



सत्यमेव जयते

Government of India
Ministry of Power
North Eastern Regional Power Committee
Lapalang, Shillong 793006



No. NERPC/SE (O)/OCC/2021/**8441-8477**

Dated: 03rd November, 2022

संलग्न सूची के अनुसार
As per list enclosed.

Sub: Minutes of 195th OCC Meeting.

Sir/Madam,

Please find enclosed herewith the minutes of 195th OCC Meeting held at “**NERPC Conference Hall, Shillong, on 18th October, 2022** for your kind information and necessary action. The minute is also available on the website of NERPC, **www.nerpc.gov.in**.

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

Encl: As above

Yours faithfully,

(A.Agrawal)
Dy. Director

List of Addressees:

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. Engineer-in-Chief (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, Dongtiah-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. ED, NERLDC, Dongtiah, Lower Nongrah, Lapalang, Shillong -793 006
24. Chief Engineer, GM Division, Central Electricity Authority, New Delhi – 110066
25. Chief Engineer (NPC), GM Division, Central Electricity Authority, New Delhi – 110066
26. CGM, AEGCL, Bijuli Bhawan, Guwahati – 781001
27. CGM, APGCL, Bijuli Bhawan, Guwahati – 781001
28. CGM, DISCOM, Bijuli Bhawan, Guwahati – 781001
29. Head of SLDC, MeECL, Lumjingshai, SR Road, Umjarain, Shillong – 793022
30. Head of SLDC, Dept. of Power, Govt. of Arunachal Pradesh, Itanagar – 791111
31. Head of SLDC, Dept. of Power, Govt. of Nagaland, Dimapur – 797103
32. Head of SLDC, MSPCL, Imphal – 795001
33. Head of SLDC, P&E Deptt. Govt. of Mizoram, Aizawl – 796 001
34. Head of SLDC, TSECL, Agartala – 799001
35. Chief Engineer(Elect), Loktak HEP,Vidyut Vihar, Kom Keirap, Manipur- 795124
36. DGM (O&M), OTPC, Badarghat Complex, Agartala, Tripura – 799014
37. Director,NETC,2C,3rdFloor, D21Corporate Park, DMRC Building Sector 21, Dwarka, Delhi-110077.



(A.Agrawal)

Dy. Director



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Minutes for 195th OCCM, NERPC



Govt. of India
Ministry of Power
North Eastern Regional Power Committee
Shillong

North Eastern Regional Power Committee

Agenda For

195thOCC Sub-Committee Meeting

Time of meeting : 10:00 Hrs.

Date of meeting : 18th October 2022 (Tuesday)

Venue : "NERPC, Shillong"

The List of Participants in the 195thOCC Meeting is attached at **Annexure - I**

Shri B. Lyngkhai, Member Secretary, NERPC welcomed the participants to the 195th OCC meeting. He apprised the members about the deliberations from 12th National Power Committee (NPC) Meeting chaired by Chairperson, CEA. The following issues were highlighted:

- a. Draft proposal of CEA for a National Level Optimization of Surplus Generation Capacity is under deliberation and the same has been circulated to the states, UTs, DISCOMs, SLDCs, state sector and central sector Generator companies for their inputs.
- b. NPC forum reviewed the update of Islanding Scheme in NER and requested to expedite the implementation of Guwahati Islanding Scheme.
- c. NERPC was asked to take up matter with the states in the OCC meeting on priority basis for Mapping of feeders (on which UFR and df/dt relays of AUFLS scheme are installed) to SCADA.

Thereafter, Member Secretary requested Sh. A Agrawal, Deputy Director to take up the agenda items for discussion. After the discussion of the agenda items, a technical session was conducted wherein following presentations were made:

1. Cyber Security Solutions for SCADA System – by Security Solution Leader M/s Trend Micro and IT & Power Automation by M/s Orbit Tech Sol India. **(Anx II)**
2. Remote Accessibility System/Protection Management System – M/s Kalkitech. **(Anx III)**

A. CONFIRMATION OF MINUTES

CONFIRMATION OF MINUTES OF 194thMEETING OF OPERATION SUB-COMMITTEE OF NERPC.

The minutes of 194thmeeting of Operation Sub-committee held on 15th September, 2022 at Shillong were circulated vide letter No. NERPC/SE (O)/OCC/2021/7537-7573 dated 30th September, 2022.

The Sub-committee confirmed the minutes of 194th OCCM of NERPC as no comments/observations were received from the constituents.

B. FOLLOW UP AGENDA ITEMS

B.1. Operational Performance and Grid discipline during September,2022:

NERLDC presented the Operational Performance and Grid Discipline for the month of September '2022. The same is provided in the **Annexure B.1.**

B.2. Generation Planning (ongoing and planned outages)

- a. Present per day MU and projected number of days of operation.

Plants	Reservoirs level in meter	MU content	Present DC (in MU)	No of days as per current generation
Khandong + Kopili stg II			0	
Kopili			0	Will be "0" until further intimation.
Doyang	319.81	24.3	0.381	64
Loktak	766.63	16.3	1.251	13

The outage of other generating stations may be approved considering the present water levels in reservoirs and long-term outage of Kopili HEP.

Deliberation of the sub-committee

After detailed deliberation the forum approved the outage of Generators in November'22

The sub-committee noted as above.

B.3. Outage Planning Transmission elements

It was agreed in the 99thOCC 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.

It was decided in the previous OCCM that shutdown would be granted from the 1st day of the following calendar month to the 30th/31st day of the same month.

Deliberation of the sub-committee

After detailed deliberation the forum approved the shutdown of transmission elements for November'22 (attached at **Annexure-B.3**)

The Sub-committee noted as above

B.4. Estimated Transmission Availability Certificate (TAC) for the month of September, 2022:

Transmission Utilities have submitted the outage data for the month of September, 2022. So, the attributability of outage of the said elements is being finalized by NERLDC & NERPC. The Availability of the transmission elements of ISTS licensees for the month of August,2022 is as follows-

SN	ISTS Licensee	Availability for August'22 (%)
1	NETC	99.9827
2	KMTL	99.9970
3	NER-II TL	99.8275
4	PGCIL	99.9265 (For July 2022)

The sub-committee noted as above.

B.5. Mock Black Start Exercise:

The previous mock black start & restoration exercise has been conducted at various generating stations in NER on the dates mentioned in the following table:

As per discussion in 177th OCC meeting on 22nd April 2021, schedule of Mock exercise at AGBPP and RHEP was to be finalized by NEEPCO after discussion with OEM. As per regulation 5.8 (b) of IEGC, mock black start shall be carried out by Users/CTU/STUs at-least once in 6 months.

NEEPCO and NHPC informed the dates for testing as follows:

Plant Name	Performed On	Due Date	Schedule of Testing as per 194 th OCCM
AGBPP	after upgradation of DG under R&M
AGTTCCPP	09.04.2019	09.10.2019	Sep'22 first week*
PareHEP	25.01.2020	25.07.2020	To be done in lean hydro season
Kopili HEP	10.05.2019	NA	NA
Kameng HEP	In Lean Hydro season
KopiliStg-II	-	-	Under prolonged shutdown

*In the 194th OCCM, NERTS informed that for 132kV AGTCCPP – 79Tilla Ckt #I the CB is operational, however synchronization cannot be done due to trolley issues. For 132kV AGTCCPP – 79Tilla Ckt #II, closing issue of CB shall be rectified in Oct'22 and shutdown has been applied for the same in Oct'22.

DGM, SLDC, TSECL stated that the trolley at 79Tilla S/S would be replaced by Sep'22. Further, the forum decided that Black Start at DHEP would be carried out by Oct'22

Deliberation of the sub-committee

DGM (SLDC), TSECL informed that the synchronization trolley couldn't be replaced so far. He added that the same would be replaced by Oct'22. NERTS informed that the CB for 132kV AGTCCPP – 79Tilla Ckt #II is healthy.

NEEPCO apprised the forum that mock black exercise for Doyang can be done on 21st Oct, 2022. NEEPCO raised apprehension regarding the synchronization to be performed at Dimapur(PG) end. The forum requested NERLDC to coordinate amongst the two so that smooth synchronization is achieved. NERLDC requested that both Doyang and Dimapur personnel should ensure that synchronization shall take place only after proper matching of required parameters.

The sub-committee noted as above

Action: NEEPCO, TSECL, NERTS, NERLDC.

B.6. Status of ADMS:

Status for Automatic Demand Management Scheme in 7 states of NER. The SLDCs informed the latest status as follows:

Name of the utility	SAT Completion	DoCO
DoP Ar. Pradesh	27-01-2021	Enabled & in-operation
AEGCL/APDCL	07-12-2020	Enabled & in-operation
MSPCL	24-11-2020	Enabled & in-operation
MePTCL/MePDCL	31-08-2020	Enabled & in-operation
P&ED Mizoram	22-02-2021	Enabled & in-operation
DoP Nagaland	17-11-2020	To be enabled after stability of ICCP link
TSECL	24-12-2020	To be enabled by Oct'22

In the 194th OCCM, Member Secretary, NERPC informed that after Inspection by PSDF-CEA team the following points have been raised w.r.t. ADMS implementation in Assam:

- a. ADMS implementation over ICCP protocol rather than with the approved OPC system
- b. Go Live or DoCO post Cyber Security Audit certification
- c. Non-communication of 5 out of 10 Sub-stations with ADMS Server

After detailed deliberation the forum decided the following:

- The detailed justification for Implementation using ICCP link will be prepared by NERPC after consultation with the respective utilities, M/s ORBIT and M/s GE.
- For revision of x Go Live or DoCO date the respective utilities (post Completion of Cyber Security Audit) shall discuss with the vendor(M/s ORBIT) for revision of Go Live/DoCO date.

DGM, SLDC, TSECL informed the forum that ADMS could not be enabled due to connectivity problems i.e. at present only 1 MODEM is working and 3 MODEMs are non-operational. The forum requested TSECL to enable the scheme ASAP.

Deliberation of the sub-committee

Justifications emerged out of deliberations of the forum are as below:

- **ADMS System Implementation with ICCP Protocol Interface with existing EMS SCADA System implemented and supported/managed by GE:**
 - a. As per Section B.1- clause 5&6 of Tender Document, data from the existing SCADA Servers at SLDC has to be provided to ADMS Servers on OPC by the Utility concerned.
 - b. However, GE T&D India Ltd, being the contractor as per the Comprehensive Annual Maintenance Contract of the existing SCADA system at SLDC, had suggested to NERPC and all State utilities to use ICCP for Data communication interface with ADMS Servers citing better provision of data security with ICCP as compared to OPC. Accordingly, one way data transfer from the SCADA system to the ADMS Servers over ICCP was done without any financial implication to the project.
- **Cyber Security Audit Certification:**
 - a. There is no provision for Cyber Security Audit Certification requirement in the ADMS Tender Technical Specifications which were framed in 2019. The details of “Go Live” of NER States for their respective ADMS is given below:

Sl.no.	State	ADMS Go Live date
1	Arunachal Pradesh	27-01-2021
2	Assam	07-12-2020
3	Manipur	24-11-2020
4	Meghalaya	04-09-2020
5	Mizoram	22-02-2021
6	Nagaland	17-11-2020
7	Tripura	24-12-2020

- b. Considering that the AMC for ADMS has been on-going, starting from around two years back albeit without Cyber Security Audit Certification which was not incorporated** in the ADMS Tender Technical Specifications, it is felt that changing the date of Go Live for the respective ADMS of the States cannot be done on account of the contract already entered into.

Note:** It may be mentioned that testing of all communicable devices for communication protocol (IEC 60870-5-104 for ADMS) as per ISO/IEC/IS standards were listed in MoP Order No.12/13/2020-T&R dt.08.06.2021 during which time, ADMS had already been implemented in all NER states. The above Clause was also included in the CEA (Cyber Security in Power Sector) Guidelines, 2021.

- c. The ADMS servers and equipment are provisioned with adequate cyber security protection measures. However, states will ensure that their respective ADMS must be subjected to periodic cyber security audits and if any vulnerability is detected, the vendor will be responsible for mitigating and resolving the vulnerabilities.

The same would be conveyed by NERPC Secretariat to NPC for the clarification.

The sub-committee noted as above

B.7. Violation of state wise TTC/ATC:

As per POSOCO KPI, NERLDC has to report the violation of import TTC/ATC of NER states in daily, weekly and monthly basis. It has been observed that most of the NER states are not N-1 secure causing violation of TTC/ATC limit although the actual drawl remains within the schedule values. Violation has been observed in case of Assam, Meghalaya, and Tripura states.

The TTC/ATC calculation of States done by NERLDC is as follows:

State	Time Period	N-1 considered	Limiting element	TTC	RM	ATC
Arunachal Pradesh	Off-Peak	132kV Lekhi –	132 kV Pare –	195	5	180
	Peak	Pare	Itanagar S/C	195	5	180
Assam	Off-Peak	220kV Misa-Samaguri I or	220 kV Balipara-Sonabil	1730	40	1690
	Peak	II		1600	40	1690
Manipur	Off-Peak	132kV Imphal MA-	132 kV Imphal	320	5	315
	Peak	Imphal PG Ckt I	(MA)-Imphal (PG) II & III	320	5	315
Meghalaya	Off-Peak	132 kV Umiam3 – Umiam I	132 kV Umiam-Umiam	340	10	330
	Peak		Umiam 1 II	260	10	250
Mizoram	Off-Peak	132 kV Melriat-Silchar I	132 kV Aizawl-Luangmual	160	5	155
	Peak	ORII	S/C	155	5	150
Nagaland	Off-Peak	220/132 kV ,100	220/132 kV ,30	255	5	245
	Peak	MVA Dimapur ICT	MVA Mokokchung ICTs	290	5	285

Tripura	Off-Peak	132 kV SM Nagar(ISTS)	132 kV SM-Nagar (TR) –	340	6	334
	Peak	Budhjungnagar S/C	SM Nagar (ISTS) S/C	315	6	304

In previous OCC meeting(s) it was decided that in the event of any major shutdown(approved/emergency) the state periphery ATC/TTC shall be calculated by respective SLDC and communicated to NERLDC. NERLDC conducted a training session on 29.06.2022 on calculating ATC, TTC for states at NERPC.

Calculation of state-wise TTC is only received from Assam and Meghalaya on continuous basis every month. Nagaland has sent its state-wise TTC calculation once. Other utilities may share the progress of said report and send the same to NERLDC.

Deliberation of the sub-committee

NERLDC informed the forum that Assam, Manipur, Meghalaya, Mizoram & Tripura have provided the state-wise TTC/ATC for the month of Sep 2022. DoP, AP & SLDC, Nagaland assured that the same will be provided from next month.

DoP, AP & SLDC, Nagaland told the forum that they need further guidance from NERLDC on calculation of TTC/ATC. NERLDC assured that necessary guidance shall be provided for the same on mutually agreed dates.

The sub-committee noted as above

Action: All SLDCs.

B.8. Issues pertaining to Kopili & Khandong.

A. Load restriction in Meghalaya Power System due to planned outage of Khandong HEP &Kopili Stg-II:

The planned shutdown of Khandong HEP and Kopili Stage II has been approved from 10.01.2022 to 09.05.2022 in the 185thOCCMfor the following activities:

- a. Inspection and repairing of Khandong Head Race Tunnel, Trash Rack Gate, Intake Gate, Surge Shaft Gates, Steel Liner of HRT etc.
- b. Acid Proof Coating of Stage-II Penstock
- c. Installation and commissioning of Penstock Protection BFV System of Khandong
- d. Annual Planned Maintenance of Khandong Unit# I & II.

Decisions as per previous meetings: (i) Meghalaya System shall be operated by opening of 132kV Mawngap-Nongstoin T/L right from the start of Khandong HEP shutdown. (ii) In normal circumstances no load shedding is required and Meghalaya can continue to cater full demand based on present generation scenario. (iii) In event of tripping of any one circuit of 132kV UmiamStg-I to UmiamStg-III D/C SLDC Meghalaya shall

swiftly shed load till loading of 132kV UmiamStg-I to UmiamStg-III S/C is within limit and also increase generation from UmiamStg-I HEP and Leshka HEP. (iv) based on Real Time Condition Mawphlang may be shifted to be fed from Agia side after concurrence of NERLDC, (v) Early restoration of Misa-Kopili-Khandong link by NERTS/NEEPCO.

In the 194thOCCM,

- NERPSIP informed the forum that 220kV Mawngap-Killing line is facing severe RoW problem in Ri-Bhoi district. The issue was raised in the Project Monitoring Group of DPIIT also and District administration has been directed to resolve the issue within two weeks.
- NERTS updated that back filling for Tower No. 1 and 2 of 132Kv Khliehriat-Khandong Ckt 2 is underway but due to excessive water retention in soil the Tower No. 1 has become unstable. In such scenario, some modifications in the towers near Loc. No.1 & 2 with possible replacement of two towers with one tower is being explored. Further, for connections at Khandong Switchyard continuous shutdown of 132kV Khliehriat-Khandong-Umrangso line for continuous 3 days is required. DGM, SLDC, AEGCL stated that shutdown may be accommodated after Puja. The forum requested NERTS/NEEPCO to intimate the schedule ASAP.

Regarding restoration of 132kV Jiribam –Haflong line, CGM(AM) NERTS informed the forum that the matter of wildlife clearance has been referred to the National Wildlife Board and it is expected to be restored by Nov'22.

After detailed deliberation, the forum requested NERTS to restore the 220kV Kopili, 132kV Kopili-Khliehriat link by Nov'22 subject to readiness of switchyard room (being constructed by NEEPCO) completion by Oct'22.

B. Station supply at Khandong and Kopili Power Station:

Following the discussions in the 189th OCC and in the special meeting held on 27.04.2022 in presence of representatives from NERPC, NERLDC, NEEPCO, NERTS and AEGCL, Khlerihat – Khandong – Umrangshu link was charged as an interim special arrangement.

1. As agreed in the special meeting, AEGCL was requested to extend the PLCC system from Umrangshu to Haflong by 15th May 2022.
2. Since all the CRPs at Khandong Control room are under debris now and it is doubtful for revival of the same, NEEPCO is planning to arrange following CRPs

and 220V DC source to charge the Khandong bus radially from Umrongso Sub-station only.

It may kindly be noted that due to Khandong incident, the construction restoration activities of 4x50MW Kopili P.S, 2x25MW Khandong and 1x25MW Kopili Stage-II is badly hampered. Whatever activities are being carried out is based on DG Power only which is not the solution and progress of work has been severely hit.

As a stop gap arrangement following CRPs and 220V DC source shall be arranged by NEEPCO at the earliest.

- 132KV Umrongso bay – 1 No.
 - 132/33KV 7.5MVA & 3MVA – 2 Nos.
 - 33/0.4KV SAT 1MVA – 2 Nos.
 - 33KV Umrongso line – 1 No.
 - 33KV Kopili line – 1 No.
3. As discussed in 192nd OCC, NEEPCO has sent consent letter for becoming Bulk power consumer of APDCL for the consumption of construction power for restoration works of Khandong HEP. Further, NEEPCO shall be sending weekly SEM reading to Assam/NERLDC. Also, NEEPCO requested for installation of 2 nos SEMs at the earliest so that restoration works can be started.
 4. In 193rd OCC, GM, NEEPCO proposed space for 2 CRP in old kiosk room near Khandong stage 1 to PGCIL for Panel installation for 132kV Khliehriat-Khandong - 2 line and 132kV Khandong-Kopili line 2.
 5. In 194th OCC, GM, NEEPCO informed the forum that for drawing of construction power from 132kV Bus at Khandong via the two 132/33kV Transformers CRPs are at site but 220V DC battery bank is unavailable, for which order has been placed and will be supplied by Sep'22. Thereafter, drawing of power from the Grid shall commence by 1st week of October'2022. Regarding Panel installation for 132kV Khliehriat-Khandong - 2 line and 132kV Khandong – Kopili - 2, NERTS assured the forum to complete the work before Feb'23.

C. Recommissioning of 1X25 MW Khandong Stage-II plant

NEEPCO is planning to re-commission and synchronize 1X25MW Khandong Stage-II unit within this current financial year. Since all the Control & relay panels are submerged and damaged beyond repair during the inundation on 26.03.2022, for successful commissioning and evacuation of the generated power, the Khandong Switch Yard has to be adequately restored within February – 2023.

Present Status:

1. One CRP for Khandong-Umrongso feeder at Khandong end is procured and expected to be commissioned by NEEPCO before February 2022.
2. One Temporary KIOSK room has been identified and Cable trenches are under construction and, cables are being re-routed.

Status of action being taken by NERTS, POWERGRID:

1. The matter for availability of one more 132KV line from Khandong SY to Khliehriat (PG) Sub-Station was discussed in the last OCC meetings, the availability of towers nearby Khandong Power Stations/new arrangement may be intimated to NEEPCO.
2. For the above, NERTS, POWERGRID was requested to install 1(one) BCU based CRP February-2023. Status of the same may kindly be shared with NEEPCO.
3. NERTS, POWERGRID was requested to ensure the installation of PLCC panel for Khandong – Khleirihat line alongwith FOTE panels for digital and analog data/voice, protection and communication to NERLDC before synchronization of the Khandong Stage-II.

Status of action taken by AEGCL:

1. AEGCL was requested to provide a PLCC Panel for Khandong-Umrongso line and NEEPCO was to provide the 48V battery bank with charger for PLCC. Status of the same may please be intimated to NEEPCO.

Deliberation of the sub-committee

NEEPCO informed that the switchyard room at Kopili will be completed by Nov, 2022. The forum noted that due to this development, it may not be possible for NERTS/NEEPCO to restore Misa-Kopili-Khandong link before lean hydro season. SLDC, Meghalaya raised the concern that this may cause significant shortage of power in Meghalaya. In line of the above, the following options were explored:

- Meghalaya Power system to operate in bifurcation i.e. 132kV Mawngap-Nongstoin T/L shall be opened and Nongstoin, Nangalbibra, Tura and Ampati to be fed from Agia. It is decided that joint studies will be done by NERLDC & SLDC, Meghalaya for winter peak load management. NERLDC raised concern that such radial connectivity may create security issue in Meghalaya power system and frequent disturbances may occur.
- Early restoration of 132kV Jiribam –Haflong line (out due to Line diversion work by NHIDCL – NH48 / replacement of tower due to landslides in road widening area) which will improve the ATC/TTC of Meghalaya State. NERTS informed the

forum that the matter of wildlife clearance for the said line has been referred to the National Wildlife Board.

- Early commissioning of 220kV Mawngap-Killing line. NERPSIP informed severe RoW issues are hampering the progress, the matter has been taken up with the Government of Meghalaya.

NERTS opined that since the temporary restoration works may not be able to restore the envisaged Misa-Kopili-Khandong link before lean hydro season, it would be prudent to take up the permanent restoration work instead of going for the temporary arrangements. Permanent restoration at Kopili & Khandong is to be completed by March'23 for providing alternate path to Meghalaya System via Misa and 2nd line for evacuation of Khandong Stage#2 generation. Following decisions emerged out of the deliberations:

1. Kopili Related activities -

- i. 48V DC Supply for PLCC Panels at Kopili Switchyard to be taken up by NEEPCO. NEEPCO requested NERTS to provide the load requirement.
- ii. All POWERGRID owned bays shall be restored as per their permanent scope.

2. Khandong S/y related activities

- i) 132kV Khliehriat- Khandong#1&2 to be restored on permanent towers
 - ii) AEGCL has agreed to provide 02 sets of CRP Panels to NERTS for restoration of 132kV Kopili-Khandong#2 & 132kV Khandong-Khliehriat#2 Lines. These panels shall be provided from Srikona (AEGCL) S/s on replenishment basis. POWERGRID requested AEGCL to provide panels for utilization in line with assets of POWERGRID being used by AEGCL in Mariani. CGM, AEGCL agreed.
 - iii) NERTS & NEEPCO officials visited site for finalizing the location to house the CRP panels of Lines mentioned in Point no. 3 above. After exploring all options, New Switchyard Panel Room constructed by NEEPCO has been finalized for housing CRP & PLCC panels for 2 Lines.
 - iv) 48V DC system for PLCC shall be arranged by NEEPCO.
3. POWERGRID requested NEEPCO to provide staff accommodation at Umrangsho Township for maintenance of bays at Khandong & Kopili. NEEPCO informed that the same will be reverted back after discussion with Management.

The sub-committee noted as above

Action: NERTS, NEEPCO, NERLDC, AEGCL, SLDC Meghalaya.

B.9. Implementation of Guwahati Islanding Scheme:

In the 190th OCCM, DD, NERPC stated that in the Special Meeting on 13th May'22 it was decided that dedicated fiber is required in order to ensure Cyber Security. AEGCL intimated that Dedicated Fiber is available in the link SLDC – Sarusajai – Mirza – Boko – Agia – BTPS – BgTPP and offered the same for the Islanding Scheme. The forum requested NERTS to explore the availability of dedicated fiber. Member Secretary, NERPC stated that after budgetary offer is received from at least two vendors the DPR will be finalized.

In 194thOCC, DGM, SLDC, AEGCL informed that in the meeting with M/s GE at SLDC Assam on 25th Aug'22 all points have been clarified and the inputs have been submitted also forthwith.

Deliberation of the sub-committee

Member Secretary, NERPC informed the forum that the budgetary offer from M/s GE has been received. He added that the DPR for the Guwahati Islanding Scheme shall be finalized by Oct, 2022.

The sub-committee noted as above

Action: NERPC.

B.10. Furnishing details of upgraded UFR settings alongwith list of feeders and quantum of load:

Status as updated in the 194thOCC meeting:

Name of the state/utility	Submission of revised UFR list	Implementation of revised settings	Status of mapping
Ar. Pradesh	Submitted	Stg-1 (49.4Hz) implementation in new feeders. UFR to be procured by July'22, implementation to be done by Mar'23**	Written to GE, will be done soon*
Assam	Submitted	Installation Completed. UFR to be shifted to Samaguri for 132kV Khaloigaon-Samaguri line.	Done
Manipur	Not submitted	No extra shedding required only Stage upward revision to be done.	To be done

Meghalaya	Submitted	17 out of 17 feeders completed. Forum requested to share the points with RLDC SCADA	One feeder of Stage IV left for mapping Other stages completed.
Mizoram	To be submitted	Completed	By Sep'22 subject to resolving of SCADA issues***
Nagaland	Submitted	Completed	Mapped except Stage-I feeders##
Tripura	Submitted	Stage-1(49.4Hz), Stage-2 (49.2Hz), Stage-3(49Hz) require installation of UFR. – Delivery at site by Sep22 and installation by Oct'22	To be done by the end of this month except for Non-RTU lines.

*No RTUs available for the selected feeders, DPR being prepared. The forum requested to share the SLDC display with NERLDC.

**waiting for Guwahati Islanding scheme to come. UFR to be put into that scheme

***Forum requested to resolve the communication issue and meanwhile share the SCADA display with the RLDC.

Deliberation of the sub-committee

Member Secretary, NERPC informed the forum that the status of UFR scheme has been closely monitored in the 12th NPC Meeting held on 17th Oct, 2022 chaired by Chairperson, CEA. He added that the following points should be noted:

- The Quantum of load to be shed at each step to be matched by the states as per the minutes of the 12th NPC Meeting.

- As envisaged one-third of the UFR relays shall be inspected. The list for the same shall be shared by NERPC.
- The states are requested to map the respective feeders for required visibility purposes at SLDC/NERLDC.

P&ED, Mizoram and DoP, AP raised the issue of non-availability of connectivity with SCADA for the feeders installed with UFR at 33kV level. The forum requested P&ED, Mizoram and DoP, AP to install RTUs for these feeders so that the same can be mapped.

SLDC, Tripura informed the forum that 12 nos. of UFR have been installed and work for SCADA mapping is under progress. UFR installation and SCADA mapping shall be completed by Oct'2022.

Sr. GM, NERLDC informed the forum that the ADMS and UFR feeders should be segregated which is currently not followed by DoP, Nagaland as UFR Stg-I has been implemented through ADMS in Nagaland. The forum recommended that DoP, Nagaland should segregate the UFR scheme from ADMS. This would also resolve the SCADA Mapping issues of Stg-I.

He further added that the quantum of load shedding to be done at Stage 1 and Stage 4 for the Manipur is presently not 10 MW as envisaged.

NERLDC highlighted that there should be uniformity in ADMS logic for all the NER states. The forum requested NERLDC to coordinate with the NER states in order to bring the said uniformity.

The sub-committee noted as above

Action: Concerned SLDCs, NERLDC.

B.11. Primary Frequency Response testing plan of remaining units in NER:

Primary Frequency Response Testing of generator units is being carried out in line with the Clauseno.5.2(g) of Central Electricity Regulatory Commission (Indian Electricity Grid Code) Regulations, 2010.

Schedule as agreed in the 194thOCC meeting:

Region	Station	No. of generators	Suggested Schedule		Duration (days)
			Test Start	Test End	
NER	NEEPCO-Monarchak	1	26 th July'22	28 th July'22	done

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NER	NEEPCO-Kameng	1 (by M/s Solvina)	Oct'22	Oct'22	2
NER	OTPC- Palatana	Module 1 (by Siemens) and Module 2 (by M/sSolvina)	Oct'22	Oct'22	4
NER	Doyang- NEEPCO	2 (by M/s Siemens)	Sep'22	Sep'22	4(water level to be sufficient enough to run the units at full capacity)

In the 194th OCC, the forum noted that conducting PFR testing of Doyang HPS might not be possible this year due to inadequate water level. After detailed deliberation, the forum asked NEEPCO to talk with M/S Solvina to conduct PFR for additional two units (i.e. Unit 2 & Unit 3 with 80% capacity in view of DGA issue) of Kameng HPS.

Deliberation of the sub-committee

NEEPCO informed that the PFR testing for Kameng may be scheduled on 20th – 21st October, 2022 for unit-4. He added that the water level at Doyang is sufficient to run the machine at close to 90% of Generating unit MCR. The forum requested NEEPCO to schedule the testing of Doyang PFR testing based on the water level sufficiency.

OTPC informed that the PFR testing can be conducted after the planned shutdown of Unit#1 to be availed from 28th Oct,22 - 3rd Nov, 22.

