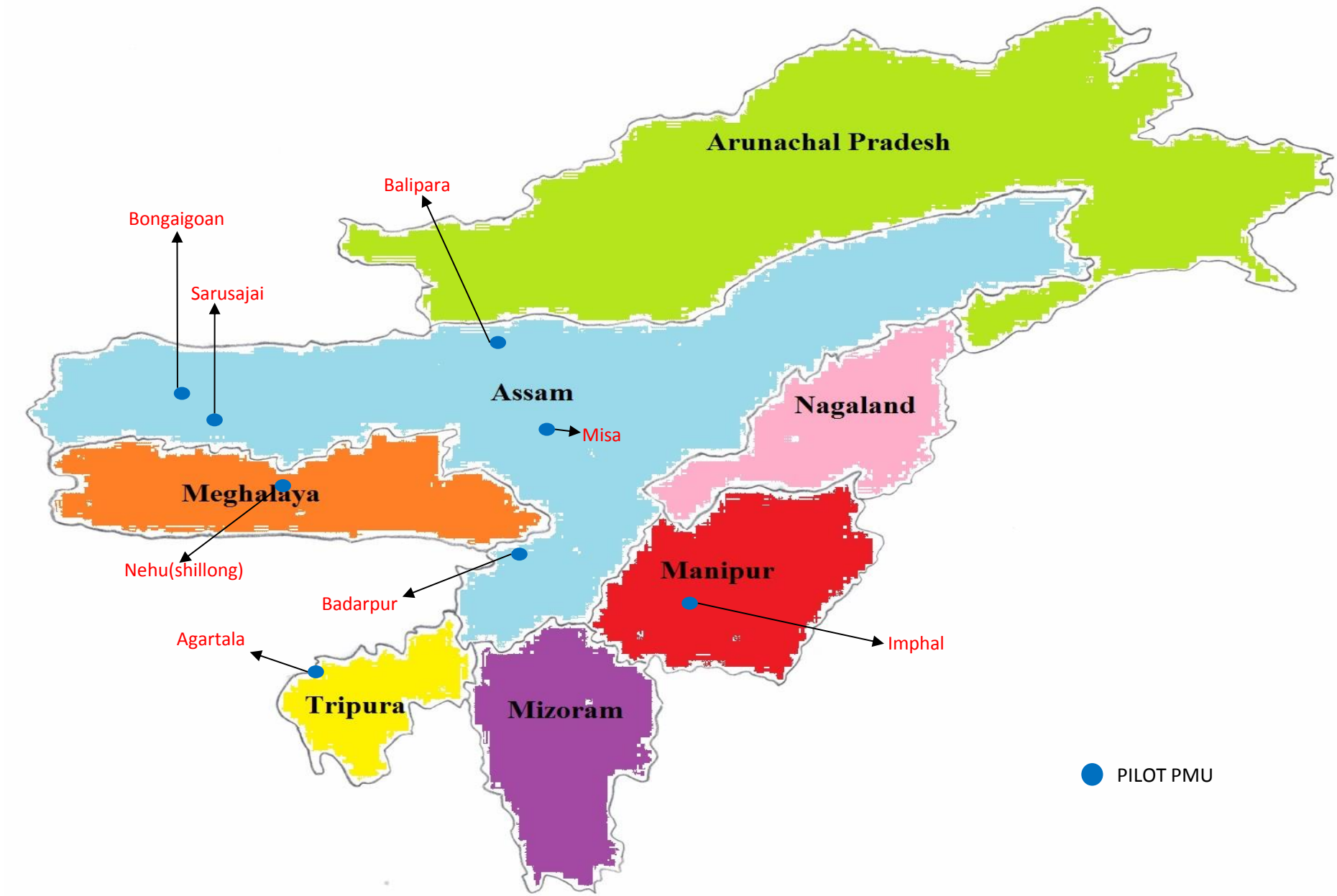
Region	Sub-stations		No of Line		PMU	
	ISTS	STU	ISTS	STU	ISTS	STU
NR	9	55	40	211	21	111
WR	11	58	64	280	33	145
ER	-	13	-	50	-	26
SR	3	55	10	199	5	105
NER	9	17	26	45	14	23
Total	32	198	140	785	73	410
	230		***925***		***483***	

Current Status of URTDSM

Region	Total PMU	Reporting	% percentage
Northern Region	400	238	60
Eastern Region	286	227	79
Western Region	406	368	91
Southern Region	255	248	97
NE Region	51	0	
	1398	1081	