The sub-committee noted as above

Action: Concerned generating utilities

B.12. Regular furnishing of Patrolling report for all Important Lines to NERLDC/NERPC

There is a requirement of regular and proper maintenance of transmission lines. It is requested to carry out the patrolling activities as per ClNo.23(2), (3) & (4) of CEA Grid Standards Regulation,2010on regular basis and submit the report to NERPC/NERLDC.

It is requested to upload DR, EL& FIR outputs for transmission lines in the NERLDC tripping portal in line with Cl.5.2 R of IEGC 2010 Regulations.

In the 192nd/193rd/194thOCC, Member Secretary, NERPC took strong note of the non-submission of patrolling report by the utilities in spite of repeated persuasion. He directed all the utilities to submit the patrolling report for all Important Lines to NERLDC/NERPC periodically. The forum requested NERPC to send letters to states in order to urge them to submit patrolling reports.

Deliberation of the sub-committee

NERLDC informed the forum that P&ED, Mizoram has not submitted the patrolling report. The forum requested all the utilities to submit the patrolling report regularly.

The sub-committee noted as above

Action: Concerned Transmission Utilities.

B.13. Monthly Review of LGBR

PARTICULARS (Peak Demand in MW as per LGBR vs Actual)	July-22 (LGBR)	July-22 (Actual)	Aug-22 (LGBR)	Aug-22 (Actual)	Sept-22 (LGBR)	Sept-22 (Actual)
Arunachal Pradesh	155.75	119	162.00	154.72	163.00	144
Assam	1978.00	2231	2261.81	2378.85	2267.21	2308
Manipur	232.05	201	206.25	206.79	199.00	203
Meghalaya	343.84	332	332.97	348.369	340.69	354
Mizoram	107.29	119	106.81	118.68	113.30	127
Nagaland	159.58	159	184.99	161.8	170.00	161
Tripura (exc. Bangladesh)	307.22	319	310.49	323.95	305.00	333
NER DEMAND (exc. Bangladesh)	3019.86	3482	3258.70	3599.76	3309.56	3497

PARTICULARS (Energy Requirement in MU as per LGBR vs Actual)	July-22 (LGBR)	July-22 (Actual)	Aug-22 (LGBR)	Aug-22 (Actual)	Sept-22 (LGBR)	Sept-22 (Actual)
Arunachal Pradesh	79.8	82.03	82.43	79.7	77.00	72.12
Assam	1132.23	1249.06	1187.80	1320.510	1159.35	1211.630
Manipur	84.93	82.37	84.96	83.090	82.09	79.7
Meghalaya	202.73	183.22	180.84	185.320	168.39	176.96
Mizoram	51.75	55.82	50.07	55.498	48.46	51.58
Nagaland	81.60	84.48	83.69	86.180	78.68	82.69
Tripura (excl. Bangladesh)	149.34	166.03	151.58	168.6	155.40	155.14
NER DEMAND (exc. Bangladesh)	1776.71	1903.873	1788.46	1979.643	1743.50	1830.5987

Deliberation of the sub-committee

Director, NERPC informed the forum that for preparation of LGBR for 2023-24 outage schedule has to be submitted by the generators and load forecast by the state utilities. He requested NEEPCO, NHPC, NTPC & OTPC to submit the generation forecast ASAP.

The sub-committee noted as above

Action: All generating utilities

B.14. Installation of AWS by IMD Guwahati

It was informed in 158th OCCM that RMC, IMD, Guwahati would install Automatic Weather Station (AWS) in NER. As per the proposed list of stations by the constituents, IMD has surveyed the stations and has mentioned the requirement of NoC for the suitable stations.

As per minutes of 189th OCCM,

- a. MSPCL and P&ED Mizoram to submit the list of additional stations for installation of AWS. DoP, Nagaland has provided list of 14 stations for inspection. IMD is requested to plan inspection of site selection for the same.
- b. DoP AP, AEGCL and MePTCL to provide latest update on issuance of NoC for selected sites. NoC is received from Tripura for 6 stations so IMD may provide AWS installation schedule for the same.
- c. Further, IMD is requested to visit the stations of Mizoram, Nagaland, NEEPCO, POWERGRID and NTPC for site selection for AWS.

In 191st OCC some states had expressed the need for entering into MoUs with IMD in order to clarify on various issues. In 194th OCC, DGM SLDC, TSECL informed the forum that installation of AWS at Bagafa, Budhjungnagar and Gournagar is completed and is nearly completed at Agartala. NERLDC intimated that Manipur and Mizoram have not submitted the list of additional locations for installation of AWS.

Regarding NoC and MoU, Assam and Arunachal Pradesh clarified that NOC will only be given after signing of MoU between IMD and individual states. After detailed deliberation the forum requested NERLDC to co-ordinate with IMD and request them to present the draft MoU in the next meeting.

Deliberation of the sub-committee

Representative from IMD in his presentation (**Annex B.14-a**) highlighted the status of site surveys and the location finalized by the respective states and IMD w.r.t the installation of AWS. NERLDC informed that a draft MoU has been prepared by Assam.

The forum requested that for the benefit of other states the said draft MoU may be circulated as **Annexed B.14-b** and requested all the other states to provide inputs on the draft MoU prepared by Assam so that the same may be finalized as early as possible.

The sub-committee noted as above

Action: All SLDCs.

B.15. Outage of State-owned generating stations in Meghalaya System:

As per NERLDC records, many state-owned generators of Meghalaya are in outage since long as per following table.

Plant	Outage date	Reason	Expected revival date
Umtru Unit 1(2.8 MW)	2011	Not furnished	Not provided*
Unit 3 (42 MW) Leshka	27 th Jun'22	vibration in unit	6 months to 1 year

*DoCo of the unit is 1957, Head water level has increased due to raising of dam level. Machine design has to be changed and M/s WAPCOS has been engaged to carry out the study, report awaited.

Deliberation of the sub-committee

Meghalaya updated the forum that all the units of Umtru HEP are decommissioned. The forum requested MePGCL to intimate de-commissioning details to CEA as well.

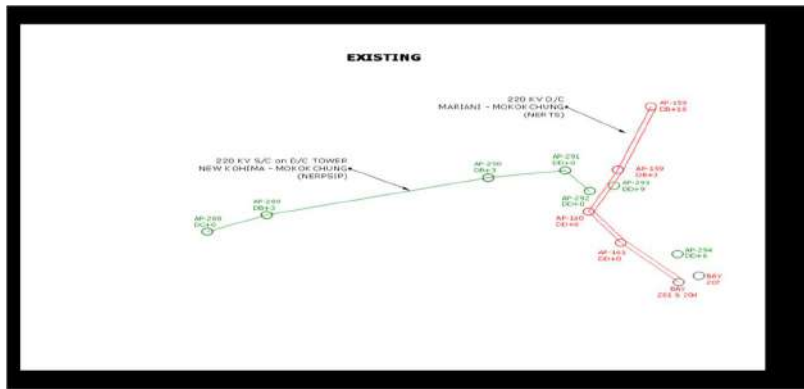
The sub-committee noted as above

Action: MePGCL

B.16. Requirement of shutdown for executing bay exchange and line swapping for 220kV New Kohima – Mokokchung TL under NERPSIP Nagaland:

Under the scope of NERPSIP, 220kV New Kohima GIS bay at 220/132kV Mokokchung GIS (POWERGRID) is completed and associated 220kV New Kohima – Mokokchung Transmission line on the verge of completion. However, due to non-availability of adequate corridor for crossing the existing 220kV Mariani – Mokokchung TL by the newly constructed line, swapping of the two lines near the substation and exchange of the bays at the substation is required. Matter has also been intimated to DOP.

The swapping of the transmission lines are proposed to be carried out from 07.09.2022 and since one number tower erection along with de-stringing and re-stringing of both the lines are required to be carried out only after obtaining shutdown of the existing 220kV D/C MarianiMokokchung TL. The minimum shutdown requirement shall be of 18 days.



In the 193rd OCCM the forum had requested DoP Nagaland to intimate suitable timeline for the proposed shutdown of 220kV Mariani-Mokokchung D/C so that swapping of the two lines near the substation and bay exchange work at 220/132kV Mokokchung substation can be carried out.

In the 194th OCC, EE, DoP Nagaland intimated the forum that the shutdown of 220kV Mariani-Mokochung D/C is contingent upon return of shutdown of 132kV Kohima-Meluri line which is under outage due to tower collapse, and can be taken from 23rd Sept to 10th October. However, Manager, NERPSIP expressed concern over the proposed schedule as it overlaps with Durga Puja and hence may encounter shortage of manpower. The forum requested NERPSIP to finalise the schedule by 20th September'2022 and intimate to NERPC thereafter.

Deliberation of the sub-committee

As per the decision of the 195th OCCM, special meeting was convened on 20th Oct, 2022 to resolve the issues w.r.t the bay exchange and line swapping for 220kV New Kohima – Mokokchung TL with 220kV Mariani-Mokokchung line 1. The deliberation of the said meeting is as follows:

- POWERGRID informed that after bay swapping, the changes in Bays will be as follows:

Bay No	201	204	207
Before Bay Exchange/Existing	Mariani II	Mariani I	New Kohima
After proposed Bay Exchange	New Kohima	Mariani II	Mariani I

The owner of Bay no 207 shall remain with DoP, Nagaland only while Bay no 201 and 204 will remain with POWERGRID.

- Since transfer of assets is not possible, it was requested that NERTS and DoP, Nagaland may have a bilateral agreement for O&M of their respective bays.
- CTU connectivity agreement shall not be required.

- NERTS to confirm with the RIO w.r.t the clearances required for charging of the Bays after the proposed changes are made, since there is an addition of two towers (AP293 and AP294) for the diversion of 220 kV Mariani – Mokokchung I and II Line.
- NERTS to adhere to the PTCC clearance as per the CEA's guidelines.
- Since the proposed configuration allows for double OPGW at tower AP-159, its collapse may make the system vulnerable. NERTS mentioned that the same shall be reviewed.
- Various undertakings/compliances (Protection, Telemetry, and Metering etc.) were requested by NERLDC to be duly filled by NERTS before FTC.
- Necessary changes to be done by NERTS in the SCADA & metering database.
- SIO clearance dated 28.02.22 submitted by DoP, Nagaland for Bay no 207 mentions New Kohima Bay and has no validity. Also, the same has not been energized until date. DoP, Nagaland prior to FTC, may obtain clarification from SIO regarding validity of SIO clearance and swapping of the inspected Bay (207) for New Mariani II Line.

The sub-committee noted as above

Action: NERTS, NERPSIP, DoP Nagaland, NERLDC

B.17. OTPC Palatana unit 1 tripping due to oscillation

The OTPC Palatana U-1 was tripped on 11th June 22 and the same was discussed in 192nd OCC and it was decided to have special meeting to address the issue. On 18th Aug 22 at 23:52 LFO was again observed though its magnitude was low but 10 to 15 MW load variation in GT-1 & GT-2 was observed.

In the 194th OCC

NERLDC and OTPC presented their analyses regarding the incident and disagreements arose on whether the problem is in Governor Control System or PSS. After detailed deliberation, it was agreed in the next Sub-group meeting OTPC will present the study report of the OEM and detailed analysis will take place and exact reason will be ascertained.

Deliberation of the sub-committee

OTPC informed that the OEM has informed that PSS tuning is required for the plant which will be scheduled shortly. The forum referred the item for monitoring in PCC/subgroup.

The sub-committee noted as above

Action: OTPC.

C. NEW AGENDA ITEMS

Agenda from NERLDC

C.1. Synchronization issue at Agartala

At 29/08/2022, ESD of 132 kV RC Nagar – Agartala II was to be availed by AGTCCPP to facilitate Hotspot in both bus side isolators of RC-Nagar line II. However, Breaker opening failed at Agartala end and the SD was delayed by around 1 and a half hours. Also, during return of S/D breaker closing issue was observed at Agartala end leading to delay in charging of line (charging done at 14:13 Hrs whereas charging code was initially given at 12:53 Hrs). Such delay in breaker operation is a major safety issue. During the period of the outage, Bangladesh Load was restricted to manage the loading of 132 kV SM Nagar (ISTS) – SMNagar (TSECL).

As per the minutes of 194th OCCM of NER held on 15th September 2022, issue of CB at 79Tilla of 132 kV AGTCCPP – 79Tilla ckt II shall be rectified by Oct 2022.

It is requested to expedite the work to avoid such inordinate delays and intimate the present status of the same.

Deliberation of the sub-committee

Issue was discussed as part of item B.5.

The sub-committee noted as above

Action: TSECL.

C.2. Multiple trippings of 400 kV Silchar – Misa D/C:

In the past few months, 400 kV Silchar – Misa I tripped six times. Following are the relay details:

a) 400 kV Silchar – Misa I:

Date & Time	Silchar end details	Misa end Details
20-08-2022/08:01	Y-G ph,Z-1, 125.3km, 2.33kA	R-G ph, Z-1, 66.46km, 3.54kA
11-09-2022/12:55	Y-ph, Z-1, 137.78 km, 1.96kA	R-ph, Z-1, 70.7km, 2.76kA, A/R successful
24-09-2022/11:53	Y-N, Z-2, 146.78 km, A/R successful	R-N, Z-1, 79.10 km
01-10-2022/11:56	R-Nph,101.1km,Z-1,2.7kA	B-Nph,Z-1,76.6 km
06-10-2022/09:27	Y-ph, 102.6kM, 2.2 kA, AR lockout	R-ph, Z-1, 68.7kM, 3.07 kA

b) 400 kV Silchar – Misa II:

Date & Time	Silchar end details	Misa end Details
03-10-2022/13:46	Y-G ph, Z-1, 106.3KM, 1.7 kA, A/R successful	R-G ph, Z-1, 111.17 km, 3.13kA

As per the DR analysis, lines tripped due to single phase fault which is mostly transient in nature. Also, it can be observed from the above that Single Pole Auto Reclose (SPAR) at Silchar and Misa S/Ss for the aforementioned lines are intermittently functional. Further, simultaneous operation on SPAR from both ends have also been an issue.

Letter vide ref. NERLDC/SOII/2021/14/3835 dated 07/10/2022 have been issued by NERLDC in this regard.

It is requested to look into the following matter for corrective actions as these lines are vital for grid security of Southern part of NER:

- a) Vegetation Clearance to be done for 400 kV Silchar – Misa D/C by M/s IndiGrid and any other issue to be rectified forthwith to avoid frequent tripping of the lines.
- b) SPAR Issue for both ends to be rectified by NERTS, POWERGRID.

Deliberation of the sub-committee

NERTS informed that on 1st Oct, 22 and 6th Oct, 22 due to persistent fault AR was not successful. However, the root cause analysis for AR failure at Silchar end on 11th Sept, 2022 and at Misa end on 24th Sept, 22, at Misa end on 3rd OCT,22 has to be analyzed. NERLDC added that the non-operation of simultaneous SPAR at both ends is also an issue. Representative from M/s Indigrid, informed the forum that as per their analyses, only two tripping can be attributed to vegetation. They further observed jumper flash-over marks which indicates other reasons such as lightning for which they are checking the tower footing resistance and installation of counter poise earthing and bentonite treatment may also be administered.

The forum noted the above and referred the issue to PCC/subgroup for detailed discussion on the matter.

The sub-committee noted as above

Action: NERTS, Indigrid.

C.3. Frequent tripping of 132 kV Loktak-Rengpang Line and 132 kV Rengpang-Jiribam Line

132 kV Jiribam-Rengpang and 132kV Loktak-Rengpang lines are vital links which cater the demand of Rengpang and Jiribam areas of Manipur Power System and also

provides evacuation path of power from Loktak HEP. It has been observed that within a span of two months (From 1st Aug'22), there have been seven number (7) of trippings in 132 kV Loktak-Rengpang and twenty-three (23) nos. of trippings in 132 kV Rengpang-Jiribam line.

The list of trippings of 132 kV Jiribam-Rengpang line during August'22 and September'22 is shown below:

	Tripping Time	Revival Time
06-08-2022	01:56	02:15
08-08-2022	12:35	13:04
12-08-2022	04:53	09:08
13-08-2022	15:20	15:35
14-08-2022	14:30	16:05
16-08-2022	11:35	08:13 (17-08-2022)
17-08-2022	14:00	18:10
21-08-2022	00:28	07:40
27-08-2022	05:42	06:26
30-08-2022	12:42	13:12
01-09-2022	13:08	13:30
03-09-2022	10:36	11:30
05-09-2022	10:17	10:58
07-09-2022	12:43	15:12
08-09-2022	12:12	14:02
09-09-2022	12:01	13:21
11-09-2022	11:36	15:09 (16-09-2022)
17-09-2022	10:47	11:22
	11:36	16:19 (19-09-2022)
20-09-2022	09:25	11:02 (21-09-2022)
23-09-2022	10:45	17:15
25-09-2022	12:07	12:38
26-09-2022	11:20	17:09 (27-09-2022)
28-09-2022	09:46	Line faulty

Root cause of majority of the trippings could not be analysed due to non-submission of DR and EL outputs by MSPCL which is the violation of Cl 5.2 R of IEGC 2010 regulation. It is requested to regularly upload the DR EL files related to both the lines

in NERLDC Tripping portal <https://tripping.nerldc.in/Default.aspx> for proper analysis purpose. There is a requirement of proper patrolling & regular maintenance of these transmission elements by MSPCL

Hence, MSPCL is requested to look into the matter with utmost priority and ensure strict compliance of mandated O&M practices to ensure security and reliability of Manipur Power System.

Deliberation of the sub-committee

The forum referred the item for monitoring in PCC/subgroup.

The sub-committee noted as above

Action: Manipur, NERLDC, NERPC.

C.4. Frequent Tripping of Monarchak Units

Frequent Tripping of Monarchak Units has been observed during recent months.

Tripping details during September month is shown below:

No.	Tripping date	Tripping Time	Restoration Date	Restoration Time	Unit	Reason of Tripping
1	05.09.22	18:02	05.09.2022	21:48	Unit 1	Rotor E/F
2	14.09.22	11:34	14.09.2022	15:03	Unit 1	Tripped due to communication error
3	14.09.22	11:34	14.09.2022	16:05	Unit 2	Tripped due to communication error
4	16.09.22	08:02	17.09.2022	22:06	Unit 1	Due to bleed valve problem
5	16.09.22	08:02	19.09.2022	01:32	Unit2	Bleed valve problem
6	19.09.22	09:30	20.09.2022	01:32	Unit 1	To facilitate PSD of 132 kV Monarchak - Rokhia& 132 kV Monarchak - Udaipur(Unit could not be revived due to GTG ignition problem)

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7	19.09.22	09:30	20.09.2022	03:55	Unit 2	To facilitate PSD of 132 kV Monarchak - Rokhia& 132 kV Monarchak - Udaipur(Unit could not be revived due to GTG ignition problem)
8	28.09.22	10:24	28.09.2022	13:16	Unit 1	Tripped due to Thermocouple sensor issue
9	28.09.22	10:24	28.09.2022	14:44	Unit 2	Tripped due to Thermocouple sensor issue
10	30.09.22	13:57	30.09.2022	15:27	Unit 2	LP drum level low
11	03.10.22	05:20	03.10.2022	07:14	Unit 1	Rotor E/F
12	03.10.22	05:20	03.10.2022	08:22	Unit 2	Rotor E/F
13	03.10.22	08:45	03.10.2022	11:06	Unit 2	Due to AVR tripped
14	07.10.22	13:16	07.10.2022	16:56	Unit 1	Tripped due to miscommunication
15	07.10.22	13:16	07.10.2022	17:23	Unit 2	Tripped due to miscommunication

Due to tripping of Monarchak Units, loading of 132kV SMNagar – SMNagar increases which leads to vulnerable situation in Tripura system and may lead to cascade trippings. Also due to tripping, Bangladesh drawal is reduced to 130MW to maintain the loading the 132kV SMNagar – SMNagar within limit.

NEEPCO may take all necessary measures to reduce such frequent tripping of units in future. Further, in such contingency, SLDC Tripura is requested to take prompt action to reduce the loading of 132 kV SMNagar (ISTS) – SMNagar (TSECL) line as it can trigger Grid Disturbance in Tripura Power System at any moment. Also, the commissioning of the following approved elements may be expedited for strengthening the Tripura Power System:

- a) 132 kV Monarchak – SMNagar D/C
- b) HTLS reconductoring of 132 kV SMNagar(ISTS) – SMNagar(TSECL) line, 132 kV SMNagar(ISTS) – Budhjungnagar line, 132 kV PKBari(ISTS) – PKBari(TSECL) line and 132 kV PKBari(ISTS)-Ambassa line.

Deliberation of the sub-committee

NEEPCO mentioned that due to frequent line outage, Monarchak machine has deteriorated and maintenance will be done tentatively in 2023.

The forum requested TSECL to commission 132kV Monarchak-SM Nagar line at the earliest. TSECL requested the forum to take the issue in the RPC forum for the speedy commissioning of the said line.

NERLDC requested that during the event of tripping at Monarchak, prompt action is required to reduce line loading of 132 kV SMNagar (ISTS) – SMNagar (TSECL) via curtailment of export to Bangladesh.

NERLDC suggested that before availing the shutdown of Monarchak, the long pending works of HTLS conversion of SM Nagar – SM Nagar etc. and commissioning of 132 kV Monarchak – SM Nagar D/C to be completed. Also, the forum decided to refer the pending transmission strengthening work by Tripura to the next TCC/NERPC meeting.

The sub-committee noted as above

Action: TSECL, NEEPCO, NERLDC, NERPC.

C.5. Bus Bar operation in 220/132kV Dimapur (PG) Bus on 22 September 2022

At 09:48 hrs, following elements tripped at 220/132kV Dimapur (PG):

- a. 220KV/132KV DIMAPUR-ICT-1 (master trip operated) and charged at 10:50 hrs
- b. 132KV-DIMAPUR(PG)-DOYANG-1 (master trip operated) and charged at 10:55 hrs
- c. 220KV/132KV DIMAPUR (PG)-ICT-3 (master trip operated).
- d. 132kV Bus Coupler and restored at 10:53 hrs

Again, at 11:44 hrs Bus Bar protection of 132kV Bus -1 operated at 220/132kV Dimapur(PG) S/S resulting in tripping of all the elements connected to Bus-1. It can be inferred from the above incident that after tripping of 220KV/132KV DIMAPUR (PG)-ICT-3(at 09:48 hrs), some work was carried out in ICT-3 without intimation to RLDC which resulted in operation of Busbar protection at 11:44 hrs. Also at 14:02hrs, Grid disturbance of Nagaland occurred due to tripping of 132 kV Dimapur(PG) - Dimapur(NL) I (as 132Kv Dimapur – Dimapur(NL) -2 had earlier tripped due to Bus Bar protection operation.) with load loss of 73MW.After several

request by RLDC, no information was provided. At 23:40hrs reason of ICT 3 tripping was provided (DC Earth Fault) and charged during off-peak hours.

Deliberation of the sub-committee

The forum advised NERTS to better coordinate with SLDC/NERLDC w.r.t latest update of the outage elements. NERTS mentioned that necessary information whenever enquired shall be provided from RTAMC. Further, the Agenda item was referred to PCC/Subgroup for detailed discussion.

The sub-committee noted as above

Action: NERTS, NERPC.

C.6. Outage of 132 kV Haflong – Jiribam line

132 kV Haflong – Jiribam line is crucial link for reliable power supply to Meghalaya and South Assam Grid during low hydro period. 132 kV Haflong -Jiribam line has been out of service since 11th May 2022. Also, Khandong HEP will take construction power from the Grid and will start generating from Mar 2023. 132 kV Haflong -Jiribam line is very crucial for reliable evacuation of Khandong HEP. In this context, Powergrid may intimate the exact status of work along with status of wildlife clearance issue for restoration of this important link. Further, the restoration may be expedited for reliability and security of the NER Grid.

Deliberation of the sub-committee

Agenda Item C.6. was taken with B.8. Kindly refer discussion for Agenda Item B.8.

The sub-committee noted as above

Action: NERTS

C.7. Reconductoring of 220 kV BTPS-Salakati D/C

220 kV BTPS- Salakati D/C are crucial in providing reliable power to Assam and the other states of NER. These two lines are also a major constraint limiting the NER-ER TTC/ATC Values. Upgradation of the 220 kV BTPS-Salakati I & II lines with HTLS conductor with requisite modification in bay equipment at both ends was agreed in the 2nd Meeting of NERSCT. It is expected that the import TTC/ATC values will increase by 100-150 MW after commissioning of the HTLS.

The shutdown of 220 kV BTPS- Salakati Line I have been approved from 6th Oct 2022 but the same was not availed.

It is requested to expedite the reconductoring of 220 kV Salakati – BTPS D/C on immediate basis as the shutdown has already been approved.

Deliberation of the sub-committee

CGM, NERTS informed that the Shutdown could not be availed on due date due to shortage of socket clamp. He added that the shutdown will be taken from 4th November, 2022 after the planned shutdown of OTPC, Palatana Unit 1 is returned. The forum directed all utilities to keep everything ready before applying for shutdown.

The sub-committee noted as above

Action: NERTS

C.8. Overloading of 220 kV Mariani (PG)-Mariani (AS) S/C

It has been observed that the loading in 220 kV Mariani (PG)-Mariani (AS) has reached beyond 180 MW on some instances while the maximum allowable loading of the line is 213 MVA.

SLDC, Assam vide letter no. AEGCL/CGM/SLDC/Tech-13/2022/33 dated 13.09.2022 has mentioned the overloading of 220 kV Mariani (PG) – Mariani (AS) line and sought for remedial measures from NERLDC that can be taken care the end of SLDC, Assam. A joint visit was conducted by AEGCL and POWERGRID and the matter was discussed among NERPC, POWERGRID and AEGCL through a VC meeting on 06-10-2020. Based on the joint investigation of the matter, Triangular configuration of Mariani (POWERGRID) – Kathalguri (NEEPCO) – Mariani (AEGCL) at 220kV level with existing Twin Moose Conductor was recommended by NERPC. AEGCL vide letter dated 22.01.2021 requested for ‘in-principle’ approval of triangular configuration of the same. CEA, vide letter dated 09.02.2021, granted no objection in implementation of triangular configuration by AEGCL. The scheme was agreed in the 3rd NERPC-TP held on 19th July 2021.

AEGCL may look into the implementation of the downstream 220 kV system at New Mariani and plan for better evacuation of the generation in Upper Assam Power System.

It is also proposed for upgrading the conductor configuration of 220 kV Mariani (PG) – Mariani (AS) line from existing Zebra to Twin Moose Conductor, as no objection received from CEA, vide letter dated 09.02.2021. This will increase the capacity of the conductor from 213 MVA to more than 300 MVA.

It is also proposed to look into the possibility of commissioning of 2nd circuit of 220 kV Mariani (PG) – Mariani (AS) line so that under the N-1 contingency of 220 kV Mariani (PG) – Mariani (AS) one circuit, the other circuit will provide safe evacuation of generation of Upper Assam Power.

Deliberation of the sub-committee

AEGCL informed that at present some portion of the 220 kV Mariani (PG) – Mariani (AS) line is still Zebra Conductor and could not be converted to Twin Moose as it is likely to create clearance issue while charging. The forum requested NERTS and AEGCL to do a joint inspection so that a solution can be drawn as the said portion of the line is limiting the loading capacity for the line. The forum suggested that the option of conversion of the Zebra Conductor to HTLS Conductor may also be explored to avoid clearance issue.

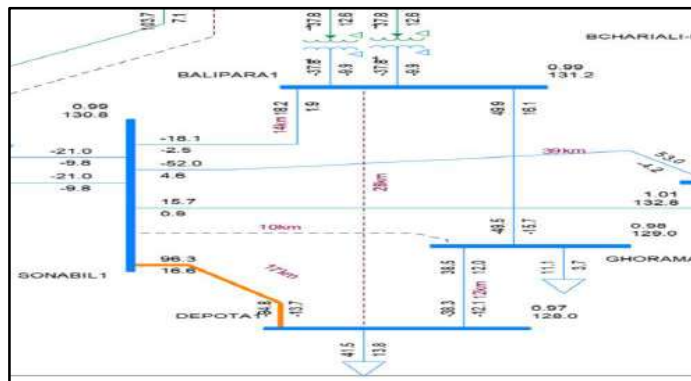
The sub-committee noted as above

Action: AEGCL, NERTS

C.9. Proper Utilization of 220/132 kV,160 MVA ICT at Balipara

Before June 2018, the following 3 number of interconnections were available for utilization of the 220/132 kV Balipara ICTs viz. 132 kV Balipara – Ghoramari line, 132 kV Balipara – Sonabil line and 132 kV Balipara- Khupi line. Presently, as only one 132 kV connectivity is utilized for Khupi area of Arunachal Pradesh system (around 25 MW flow in peak hour) the 220/132 kV ICTs at Balipara remains underutilized (the ICTS being loaded upto only 10% of their capacity). As per system study done by NERLDC, LILO of 132 kV Balipara-Sonabil line at Depota would relieve congestion in 132 kV Sonabil-Depota S/C line and provide additional connectivity at 132 kV Depota station. It would also increase the capability of the system to cater more downstream loads of Depota area of Assam leading to better utilisation of 220/132 kV ICTs at Balipara. However, following lines must be restored before conversion to LILO of 132 kV Balipara-Sonabil line at Depota.

- a. 132 kV BaliparaSonabil line
- b. 132 kV Balipara-Ghoramari line
- c. 132kV Sonabil-Gohpur line
- d. 132 kV Sonabil-Pavoi line



If the above solution of LILO at Depota is not agreeable by AEGCL, then the entire section of 132 kV Balipara- Ghoramari – Depota – Sonabil link is to be reconducted with HTLS.

Deliberation of the sub-committee

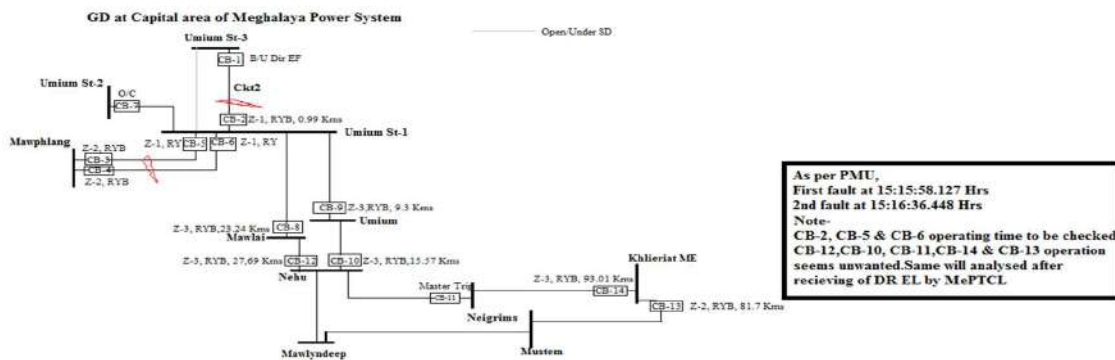
The forum referred the Agenda Item to CMETS for detailed discussion.

The sub-committee noted as above

Action: NERPC

C.10. Grid Disturbance in Meghalaya Power System on 21st Sep'22

Grid Disturbance of Category GD-1 with a load loss of 50 MW and generation loss of 12 MW occurred in Capital area of Meghalaya Power System at 15:17 hrs on 21st Sep'22 due to tripping of multiple elements.



Double phase to Earth fault were in 132 kV Umiam St I – Umiam St III 2 Line and was cleared within 85 msec from both ends on operation of Z-1. Also, another 3-Phase fault were in 132 kV Mawphlang - Umiam St I- 1&2 Line and was cleared within 75 msec from the Umiam St I on operation of Z-1 and cleared within 296 msec from the Mawphlang end in Z-2. The Z-2 time delay at Mawphlang seems low. **Also, The DP Z-III setting needs to be checked/reviewed by MePTCL at earliest as tripping of the following lines on Z-III seems to be mis-operation.**

- Tripping of 132 kV Mawlai - Umiam St I-1 from Mawlai (CB-8) on operation of Z-3 in 451 msec.
- Tripping of 132 kV NEHU - Mawlai Line from Nehu (CB-12) on operation of Z-3 within 475 msec.
- Tripping of 132 kV Umiam-Umiam St I-1 from Umiam (CB-9) on operation of Z-3 in 463 msec.
- Tripping of 132 kV Umiam- Nehu from Nehu (CB-10) on operation of Z-3 in 464 msec.

NERLDC vide letter dated 29th Sep'22 to MePTCL highlighted the issue and requested to find out the root cause along with sharing a copy of remedial measures that has

been taken to resolve the issue. Time drift of about 14-15 minutes was observed in DR of all the tripped elements, which needs to be addressed by MePTCL immediately to get the exact sequence of events for proper analysis purpose. Also, most of the SOE of above events were not reported at NERLDC.

MePTCL is requested to take prompt action and resolve the issues at the earliest for healthy operation of the protection system.

Deliberation of the sub-committee

SLDC, Meghalaya requested the forum to suggest proper setting at MePGCL end. The forum referred the Agenda Item to PCC/Subgroup for detailed discussion.

The sub-committee noted as above

Action: MePTCL.

C.11. Repeated tripping of 132 kV Along-Pasighat Line and 132 kV Balipara-Tenga Line

132 kV Along - Pasighat line and Balipara-Tenga lines are vital links which cater the demand of Pasighat/Roing/Tezu/Namsai and Khupi/Tenga areas of Arunachal Pradesh Power System. There have been a total of **6 (Six) numbers** of Grid Disturbance occurred in the Arunachal Pradesh system due to the tripping of the said lines on account of fault on line in the month of September'22.

As per DR analysis, the tripping of 132 kV Along-Pasighat line were mainly due to vegetation. Root cause of tripping of 132 kV Balipara-Tenga Line could not be analyzed due to non-submission of DR and EL outputs from Balipara (PG) end which is the violation of cl 5.2 R of IEGC Regulation-2010. NERLDC vide letter dated 29th Sep'22 to DoP, AP highlighted the same.

It is requested to regularly upload the DR EL files related to the tripping of 132 kV Balipara-Tenga in NERLDC Tripping portal <https://tripping.nerlhc.in/Default.aspx> for proper analysis purpose. Further, the frequent tripping of 132 kV Along - Pasighat line and 132 kV Balipara-Tenga Line signals that there is the requirement of proper patrolling & regular maintenance of these transmission elements by DoP Arunachal Pradesh.

Therefore, it is requested to look in to the matter on urgent basis and ensure strict compliance of mandated O&M practices as per CEA regulations to prevent frequent outage of the above-mentioned line. Also, a copy mentioning details of corrective and preventive measures may be shared.

Deliberation of the sub-committee

SE, DoP, AP informed that Event Logger at Balipara end for 132 kV Balipara-Tenga Line is non-functional and the same shall be rectified by DoP, AP.

DoP, Arunachal Pradesh informed the forum that the DR/EL files related to the tripping of 132 kV Balipara-Tenga as well as 132 kV Along-Pasighat line will be submitted to NERLDC for further analysis. The forum referred the item for monitoring in PCC/subgroup.

The sub-committee noted as above

Action: DoP Ar. Pradesh,

C.12. Requirement of Control & Relay panel for restoration of POWERGRID owned bays at Khandong S/s

During flooding incidence of the powerhouse on 26/03/22, complete powerhouse building got inundated with water and debris. Due to the same, related panels of aforesaid line got damaged and same are beyond repair.

NEEPCO has informed that by Feb'23 Khandong Stage#2 (25MW) generation shall be brought back in service. NEEPCO informed that there shall be requirement of at least one more 132kV Line for reliable evacuation of power.

POWERGRID is owning Line bays for following 132kV Lines at 132kV Khandong S/y of NEEPCO Khandong Powerhouse: -

1. 132kV Khlerihat Khandong#2
2. 132kV Khandong Kopill#2

As the Control & relay panel, PLCC and telecom equipment got damaged during flooding, hence to charge the line, there is requirement of 132kV SAS based Control & Relay panels. Availability of suitable spare panels have been explored, however, SAS based panels are not available and available conventional panel is requiring complex wiring modification. Hence, matter has been discussed with AEGCL for availability of spare panels and it was informed that panels (02 sets) procured under PSDF is available. POWERGRID has requested AEGCL to provide 02 sets of Control & Relay panels.

Deliberation of the sub-committee

Agenda Item C.12. was taken with B.8. Kindly refer discussion for Agenda Item B.8.

The sub-committee noted as above

Action: AEGCL, NERTS.

C.13. Upgradation of 132kV Badarpur & 132kV Khliehriat substations from Single Main and Transfer Bus Scheme to Double Main Bus Scheme by converting from AIS to GIS

In NER, upgradation of 132kV Aizawl, Haflong, Jiribam, Kumarghat and Dimapur substations from Single Main and Transfer Bus Scheme to Double Main Bus Scheme by converting from AIS to GIS done on completion of 25 Years.

In line with above, upgradation of 132kV Nirjuli and Imphal substations from Single Main and Transfer Bus Scheme to Double Main Bus Scheme by converting from AIS to GIS also agreed 01st NERPC Transmission Planning meeting held on 08/11/19. However, upgradation of 132kV Khliehriat and Badarpur substations from Single Main and Transfer Bus Scheme to Double Main Bus Scheme by converting from AIS to GIS was kept in abeyance in said 01st NERPC TP meeting on 08.11.2019 due to considerable time was left out for completion of 25 years which is by February 2024. Now, considering minimum 2 years of lead time for detail engineering, tendering and implementation of the project it is proposed to approve the upgradation with conversion to GIS for Badarpur and Khliehriat Sub Station as less than 2 years left out for completion of 25 years of life.

Deliberation of the sub-committee

The forum gave the in-principle approval for the said upgradation works in line with earlier approval accorded for Imphal, Nirjuli, Jiribam, Haflong, Aizawl, Kumarghat & Dimapur Sub Station and referred the item to TCC/RPC Meeting.

The sub-committee noted as above

Action: NERTS.

C.14. Upgradation of 33kV Indoor Switchgear at 132/33kV Ziro S/s from AIS based to GIS

132/33kV Ziro Substation was commissioned in the year 2004. On 33kV Side AIS type Indoor switchgear panel scheme is implemented. Substation is situated at an altitude of 1700 above msl. There are following feeders connected on 33kV Side: -

1. 33kV Ziro – Old Ziro
2. 33kV Ziro – KurungKumey
3. 33kV Ziro – Kimin

Now, due high altitude and humidity the 33kV AIS insulations and equipment are suffering frequent flashover / failure which is causing unwanted outage of power supply.

Presently, there is hardly any service support from OEM and also, OEM recommends for replacement of 33kV AIS system with GIS for trouble-free operation. It is understood that DoP, AP has already replaced the 33kV System with GIS in contemporary stations at Daporijo and Along.

In view of above, it is proposed that 33kV Indoor switchgear (AIS based) may be replaced with GIS based Indoor switchgear on POC Mechanism for reliable power

supply to the downstream consumers at Ziro Sub Station. Approximate expenditure towards the same shall be INR 2 Cr.

Deliberation of the sub-committee

NERTS highlighted that as per OEM recommendations 33kV AIS system may be replaced with GIS for trouble-free operation under POC Mechanism. The forum has endorsed the proposal and referred the same to next TCC/NERPC meeting for the approval.

The sub-committee noted as above

Action: NERTS, NERPC.

C.15. Requirement of 48V DC system at Kopili S/s

Under NERSS III, provision of providing 48 V supply was in scope of NEEPCO, hence, the same was not in the BOQ of ongoing GIS pkg. During last joint visit at Kopili on 26/09/22 by POWERGRID and NEEPCO, NEEPCO requested POWERGRID to provide new 48V DC system at Switchyard panel room for meeting the aux. power requirement of Telecommunication system.

Deliberation of the sub-committee

Agenda Item C.15. was taken with B.8. Kindly refer discussion for Agenda Item B.8.

The sub-committee noted as above

Action: NEEPCO, NERTS.

C.16. Frequent failure of Transformer at 132kV Ziro S/s

Since commissioning of 132/33kV system at Ziro S/s, repeated downstream faults are occurring in 33kV Lines at Ziro S/s. List of tripping of previous couple of years as given below: -

Sr. No.	Name of Line	Tripping Statistics	
		2021	2022 (upto Sep22)
1.	KurungKumey	433	353
2.	Kimin	437	318
3.	Old Ziro	73	106

04 Single phase units have been provided at Ziro S/s (03 Nos Main Units & 01 No as Cold Spare).

Due to frequent 33kV line tripping, there had been 05 instances of failure of Transformer units where the faulty units have been replaced with the spare unit.

As instances of repeated tripping is still ongoing, there are very high chances of breakdown of Transformer again at Ziro S/s.

There is only one bank of Transformer at Ziro S/s, in case of breakdown, all the connected areas through these 33kV Lines shall be without power till restoration.

Hence, it is proposed that 2nd ICT may be provided at Ziro S/s.

Deliberation of the sub-committee

NERTS highlighted that due to very large number of trippings on 33kV level, the transformer O&M is a challenge. He further added that in the event of breakdown, all connected areas through 33kV lines shall be without power till restoration. Thus, to ensure N-1 availability, the proposal of 2nd ICT is endorsed by the forum and referred to TCC/NERPC for final approval.

The sub-committee noted as above

Action: NERTS.

C.17. Implementation of Bus Bar Protection at 132 kV SM Nagar (TSECL) Substation

Two numbers of Grid Disturbances occurred in SM Nagar (TSECL) area of Tripura Power System including South Comilla (Bangladesh) on 13.02.22 and 02.10.22 respectively due to operation of LBB protection which resulted in tripping of all the elements connected to both Bus-I and Bus-II at SM Nagar (TSECL). The Grid Disturbances resulted in load loss of 81 MW on 13.02.22 and 84 MW on 02.10.22 and also resulted in tripping of cross-border line. i.e., 132 kV SM Nagar – Comilla D/c which is a matter of great concern.

Due to unavailability of Bus Bar protection scheme at SM Nagar (TSECL), both the Buses tripped which is undesirable. Implementation of Bus Bar protection scheme at SM Nagar (TSECL) was also discussed in Special Review Meeting with TSECL on 19.05.22 and Subgroup Meeting dated 12.04.2021.

It is requested to implement Bus Bar protection scheme at SM Nagar (TSECL) to ensure the reliability of Tripura Power System including reliable power supply to South Comilla (Bangladesh).

The forum may discuss.

Deliberation of the sub-committee

The forum requested SLDC, Tripura to implement the Bus Bar protection scheme at SM Nagar (TSECL).

The sub-committee noted as above

Action: TSECL.

D. ITEMS FOR STATUS

D.1. Implementation of projects funded from PSDF:

The status as informed in 195thOCC:

State	R&U scheme	ADMS	Capacitor Installation	SAMAST* *	Line Differential Protection
Ar. Pradesh	Package-I (Diagnostic tools) Complete in all respects. P-II (for PLCC & communication) Materials placed at site, installations to start after monsoon rainfall. P-III (Substation equipment) Agreement signed and 10% requisition submitted. Total 90% requisition by Apr'22. Completion by Dec'22. (Approval from TSA and Account opening in 3 months)	Project completed in all respects.	-	30% requisition submitted.	-
Nagaland	Completed in all respects.	Work completed in all respects. UC submitted	-	30% Payment received. Yet to disbursed due to some technical issues in PFMS	Lines identified. Under DPR preparation stage.
Mizoram	Final 10% disbursed. UC to be submitted.	Work completed in all respects. Remaining part of final 10% to be disbursed ASAP.	To reply to TESG queries.	30% requisition submitted.	Revised DPR including both 132kV Aizawl-Luangmual and 132kV Khamzawl-Khawiva to be submitted.
Manipur	Package-II: completed Package-I: all stations	Work completed in all respects.	WIP.	10% disbursed. 20% requisition	Revised DPR for LDP of 132kV Imphal-Yurembam-III

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	complete except Ningthoukhong. By May'22.	UC submitted in Oct'21.		sent.	to be submitted by June'22.
	33kV System Integration with SLDC	In tendering stage			
	Reliable Communications for grid connectivity	In tendering stage			
Tripura	Completed. Final UC submitted on 04 th May'22.	Final 10% requisition submitted. Queries to be submitted	Not relevant in present scenario with commissioning of ISTS lines. Issue dropped	10% funds received to agency. 20% requisition to be sent ASAP	For 132kv 79Tilla-Budhjungna gar line and for Rokhia link LDP at own cost. Tendering undergoing. DPR preparation for rest of the lines
Assam	Work completed except CRP, SAS work in 8stations which have been retendered and awarded to M/s SIEMENS. Completion by Dec'22	Project completed in all respects.	-	30% funds yet to be fully disbursed. 60% requisition sent.	Lines identified. Under DPR preparation stage.
Meghalaya	MePTCL – completed in all respects. MePGCL – Completed in all respects.	Project completed in all respects.	-	30% funds yet to be fully disbursed. 60% requisition sent.	All works except OPGW done

In the 194th OCC, CGM, SLDC, AEGCL requested for extension of Milestone date for SAMAST. The forum unanimously decided that in view of the pandemic restrictions throughout NER in 2021 the extension is to be granted. Member Secretary, NERPC informed that originally the Project Completion deadline as per PSDF was 12 months, however in LoA target is completion by 18 months. The forum decided to extend the

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milestone date(s) and completion/Go Live/DoCO date(s) by 3 months, with target completion by 10th November'2022.

D.2. Status update of important grid elements under prolonged outage impacting system operation:

Sl. No	Element	Owner	Status as informed in the 194 th OCCM	Latest Status
1	132kV Mariani – Mokokchung (out since April'2008)	AEGCL	Non clearance due to persisting funding issue	Non clearance due to persisting funding issue
3	132kV Roing-Pasighat (charged through ERS tower)	NERTS	By Mar'23	By Mar'23
4	220kV Misa-Kopili D/C, 220/132kV ICTs at Kopili, 132kV Khandong –Kopili D/C(out since Oct'19)	NEEPCO/ NERTS	Nov 22	As decided, under NERTS Scope, restoration of ICT#2, one ckt of 132kV KhandongKopili is targeted for restoration. As decided, Control & Relay panel for the same shall be placed in SPR being constructed by NEEPCO. After readiness of SPR, one month shall be required for commissioning.
5	132kV Srikona – Panchgram	AEGCL	DPR approved by the standing finance committee of Govt of Assam. However Administrative approval still awaited	DPR approved by the standing finance committee of Govt of Assam. However Administrative approval still awaited
6	400kV Imphal – Thoubal-I and 315MVA 400/132kV ICT at Thoubal	MSPCL	RoW, litigation pending in court.	RoW, litigation pending in court.
7	63MVAR Bus Reactor at Byrnihat to be replaced with 80MVAR Reactor	MePTCL	Price resolution underway	Reactor dispatched from the Siemens Factory on the 12th October 2022. Will reach by November 2022.
8	Main CB at Zuangtui for 132kV Melriat-Zuangtui	P&ED Mizoram	Applied for shutdown for CB replacement on 4 th and 7 th October	CB installed and commissioned on 16 th October, 2022.

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9	Mawlyndep and Khliehriat CBs at Mustem	MePTCL	Oct'22	Expected to energize after 29th October 2022. Bus shutdown will be require for Mustem Sub Station.
10	400kV Silchar-Misack 2	NER-II TL	Restoration of ckt 2 through ERS underway. For the restoration work shutdown of ckt 1 approved by NERPC from 11.09.2022 to 15.09.2022	Restoration work (ERS) of both the ckt done.

D.3. Status of commissioning for upcoming projects:

Sl. No	Name of the element	Utility	Status as informed in 194 th OCC meeting	Latest Status
1	132kV Monarchak-Surjamaninagar	TSECL	Oct'22. Meanwhile for evacuation of Monarchak, 132kV Monarchak-Rokhiack 2 is being provided	March 23
2	PLCC for 132kV Loktak-Ningthoukong and 132kV Loktak-Rengpang(existing lines)	MSPCL	For loktak-Ninthoukong line s/d for installing CVT is scheduled in August'22.For, Loktak-Rengpang line, by March'24	PLCC EQUIPMENT INSTALLATION COMPLETED AT RENGPAANG END. COMMISSIONING PENDING. PLCC FOR LOK-NINGTHOUKHONG TO BE TAKEN ALONGWITH WITH 132KV LOK-NINGTHOUKHONG 2ND CKT
3	Construction of 2 nd bay at Balipara for 220kV Balipara-Sonabil-2	AEGCL	OEM is awaited for SAS integration	SAS integration going on.
4	Upgradation of 132kV Lumshnong - Panchgram line	MePTCL	Material has reached the site. Tentative s/d in Oct'22.	Recondcutoring works of Lumshnong-Panchgram line has started on the 13th October 2022 and is in full progress. About

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				0.434 Ckt. Km is completed
5	PLCC for 132kV Karong-Kohima. PLCC at Kohima	DoP Nagaland	PLCC panel at Karong has also to be changed as to ensure same make at both the substations	Awaiting sanction from PSDF
6	132kV Loktak-Ningthoukhong-II	MSPCL	RoW issue at two spans, resolution underway	RoW issue at two spans, resolution underway
7	132kV Roing-Chapakhowa	NERTS	FC obtained on 10.06.2022. Severe ROW issues. Targeted by Dec'22	Work is in progress with a target for completion of the line by Dec'22. Constraints/Challenges: a. Severe Obstruction from Forest dwellers in Deopani RF(20 loc.) b. Severe ROW in 21 locations in Jia & Ezengo areas. c. Immediate requirement of releasing compensation. Approval for final compensation awaited from District Admn.
8	Re-conductoring 220kV BTPS-Salakati D/C	NERTS	Applied for shutdown and awaiting for Shutdown approval against the same.	Work in Circuit -1 targeted for commencement by 3 rd week of October 2022. Constraint: Incessant Rain
9	420kV 80MVAR Bus Reactor	NEEPCO	By May'23	October'2022
10	220kV Killing - Mawngap	NERPSIP	Severe RoW in Jirang circle in Ri Bhoi district. Still un-resolved, Issue raised in PMG (DPIIT) also.	RoW not yet resolved at 05 locations (01 foundation & 04 erection).

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				Stringing RoW in 01 section in Mawphlang area, East Khasi Hills to be resolved.
11	220kV Samaguri - Mariani-I	AEGCL	FC still awaited in the Samguri-Khumtai section. While the Mariani-I to Khumtai section is charged	FC still awaited in the Samaguri-Khumtai section. While the Mariani-I to Khumtai section is charged
12	Reconductoring of 132kV UmiamStg-III to UmiamStg-I by HTLS	MePTCL	Upgradation of Ckt 1 is underway, to be completed by early Nov and for forckt 2, by Dec'22	About 10 Ckt Km has been completed out out of 13 Ckt Km.
13	PLCC/DTPC for 220kV Balipara- Sonabil	AEGCL	Will be commissioned along with charging of line 2	Will be commissioned along with charging of line 2
14	220kV AGBPP -Namsai D/C	TBCB	REC (which is the BPC) is yet to issue LoI to Powergrid(L1). 36 months after issue of LoI	
15	Upgradation of 132kV Surjamaninagar-Surjamaninagar(ISTS), 132kV Bodhjunnagar-SMNagar, 132kV P.K.Bari-Ambassa, 132kV P.K. Bari-P.K.Bari(ISTS)	TSECL	WIP	
16	LILO of 132kV Leshka-Khliehriat-I at Mynkre and Mynkre SS and 33kV downstream at Mynkre.	NERPSIP	LILO completed. At Mynkre, at least one transformer will be installed by Sept'22 and the whole SS will be ready by Oct'22	Mynkre SS work is severely affected by incessant rain in the last month. S/s will be ready by Nov'22.
17	220kV Tinsukia-Behiating D/C	NERPSIP	One foundation left but water logging issue. Targeted by Oct'22	The balance 01 no. foundation location is still water logged. Line targeted to complete by Nov'22.
18	LILO of 132kV Kamalpur-Kamakhyia& 132kV Kamalpur-Sishugram at Amingaon	NERPSIP	No S/D approval by Assam yet. So, LILO to be done through ERS. Shutdown requirement will be Day time only	AEGCL will arrange S/D by end Oct'22. As a special case and on request of AEGCL, POWERGRID has sanctioned Rs 15.5 Lacs for installation of ERS.

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19	220kV Rangia – Amingaon D/C and 220/132kV 2x160MVA Amingaon S/S	NERPSIP	Nov'22	Work in Progress. By Nov'22.
20	132kV Rengpang- Tamenglong and 132/33kV 4x6.67MVA at Tamenglong at Manipur	NERPSIP	Compensation disbursal issue at Tamenglong. By Nov'22	Compensation estimate received from District Authority, Noney and is under process for disbursement. By Nov'22.
21	132/33kV 2x20MVA Gamphazol at Manipur	NERPSIP	Testing ongoing. To be charged in 1 week	Few balance testing are under progress. Will be charged Nov'22.
22	132/33kV West Phaileng S/S at Mizoram	NERPSIP	Ready for charging	Ready for charging. 3 nos of collapsed towers in the connecting line to be restored by State DISCOM.
23	132/33kV 2x12.5MVA Marpara S/S at Mizoram	NERPSIP	Sep'22	Work hampered due to frequent Rain and landslide. Materials transportation is severely affected due to very bad road conditions. By Dec'22
24	132/33kV 2x12.5MVA Lungsen S/S at Mizoram	NERPSIP	Sep'22	Work hampered due to frequent Rain and landslide. Materials transportation is severely affected due to very bad road conditions. By Dec'22
25	132kV Lungsen- Chawngte S/C at Mizoram	NERPSIP	Sep'22	Foundation work completed. Erection and Stringing activities are going on. By Oct'22.
26	132kV Chawngte – S.Bungtlang S/S at Mizoram	NERPSIP	Oct'22	Work in Progress. By Oct'22.
27	132kV W.Phaileng- Marpara S/C at Mizoram	NERPSIP	Work hampered due to Rain and malaria. By Nov'22	Work hampered due to frequent Rain and landslide. Materials transportation is severely affected due to very bad road conditions. By Nov'22

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28	220kV Zhadima – Mokokchung at Nagaland	NERPSIP	WIP. By Aug'22 subject to weather condition	Bay Swapping at 220kV Mokokchung (GIS) SS under progress. By Oct'22.
29	LILO of 132kV Wokha – Kohima at 132/33kV New Kohima at Nagaland	NERPSIP	Row at one location. By Sep'22	Row at one location is yet to get resolved. A compensation amount yet to be furnished by DC Kohima. Nov'22.
30	132kV Wokha-Zunheboto – Mokokchung at Nagaland	NERPSIP	By Sep'22	Heavy rain fall affected progress. RoW pertaining to tree cutting / stringing is being resolved with support from District Administration. Transportation of man and materials are affected due to bad road condition. By Nov'22
31	132kV Tuengsang – Longleng at Nagaland	NERPSIP	Line by Sep'22, but Tuensang SS is not ready	Line by Oct'22, Tuensang SS is not yet ready.
32	132/33kV Amarapur S/S at Tripura	NERPSIP	Sep'22	WIP. Heavy rain fall affected the progress. By Nov'22.
33	132/33kV Manu(new) S/S at Tripura	NERPSIP	Sep'22	WIP. Heavy rain fall affected the progress. By Nov'22.
34	132kV Dharmanagar-Kailashor	NERPSIP	RoW persisting, by Oct'22	RoW recently resolved with the support of District authorities. By Oct'22.
35	132kV Ziro-Yazali and 132/33kV Yazali S/S	POWERGRID-Comprehensive	Dec'22	
36	132kV Yazali – Palin and 132/33kV Palin S/S	POWERGRID - Comprehensive	Dec'23	
37	132kV Palin- Koloriang and 132/33kV Koloriang S/S	POWERGRID - Comprehensive	Dec'23	
38	132kV Khonsa – Deomali and 132/33kV Khonsa S/S	POWERGRID - Comprehensive	Dec'23	

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39	132kV Miao – Namsai and 132/33kV Miao S/S	POWERGRID - Comprehensive	Dec'23	
40	132kV Chimpu – Holongi and 132/33kV Holongi S/S	POWERGRID - Comprehensive	RoW issues at 5 locations resolved. Work resumed, expected by Sept'22	
41	Lower Subansiri HEP	NHPC	Unit 1 by Jan'23 and Unit 2 by Feb'23	
42	400kV Lower Subansiri-BNC line1	PGCIL	Nov'22	Nov'22
43	400kV Lower Subansiri-BNC line2	PGCIL	Feb'23	Feb'23
44	Conversion of MT to DM at (i)132kV Khliehriat, (ii)132kV Badarpur, (iii)132kV Nirjuli, (iv) 132kV Imphal	NERTS	(i)to be intimated (ii)to be intimated (iii)WIP completion by Oct'22 Completed	As per 1 st NERPC (TP) meeting, upgradation of Nirjuli& Imphal was only approved. Nirjuli – December'22 Imphal - Feb'23

D.4. Status of ISTS expansion scheme in NER:

A. Status of downstream 220kV or 132kV network by STUs from the various commissioned and under-construction ISTS substations in NER.