Pilot PMU Project

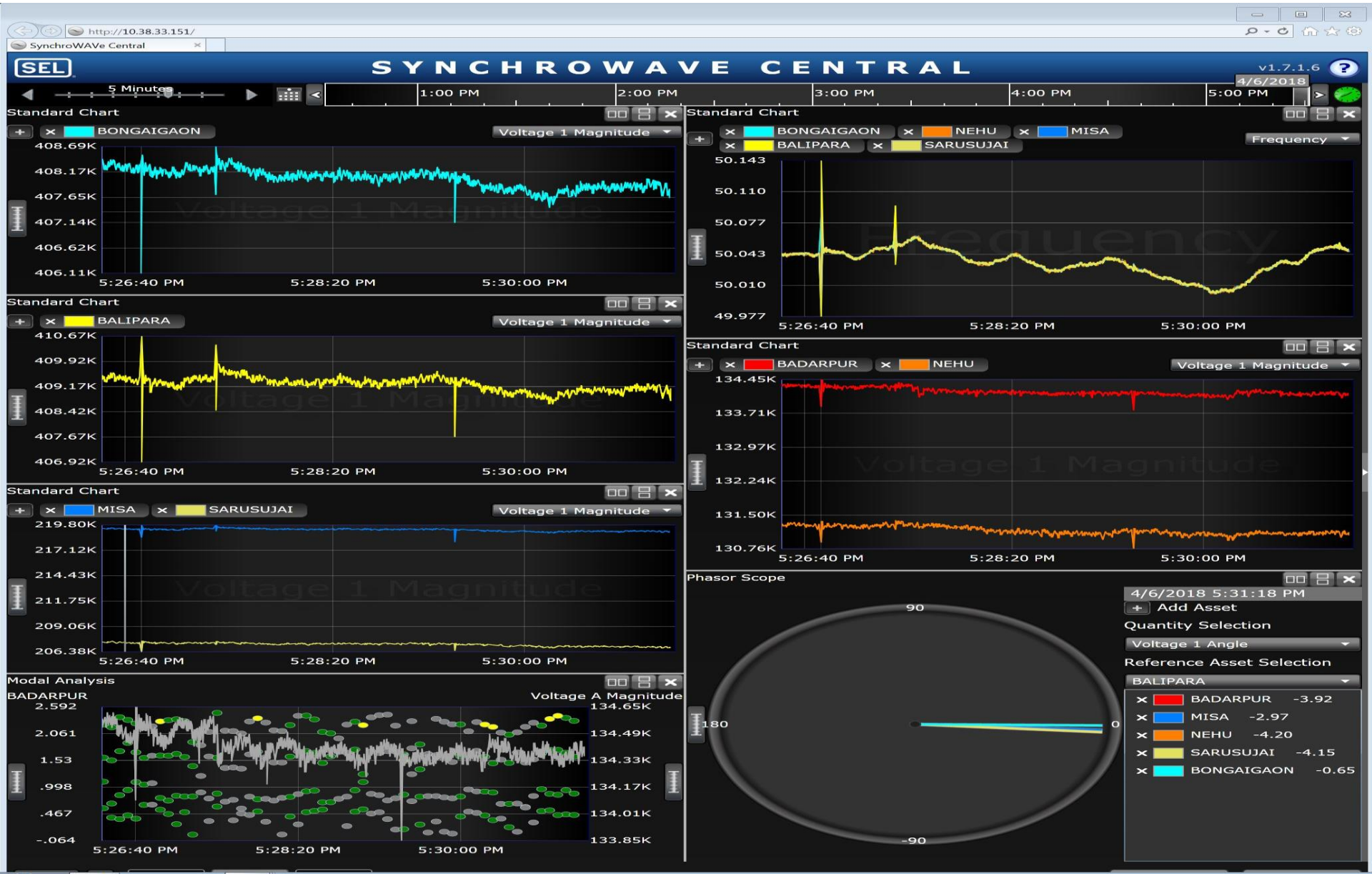
PILOT PMU LOCATIONS



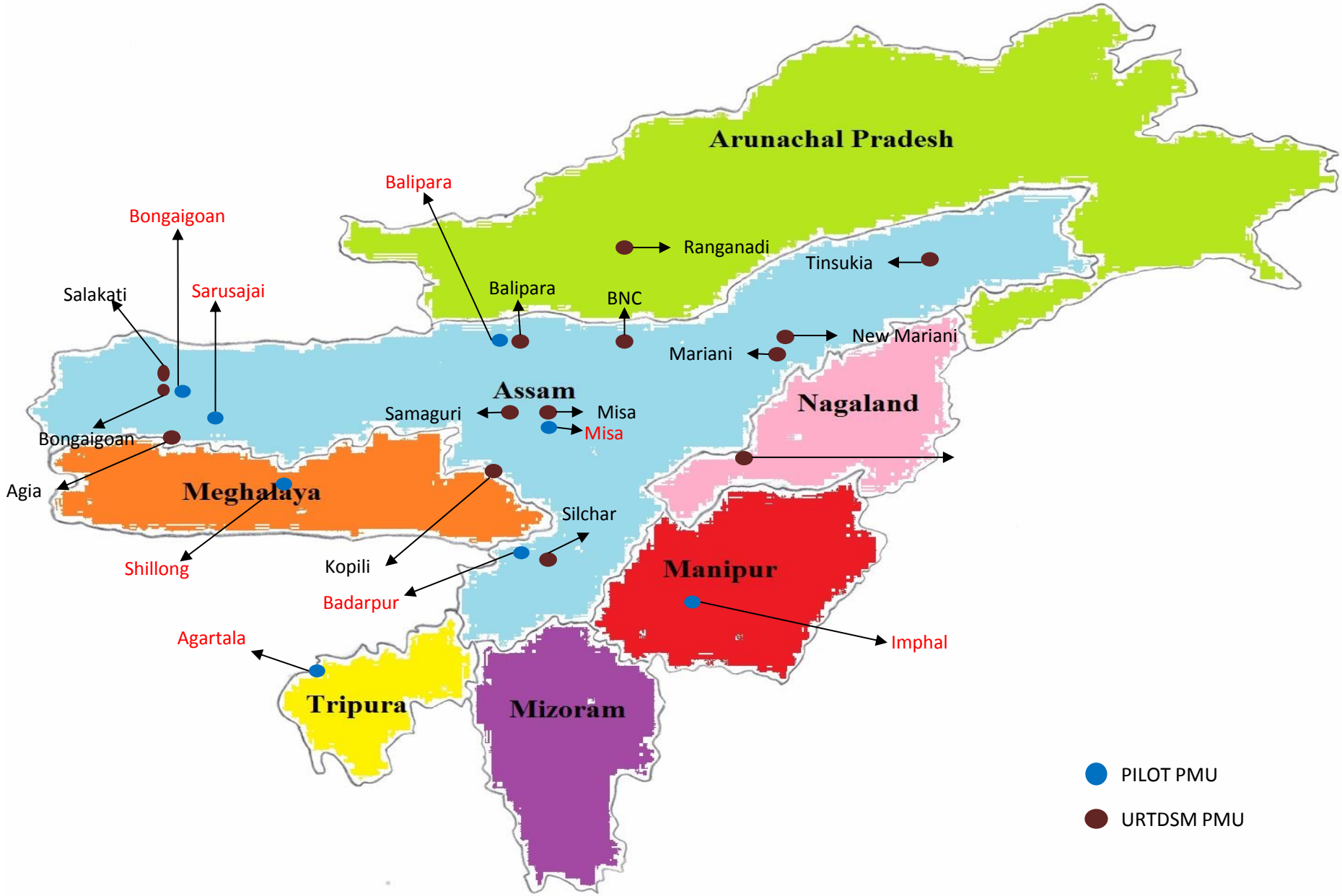
Pilot PMUs in NER

- BONGAIGAON (Balipara fdr 1 & 2)
- IMPHAL (Dimapur fdr,Ningthoukhong)
- NEHU (Sumer fdr, Khlieriat fdr)
- AGARTALA (RC Nagar fdr1, SM Nagar fdr1)
- BALIPARA (Bongaigaon fdr1, Misa fdr1)
- SARUSAJAI (Samaguri fdr2, Agia fdr2)
- MISA (Dimapur fdr2, Kopili fdr2)
- BADARPUR(Kumarghat fdr , Khlieriat fdr)

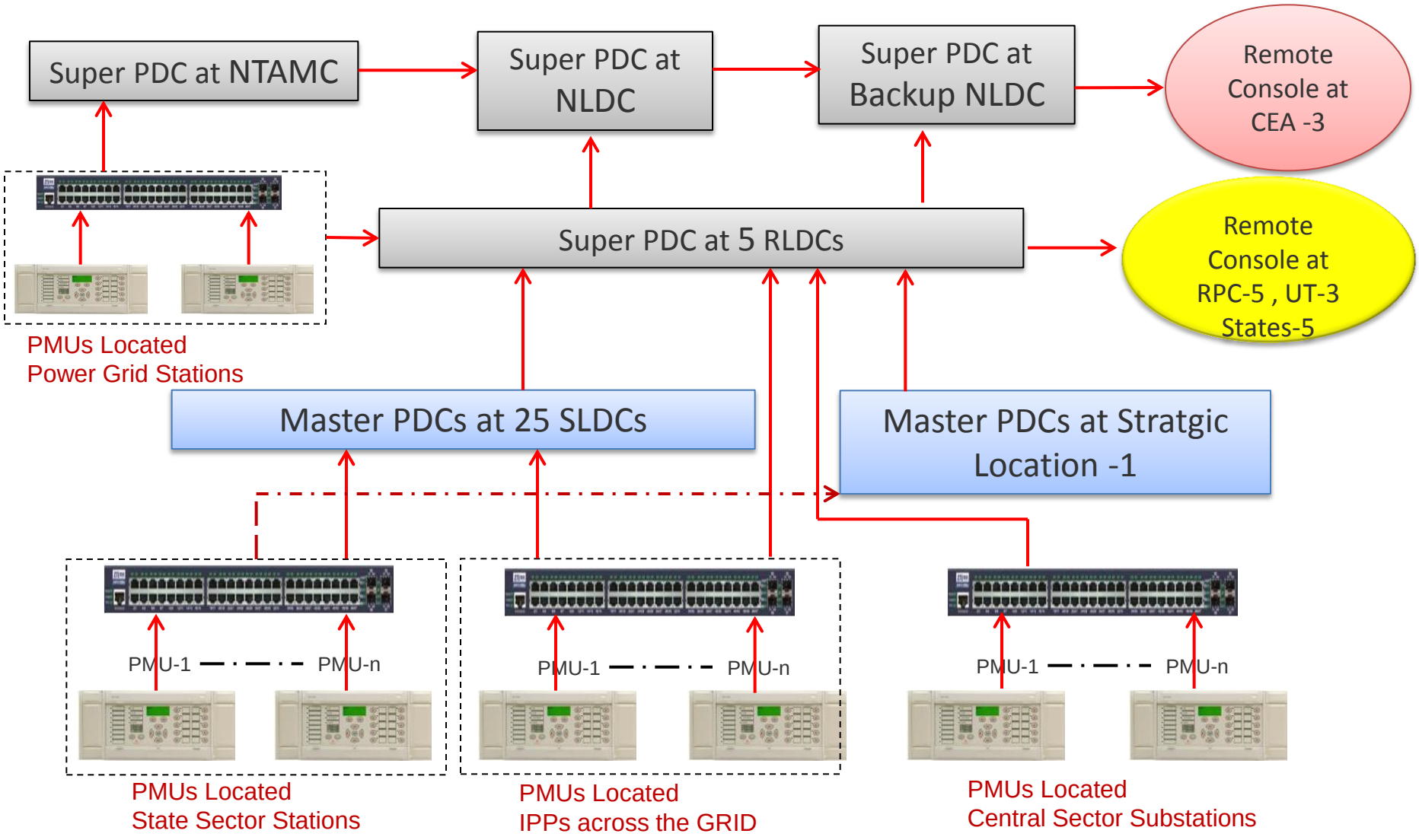
Visualisation of PILOT PMU User Interface