ISTS S/s	State	Voltage ratio, Trans. Cap	Down- stream Voltage level (kV)	Unutilized bays	Status of ISTS bay	STU Lines for unutilized bays	Status of Lines(as updated in 192 nd OCCM)		
							Date of Award	Completion schedule	
1	New Mariani (POWERGRID)	Assam	400/220kV, 2x500MVA	220	2	Commissioned	New Mariani (POWERGRID) – Diphu (Assam) 220kV D/c line	Preliminary survey completed	By Jan'25
2	New Kohima (TBCB)	Nagaland	400/220kV, 2x500MVA	220	2	Commissioned	New Kohima (TBCB) – New Kohima (Nagaland) 220kV D/c line	LoA Feb'2021	Tower foundation of 1 st tower completed on 13 th Oct 2022. To be completed by end of Nov.
3	Nangalbibra (TBCB)	Meghalaya	220/132kV, 2x160MVA	132	2	Under bidding	Nangalbibra (ISTS) – Nangalbibra (MePTCL) 132kV D/c (Single Moose) line	Survey awarded	Dec'23

B. Status of 400kV substations and other important elements being implemented by STUs in NER under intra-state schemes to be connected through ISTS

Sl. No.	Substation/Location	Transformation Capacity/Element	Date of Award	Completion Schedule
A	Assam (to be implemented by AEGCL)			
I	Rangia	400/220kV, 2x500MVA	1. EPC Contract Award is Tentatively scheduled in the early half of Dec'2022. 2. Master Plan submitted for approval. 3. Tender under preparation 4. AIB points to be addressed	Dec'2025
a)	LILO of both circuits of Bongaigaon – Balipara 400kV D/c line at Rangia	400 kV, D/C	1. EPC Contract Award is expected by Dec'2022. 2. Tender preparation is completed and is to be reviewed by AIIB	Mar'26 (36 months form date of Award)
II	Khumtai	400/220/132kV, 2x500MVA + 2x160MVA	Survey work to be completed by June'2022. EPC tender to be floated on finalization of fund allotment. 220kV work will be constructed under ongoing AIIB scheme for which contract has already been award to M/S RS infra PVT tech ltd.	May'2026
a)	Khumtai (AEGCL) – BiswanathChariyali (PG) 400kV D/c line	400kV D/c	Survey work completion by July'22, tender floating after finalization of fund allocation.	220kV LILO part 60% complete. 400kV line by May'2026
III	Upgradation of Gohpur S/s from AIS to GIS	-	1. Notice of Award has been issued on 8 th June 2022 to M/S Sumaja Electro infra Pvt ltd.	June'2025
a)	2 no. 132kV GIS line bays at Gohpur for termination of LILO of one circuit of BiswanathChariyali – Itanagar 132kV D/c line (line works under ISTS through TBCB route)	132kV	1. LoA by Jun'22	June'2025
IV	Upgradation of Sonapur S/s from AIS to GIS	-	1. Contract to be awarded by Jun'23. LoA by Jun'23	June'2026

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a)	LILO of 400kV Silchar-Byrnihat at Sonapur	-	1. LoA by Jun'23	June'2026
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Sl. No.	Substation/Location	Transformation Capacity/Element	Date of Award	Completion Schedule
B Tripura (to be implemented by TSECL)				
I	Surajmaninagar (TSECL)	400/132kV, 2x315MVA	Award by Sep'22	To be taken after formation of JV.
a)	LILO of both circuits of Surajmaninagar (ISTS) – Palatana 400kV D/c line at Surajmaninagar (TSECL) S/s	400kV D/c	All works except 400kV termination at Surajmaninagar (TSECL) by POWERGRID to be done. Balance works under separate contract.	84% Line works complete by PGCIL, total completion subjected to Sub-station readiness at Surajmaninagar
C NEEPCO (to be implemented by NEEPCO)				
I	Extension works at Ranganadi HEP end	Oct 22	Oct 22	Oct 22
II	Extension works at Pare HEP end	March'24	March'24	July'23
a)	Bypassing of LILO of Ranganadi - Naharlagun / Nirjuli at Pare HEP so as to form direct Ranganadi- Naharlagun / Nirjuli 132 kV S/c line			
b)	Re-conductoring of LILO portion at Pare end (of Ranganadi - Naharlagun / Nirjuli 132kV S/c line) with HTLS (HTLS equivalent to ACSR Zebra) along with modification of 132kV bay equipment at Pare HEP			

D.5. Status Review for the Items Referred from previous OCCMs:

S.No	Item for Discussion	Status as per 194 th OCCM	Latest Status
1.	Installation of Capacitor banks in Upper Assam area of Assam (Agenda No. B19. of 189 th OCCM)	At Dhemajifunding issue. However, with coming of other lines like Pare-N. Lakhimpur voltage issue may be automatically rectified	Same status
2.	Introduction of SPS in Leshka S/Sn of Meghalaya (Agenda No. C4 of 189 th OCCM)	OEM has visited the site and proposed certain modifications in the original scheme. The finalised scheme will be submitted to the higher management in the following week.	
3.	Voltage and MVAR issues at 400kV Kameng S/Sn (Agenda No. C7 of 189 th OCCM)	2 nd week of October'22	Within Dec'2022
4.	Non-availability of operational synchronization facility at 132kV Agartala Station (Agenda No. C10. of 189 th OCCM)	PGCIL has shared the required drawings, and wiring is completed also, but CVT issue occurred in the synchronization trolley. TSECL informed that a testing team to visit 79 Tilla to check the trolley	TO BE COMPLETED BY OCT 22 by TSECL.
5.	Difficulty in test synchronization at Ningthoukhong S/Sn (installation of line CVT) (Agenda No. C11. of 189 th OCCM)	Installation of CVTs done.	Issue to be resolved shortly. Test synchronization can be done after 22 nd Oct, 2022
6.	Outage of 400kV Imphal (PG) – Thoubal-I (Agenda B.15 of 184 th OCCM)	RoW issue, litigation in court	
7.	Charging of 33kV Khupi-Kimi line at 132kV: Recommendations of the 187 th OCCM to be implemented: (a) Installation & Commissioning of PLCC and additional Wave Trap with accessories at Khupi (NEEPCO) - By Mar'22 Minutes of 188 th OCC meeting held on 16 th March, 2022 at Guwahati (b) Defective Relays at Khupi end to be repaired (NEEPCO) – By Mar'22 (c) PID testing and replacement of defective insulators (NEEPCO) – By Mar'22	(a) PLCC installed and testing done through existing battery bank (b) Rain related issues (c) PID testing done, replacement to take place after rainy season (d) to be done just before charging of the line (e) supply issues, to be done by Sep'22 (f) Procurement and installation of LDR by Aug'22 The option of charging the line without waiting for line	Status Report submitted to NERPC.

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	(d) Infringement checking and vegetation clearance (NEEPCO) – By Mar’22 (e) Stringing of OPGW by POWERGRID Comprehensive – By Mar’22 (f) Procurement and installation of Line Differential Relays (NEEPCO) – By Mar’22 (Agenda B.15 of 188 th OCCM)	differential protection to be explored, NEEPCO to replace defective insulators and clear vegetation infringements before charging	
8.	Synchronization issue of 220kv AGBPP – Tinsukia 1 & 2 at AGBPP end.(NEEPCO to update the status of CVT procurement and other relevant details.) Item B.24 of 190 th OCCM.	About to place the tender	Tender floated in the month of August’2022.
9.	Installation of second wave trap at Nirjuli SS for both N.lakhimpur and Pare circuits by PGCIL (B.14. Of 192 nd OCC)	To be installed along with charging of the LILO portion	To be installed along with charging of the LILO portion
10.	Frequent breakdowns (BD) of Khuppi- Balipara transmission line (C2 of 191 st OCCM)	132kV Kimi –Khupi line to be commissioned by Sept’22	
11.	Proposed continuous shutdown of 132kV S/C LoktakJiribam(PG) for HTLS reconductoring (C.5 of 191 st OCCM)	in view of frequent outage of 132 kV Loktak-Rengpang-Jiribam link, the shutdown may be availed in lean hydro season when the requirement of backing down of Loktak HEP shall be minimum. Also Shutdown can only be given after the return of 132kV Dimapur-Imphal line.	132kV Loktak-Jiribam S/D needs discussion with higher authority of MSPCL.
12.	Issues faced during Mock Black Start exercise of Pare HEP on 27/05/2022 (C.7 of 191 st OCCM)	No report submitted	As per agenda the same shall be performed in lean season.
13.	Implementation of Single Phase Auto-Reclosure for 132kV Rangia- Motongaand 132kV Gelephu-Salakati Line (C.14 of 191 st OCCM)	Oct’22	Nov’22
14.	Non reporting of 132kV Mohanpur S/S under NERPSIP and Comprehensive projects (C.16 OF 191 ST OCC)	Team on site, but not yet reporting	Work in progress. Telemetry system for reporting to SLDC will be ready by next week.
15.	High level of dissolve gases on DGA report of Kameng U#3 R-phase GT: (C.17 of 191 st OCCM)	Continued DGA violation, but within manageable limits	Acetylene is within permissible limit.

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16.	Grid Disturbance in Dhaligaon area of Assam Power System (C.18 of 191 st OCCM)	Estimate prepared and submitted to Disaster Risk reduction Works, 2022-2023, Govt of Assam	Same status
17.	Tower schedule of 220 KV D/C Transmission line (from Zhadima 400/220 KV GIS Substation to Zhadima 220 KV Substation) (B.18 OF 194 TH OCC)	DoP,Nagaland to provide Line parameter details for relay setting to M/s KMTL.	Yet to submit. Line Parameters changed due to increasing in no oftowers. Revised parameters to be submitted soon.
18.	400 kV STG-1 Main Bay at OTPC Palatana (C.6 of 194 th OCCM)	Persistent DC E/F problem in the bay to be resolved during shutdown of Block 1	Bay currently Open. To be rectified in Unit 1 S/D.
19.	400 kV Bongaigaon-Byrnihat L/R at 400 kV Bongaigaon (PG) (C.6 of 194 th OCCM)	Bushing of the L/R has developed the problem of oil leakage to be replaced	Applied for shutdown in Nov'22 and awaiting for Shutdown approval
20.	Occurrence of Multiple grid disturbance in Gohpur and radially connected areas of Assam Power System (C.10 of 194 th OCC)	AEGCL updated the forum that corresponding bay is ready but RTU gateway related work has remained and by Sept'22 the work will be completed.	Work completed from AEGCL end. SEM meters to be provided.
21.	Status of Installation of TLISA in 400kV Silchar-Azara T/L & 400 kV Silchar-Byrnihat T/L (C.12 of 194 th OCCM)	Tendering process to be completed.	Same status
22.	PLCC & protection related issues at 132kV Tipaimukh S/s (C.15 of 194 th OCC)	MSPCL to ensure healthiness of 48V DC System & Protection System by Sep'22.	48V charger to be replacement done on 16th Oct 2022
23.	48V System reliability at Pasighat end (C.16 of 194 th OCC)	Arunachal Pradesh intimated the forum that the matter will be referred to the transmission circle and a report on action taken in this regard will be provided to NERPC/NERLDC in the following week.	Transmission division/ circle was requested to take up the matter, likely to be completed by March 2023 if fund is approved.

E. METERING AGENDA ITEMS

E.1. SEMs to be procured for Sterlite& KMTL on-going projects (50 SEMs):

NERTS confirmed over mail regarding receipt of 50 Nos. SEM and 10 Nos. DCD at Misa Substation on 23.03.2021. NERLDC prepared a list of 30 nos. SEM and 07 nos. DCD on priority basis and sent to NERTS via mail on 29.04.21. As deliberated in 184th OCCM, installation/ replacement of SEMs and distribution of DCDs had almost been completed.

As per NERLDC record, newly procured defective DCD at Tinsukia is yet to be replaced. In 192nd OCCM, NERTS mentioned that presently three DCDs are in stock, out of which, forum requested one to be handed over to Tinsukia. NERTS requested Assam to collect the same from Misa S/s. Out of the remaining 2 DCDs, one to be given to NEEPCO for Khandong drawl and another to be handed over to Bhutan for Motonga. In the 193rd OCCM Assam updated that they have not received the DCD yet, but will receive at the earliest. Manager, NERLDC mentioned that DCD kept for Motonga, Bhutan shall not be required to be provided to them as the SEM data is being received from ERLDC for Motonga.

In the 194th OCCM, DGM(AM), NERTS informed that 40DCDs are under procurement and delivery is to be issued by Oct'22.

Deliberation of the sub-committee

NERTS informed the forum that the above works are being carried as per schedule.

The sub-committee noted as above

Action: NERTS.

E.2. Issues regarding SEM Data Processing:

- a. Mismatch in 220 kV Deomali (AP) - AGBPP (Kathalguri) power flow data: Pair-check mismatch has been observed for 220 kV Deomali (AP) - AGBPP (Kathalguri). Deomali end is reading 2/3rd of Kathalguri end. In 194th OCCM, SLDC A.P assured the forum to send expert form Itanagar to check the SEM at the earliest. Status may be reviewed.
- b. Non-receipt of SEM data from 220kV Mariani(As) & 132 kV Pailapool Substations: Weekly SEM data of 220kV Mariani(As) & 132 kV Pailapool(As) Substations is important for accounting of Assam drawal. However, SEM data from the said substations is not being received.

In 194th OCCM, SLDC AEGCL intimated the forum that regarding SEM at Mariani(As), USB to serial converter's driver is not available, for which PGCIL

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assured to ask Mariani(PG) to extend support. Regarding SEM at Pailapool it was informed that a new laptop is required which will be procured very soon.

Status may be reviewed.

- c. Sign reversal of Rengpang end of 132kV Loktak- Rengpang line: Sign Reversal problem exist in Rengpang end of 132kV Loktak-Rengpang line. In 194th OCCM, SLDC MSPCL informed that a thorough evaluation of the meter was done but the problem still persists. The forum requested PGCIL to extend help to MSPCL. To which PGCIL concurred

Status may be reviewed.

- d. Erroneous reading of Tipaimukh end of 132kV Aizwal-Tipaimukh line: Tipaimukh end of 132kV Aizwal-Tipaimukh line is reading close to 0 (Zero). In 194th OCCM, SLDC, MSPCL informed that similar to problem with SEM at Rengpang SS, the problem with SEM at Tipaimukh still persists despite a thorough evaluation of the meter. The forum requested PGCIL to extend help to MSPCL. To which PGCIL concurred

Status may be reviewed.

Deliberation of the sub-committee

The following were concluded for the agenda items:-

- a. DoP, AP will rectify Deomali SEM by Oct'22 for 220 kV Deomali (AP) - AGBPP (Kathalguri) feeder.
- b. Mariani: SLDC, Assam mentioned that the issue has been resolved. However, NERLDC informed that data was received for only 1 week (19-09-2022 to 25-09-2022) on 26th Sep 2022, after which the same has not been received. SLDC, Assam assured to check with the field personnel. Pailapool: Laptop has not been procured by Assam yet
- c. MSPCL vide email dated 17th October 2022 informed that Rengpang SEM undergoing check.
- d. MSPCL vide email dated 17th October 2022 informed that Tipaimukh SEM needs replacement.

The sub-committee noted as above

Action: All concerned Utilities.

F. ADDITIONAL AGENDA ITEMS

Agenda from OTPC

F.1. Frequent Tripping of OTPC 400 KV Palatana –Silchar line-1

OTPC 400 KV Palatana –Silchar line-1 tripped on 7th , 9th , and 13th Oct 22. Frequent tripping of 400 KV line can hamper the reliability of system.

Deliberation of the sub-committee

The forum noted the concern raised by OTPC and referred the item to PCC/Subgroup for detailed discussion.

The sub-committee noted as above

Action: NERPC.

Agenda from NERPC

F.2. Increasing number of Shutdown requests under D-3 basis

It has been observed that in recent times the shutdown requests under D-3 basis have increased as shown below.

SN	Utility	Total	
		OCC	D-3 (TILL 17-10-2022)
1	PGCIL	392	334
2	Assam	243	66
3	TRIPURA	134	22
4	Arunachal Pradesh	3	21
5	Manipur	0	20
6	Meghalaya	46	9
7	MIZORAM	2	3
8	NAGALAND	11	15
9	NEEPCO	15	29
10	NTPC	13	4
11	NHPC	0	0
12	OTPC	4	11
13	NETC	2	8
14	INDIGRID	13	4
15	KMTL	0	2
Total		878	548

This results in inadequate time available for proper system studies by NERLDC and NERPC. It also impacts the proper and smooth planning of the shutdowns. Thus, it is requested to the utilities to better plan their shutdowns and kindly route through OCC rather than on D-3 basis.

Deliberation of the sub-committee

The forum expressed concern on the increasing trend of processed shutdown under D-3. It was impressed upon the concerned utilities to improve their outage planning and maximize their shutdown requests through OCC.

The sub-committee noted as above

Action: All concerned Utilities.

Date & Venue of next OCC meeting:

It is proposed to hold the 196thOCC meeting of NERPC on second week of November, 2022. However, exact date and venue will be intimated in due course.

Annexure-I**List of Participants in the 195th OCC Meeting held on 18.10.2022**

SN	Name & Designation	Organization	Contact No.
1	Sh. N.Perme, SE (E)	Ar. Pradesh	09436288643
2	Sh. Rupanka Kishore Goswami, AGM (SLDC)	Assam	09613146565
3	Sh. N.Bhattacharjee, SLDC	Assam	07044376443
4	Sh. Hemanta C.Sharma, CGM, SLDC	Assam	09435514589
	No Representative	Manipur	-
5	Sh. B.Wankhar, SE (SLDC)	Meghalaya	07005673697
6	Sh. T.Gidon, EE, SLDC, MePTCL	Meghalaya	06009094044
7	Sh. B.Narry, EE (SP), MePTCL	Meghalaya	07005298338
8	Sh. D.J.Lyngdoh, EE (SM), MePTCL	Meghalaya	-
9	Sh. Alokesh Koch, AEE, SLDC	Meghalaya	08257060204
10	Sh. C.Syngai, MePTCL	Meghalaya	09856133943
11	Sh. A.G.Tham, MePTCL	Meghalaya	09774664034
12	Sh. A.Shullai, MePGCL	Meghalaya	
13	Sh. P.Syiem, AEE, MePTCL	Meghalaya	09856065581
14	Sh. Y.Iakai, AEE, SLDC	Meghalaya	09402133552
15	Sh. H.Lalruatkima, Sr.EE	Mizoram	09862925462
16	Sh. V.Lalhmingliana, JE	Mizoram	09612763052
17	Sh. S.I. Asangba Tikhir, EE	Nagaland	07085508502
18	Sh. Anil Debbarma, DGM (SLDC)	Tripura	09612589250
19	Sh. Joypal Roy, GM (O&M)	NEEPCO	08837200069
20	Sh.N.Roy, ED	NERLDC	09869080265
21	Sh. Sachin kr. Singh, Dy.Manager	NERLDC	09436119794
22	Sh. Sourav Mandal, Manager	NERLDC	09402102354
23	Sh. Palash Jyoti Borah, Dy.Manager	NERLDC	08761093397
24	Sh. S.C.De, Sr.GM	NERLDC	09436335369
25	Sh. U. Katak, ED	PGCIL	09435505418
26	Sh. P.Kanungo, CGM (AM)	PGCIL	09436302823
27	Sh. Deep Sarkar, Manager, RTAMC	PGCIL	09957665341
28	Sh. Ankit Vaish, DGM, NERTS	PGCIL	09409305725
29	Sh. Pranjit Deka, Sr.GM (NERPSIP)	PGCIL	09402508304
30	Sh. Chayaniba Das	PGCIL	08486161373
31	Sh. Soubhik Choudhury	OTPC	08827008091
32	Sh. Susovan Das, AGM (EEMG)	NTPC	07637032174

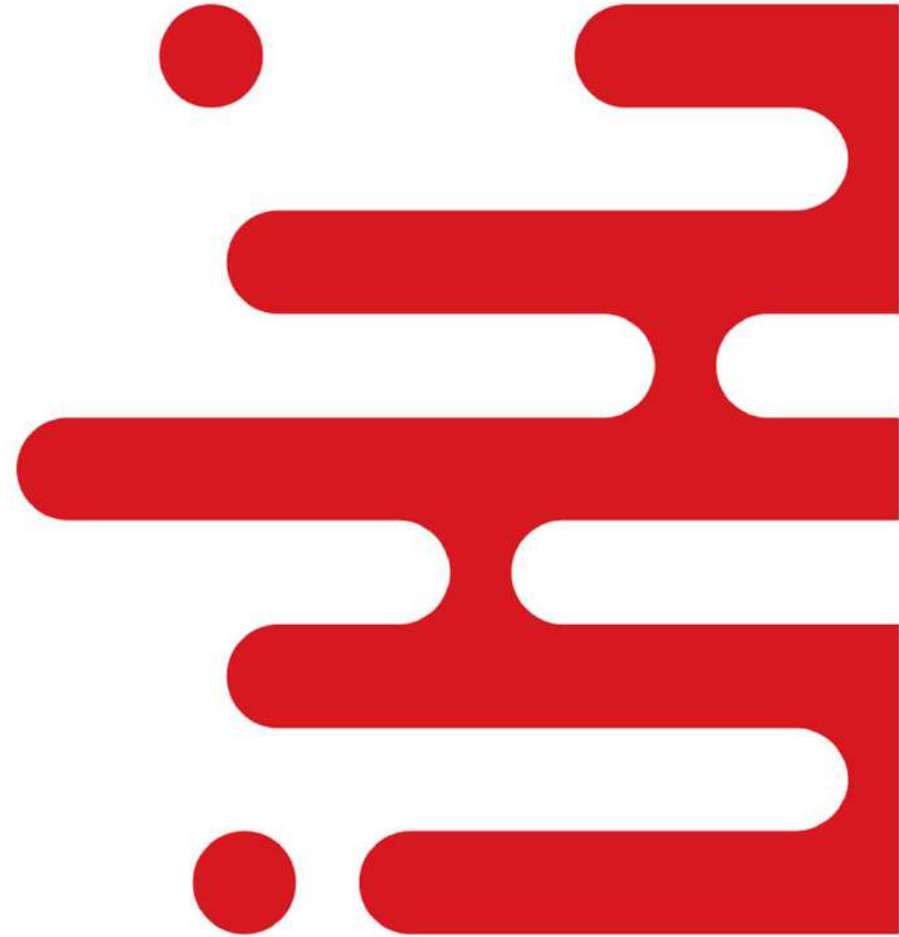
33	Sh. Kishan Chand, Sr. Mgr (E), LOKTAK	NHPC	09800284593
34	Sh. N.Ramesh Kr. Singh,Engineer (O&M)	NETC	09101658046
35	Sh. Rakesh Kumar	IMD	08729816312
36	Sh. Vivek Karthikeyan, Sr.Mgr	INDIGRID	08966903034
37	Sh. Chatla K. Kumar	INDIGRID	09644213334
38	Sh. Rajesh Bhargava	ORBIT Techsol	09958095107
39	Sh.Rakesh Kharwal	Rockladder Tech.	09899117910
40	Sh. Vikash Yadav	TRENDMICRO	09910053313
41	Sh. Debasish Sarkar	TRENDMICRO	09830284551
42	Sh. Unmesh Sharma	TRENDMICRO	09812822671
43	Sh. Krishnamoorthy	Kalkitech	08527394569
44	Sh. Hari Kumar S.	Kalkitech	09742289900
45	Sh. Viju N.R.	Kalkitech	-
46	Sh. B. Lyngkhoi, Member Secretary	NERPC	09436163419
47	Sh. S.M.Aimol, Director	NERPC	08974002106
48	Sh. A.Agarwal, Dy.Director	NERPC	09871266951
49	Sh. Rajib Das, AE	NERPC	-
50	Sh. S. Chaturvedi, AE	NERPC	08077661727



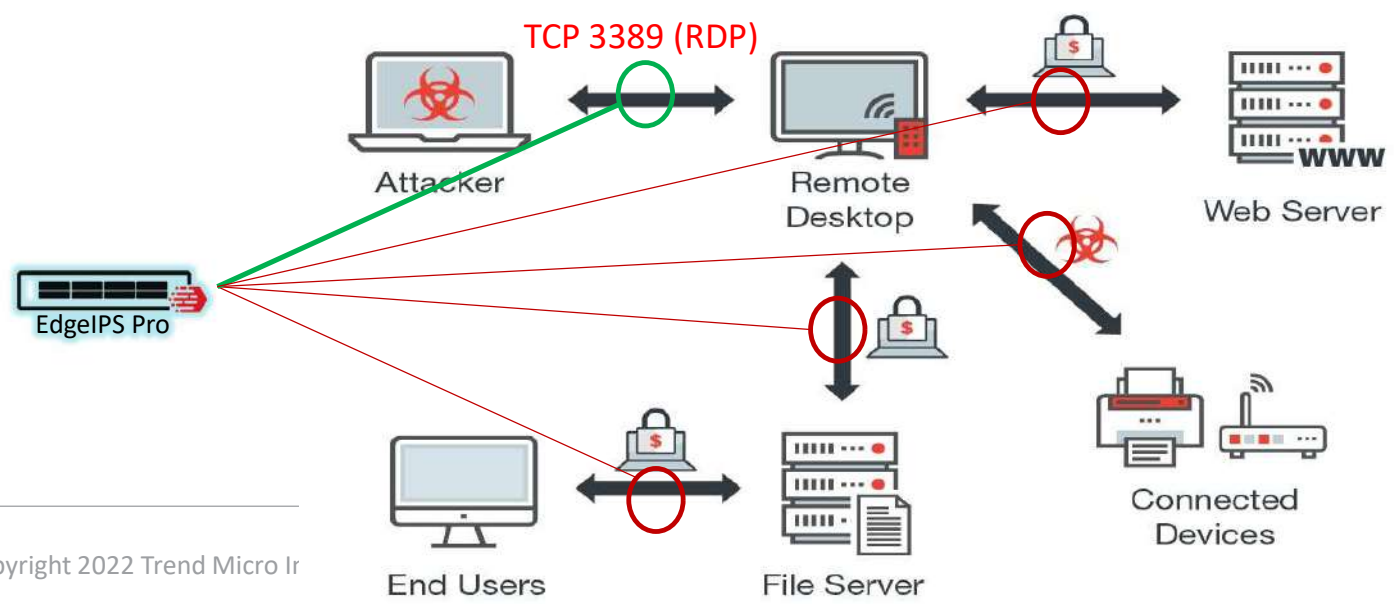
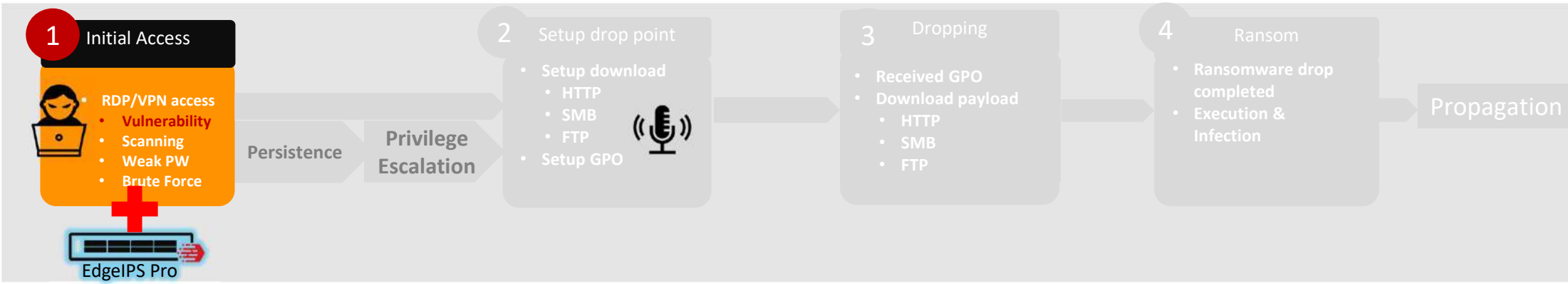
Trend Micro TX One Solution
Cyber Security Solution for EMS /DMS SCADA System
FOR
Northeast Region Power Utilities



Demo to Prevent RDP Vulnerability Attack



High risk attack demo - TCP 3389 RDP (CVE-2019-0708)



High risk attack demo - TCP 3389 RDP (CVE-2019-0708)

- Windows Victim

- Attacker gets victim's shell.

A problem has been detected and windows has been shut down to prevent damage to your computer.

019_0708_bluekeep as check
e target attempted cleanup of the incorrectly-bound MS_T120 channel.
omplete)

bsst (Admin) txOne networks

System Visibility Network Object Profiles Security Pattern Logs Administration About

Logs > Cyber Security Logs

Time	Event ID	Security Category	Security Severity	Security Rule Name	Slot	Port	Attacker	Source MAC Address	Source IP Address	Source Port
2020-06-23T17:44:29Z	1136546	Buffer Overflow	Medium	RDP Microsoft Remote Desktop Services Remote Code Execution Vulnerability (CVE-2019-0708) 2-F/Flow	SLOT1	PORT1	10.40.3.86	00:0c:29:e5:79:79	10.40.3.86	36249

```
臨時 IP 位址 : 2001:0000:0000:0000:0000:0000:0000:0000
連接本機 IPv6 位址 : fe80::5a:10:40:3:86
IPv4 位址 : 10.40.3.86
子網路遮罩 : 255.255.255.255
預設埠道 : fe80::5a:10:40:3:86%12

通訊介面卡 Isatap. {7427CF2B-B91D-458C-B8F4-491...}
媒體狀態 : 媒體已插入
連線特定 DNS 記錄 :

C:\Users\QQ>ver
Microsoft Windows [版本 6.1.7601]
C:\Users\QQ>

*** STOP: 0x0000007E (0xFFFFFFFFC0000005, 0xFFFFF80003E91316, 0xFFFFF8B003E8A758, 0xFFFFF80003E89F80)

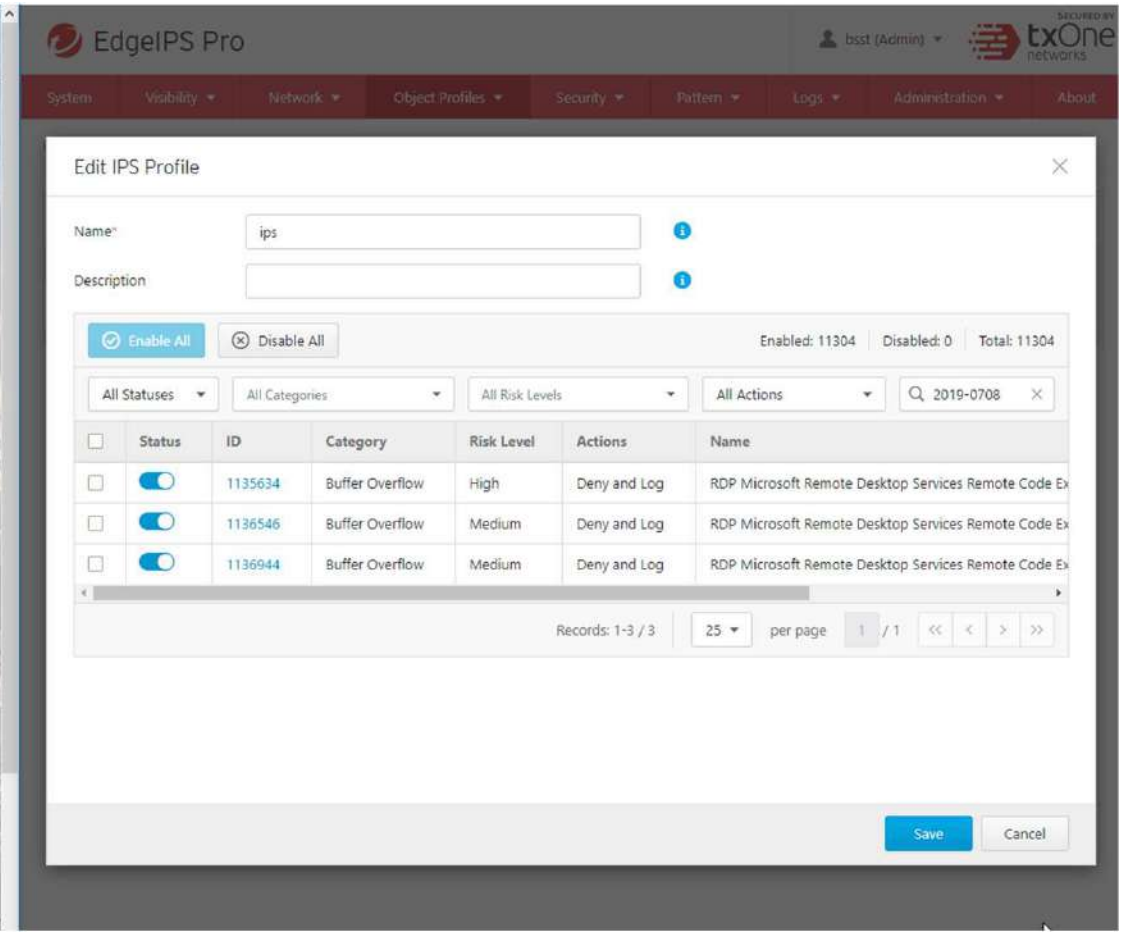
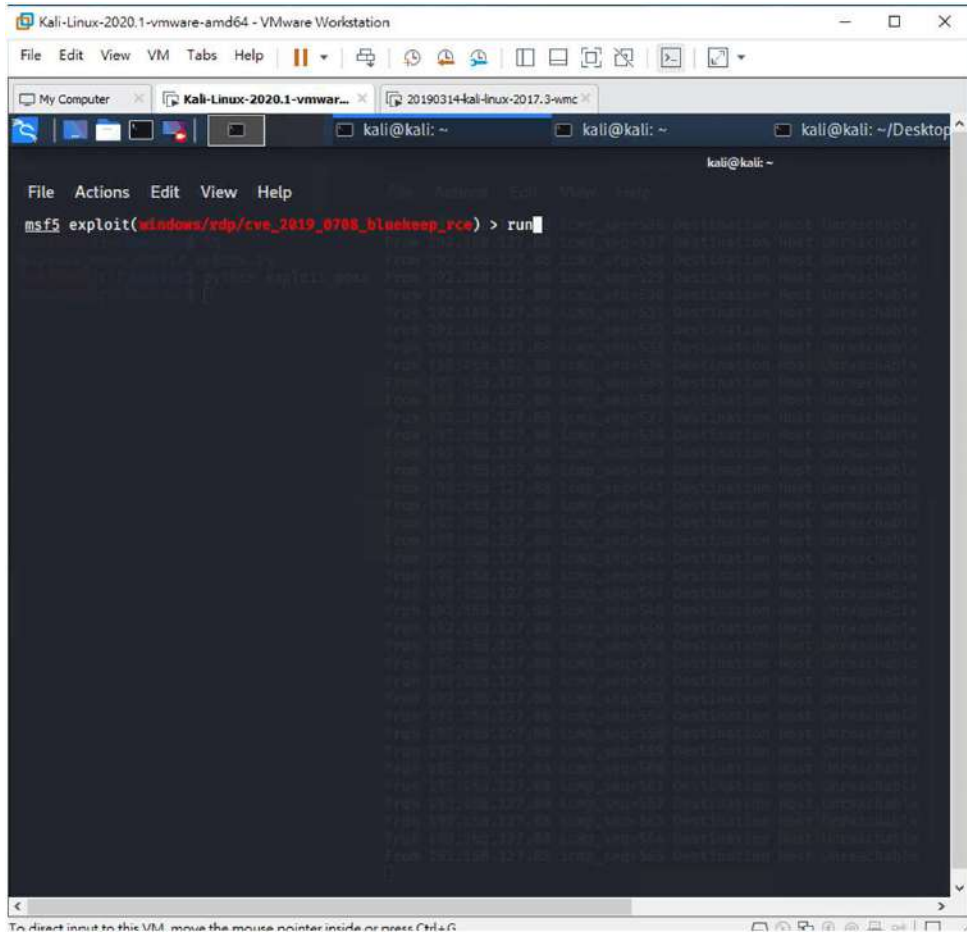
Collecting data for crash dump ...
Initializing disk for crash dump ...
Beginning dump of physical memory.
Dumping physical memory to disk: 60%
```