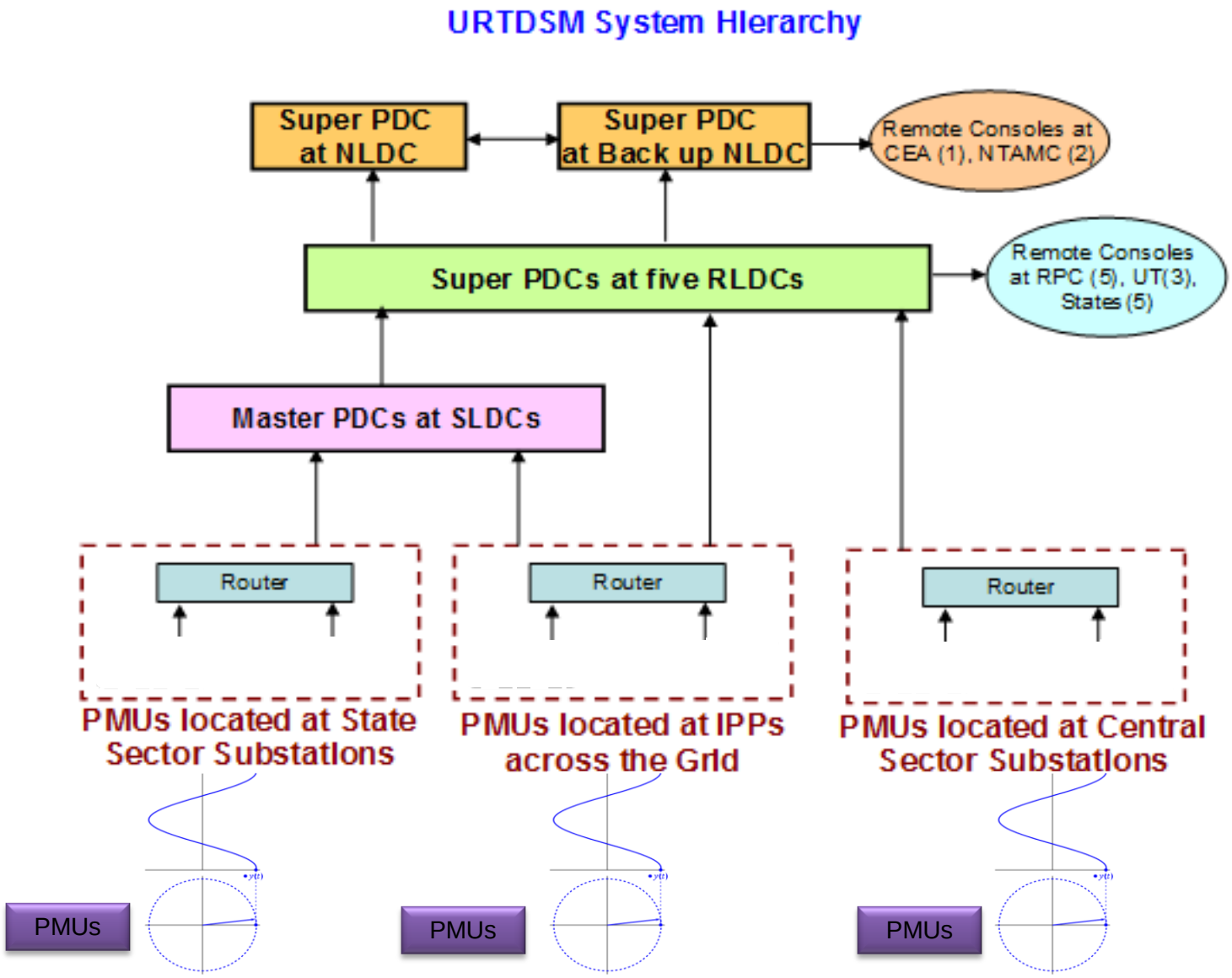
URTDSM AND PILOT PMU LOCATIONS



System Hierarchy

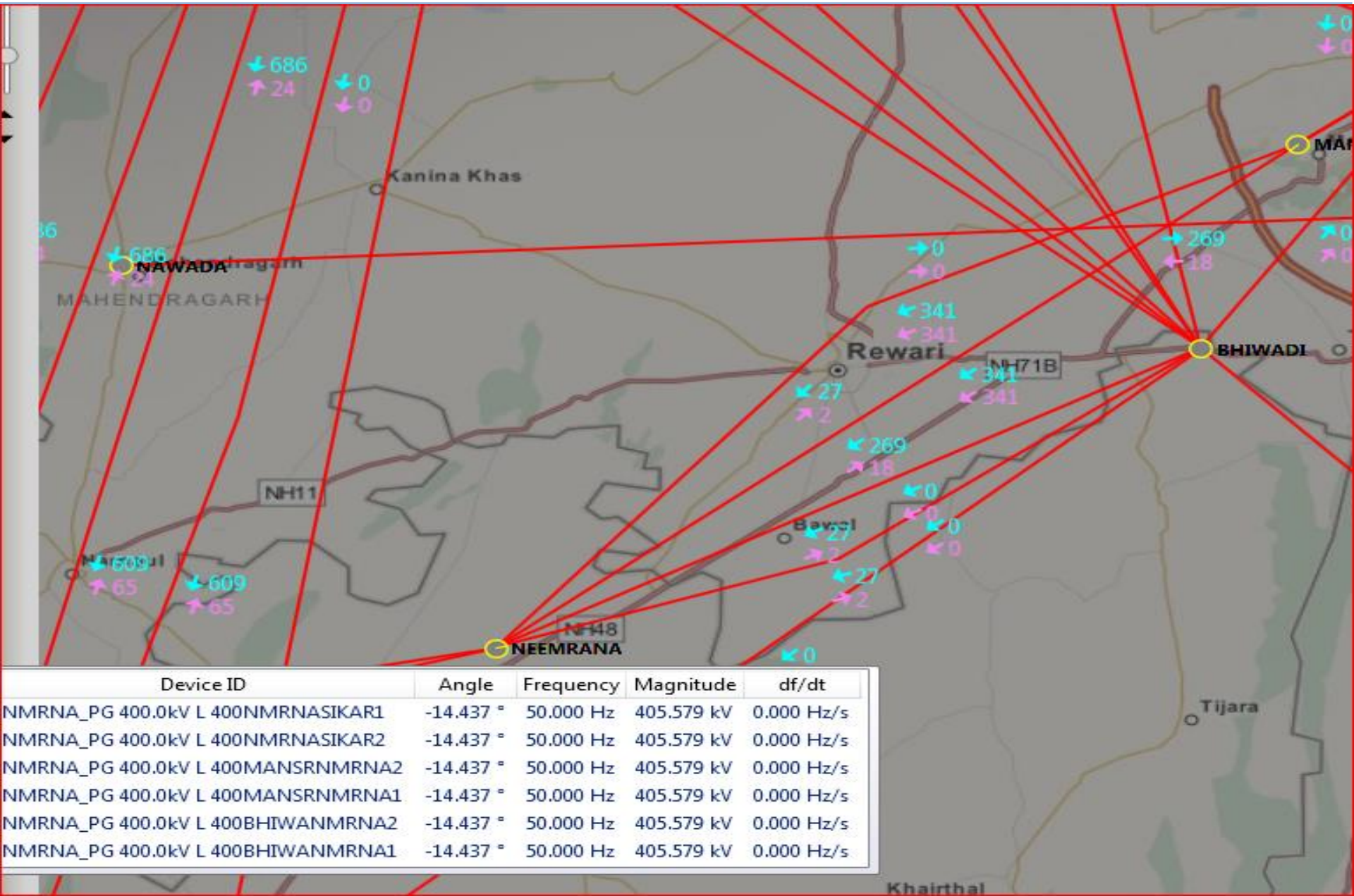


URTDSM System Data Flow Hierarchy



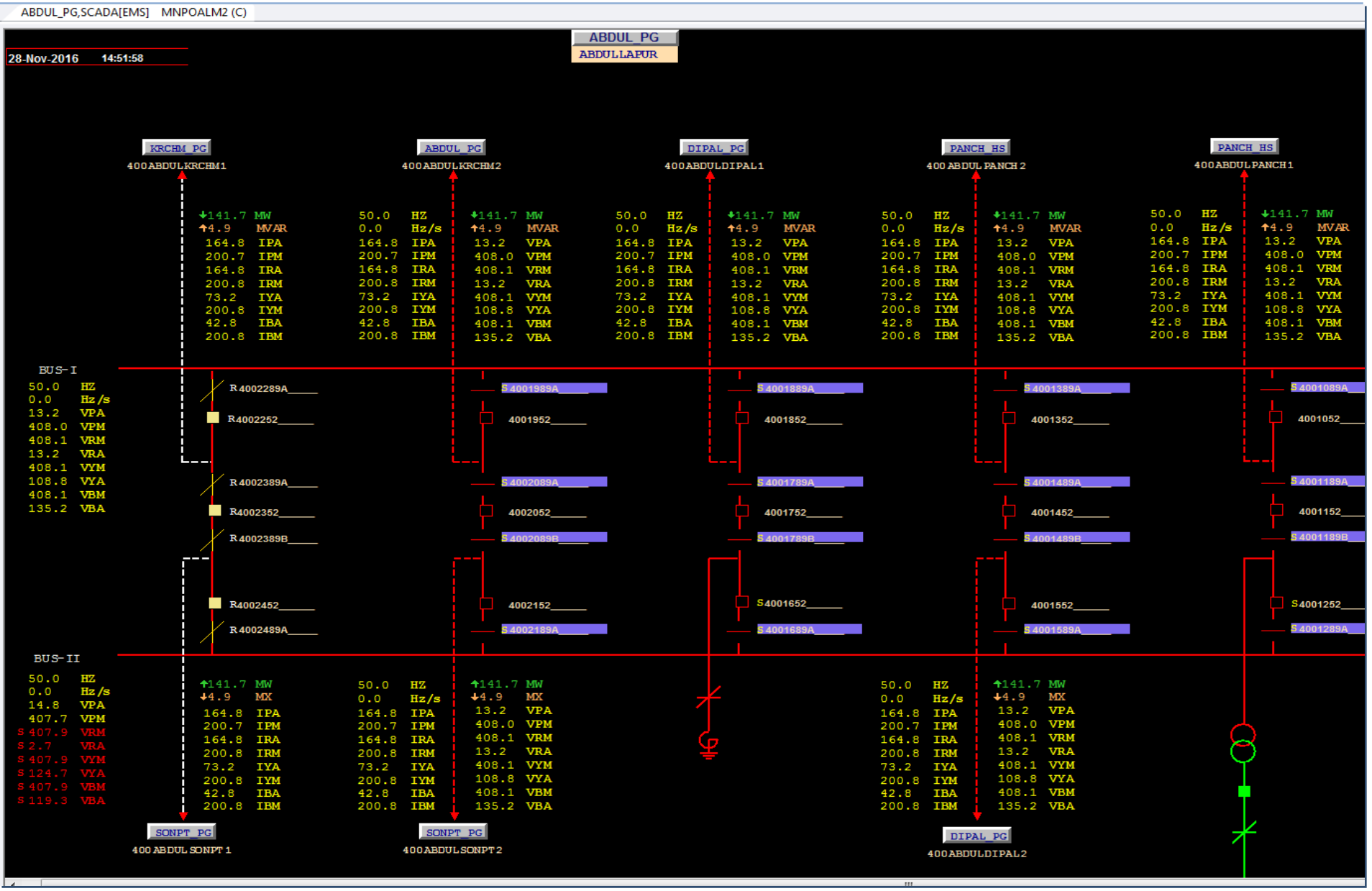
Analytics & Visualisation

Geo-Spatial Display



Device ID	Angle	Frequency	Magnitude	df/dt
NMRNA_PG 400.0kV L 400NMRNASIKAR1	-14.437 °	50.000 Hz	405.579 kV	0.000 Hz/s
NMRNA_PG 400.0kV L 400NMRNASIKAR2	-14.437 °	50.000 Hz	405.579 kV	0.000 Hz/s
NMRNA_PG 400.0kV L 400MANSRNMRNA2	-14.437 °	50.000 Hz	405.579 kV	0.000 Hz/s
NMRNA_PG 400.0kV L 400MANSRNMRNA1	-14.437 °	50.000 Hz	405.579 kV	0.000 Hz/s
NMRNA_PG 400.0kV L 400BHIWANMRNA2	-14.437 °	50.000 Hz	405.579 kV	0.000 Hz/s
NMRNA_PG 400.0kV L 400BHIWANMRNA1	-14.437 °	50.000 Hz	405.579 kV	0.000 Hz/s

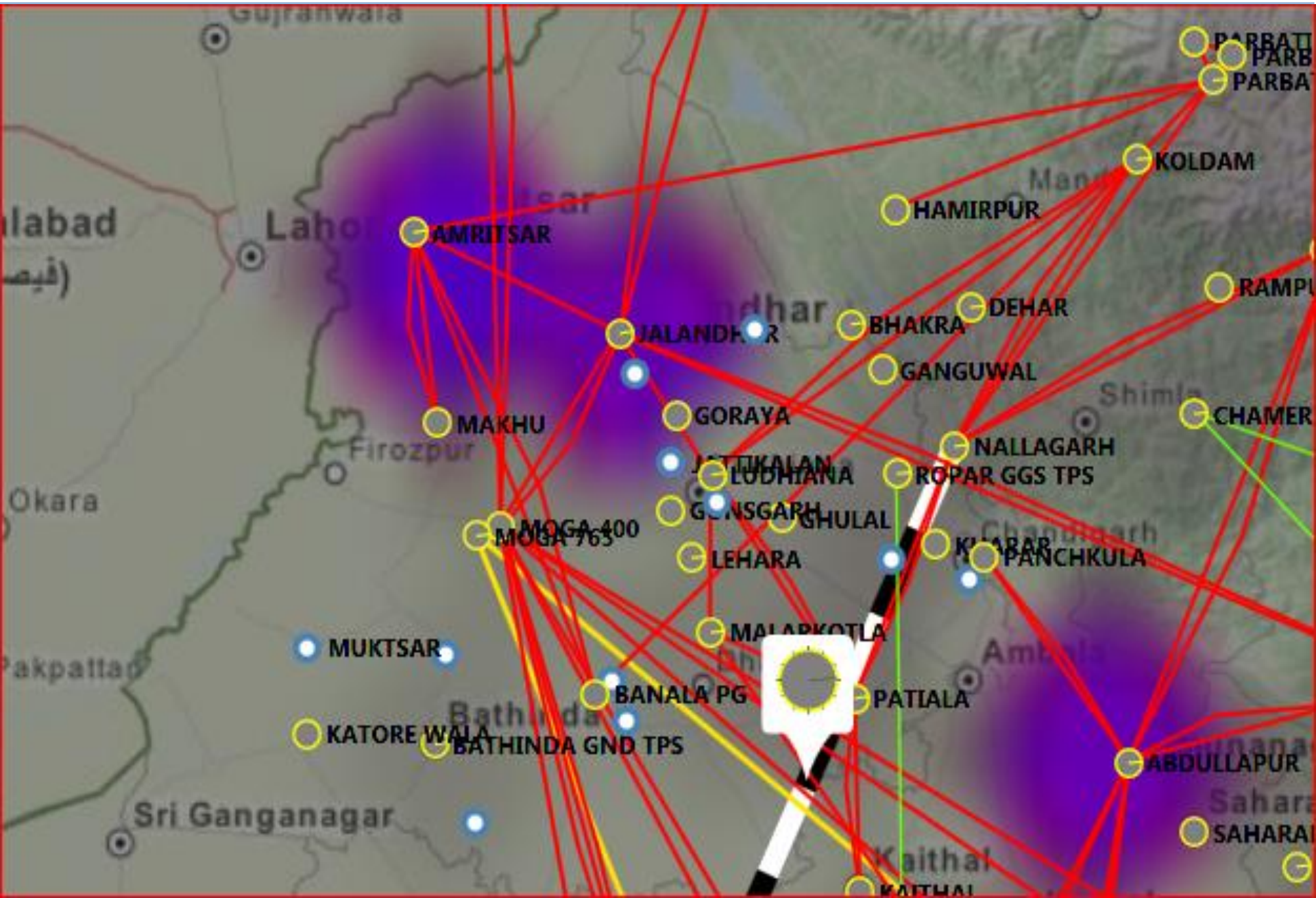
Data Visualization in SLD



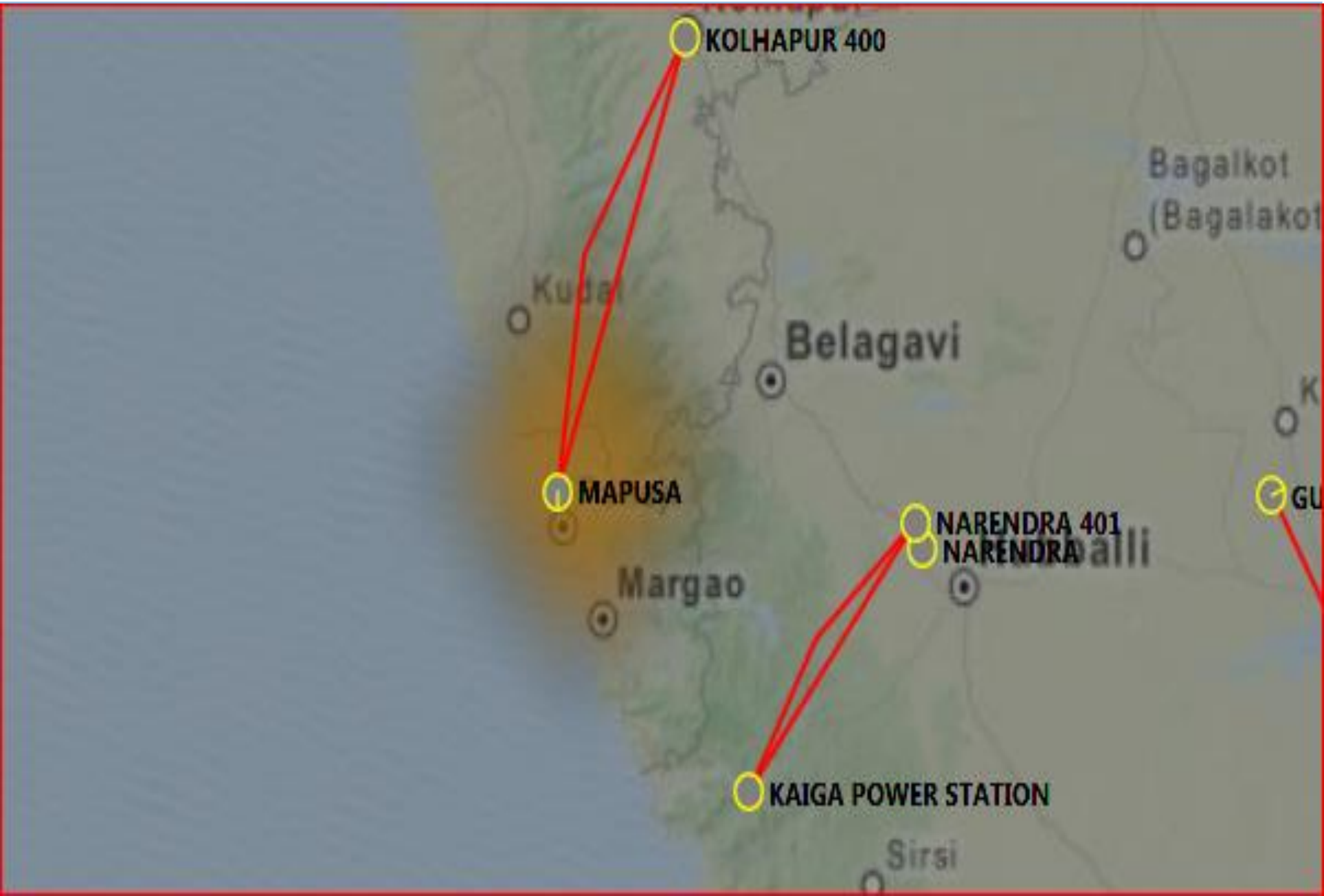
Trend Visualization

Trend Visualization

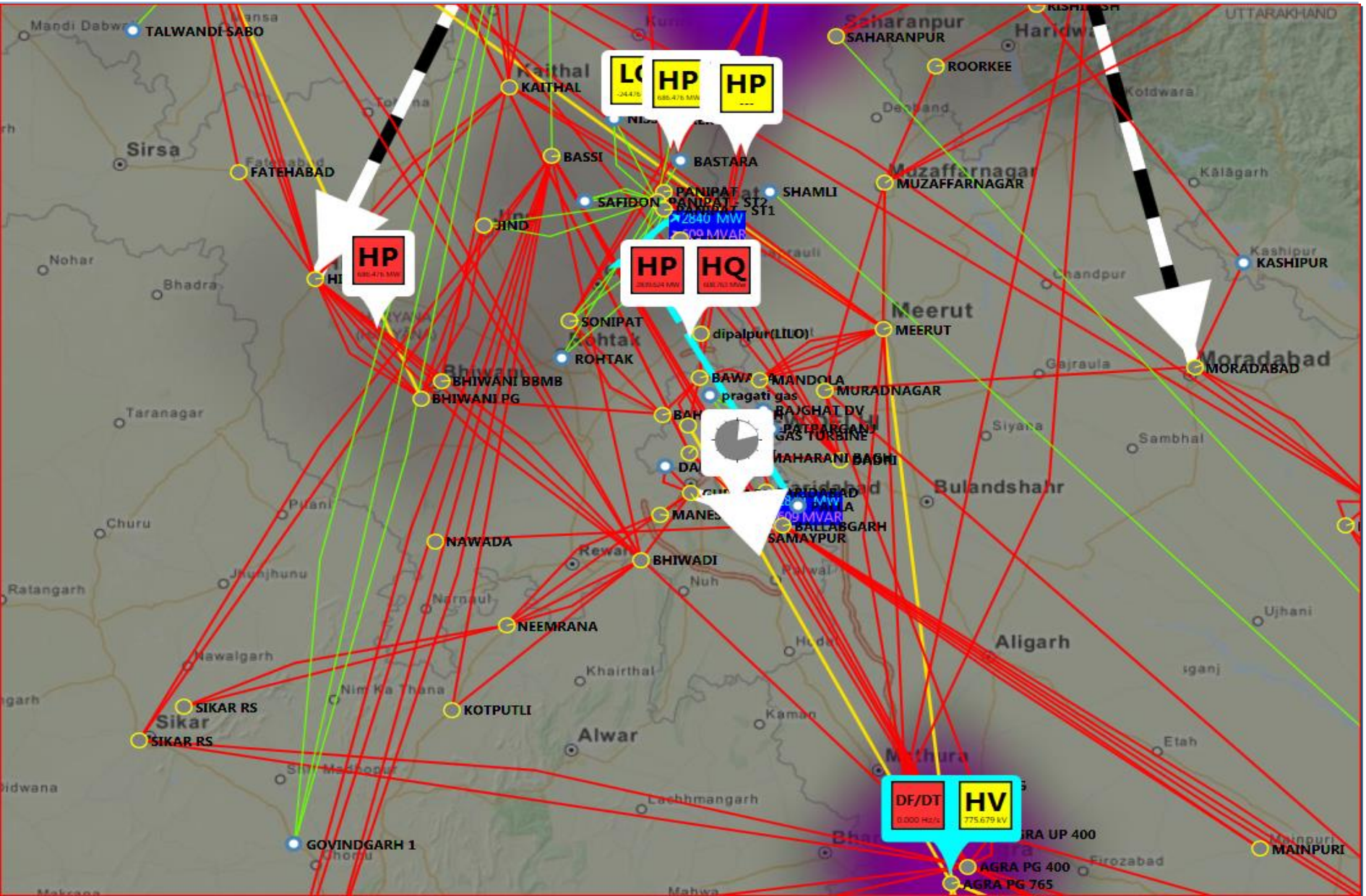
Voltage Contours