5f:8f79:6632:84b8
40:a55f:8f79:6632:84b0
69a3:9819:34c7:4901
0:40:69a3:9819:34c7:4901
8f79:6632:84b0%11

f:fcdd:4a2%11
0f:f4e3%11
3267]:
0u

Microsoft Windows [6.1.7601]
C:\Windows\system32>

High risk attack live demo - TCP 3389 RDP (CVE-2019-0708)



Agenda

- Threat Landscape in ICS industry
- IT and OT have converged
- Common Security Challenges in OT Environments
- Product Features
- High Level Deployment Architecture
- Competition
- Solution Performance
- Use case
- Customer References
- Supported ICS Protocols

Threat Paradigm Shift in ICS Security

State-sponsored target attack



Cyber Espionage

- 2010 Stuxnet
- 2011 DUQU
- 2012 Shamoon, Flamer, Gauss
- 2013 Havex/Dragonfly
- 2014 BlackEnergy 3
- 2015 Industroyer
- 2016 Shamoon 2
- 2017 Triton/Trisis

2010

2011

2012

2013

2014

2015

2016

2017

2018

2019

2020

Ransomware Attack



Cybercriminals

2017
WannaCry
NotPetya
Bad Rabbit

Ransomware Attack


2019 - 2020
LockerGoga,
Snake/Ekans
DoppelPaymer

Attacks on Indian Power Transmission Utilities




- **Red Echo:** Chinese Advanced Persistent Threat (APT) group targets **SRLDC, WRLDC, NRLDC and NERLDC in 2021.**
- **TAG-38:** Chinese state-sponsored campaign that since September 2021 has targeted **at least seven Indian State Load Dispatch Centers (SLDCs)**
- **Shadowpad Malware:** A common link between both attempts by RedEcho and TAG-38 uses Internet-facing, third-party DVR/IP camera devices as Command and Control Servers.

Attacks on Energy Utilities Globally




Generation

- **Triton** - Targeted Schneider safety system in a petrochemical facility
- **Incontroller/Pipedream** - Exploits a multiple PLCs used in power plants



Transmission






- **RedEcho** - Targeted 10 Indian power generation and transmission organizations
- **TAG-38** - Targeted 7 Indian power dispatch centers



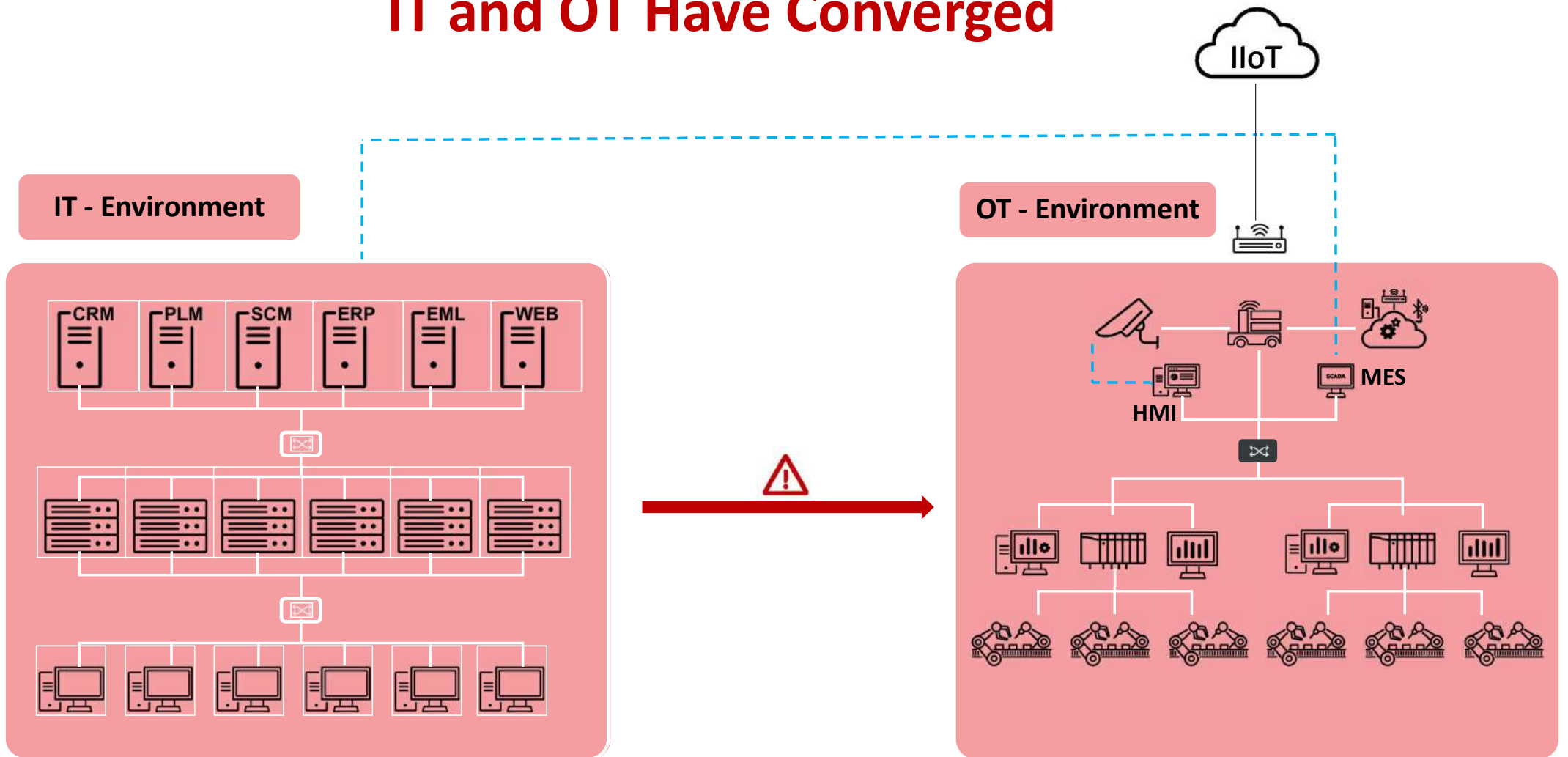
Distribution

- **Industroyer (1 & 2)** - Targeted Ukrainian electricity substations
- **BlackEnergy** - Targeted 3 regional Ukrainian electricity distribution companies

Typical Cyber Attack

-  **1. Initial access**
 - Spear-phishing emails with maldocs
 - Malware installs and gains foothold
 - Malware connects to C2 for commands
-  **2. Recon**
 - Malware performs recon
 - Learns about IT and ICS networks
 - Potentially exfiltrates important data
-  **3. Harvest credentials**
 - Obtain usernames and passwords from IT network
-  **4. Move laterally**
 - Identify ways to move to ICS network
 - Gain access to operator workstations
 - Directly interact with ICS network
-  **5. Detonate payload**
 - Malware manipulates target system such as SIS, PLC, SCADA or ICS
 - Targeted systems execute control commands sent by malware

IT and OT Have Converged



Common Security Challenges in OT Environments



Lack of Endpoint visibility & Protection



Weak authentication leads to misuse of PLC



Cannot apply patch quickly enough as it should be



Unintentional incidents caused by infected media

This is my priority

Availability

Confidentiality

Integrity

This is my priority

Confidentiality

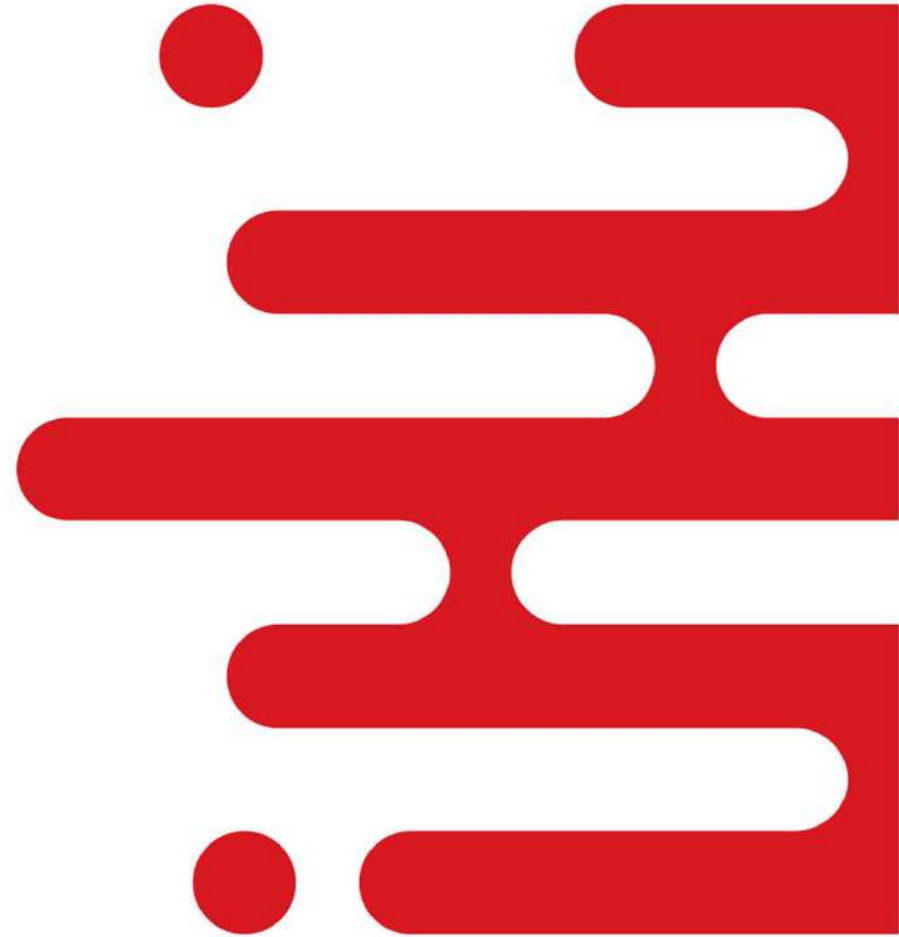
Integrity

Availability

Keep the Operation
Running



PRODUCT FEATURES



TXOne covers Endpoint Protection, Network Protection & Security Management

Layered Protection

ODC Platform

Industrial Next Generation IPS
EdgeGuard

Network Protection

Deployed in front of mission-critical assets or at network edge

Industrial host-based Lockdown

Stellar One-ICS

Endpoint Protection

Deployed on **mission-critical** embedded servers

Industrial removable media security
Portable Security

Centralized Console

Policy Management, Reporter, Signature Update, Full Visibility

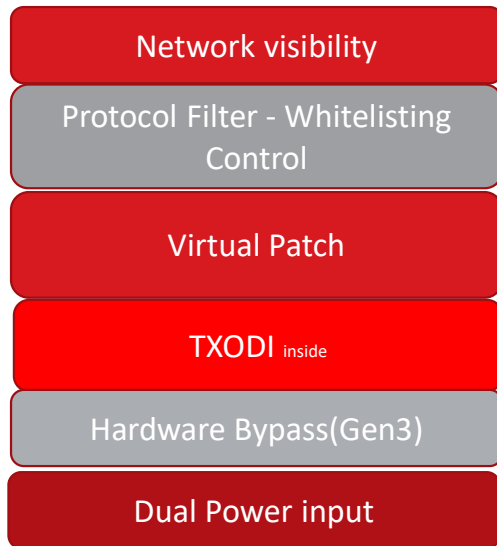


EdgeGuard - IPS



EdgeGuard Series: Next-Generation Industrial IPS

L2-L7 Visibility and Protection



Support both inline or passive Deployment

Protect mission-critical asset

- Deployed in front of important assets (computers, HMI & controllers) and provide bi-directional protection

Real IT-OT Integration

- Provide OT visibility and control as well as cybersecurity monitoring and protection to enable IT and OT collaboration
- Profile based ICS Protocol Filter.
- Hardware Bypass

Easy Management

- Centralized management by OT Defense Console (ODC)
- Single unit management via web console.
- Object based configuration for IP and Network Service
- Zero-configuration

Robust System

- High MTBF
- Dual power-Input
- -40 to 85°C wide temperature operation
- 7-years warranty
- Industrial certificates
- Self-recovery watchdog
- *Wide Temperature (-40°C to 75°C)

EdgeIPS™ Pro Specifications

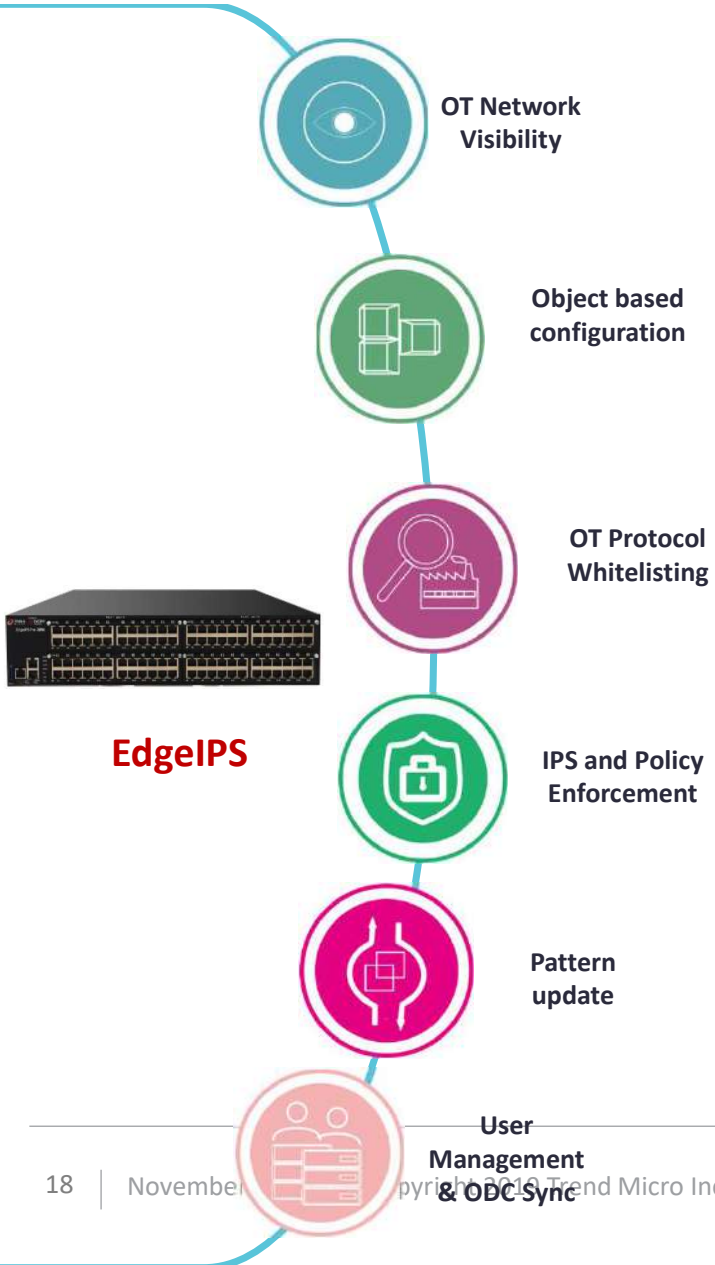


Features	EdgeIPS Pro - 1048	EdgeIPS Pro - 2096
Threat Prevention Throughput *	10Gbps (IMIX) / 20Gbps (UDP 1518 bytes)	20Gbps (IMIX) / 40Gbps (UDP 1518 bytes)
Latency	<500 microseconds	
Concurrent Connections (TCP)	2 Million	4 Million
Intrusion Prevention / Antivirus	Yes / Yes	Yes / Yes
Supported ICS Protocol	Modbus / EtherNet IP/ CIP/FINS/ STComm/STComm+/3ECS/3EM,with more being added regularly	
Policy Enforcement Rules	50,000 Rules	100,000 Rules
ICS Protocol Filter Profiles	256 Profiles	256 profiles
Form Factor	1U rack mount	2U rack mount
Weight (Stand-Alone Device)	15.8kg (34.854 lb)	23.67kg (52.182 lb)
Dimensions (W x D x H)	438mm x 750mm X 44mm (17.24 X 29.53 X 1.73 in)	438mm x 750mm X 88mm (17.24 X 29.53 X 3.46 in)
Network Interface Type	10/100/1000 BASE-TX (RJ-45) x 48 ports	10/100/1000 BASE-TX (RJ-45) x 96 ports
Hardware Failover	24 Segments Gen3 Hardware bypass	48 Segments Gen3 Hardware Bypass
USB Interface / Serial Console	1x USB Interface (Type-A) / 1x USB Interface (Type-C) for serial console	
MGMT Interface / Mirror Interface	1 x 10GE/1GE RJ-45(MGMT) / 1 x 10GE/1GE RJ-45(Mirror)	
HA Port	1 x 10/100/1GE RJ-45 for HA Port	1 x 10/100/1GE RJ-45 for HA Port
Input Voltage	90 ~ 264 VAC FULL RANGE	90 ~ 264 VAC FULL RANGE
Power Supplies	Redundant hot swap 800W power supplies (1+1 AC)	
Operating Temperature	0 - 40°C (-40 - 167°F)	0 - 40°C (-40 - 167°F)
Ambient Relative Humidity	5 to 95% (non-condensing)	5 to 95% (non-condensing)
Storage Temp.	-40 - 85°C (-40 - 185°F)	-40 - 85°C (-40 - 185°F)
Vibration	2 Gms @ UEC 60068-2-64, random wave, 5-500HZ, 1hr per axis (without any USB devices attached)	2 Gms @ UEC 60068-2-64, random wave, 5-500HZ, 1hr per axis (without any USB devices attached)
Mean Time Between Failure (MTBF)	50,000 hours based on 25°C	50,000 hours based on 25°C
Safety Certification	CE ,UL, EN60950-1, IEC60950-1,UL60950-1	CE ,UL, EN60950-1, IEC60950-1, UL60950-1
Electromagnetic Compatibility	VCCI, FCC	VCCI, FCC
Rack Rail Support	Rack Mounting Ears , Sliding Rails	Rack Mounting Ears , Sliding Rails
Green Product	Rohs, CRoHS, WEEE	Rohs, CRoHS, WEEE
Central Management System	Supported OT Defense Console, ODC	Supported OT Defense Console, ODC

* Note: Performance is measured in a Laboratory, performance values may vary according to test condition and system configuration.
 • Each EdgeIPS Pro is entitled to 1 year hardware warranty. Upon renewal of the software license and hardware warranty extension, the hardware warranty will be able to be extended for the same renewal period, subject to a maximum warranty period for the hardware of 7 years.



Edge IPS – Key Features




EdgeIPS



ODC – Web Console

OT Defense Console


demo (Demo User)  Secured by txOne networks

Dashboard Visibility Node Management Logs Applications About


Dashboard

Default Title Title Dashboard +


Top Cyber Security Events by Source IP




Top Cyber Security Events by Destination IP



Top Suspicious Object Events by Source IP



Top Suspicious Object Events by Destination IP



Device List

Device	IP	Status	Pattern Version	Firmware Version	Model	Assets
IPS-0186	172.16.0.29	Online	TM_210825_22	IPS_G02_1.3	IPS-102-8P-TM	3
IPS-0187	172.16.0.21	Online	TM_210825_22	IPS_G02_1.3	IPS-102-8P-TM	3
IPS-0188	172.16.0.19	Online	TM_210825_22	IPS_G02_1.5	IPS-102-8P-TM	3
IPS-0189	172.16.0.28	Online	TM_210825_22	IPS_G02_1.3	IPS-102-8P-TM	3

Environment Summary (Group Summary)

Node License Usage



OT Defense Console

- **ODC**

- Centralized Policy Deployment and Reporter
- Full visibility in assets, operations, and security events
- Instant threat containment by integrating with switches and firewalls
- Enable the OT visibility and protection to HQ SOC



ODC PA -105



Din Rail
Protected nodes:
5 Nodes

Starter

ODC PA -1050



Din Rail
Protected nodes:
50 Nodes

Small Zone

ODC PA -1200



Din Rail
Protected nodes:
200 Nodes

Medium Zone

ODC PA -1500



Din Rail
Protected nodes:
500 Nodes

ODC PA -1001K



Rack : 1U
Protected nodes : 1000
Nodes

Large Zone

ODC PA -2002K



Rack : 2U
Protected nodes : 2000
Nodes

Very Large Zone

ODC-VA

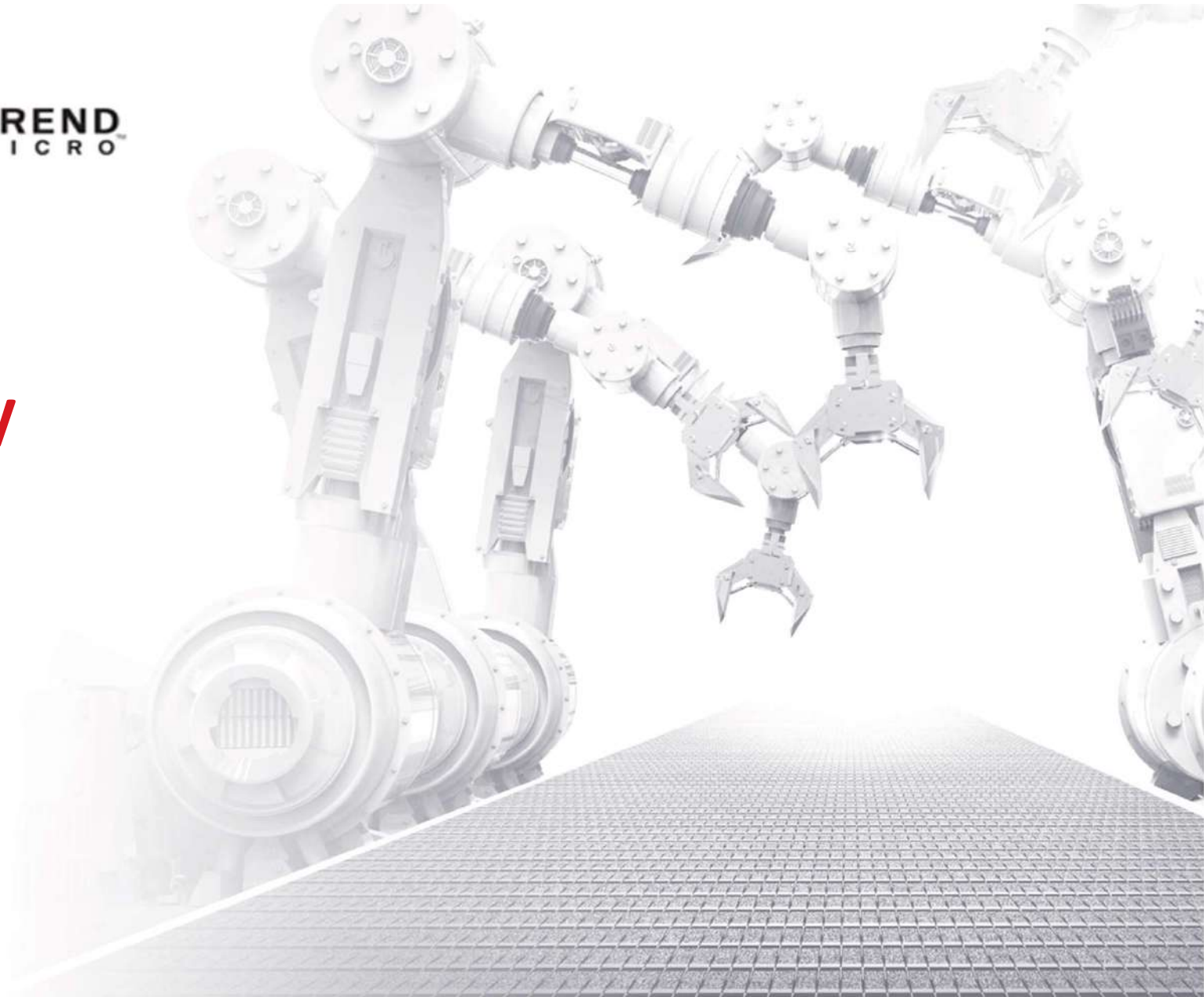


Virtual Appliance
Protected nodes
200 - 10000 Nodes

Flexible and Elastic



Portable Security



Trend Micro Portable Security

Malware Scanning & Cleanup tool for
Air-gapped System and Standalone PC



Scan status and result notification with LED



Detected and further
action is required



Malware detected and
cleaned



No malware is detected.
System is safe

No Installation Required

- Designed to scan mission critical systems that are not allow anti-virus software installed

Easy Operation

- Scan and cleanup malware by removable scanning tool
- The built-in notification LEDs display the status of a malware scan.

One Tool, Multiple Platforms

- Supports Windows and Linux, from legacy versions to the latest builds.

Eliminate Shadow OT

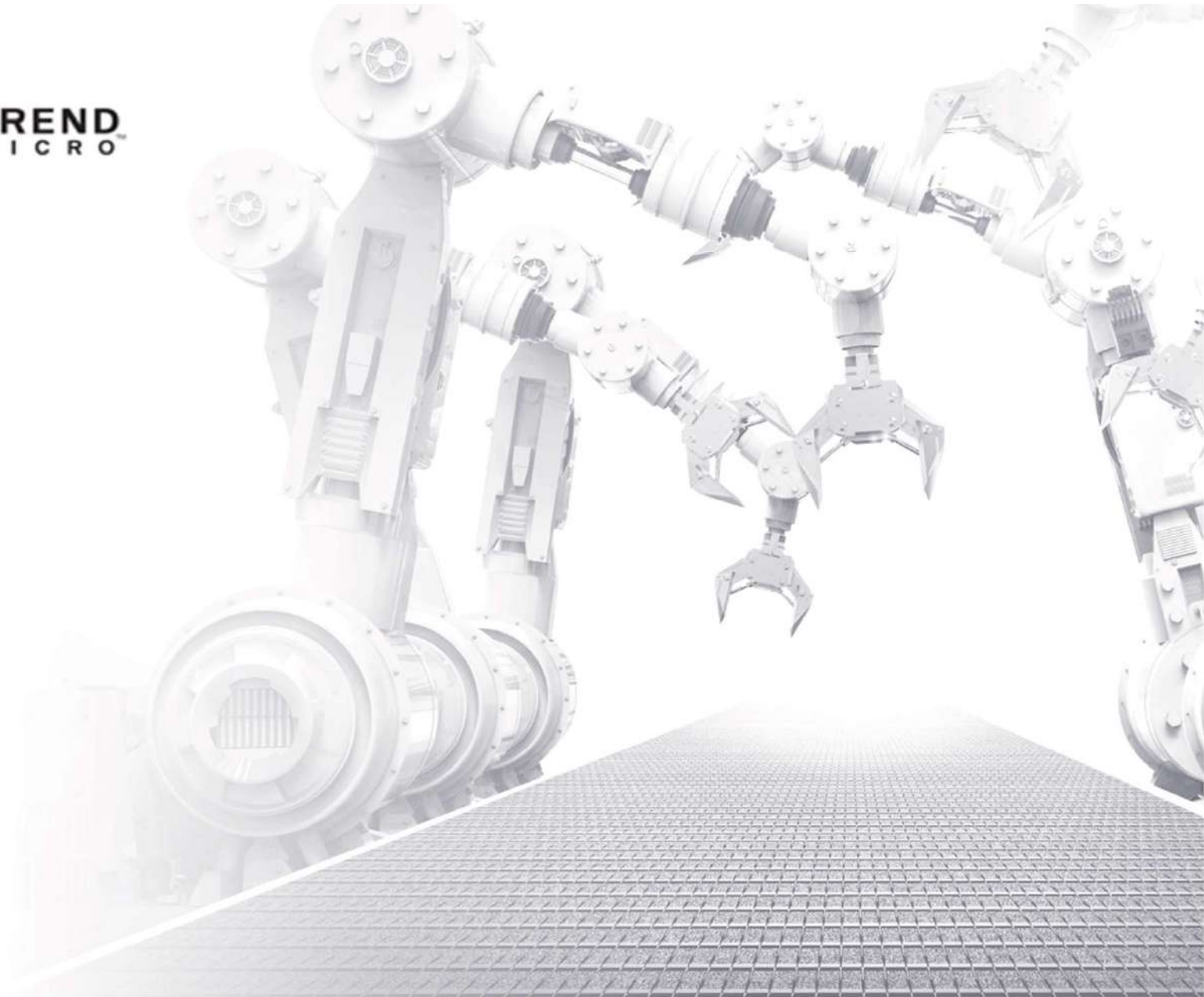
- Collects a detailed snapshot of asset data including computer information, Windows Update, and application lists simultaneously while the scan is being performed.