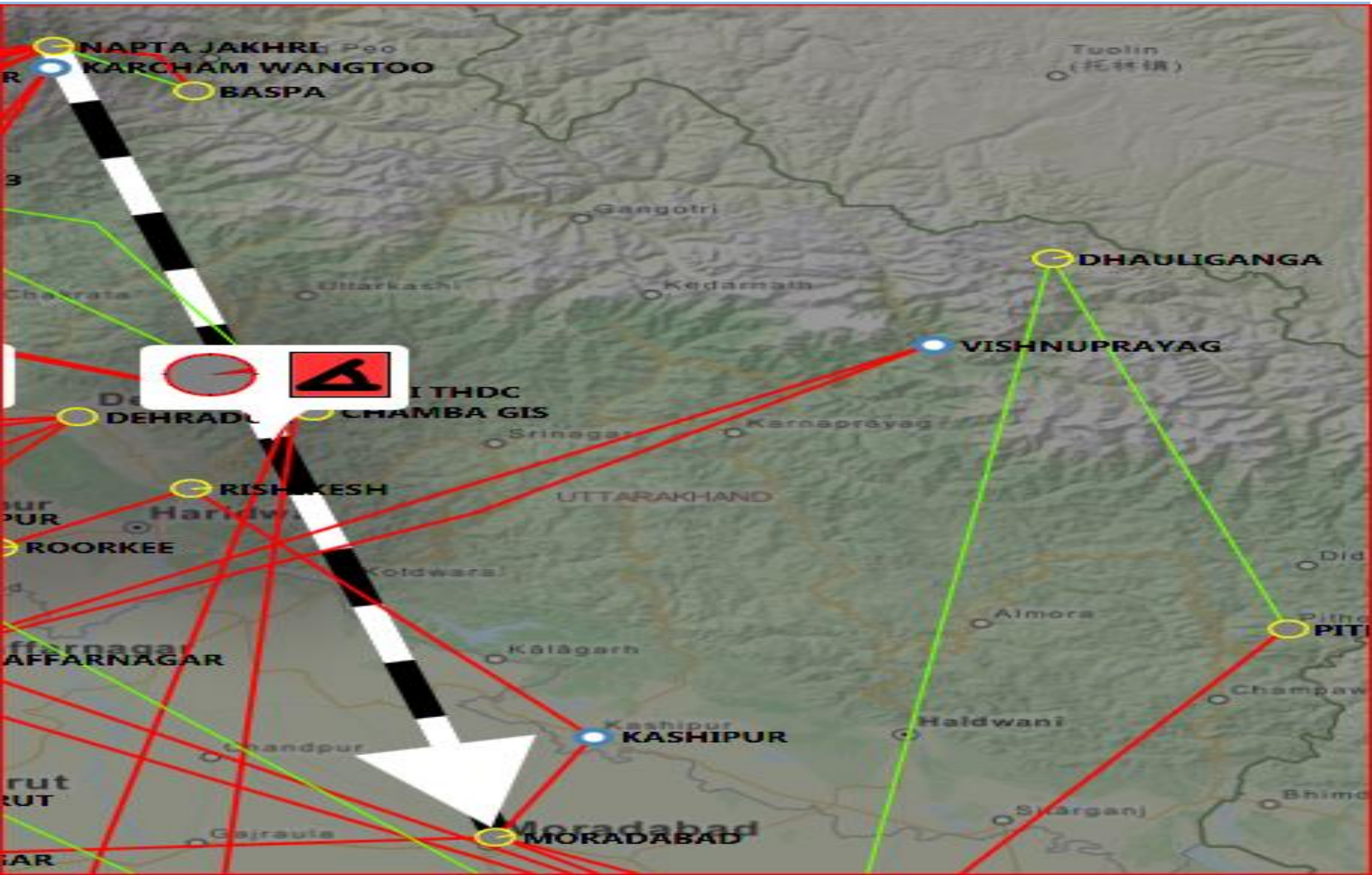
Frequency Contours



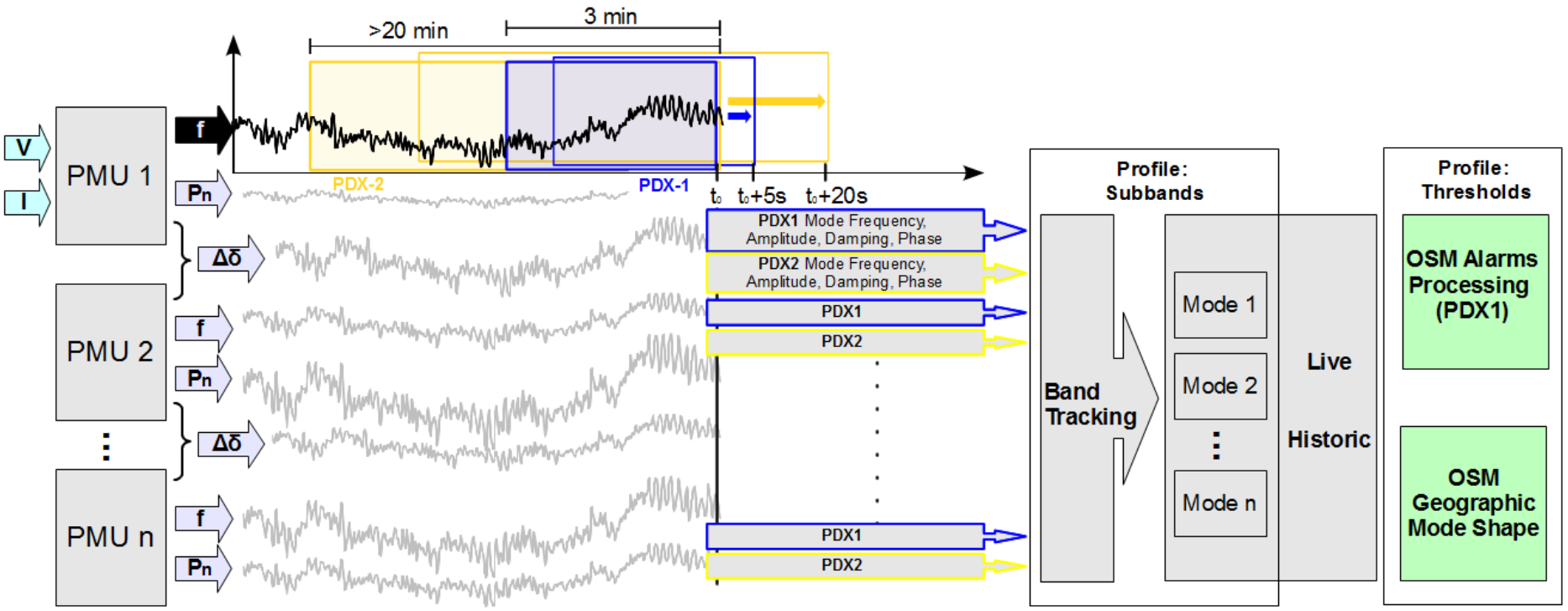
Alarm on Individual Signal



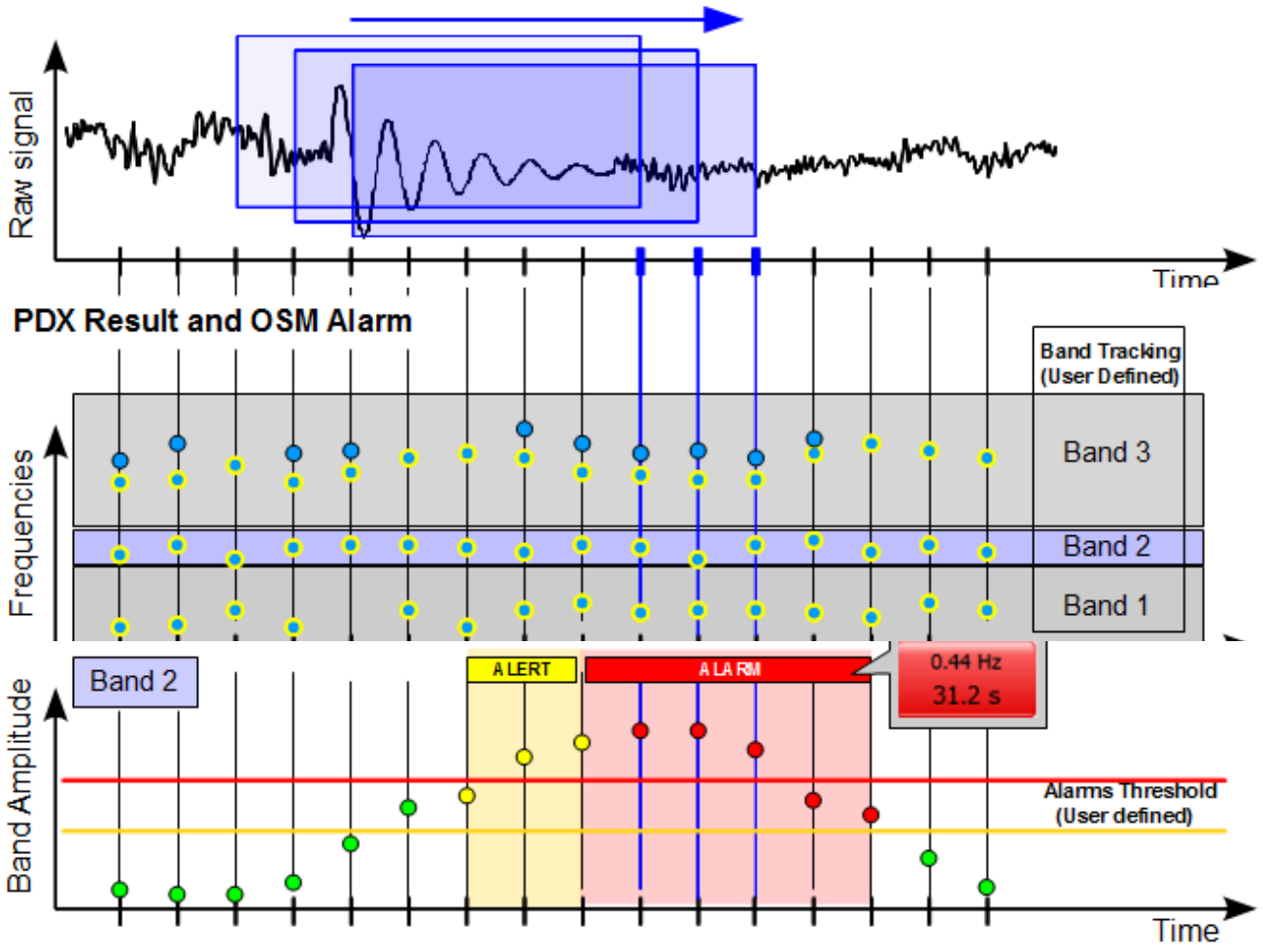
Angle Difference Visualization and Related Alarm



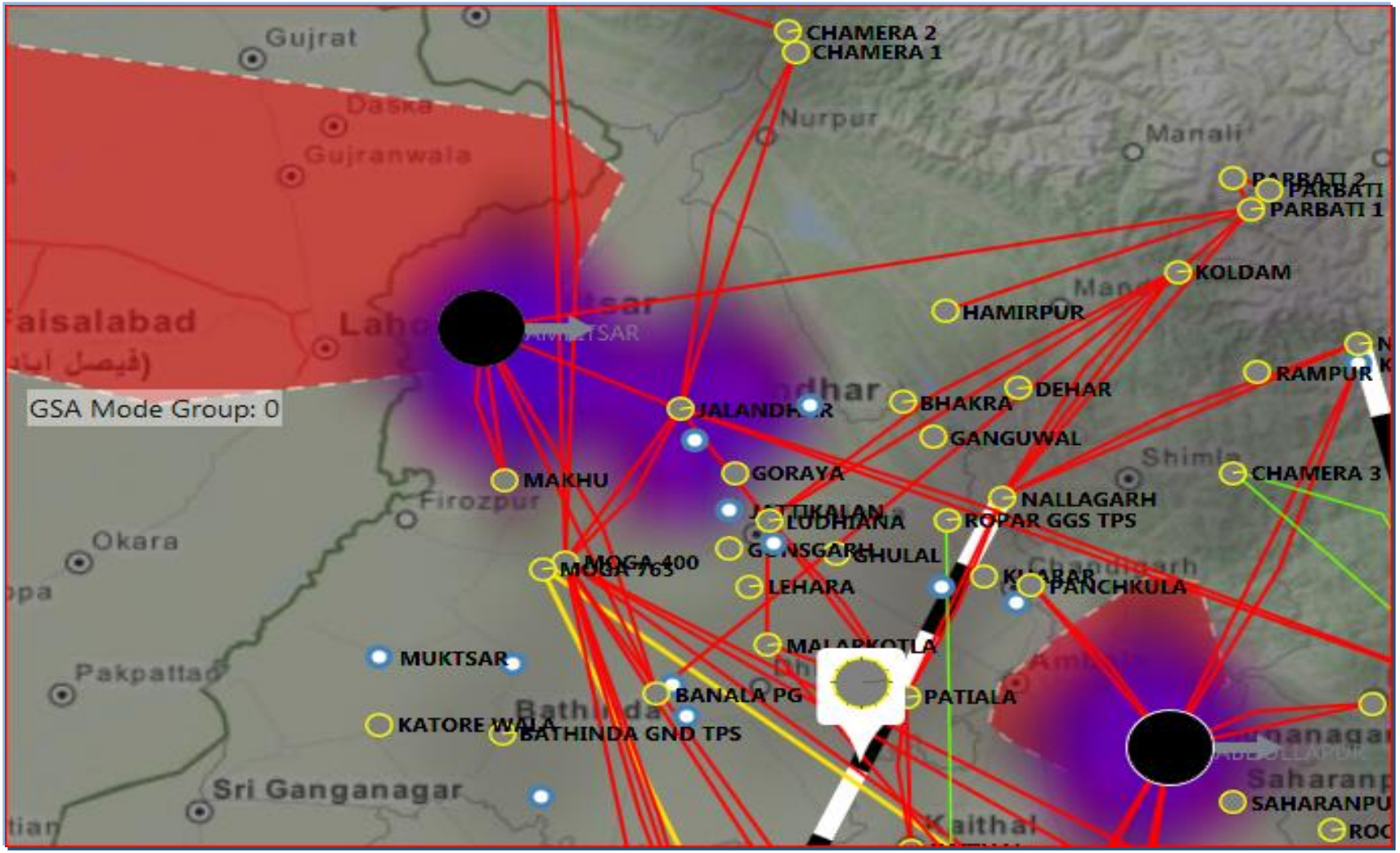
Using the Oscillatory Stability Management Application



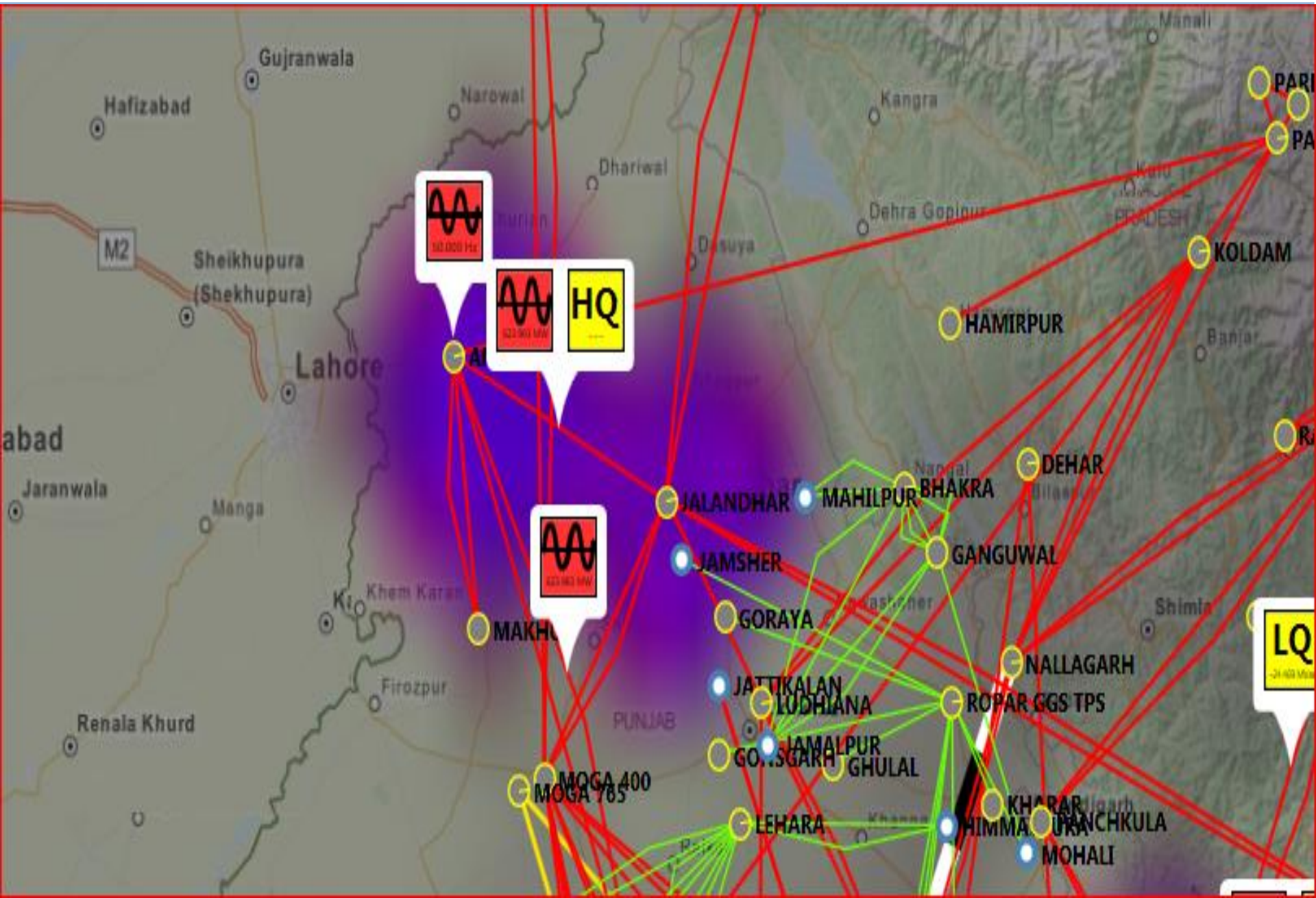
PDX Concepts: Raising Oscillatory Alarms



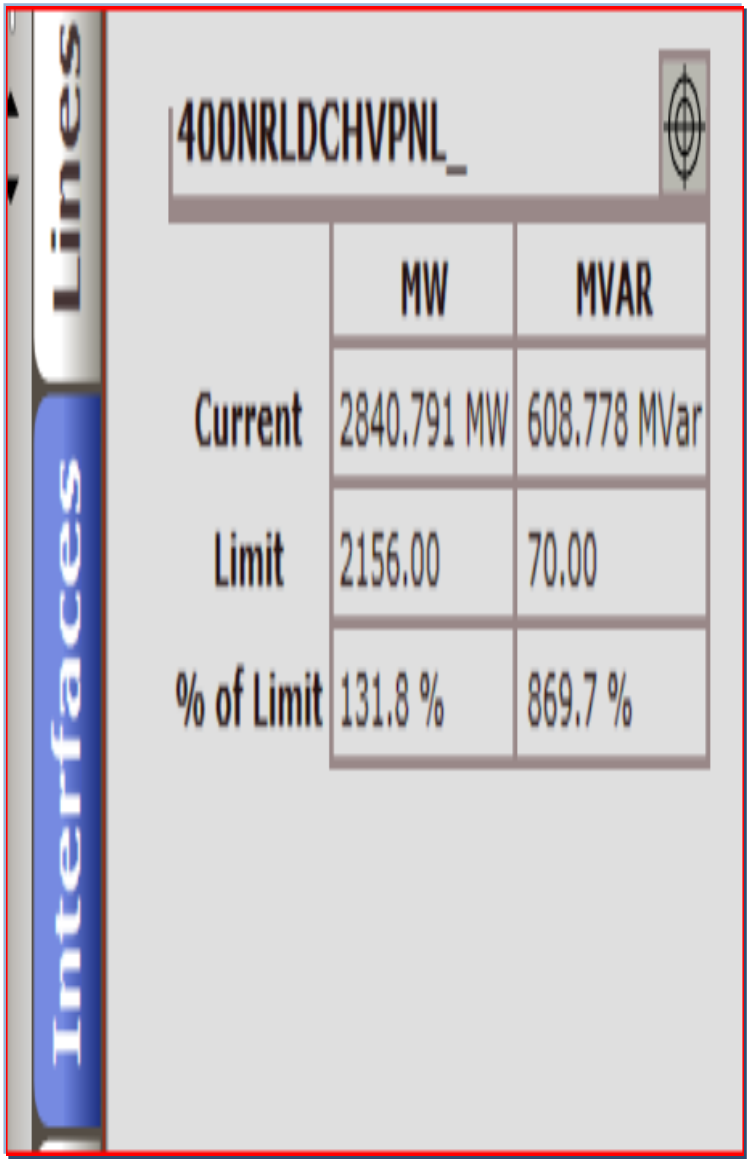
OSM Visualization on Geo-Spatial Display