Centralized Management

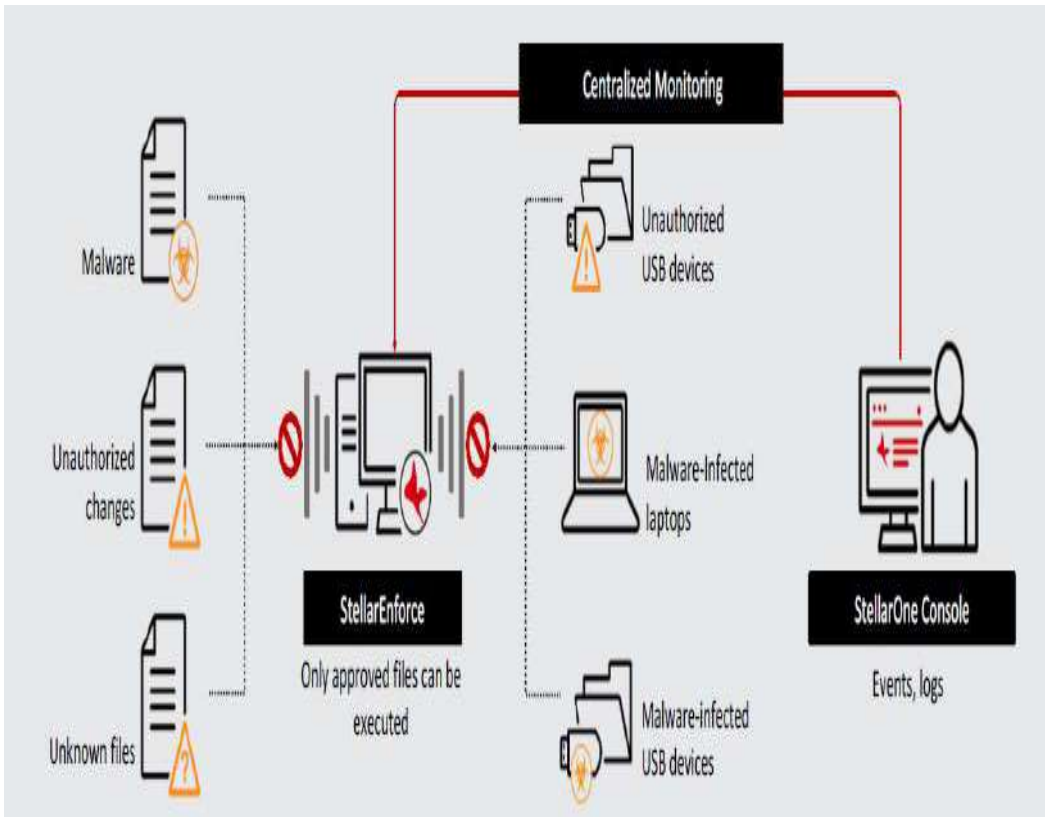
- Pattern file updates, configuration deployment, and correlation of scan logs and asset information can be centrally managed.



Stellar One

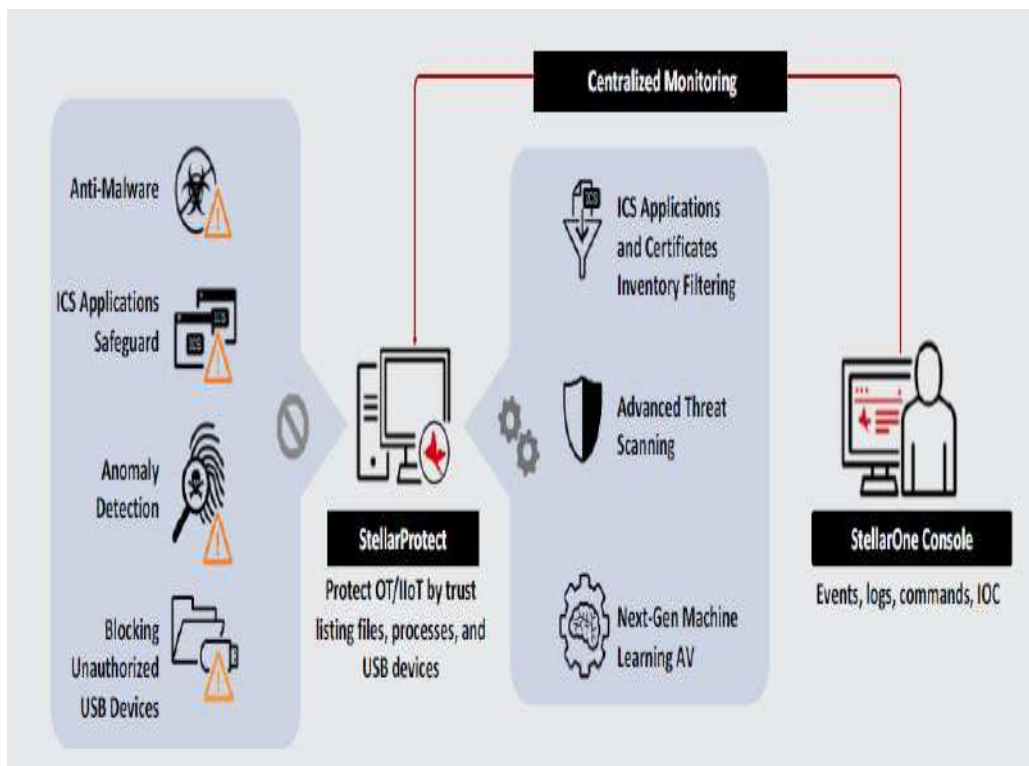


Stellar Enforce



- **4-in-1 Lockdown:** Operation Lockdown, USB Device Lockdown, Data Lockdown and Configuration Lockdown secure operational integrity while efficiently reducing both.
- **Easy Deployment and Maintenance:** Only permitted USBs can be accessible to protected servers
- Inspection on USB content
- **Minimal performance impact and operational cost**
- **Protect legacy operating system:** Specially designed to support EOS operating systems such as Windows XP and 2000

Stellar Protect



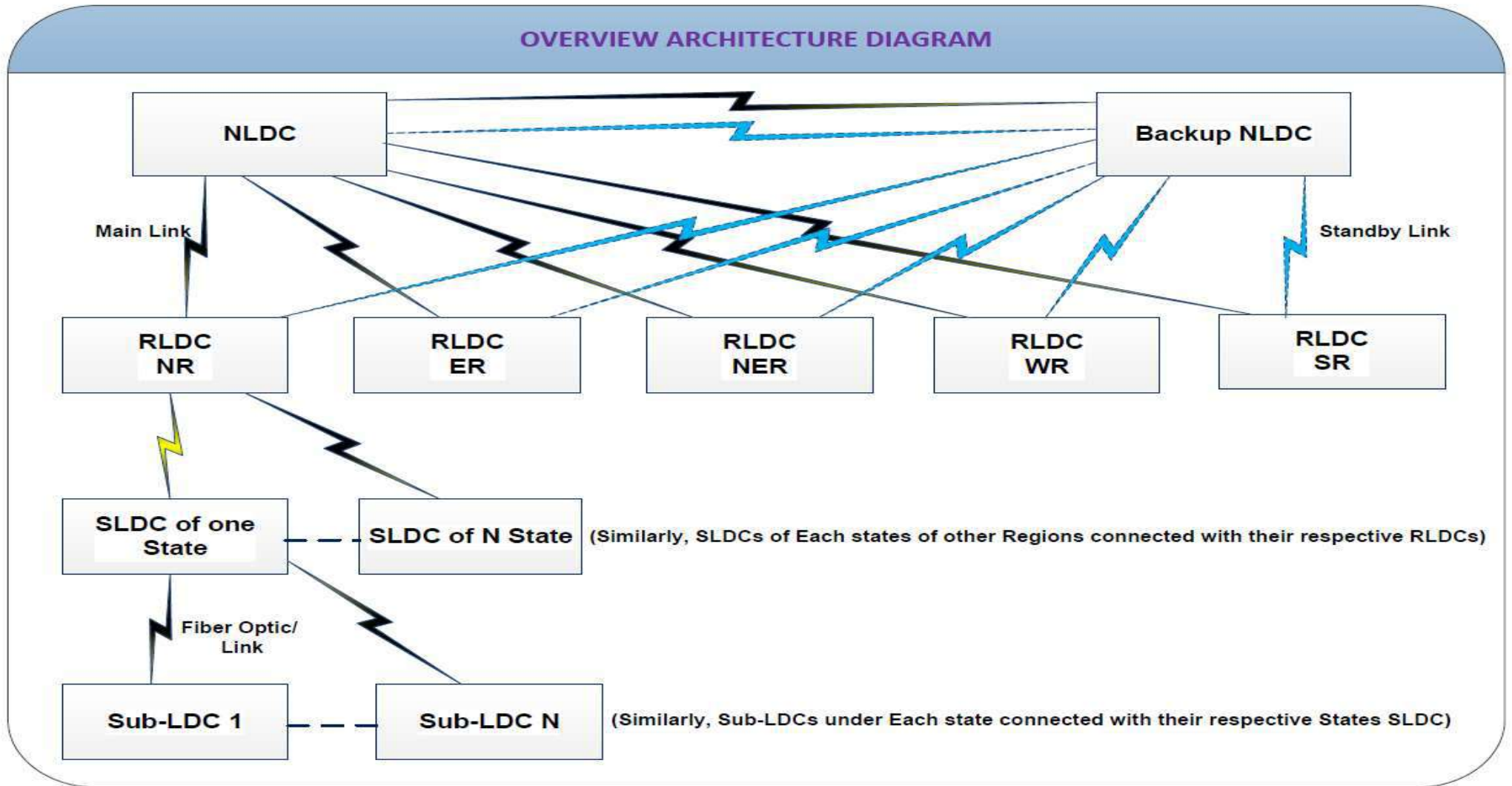
- Industrial-Grade Next-Generation Antivirus.
- Real-time malware protection
- Ransomware and fileless attack prevention
- Advanced threat protection
- Exploit prevention
- Behavior anomaly detection
- IOC integration
- USB device trust listing
- ICS application inventory informed by OT vendors
- Write-protection
- Support for both scheduled and on-demand AV scans
- Log aggregation



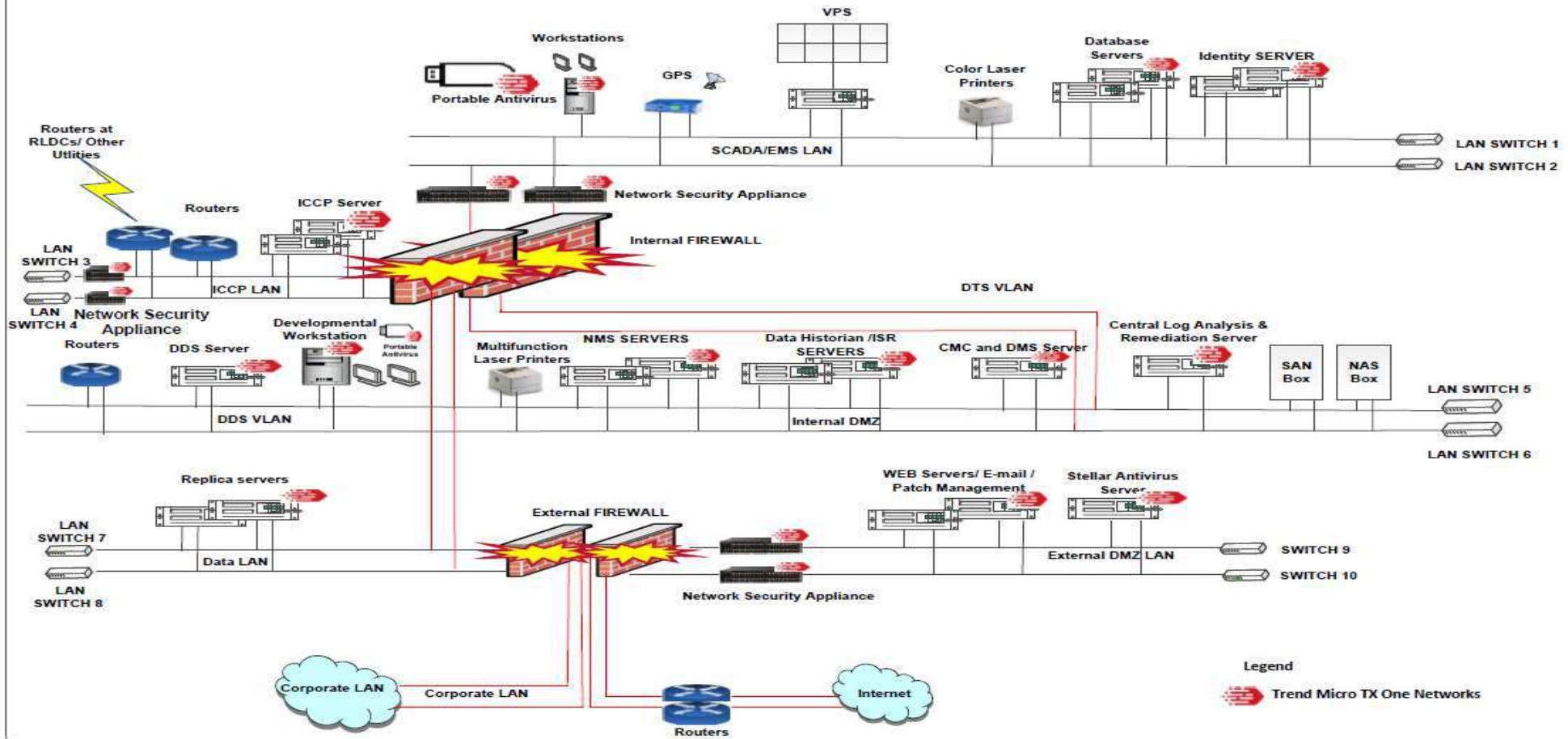
High Level Deployment Architecture for Power Grids



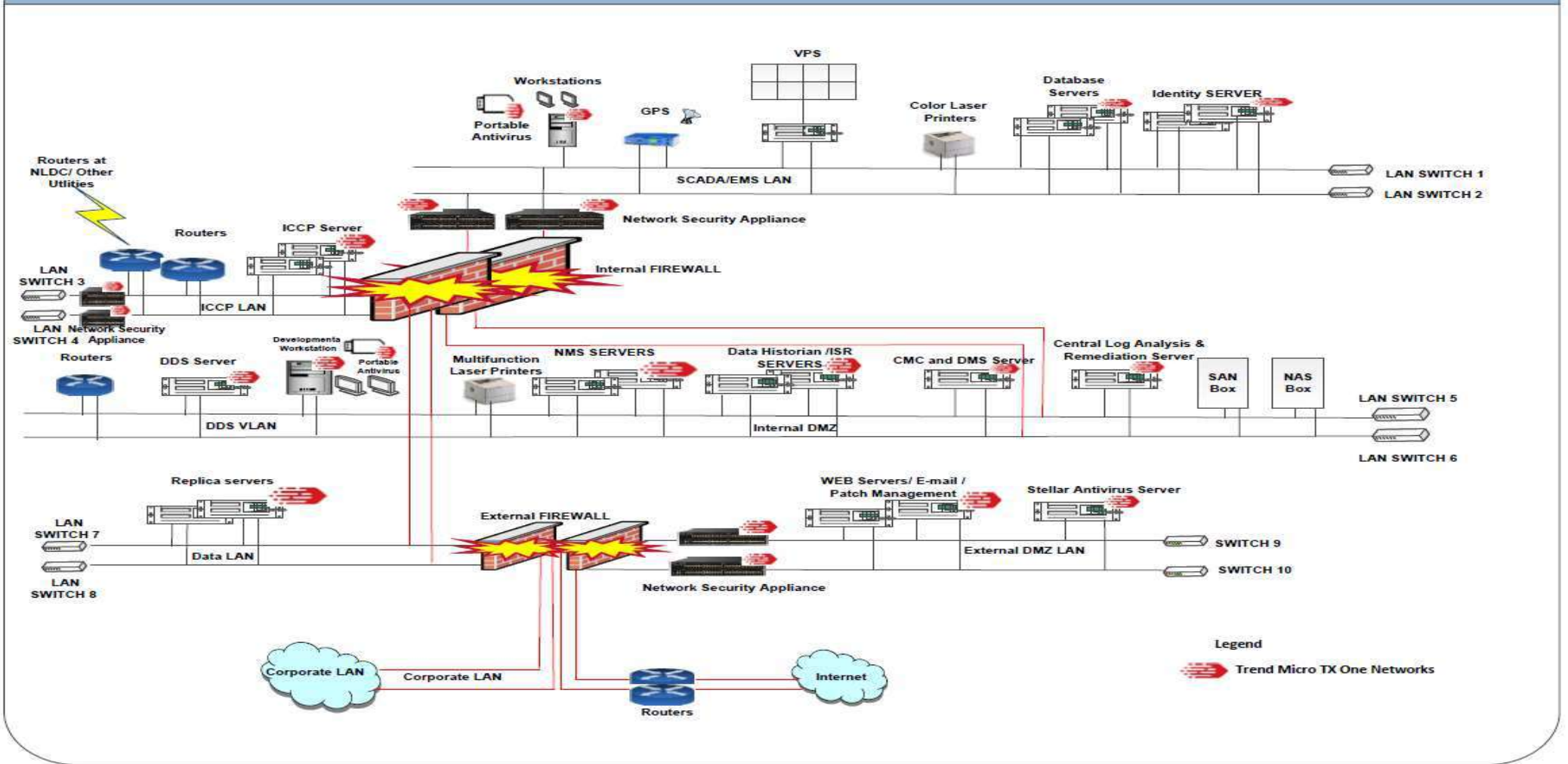
OVERVIEW ARCHITECTURE DIAGRAM



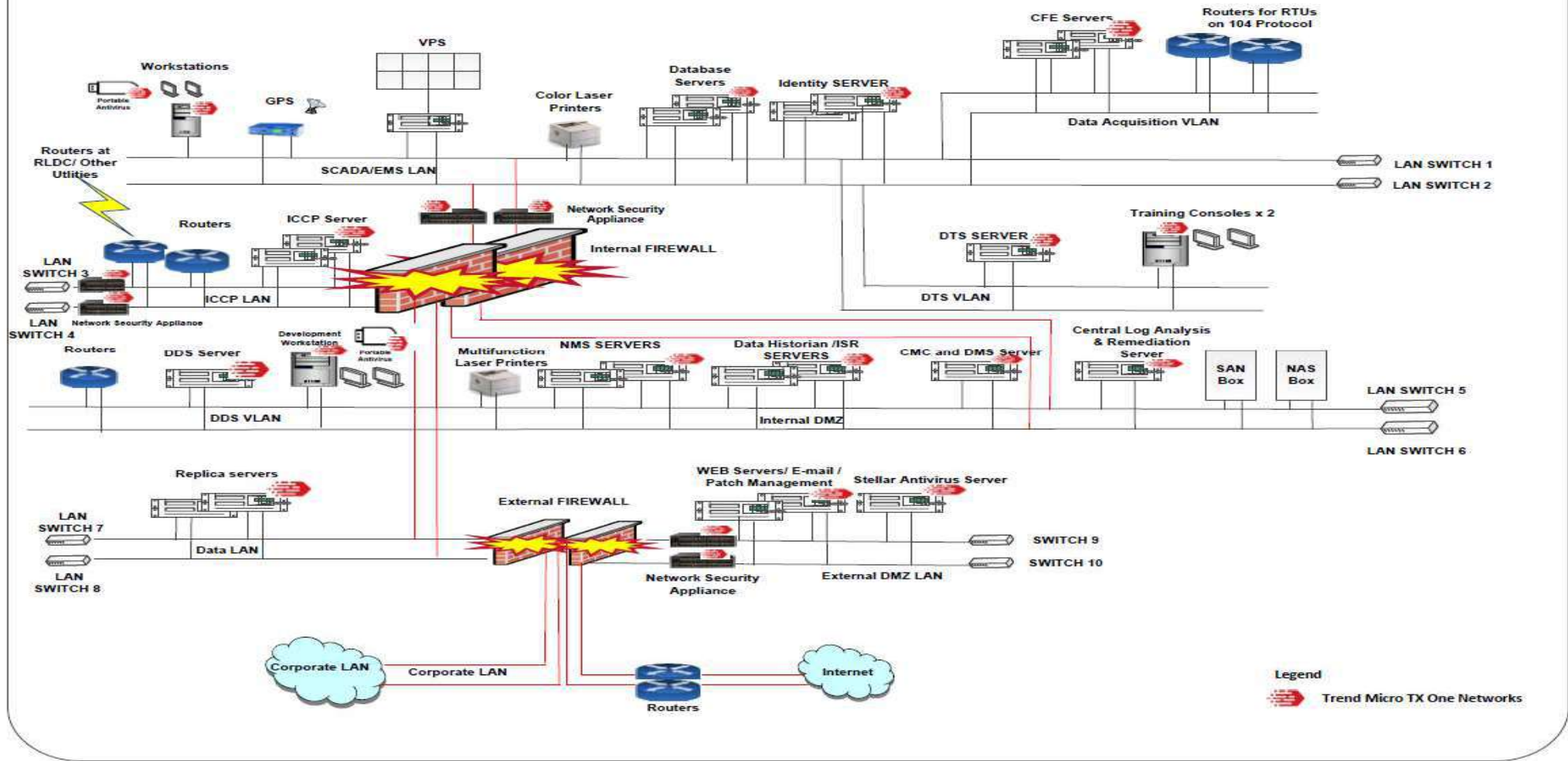
Typical Network Architecture Diagram for NLDC



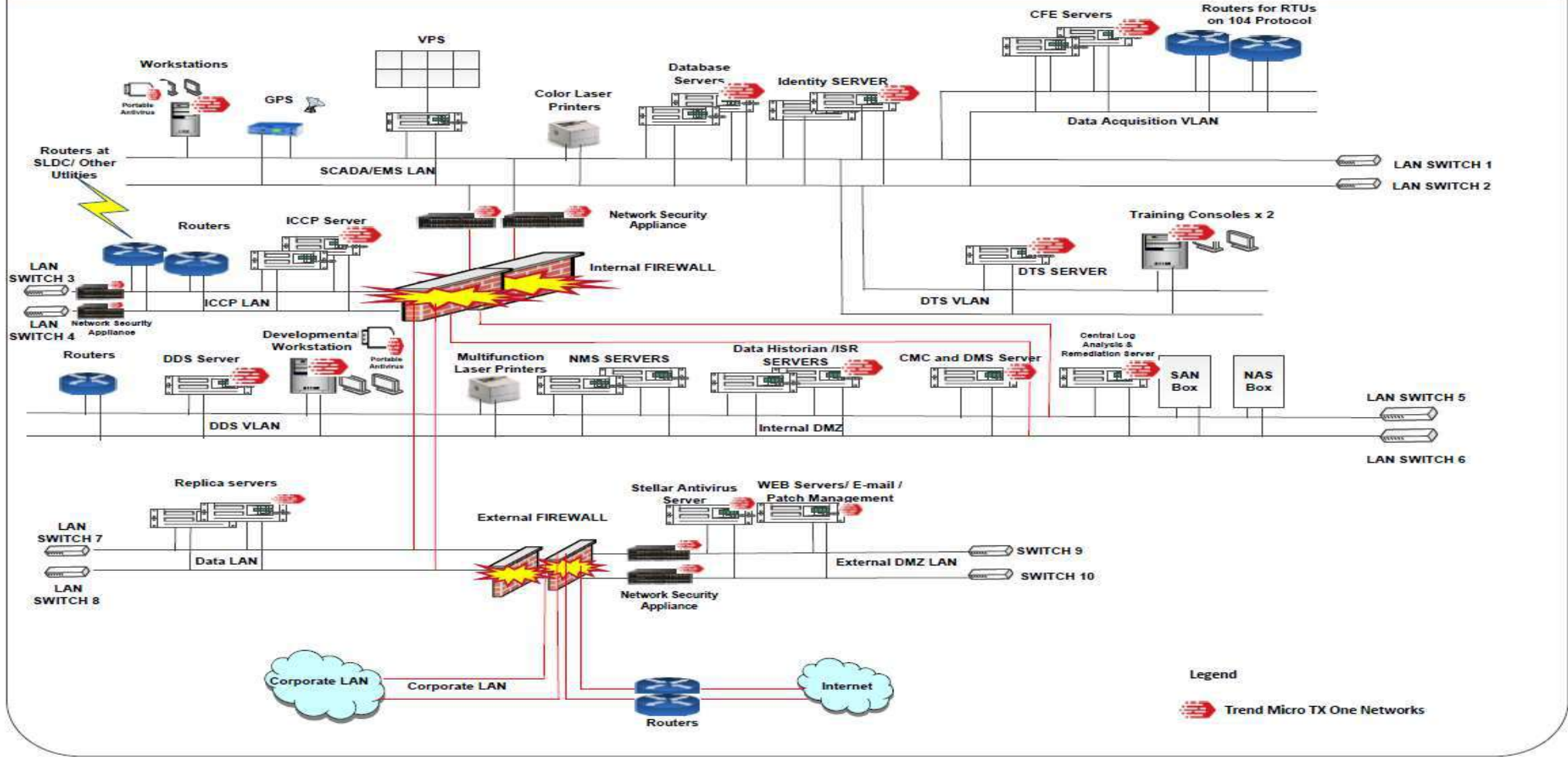
Typical Network Architecture Diagram for RLDC



Typical Network Architecture Diagram for SLDC

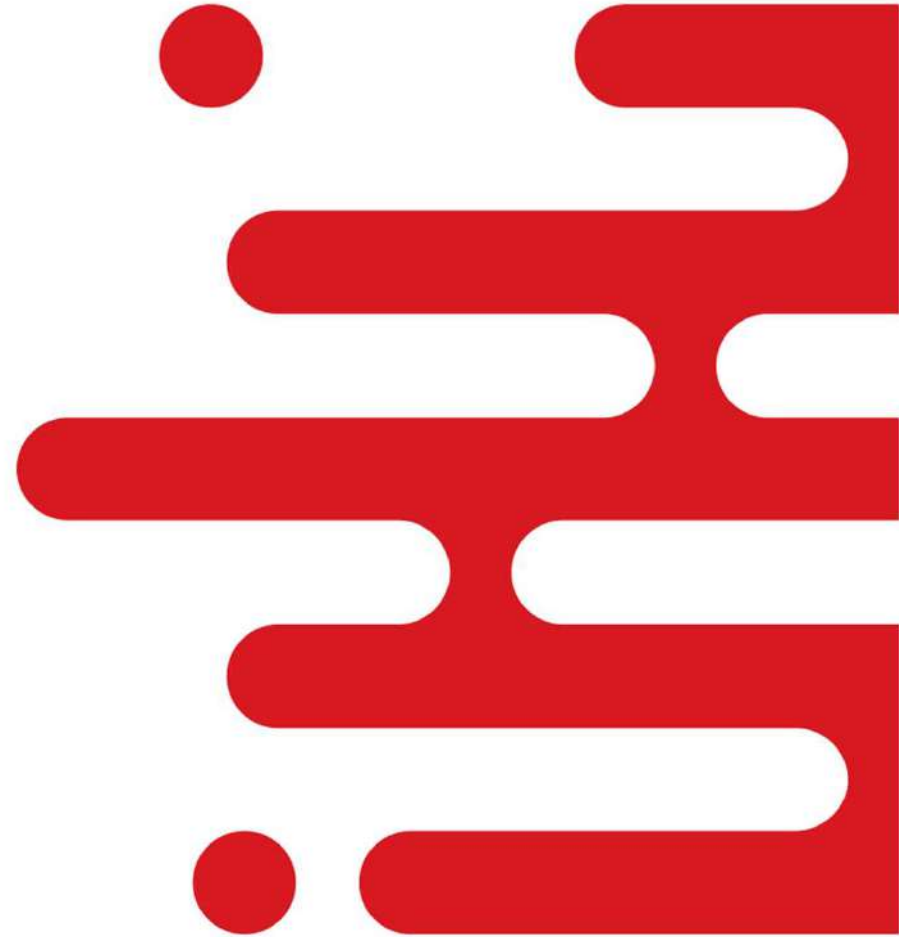


Typical Network Architecture Diagram for Sub-LDC





COMPETITION



Competitive Landscape

OT VENDORS



HIRSCHMANN
A BELDEN BRAND

PHOENIX CONTACT

SIEMENS

Rockwell Automation

TOFINO SECURITY
A BELDEN BRAND

- Hirschmann + Tofino Security (DPI firewall) + Tripwire
- Siemens Scalance SC632-2C)
- Stratix (OEM by CISCO) + CISCO ISA 3000 + IE Series switch)