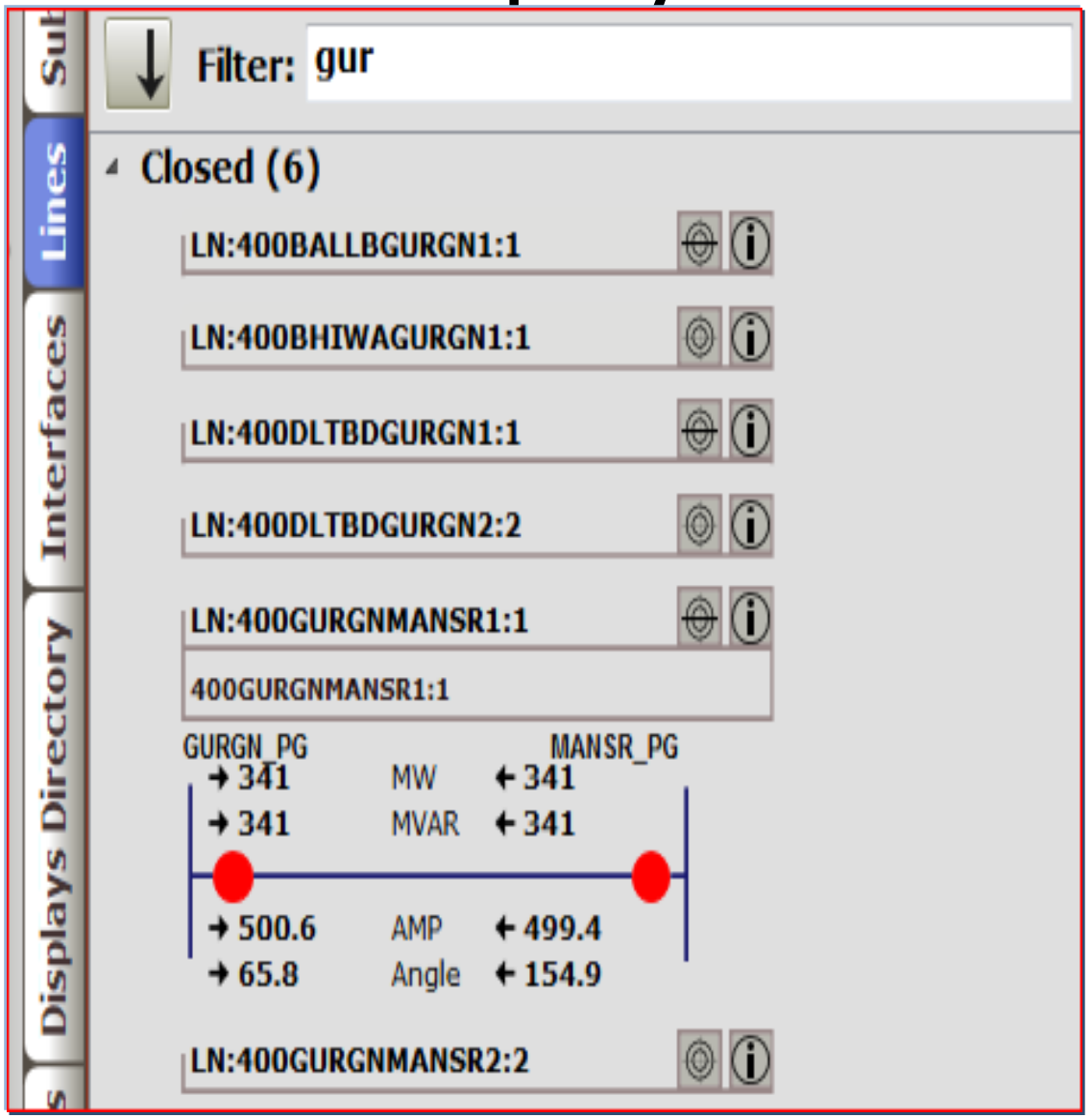


OSM Alarms

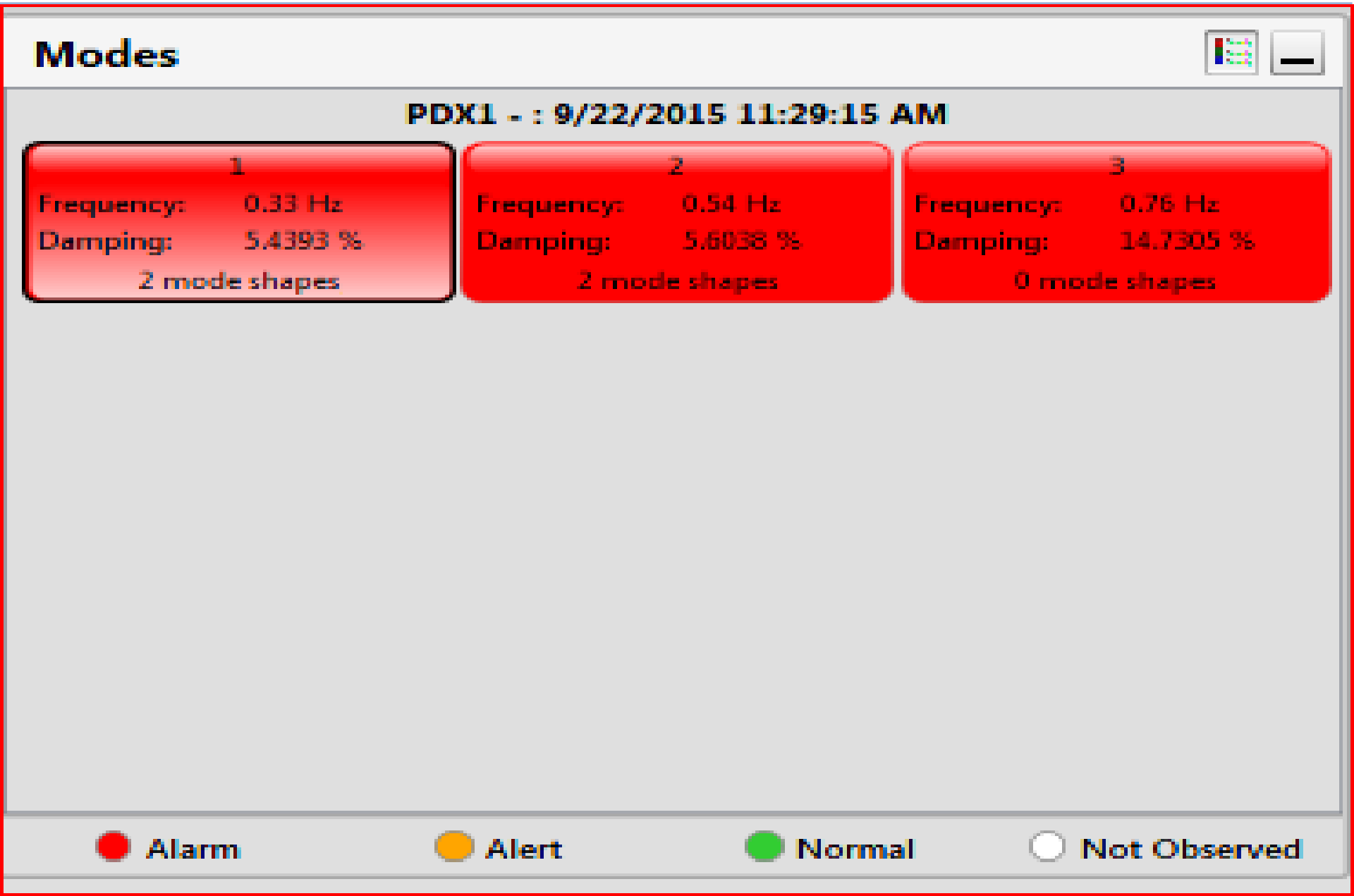

Gujranwala
Hafizabad
Narowal
Kangra
Manali
Dhariwal
Dehra Gopipur
M2
Sheikhupura
(Shekhupura)
Lahore
Jaranwala
Manga
Khem Karan
Firozpur
Renala Khurd
PUNJAB
HQ
KOLDAM
HAMIRPUR
DEHAR
BHAKRA
MAHILPUR
JALANDHAR
JAMSHER
GANGUWAL
GORAYA
NALLAGARH
JATTIKALAN
LUDHIANA
ROPAR GGS TPS
JAMALPUR
GHULAL
MOGA 400
MOGA 765
LEHARA
KHARAR
PANCHKULA
MOHALI
Shimla
LQ

Various Tabular Displays





Modes Monitoring



Advantages of OSM tool

Case Study of Low Frequency Oscillation

- On 14th July'2016 during 13:16:28.440 Hrs to 13:20:05.840 Hrs, oscillation observed in Voltage and Frequency
- Duration: 4 minutes
- Relative participation : Maximum oscillation at 132 kV Imphal
- Other oscillatory nodes: 220 kV Misa, 132 kV Badarpur

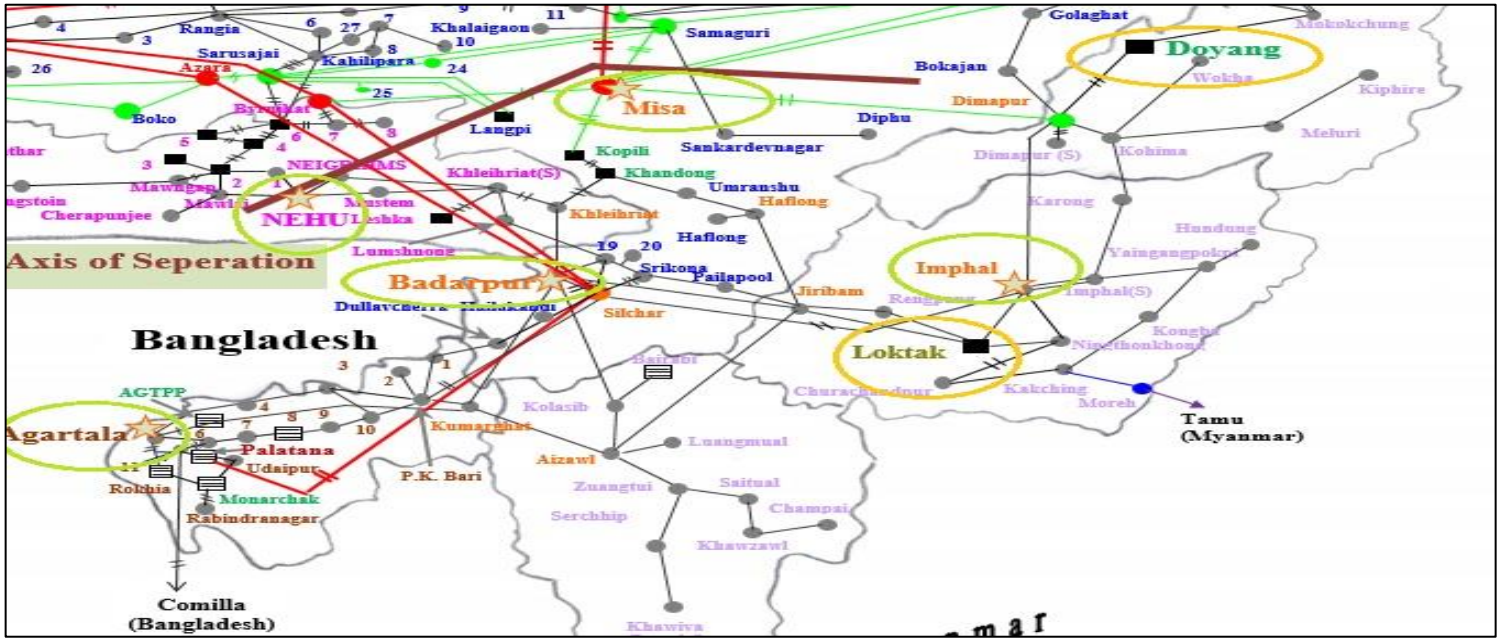


Fig: PMU Locations and participation generators

Case study – contd…

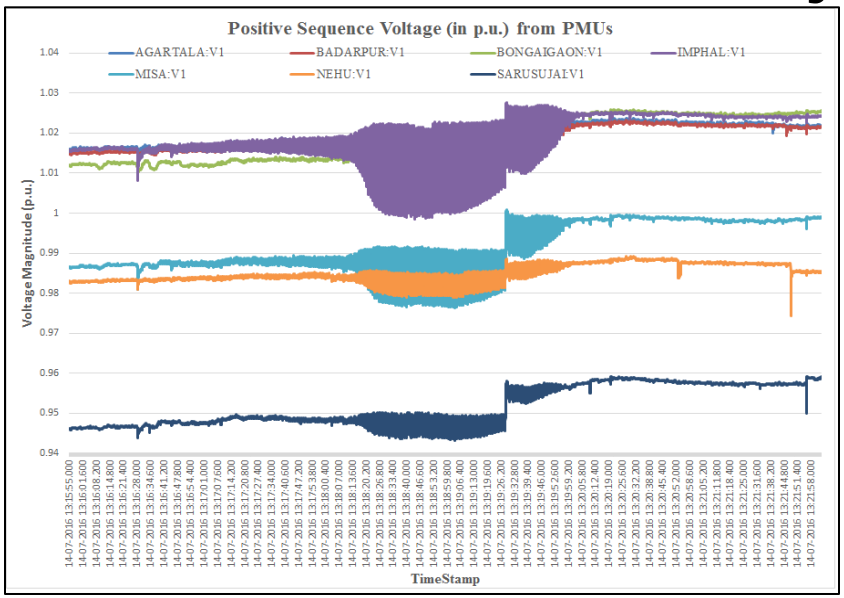


Fig: Positive sequence voltage (in p.u.)

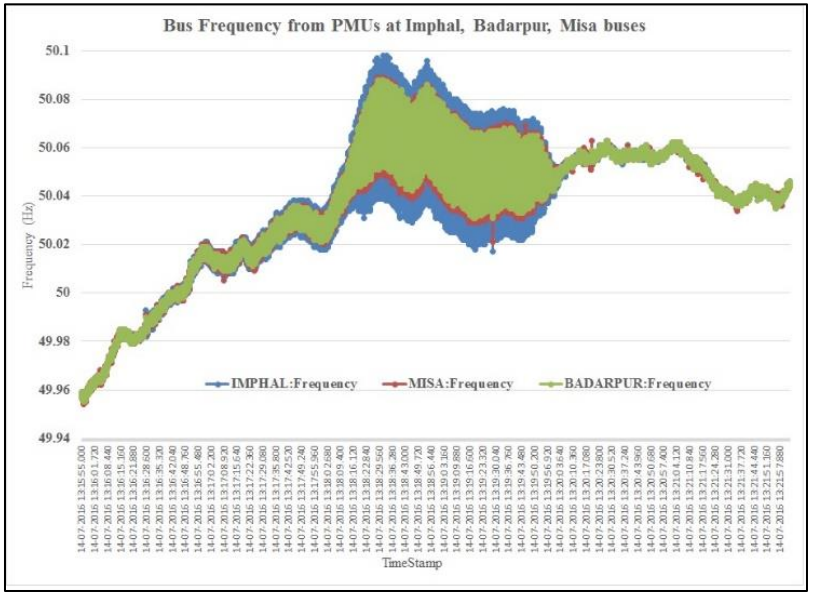


Fig: Bus Frequency (in Hz)

- Oscillatory mode from Prony analysis (OMS engine) : **0.98 Hz and 1.96 Hz** (Harmonic)
- Mode frequency indicates Local oscillations : Inter-plant and Intra-plant
- Oscillation not observed outside of NER Grid

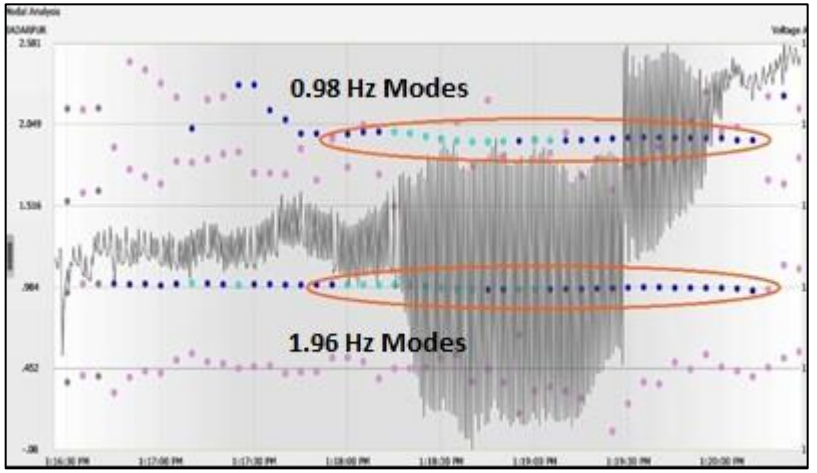


Fig: Modal Analysis (OMS engine)

Preliminary analysis and Control center actions

- Units at Loktak HEP and Doyang HEP were suspected to have participated in oscillations based on their close proximity to 132 kV Imphal (PG) and 220 kV Misa (PG), respectively
  1. **Loktak HEP: Reported hunting in line currents on 14th July case**
  2. **Doyang HEP: Reported hunting in unit on multiple dates**

- Change of network configuration noted since 12th July'2016: 220 kV Mariani – Mokokchung D/C line out of service due to Tower collapse
- Reduced Inertia of the power system around Doyang HEP
- Doyang HEP generation radially connected

- Change of scheduled injection pattern of Doyang HEP noted: Oscillations occur during generation near capability limits

Preliminary analysis and Control center actions - contd…

- State Load Despatch Center, Nagaland reported tripping of 132/66 kV transformer at Dimapur bus [close to Doyang HEP] and subsequent load loss

- All factors together: Doyang (3x25 MW) chosen to be candidate for investigation

- NERLDC instructed Doyang HEP to limit injection about 10% below capability limit.

- Further analysis on PMU data was done with Signal Processing toolbox of MATLAB

- Highest participation found at 0.965 Hz and 1.965 Hz => Corroborates with OMS engine results

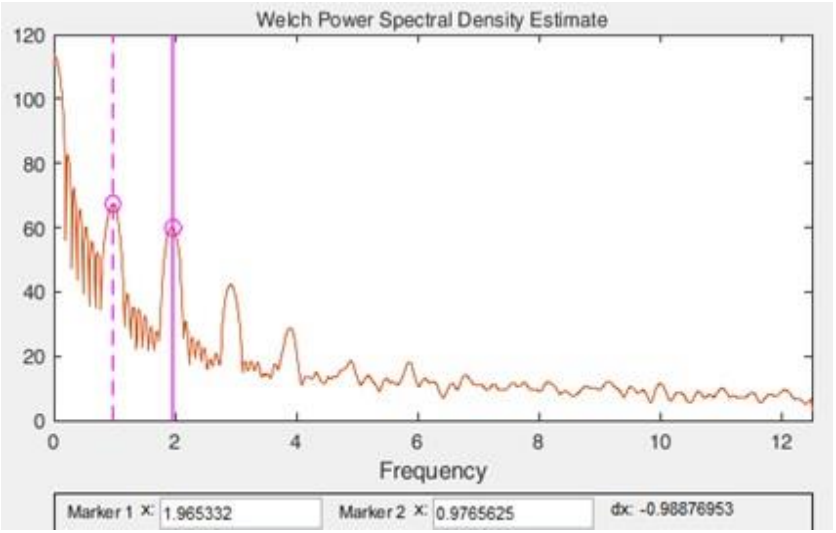


Fig: PSD estimate on measured PMU data

Corrective Action and Mitigation

- Hunting of generators is an expected phenomenon arising out of parallel operation of generators, and interaction between the Power-Angle curve and rotary inertia of generator
- Local mode oscillations have been commonly found in case of AVR of generating units acting with high output and feeding into a weak network.
- In such cases, damping can be improved by using supplementary controls to AVRs through Power System Stabilizers
- In case of Doyang HEP, the initial action was to limit injection schedule till proper solution
- From investigation, it was seen that Doyang HEP had disable their PSS in all units following a maintenance exercise
- In this case, PSS in all units of Doyang was enabled. Controlled test run displayed no presence of further oscillations
- Further action: Tuning of the PSS at Doyang after baselining of oscillation cases

PMU Analytics by IIT

- Line Parameter Estimation
- Online Vulnerability analysis
- Linear State Estimation
- CT/CVT Calibration
- Supervised Zone-3 Distance Protection
- Control Schemes for Improving System Security

URTDSM PROJECT STATUS IN NER

Status of NER-URTDSM Installation & Commissioning

- Control center Integrated FAT (Factory Acceptance Testing) completed in Aug'17 (NERLDC,SLDCs).
- Control centre Hardware at NERLDC Received in OCT-2017
- Control Centre Hardware at MeECL SLDC and Assam SLDC installation completed and yet to power up.
- Installation & Commissioning work of PMUs at field side completed except 9PMUs in 3 stations.
- Installation & Commissioning of NERLDC Control Centre Hardware March'18
- Site Acceptance Test(SAT)- Not yet started.
- SAVT – Not yet started.
- UPS Supply is pending

URTDSM Phase -I PMU Placements

URTDSM Phase -I					
SL No	Name of the Stn	Owner	Voltage level	Feeder Name	Feeders
1	Ranganadhi	AP	220	North Lakhimpur, Tezpur, Itanagar	4
2	Mariani	Assam	220	Kathalguri, Misa, Samaguri 1 & 2	4
3	Samaguri	AEGCL	400	Sarusajai, Misa PG 1 & 2, Balipara,	9
				Mariani 1 & 2,220kV tejpur 1 & 2, J.Nagar	
4	Agia	AEGCL	400	Boko	4
5	Tinsukia	AEGCL	400	Behiting 1 & 2 Makum	3
6	Balipara PG	PGCIL	400	Misa PG 1 & 2,BNC 1,2,3 & 4,Bongaigaon 1,2,3,4	12
				Kameng 1 & 2	
7	Bongaigaon	PGCIL	400	Balipara 1234,Binaguri 1& 2,400kV Azara 1& 2,400kV Alipur 1&2,220kv Birpara 1 & 2	14
8	Bishwanath	PGCIL	400	Subansiri 1234,Alipurdwar HVDC 1&2,Balipara 1234,Ranganadhi 1&2.	12
9	Silchar	PGCIL	400	Azara, Palatana 1&2,400kv Byrnihat	4
10	Misa	NEEPCO	400	Balipara 1& 2,220kv Mariani,220kv Mariani(N) 220kv Dimapur,220kv Kopili 1,2,3,220kv Byrnihat 1&2,N.Kohima	11
11	KOPILI	NEEPCO	220	Misa 123	3
12	Birpara	NEEPCO	220	Siliguri 1,2,Chukha 1,2,3 ,Bongaigaon 1,2	7
13	220kV Mariani	PGCIL	220	220kV Kathalguri,220kV Misa,220kV Mockochung 1,2	4
14	Dimapur	PGCIL	400	Misa, N Kohima	2


Thank you!