Disadvantage

- Mediocre OT visibility
- Mediocre cyberthreat intelligence

TM advantages

- Leading IPS technology
- IT-OT Visibility
- Network Whitelisting

OT- IT convergence startups

- **Claroty**
 - Alliance with Rockwell, Siemens, Palo alto networks
- **Nozomi Networks**
 - Alliance with FireEye, CISCO, Fortinet...
- **Dragos**
 - Alliance with GE
- **CyberX**
- **Sentryo** (acquired by CISCO)
 - Alliance with Schneider
- **ForeScout** (acquired SecurityMatters)

Disadvantage

- Single product; no total solution
- Detection only; No Prevention
- No existing customer relationship

TM advantages

- IT-OT Management and Collaboration
- Comprehensive Security at N/W and Endpoints
- Strong existing customer base to leverage

IT VENDORS



FORTINET

Check Point
SOFTWARE TECHNOLOGIES LTD.

paloalto
NETWORKS

CISCO

- Rugged 30D/35D/60D/90D
- 1200R
- PA-220R
- ISA3000

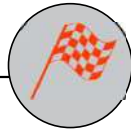
Disadvantage

- Few or None OT visibility
- Essentially still IT products

TM advantages

- Easy to maintain and replace
- OT-friendly subscription model

Leverage the world-leading Threat Research of Trend Micro



Leader in Anti-Malware technology

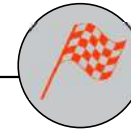
Gartner

Named a Leader Once Again

in the Gartner Magic Quadrant for Endpoint Protection Platforms

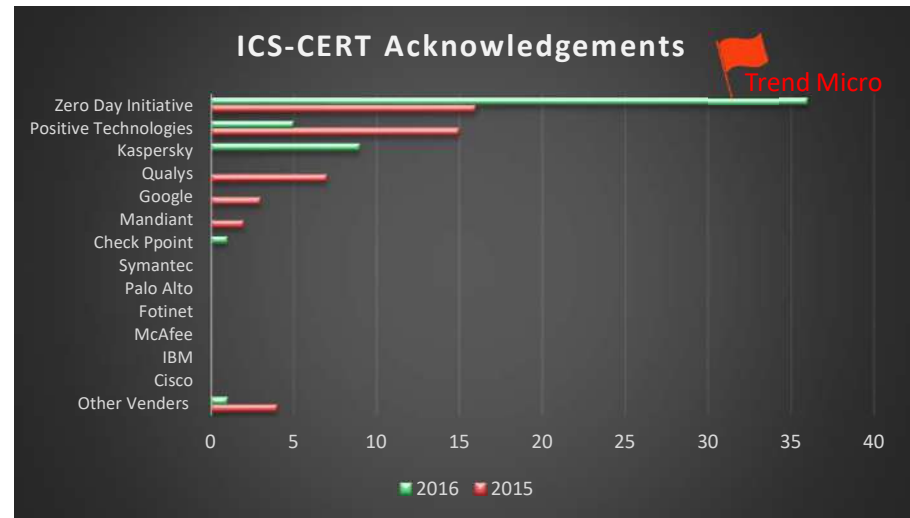
AVTEST

BEST Protection
with outstanding performance

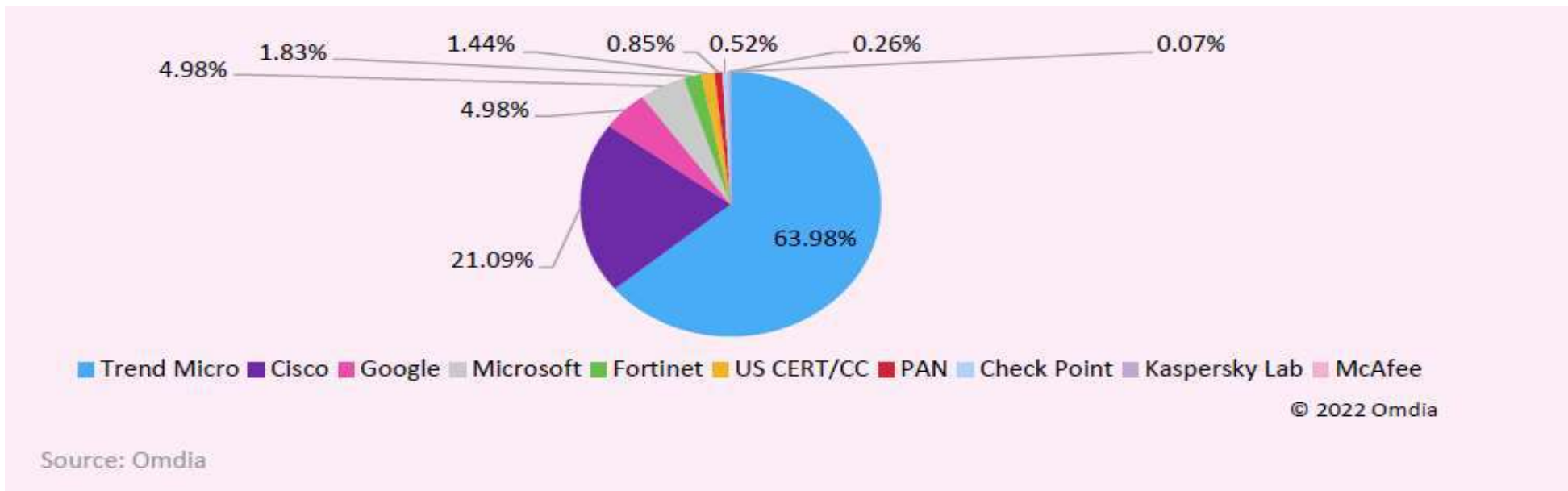


Leader in ICS Vulnerability Research

This graph is number of acknowledged reports for ICSA(ICS Advisories) of ICS-CERT by DHS



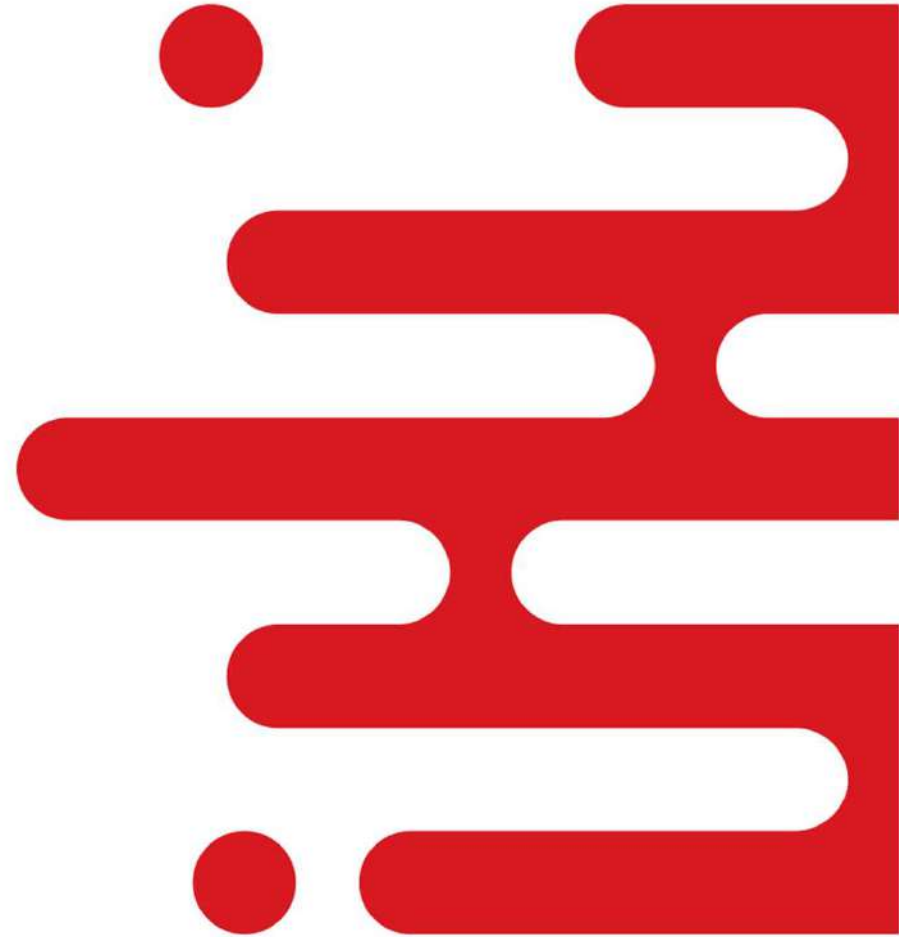
OMDIA Public Vulnerability Market Report: 2022 Edition



<https://omdia.tech.informa.com/commissioned-research/articles/quantifying-the-public-vulnerability-market-2022-edition>



Solution Performance



TXOne Industrial Application Repository



- ABB
- Acronis
- Autonics
- Baker Hughes
- Bürkert
- Codesys
- Delta electronics
- Druck limited
- Emerson
- Epson Robots
- Fanuc
- Fisher controls
- Fuji
- GE
- Idec
- Keyence
- Hitachi
- Honeywell
- Lovato electric
- Micromeritics
- Mitsubishi
- Motorola
- National instruments
- Omron
- Pactware
- Phoenix contact
- Red lion
- Roboticsware
- Rockwell
- Seiko Epson
- Schneider
- Siemens
- Verif-I
- YASKAWA
- Yokogawa
- Yamaha



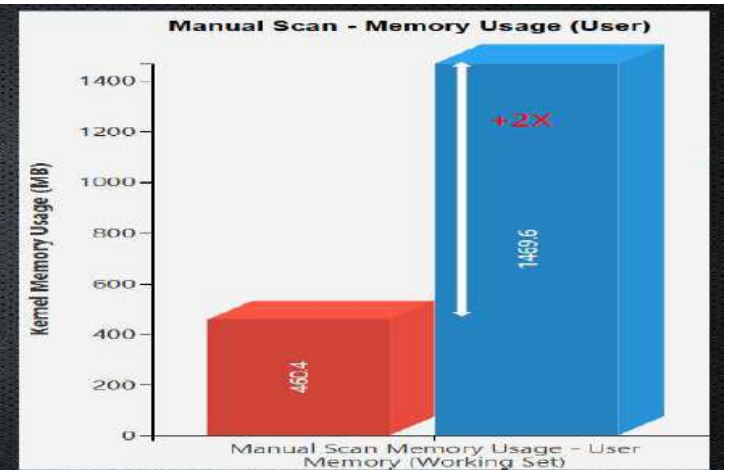
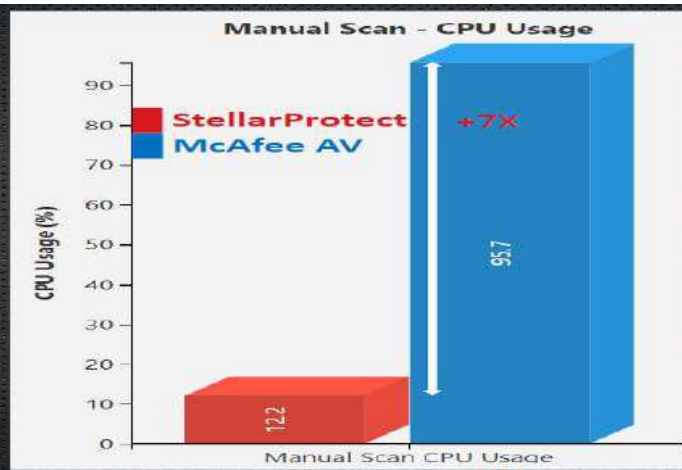
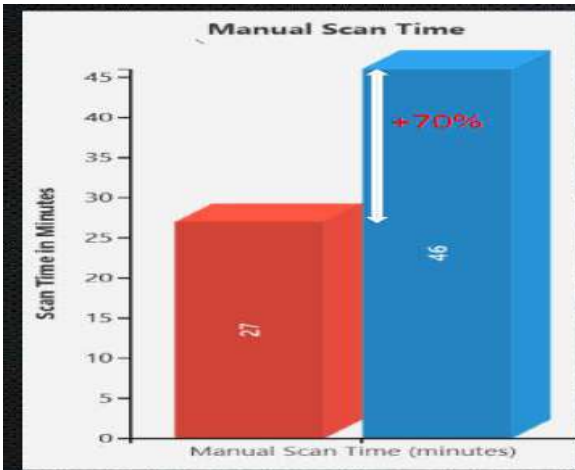
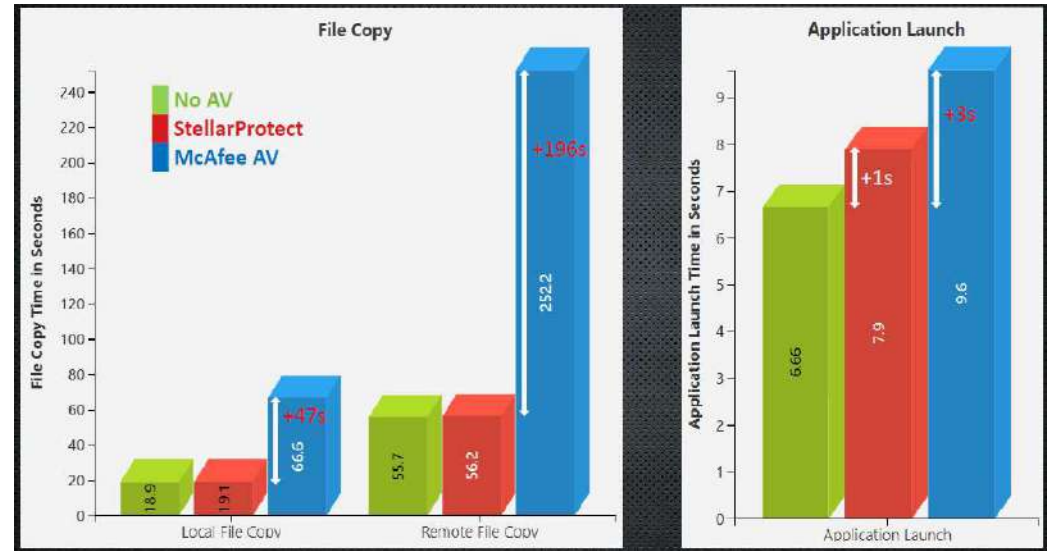
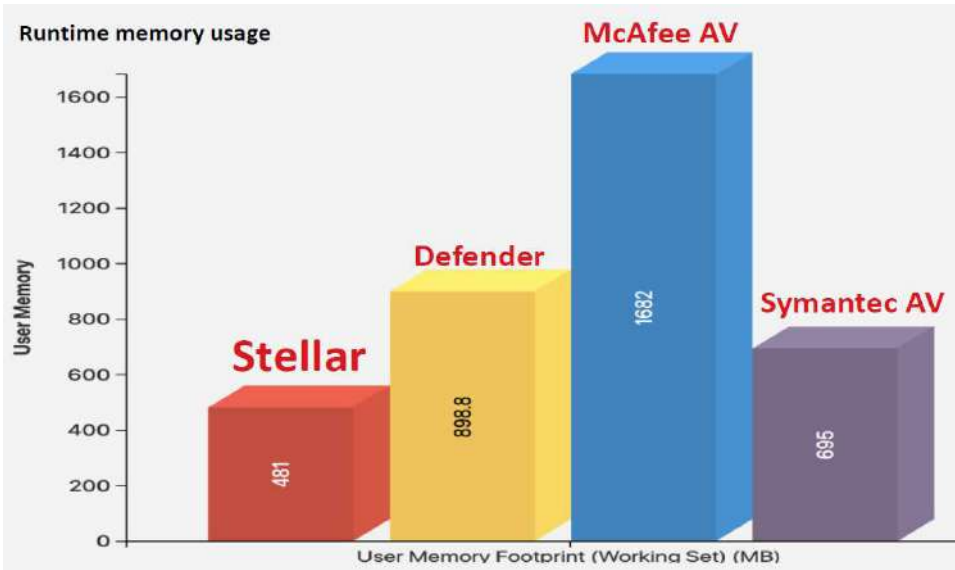
TXOne Industrial Application Repository



Key values

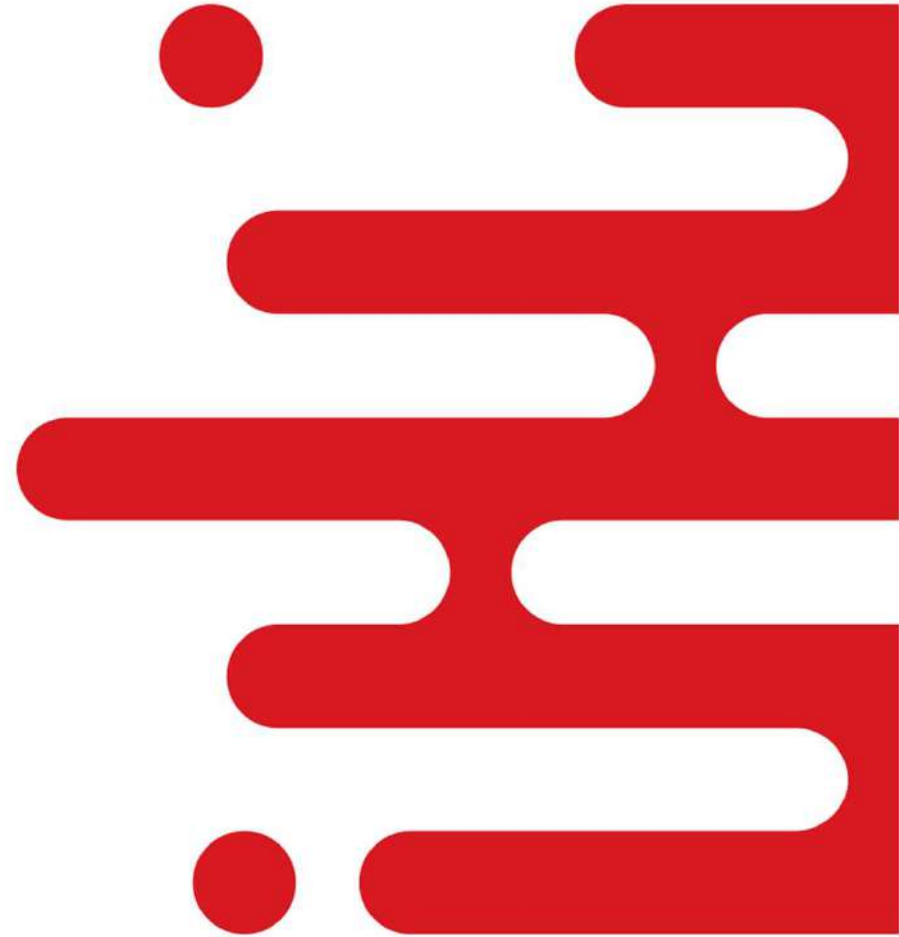
- ✦ ICS compatibility
- ✦ Lightweight and minimal latency
- ✦ No interruption to operations







Cyber Security Use Case for Power Grids



CUSTOMER CONCERNS



IMPACT



TM Solution

Non-patched legacy device leads to cyber attack

- HMI Windows - XP
- SCADA Windows - XP
- Engineering workstation - Windows Server - 2000

Key critical control system may crash



EdgeIPS - Virtual Patch

Unknown connection in the OT environment

Unknown device try to access critical assets



EdgeIPS - Access Control

Operator did misoperation

PLC Manipulation : OT environment goes down



EdgeIPS - OT Protocol Filtering

Unknown inventory in OT environment

Work as a Launchpad for attacks



OT Defense console and EdgeIPS

Flat L2 architecture across environment

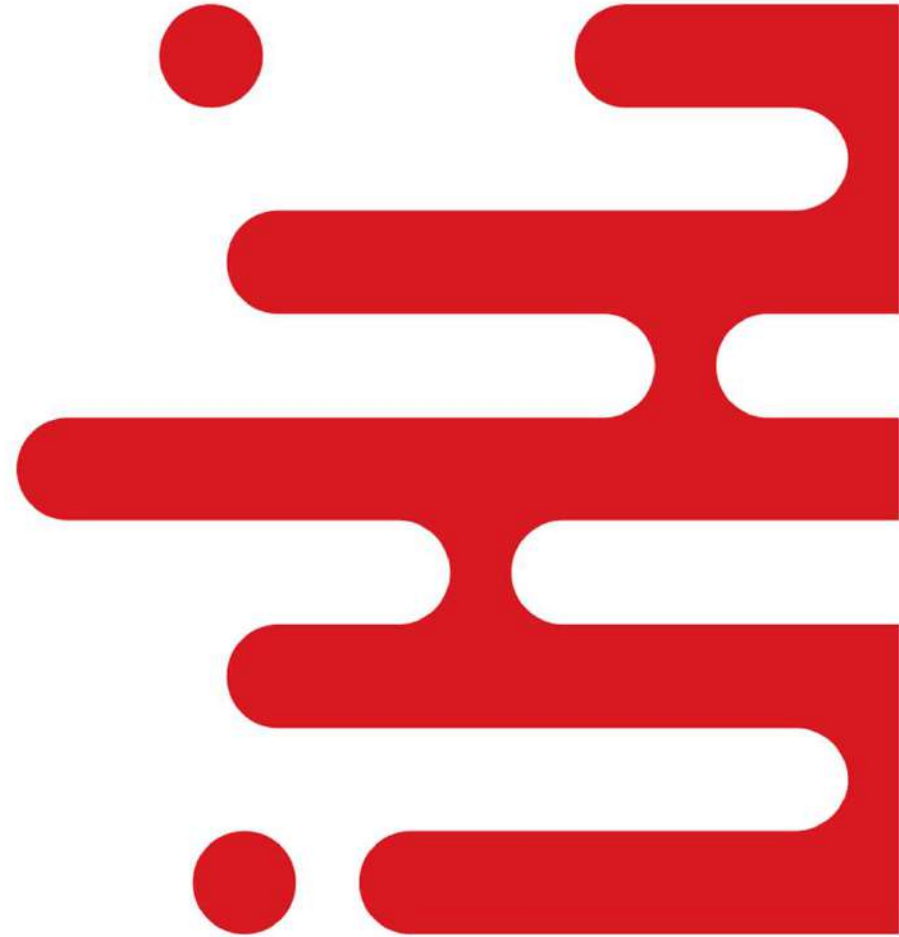
Easy access of intrusions & virus spread



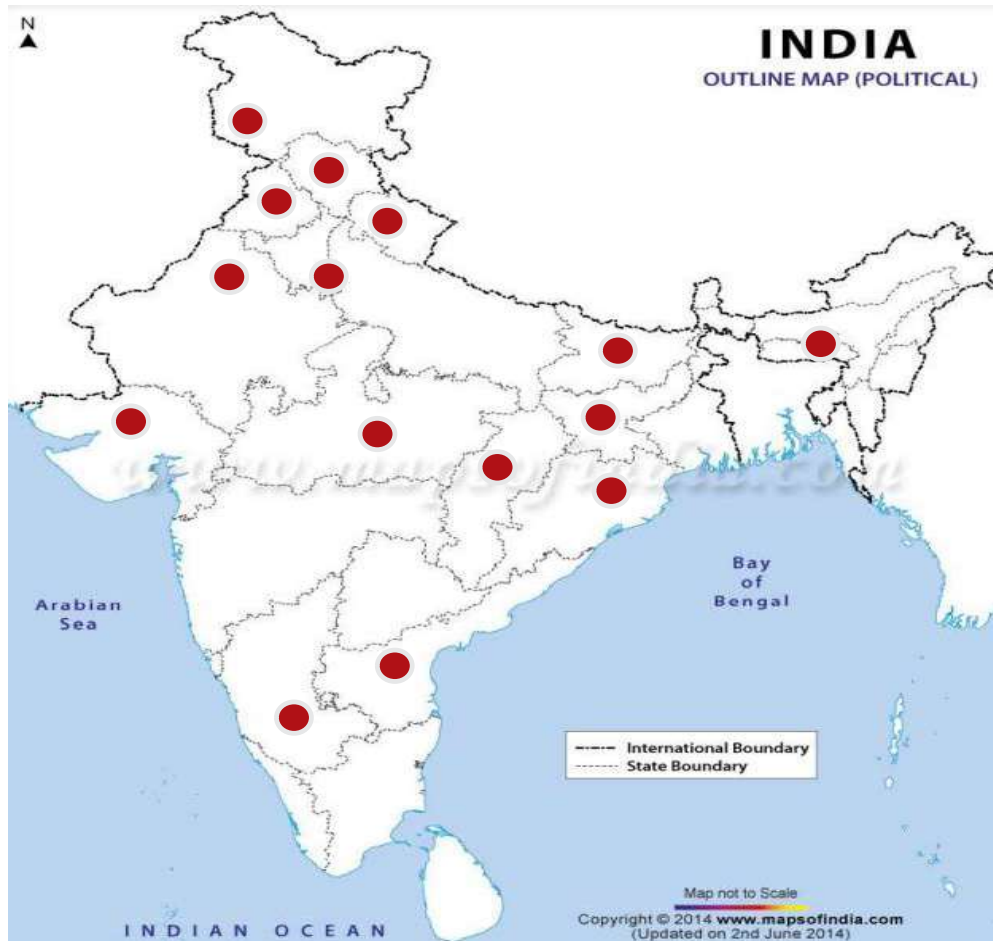
EdgeIPS - Zone Segmentation



Customer References



Presence of Trend Micro in Indian Power Utilities



POSOCO

Power Finance Corporation

Rural Electrification Corporation Limited

Kashmir Power Distribution Corporation Limited

HPSEB: Himachal Pradesh State Electricity Board.

Rajasthan - JVVNL

Punjab- PSPCL

Uttarakhand Power Distribution Company Limited

South Bihar Distribution Company Limited

Jharkhand Bijli Vitran Nigam Limited

Chhattisgarh State Power Distribution Company Limited

Odisha –OPGCL,TPODL,OPTCL

North East Regional Load Dispatch Centre

MP Power- Transmission and Distribution

Karnataka Power- KPTCL

BESCOM-Bangalore Electricity Supply Company Limited

Andhra Pradesh – South Power Distribution

Gujrat- GUVNL,GETCO

Reference Customers By Industry



ICS



Retail



Bank

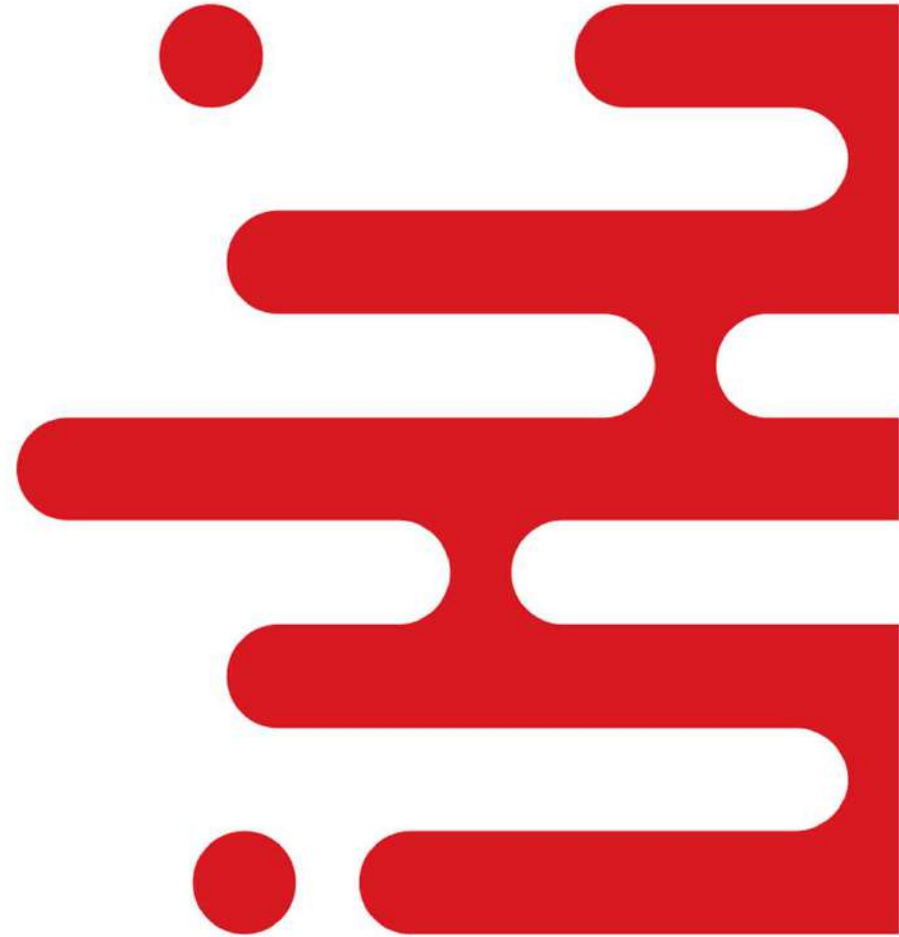


Healthcare





Supported ICS Protocols



List of OT Protocol Supported

Signature Visibility													TXODI Engine						
													Factory Automation		Power	Building Automation	HealthCare	General OT Protocol	IT Protocol
ABB Bailey	C-BUS	CSPv4/PCCC	Emerson ROC	Fisher PROVOX	HL7	IEEE C37.118	LAquis SCADA	MQTT	OSISoft PI	RTCM 10410.0	SIEMENS S7Comm	TOYOPUC	Modbus	GE SDI	IEC-61850-GOOSE(*L2)	BACNet	HL7	CoAP	HTTP
ABB Connect	C-more HMI	DALI	EnOcean	FL-net	ICCP TASE.2	IEEE C37.239 (COMFEDE)	Lantronix	MTConnect	PCWorx	RTPS	SIEMENS S7Comm Plus	TRDP	CIP	GE SRTP	DNP3	KNX	DICOM	ADDP	FTP
ADDP	CAN-ETH	DICOM	EtherCAT	FreeSCADA	IEC 60870-5-104	IENA	LonWorks/LonTalk	Niagara Fox	PostDICOM	SafetyNet p	SIEMENS Sinec H1	Triconex TSAA	S7Comm	HartIP	IEC-61850-MMS	CN/IP		RTPS	SMB
Advantech WebAccess SCADA	Cat MineStar System	DIS	Ethernet Powerlink	GE CMP	IEC 61850	IGSS	LSV2	OPC Classic(DA/AE/HDA)	ProConOS	ScadaBR	SIEMENS SINEC NMS	TriStation	S7Comm +	OPC-UA	IEC-104	Niagara Fox		MDLC	RDP
Allen Bradley Web Server	CC-LINK IE	DLMS /IEC62056	EtherNetIP /CIP	GE EGD	IEC 61850-MMS	IMAIOS	MDLC	OPC UA	PROFINET	Schneider Foxboro	SIMATIC WinCC	TTEthernet	SLMP (MELSEC)	OPC (Classic)	ICCP TASE.2	LonWorks /LonTalk		Ether-S-Bus	MQTT
ANSI C12.22	ClearSCADA	DNP3	Ether-S-Bus	GE iFIX	IEC 61850-GOOSE	Innolitics DICOM Standard Browser	MECHATROLINK	OpenADR	PROFINET IO	Schneider UMAS	SIXNET Universal Protocol	Unitronics PCOM	MELSOFT	OPC(Common)(Reserved)	IEC61850-R-GOOSE			EtherSIO	DNS
atvise scada	CN/IP (EIA/CEA-852)	DyNet	EtherSIO	GE SDI	IEC 61850-GSE	INSTEON	MELSOFT	OpenAPC	PROFINET-DCP	Schweitzer	SLMP	VSCP	OMRON FINS	MECHATROLINK III	IEC60870-R-SV			Moxa Protocol	SNMP
Automatic Tank Gauging	CoAP	Ecava IGX Web SCADA	FactoryTalk TeamONE	GE SRTP	IEC 61850-R-GOOSE	inVIEW WebSCADA	Modbus	OpenRemote	ProSoft Discovery Service	SECS/GEM	SOME/IP	VTScada	TOYOPUC	ROS SimpleMessage	IEC62056				SSH
BACNet	CODESYS	ECHONET Lite	FANUC FOCAS	GE Turbines	IEC 61850-R-SV	ION	Modbus RTU	OpenSafety	Rapid SCADA	SERCOS III	STANAG 4406	WIN-911	SECS/GEM	Emerson ROC	IEEE C37.118				TELNET
Beckhoff ADS	COTP	EDA/InterfaceA	FATEK PLC	HART-IP	IEC 61850-SV	IRIG 106	Modbus Schneider	OpenSCADA	RAPIEnet	SIEMENS AG syngo Dynamics	STANAG 5066	WinTr SCADA	EtherCat	CODESYS	IEC61850-SV				SMTp
Bently Nevada	Crimson	Emerson DeltaV DCS protocols	FINS	HEIDENHAIN DNC interface	IEC 62056	KNX	Moxa Device Discovery	OSHMI	ROS SimpleMessage	SIEMENS DIGSI	Toshiba TCnet	xAP							

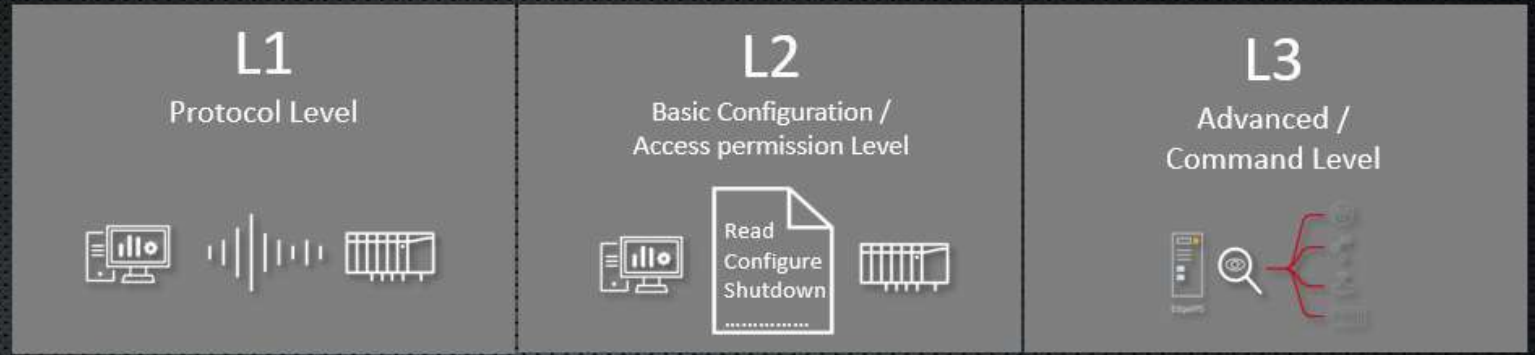
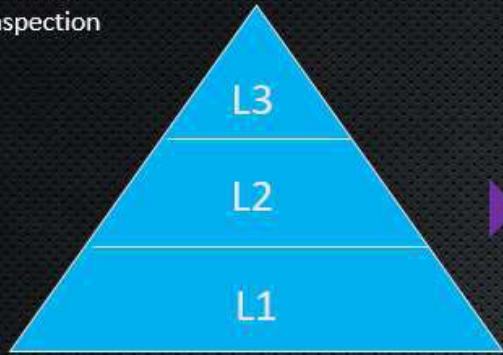


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OT Protocol granular inspection solution comparison

Deep inspection solution - OT protocol Filter

Granular inspection



txOne
networks

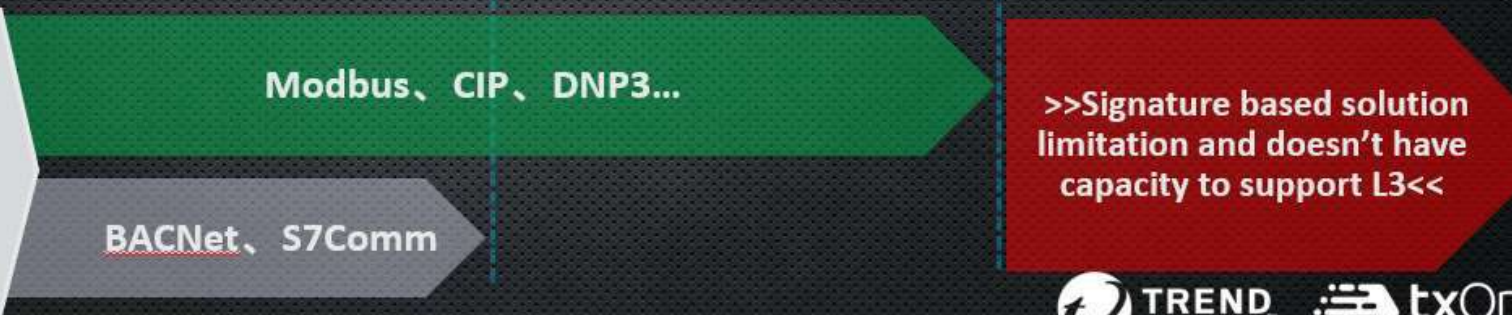
Edge Series

OT protocol inspection
Decoder based, High performance



Firewall Vendors

Signature based
An increasing signature will bring performance impact



Contact Us

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Contact : +919958095107 / +918383018832

North-East Region Business Partners

- ❖ Shakti Laitphlang, M/s SHAURYA ENTERPRISES, +919862576277



Singapore | New Delhi | Pune | Haryana | Uttar Pradesh | Mumbai | Bengaluru | Chennai | Goa | Rajasthan | Meghalaya

ISO : 9001-2008 , ISO: 20000-1:2018 AND ISO : 27001-2013 Certified, CMMI ML 3 www.orbitindia.net | YOUR IT NAVIGATOR





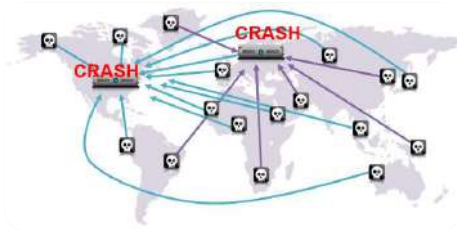
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Elevating your Cyber Experience

OCT 2022



Life Is A Struggle



DDoS



SSL/TLS & IPsec



Data Leakage



Advanced Persistent Threats



Malware & Vulnerabilities



BYOD & Wearables



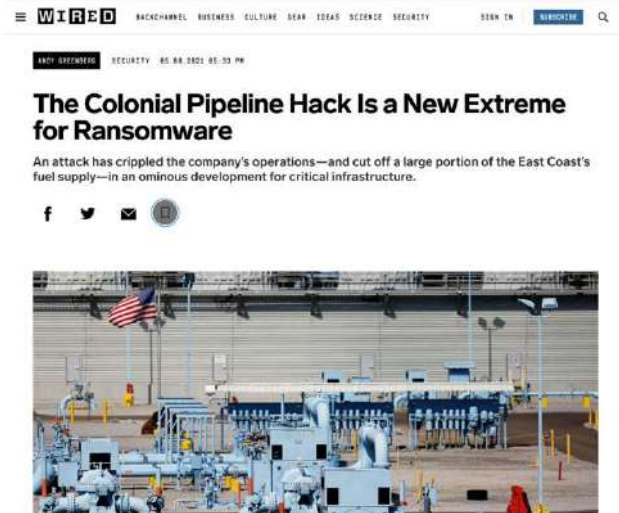
Cyber Security Training & Process



Virtualization, Cloud, Edge

Daily News Feeds

IN THE LAST FEW MONTHS



COLONIAL PIPELINE

RaaS attack

Shutdown east-coast fuel supply

\$5M ransom paid



SOLARWINDS

Complex Nation State APT

Supply Chain Attack

Affected thousands of customers

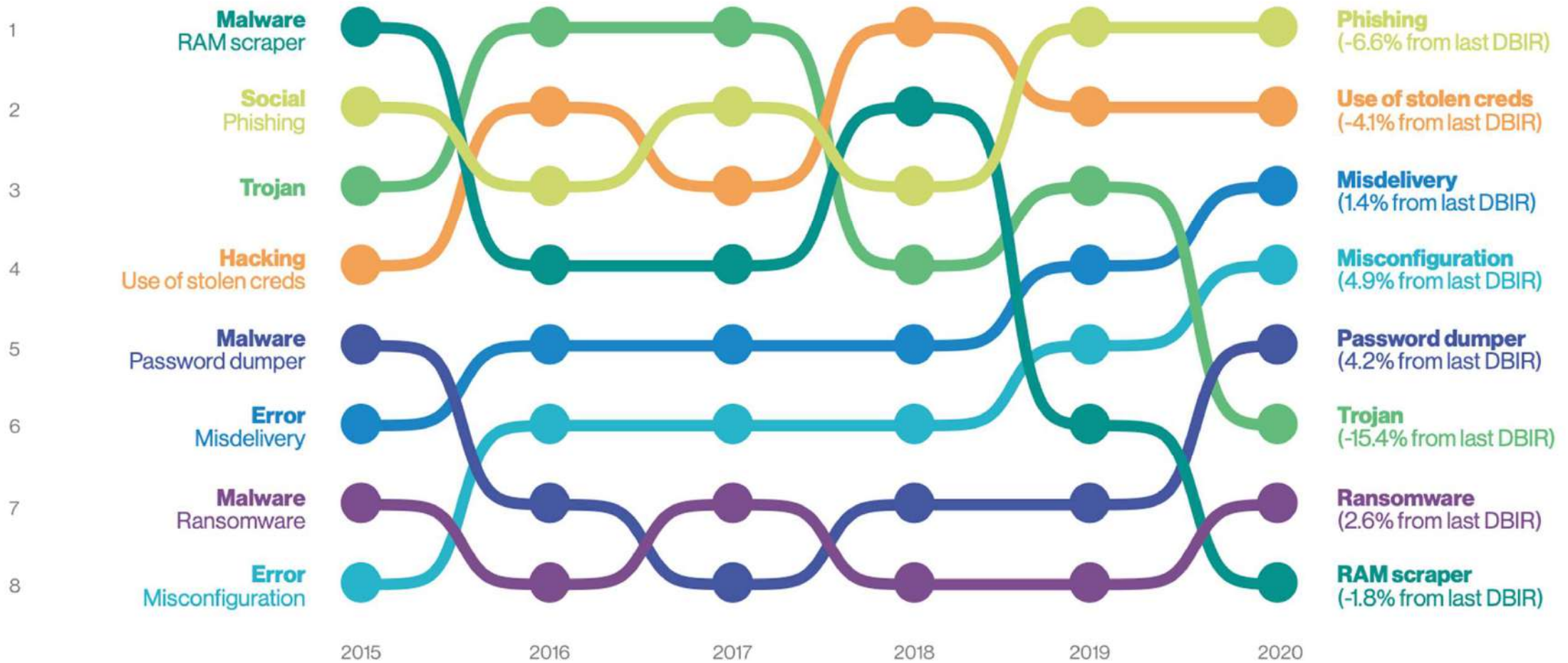


MICROSOFT EXCHANGE ATTACK

Complex Nation State APT

Significant data loss

Misconfigurations Cause Breaches



*2020 Verizon Data Breach Investigation Report

Cybercrime will grow 15% every year to hit \$10.5 trillion by 2025

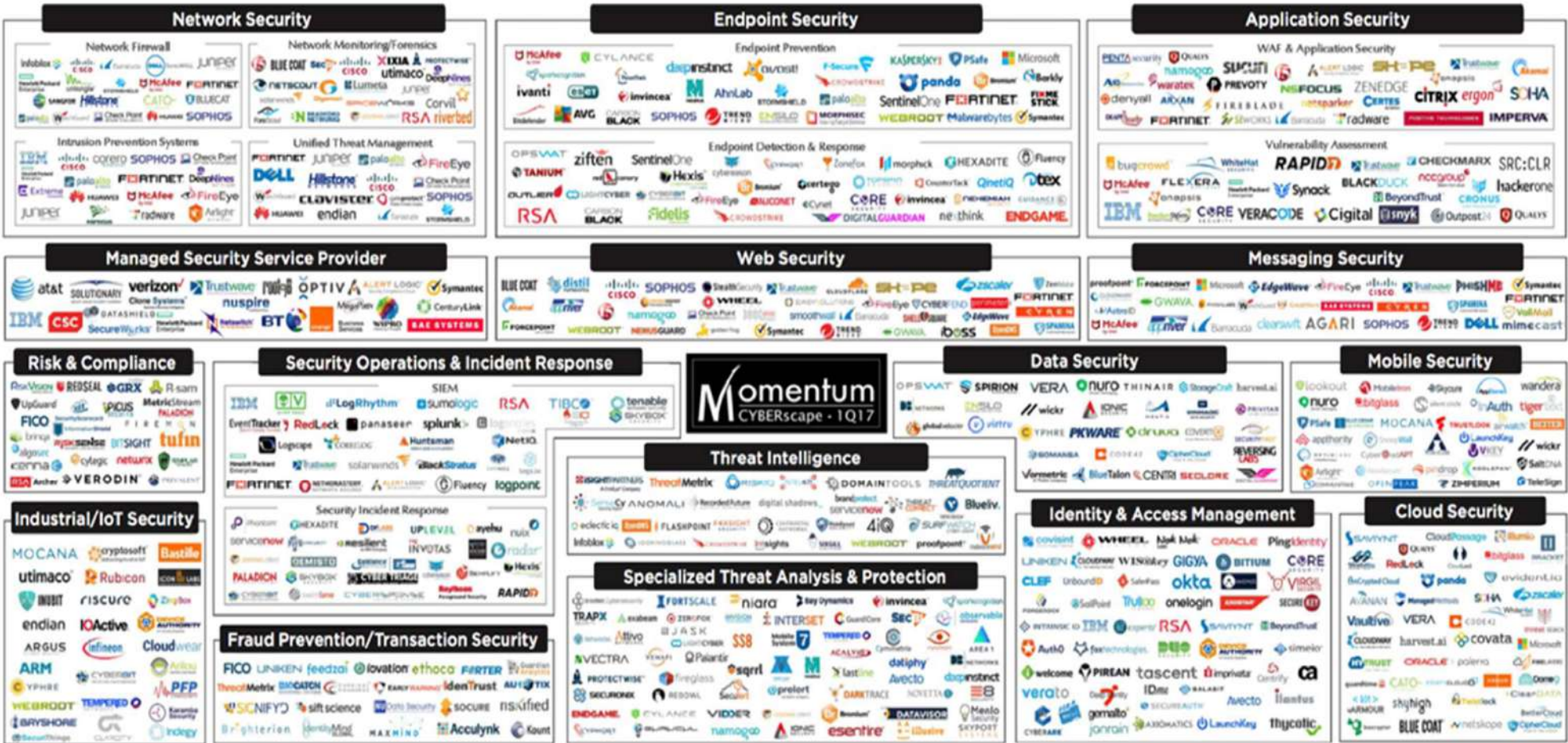
If Cybercrime was a country, only US & China have larger economies

Cybersecurity Ventures report



SECURITY GROWING EVEN MORE COMPLEX

The number of vendors that want to help you with network security



Cyber Security- Key Challenges



RockLadder – A Holistic customer Centric Approach



RockLadder Consulting Services

IT Security Audits & Certifications

- IT Audit
- ISO 27001 (ITSM)
- IEC 62443 (OT)
- SOC2
- PCI DSS
- GDPR

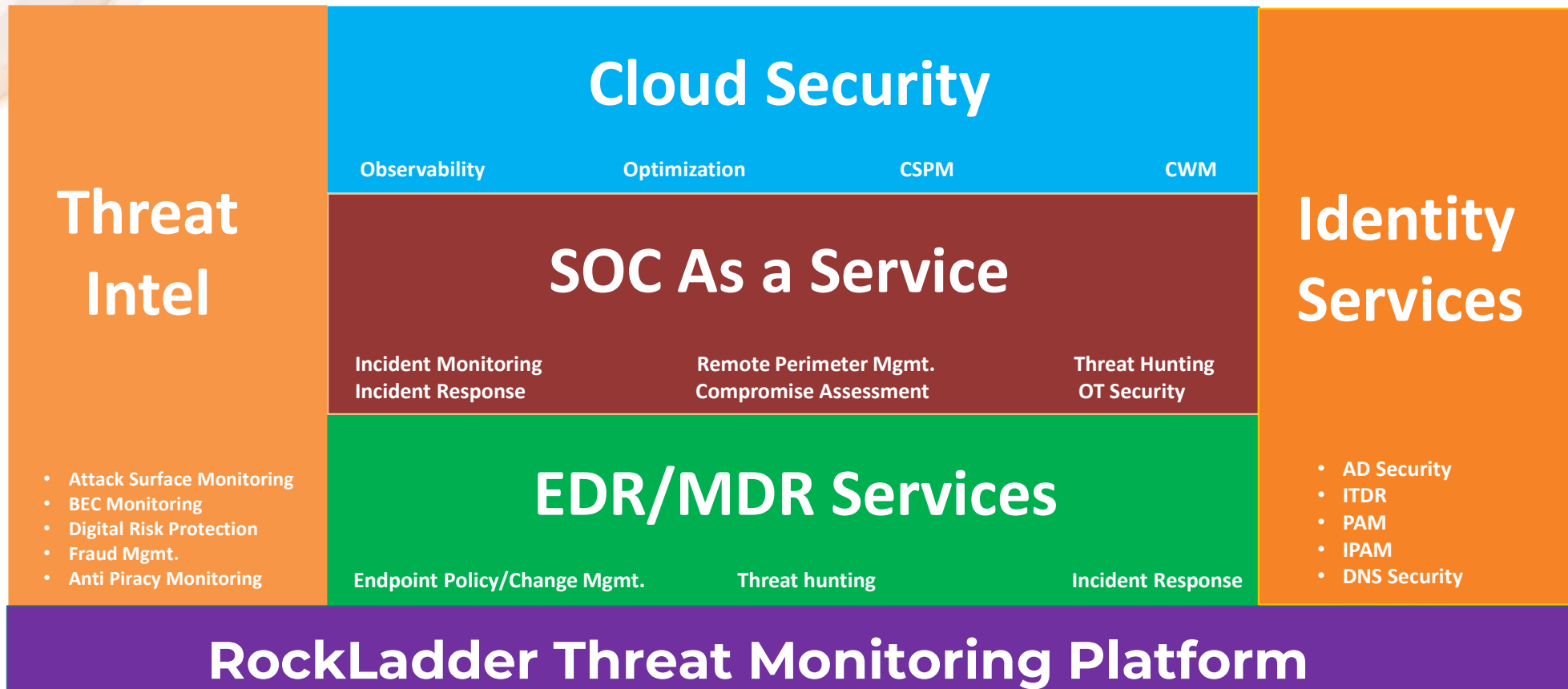
Risk/Threat Assessments

- Gap Analysis
- Security Configuration Review
- Security Roadmap
- GRC
- NIST CS Framework
- Compromise Assessments
- Cyber/Digital Forensics

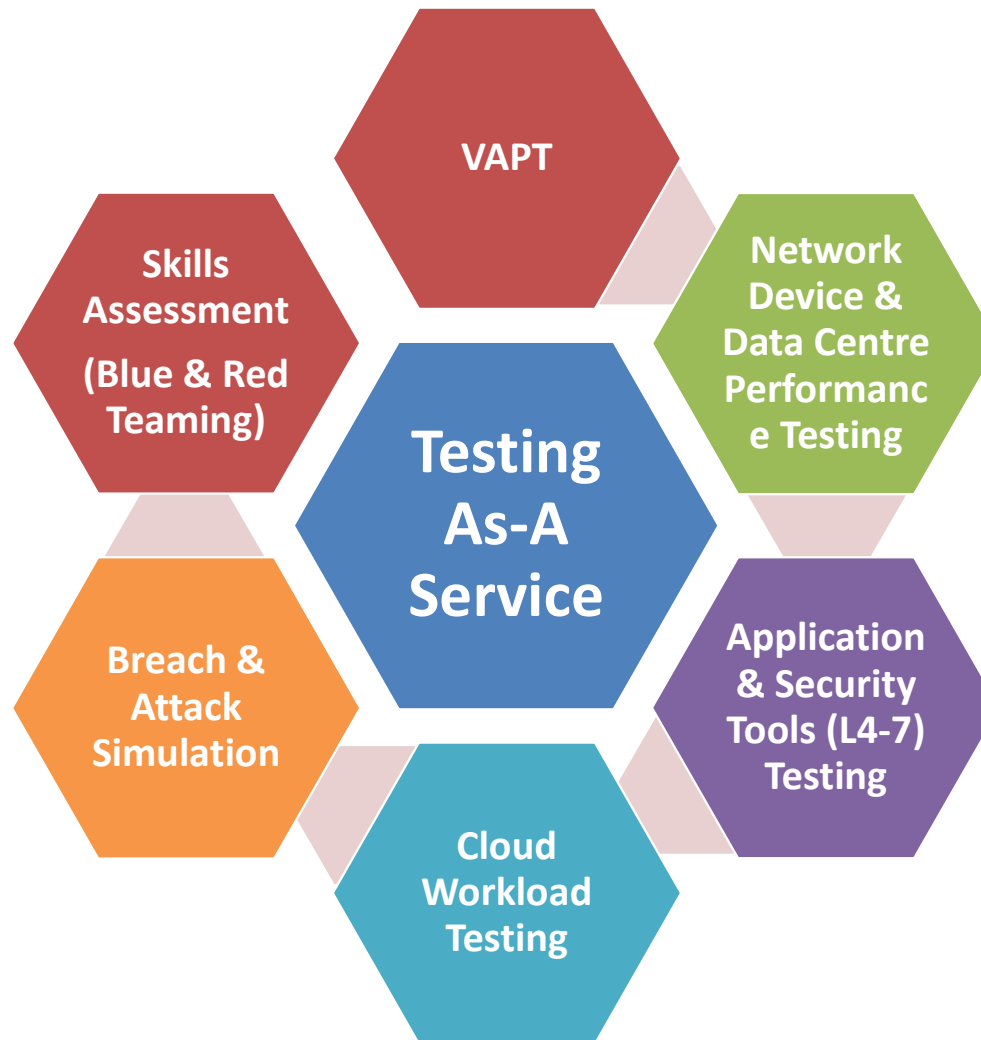
CISO- As- A- Service

- Annual T&M based Engagement
- Annual SOW based engagement
- Focused on Mid Sized Organizations who do not have the need/budget for a full time CISO

RockLadder Managed Security Services



RockLadder Testing Services



Why RockLadder

- Helping unclutter & Uncomplicate Cyber Security
- Not just pointing to the problem but partnering to deploy & manage the cyber security solutions
- Periodically test the efficacy of the deployed solutions



Thank you!



info@rockladder.com



Contact Us

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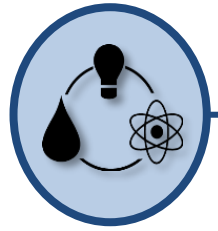
Singapore | New Delhi | Pune | Haryana | Uttar Pradesh | Mumbai | Bengaluru | Chennai | Goa | Rajasthan | Meghalaya

Protection Management and Disturbance Records Collection

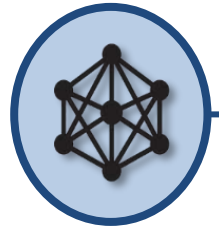
Oct 2022



Kalkitech - Company Overview



Founded in **1998** & Leading Smart Grid and technology solution provider across Energy value chain



customers in over 70 countries and extensive partner eco system



Leader in standards based control, communication and computing solutions for the Energy Industry



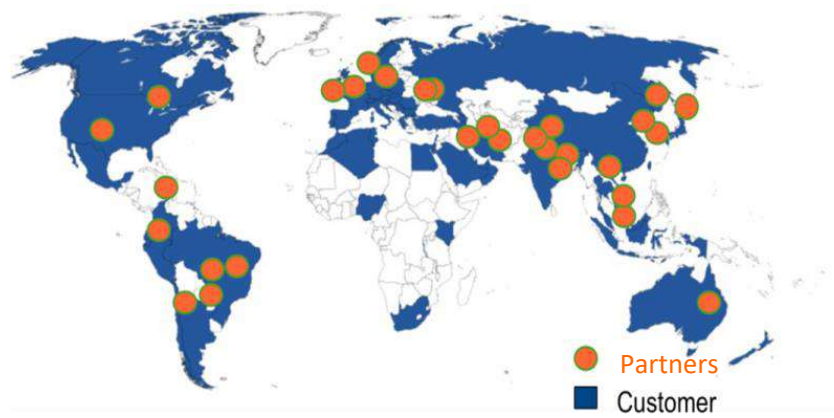
Market leader in enabling interoperability, with one of the largest set of protocol libraries & vendor



Headquartered in Bangalore, India with offices in USA and UAE



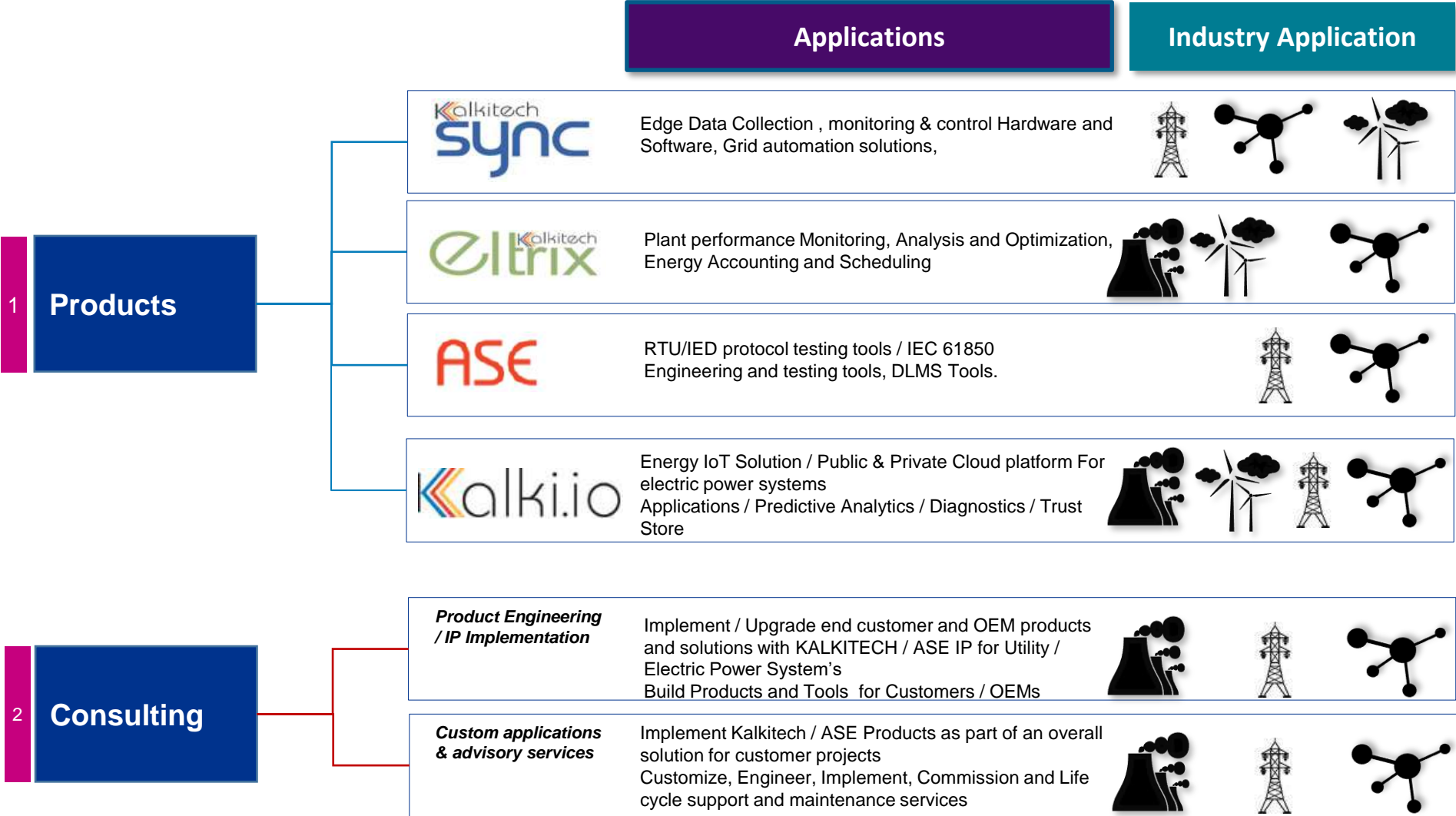
Customers in 70 countries across the globe



Extensive global industry experience

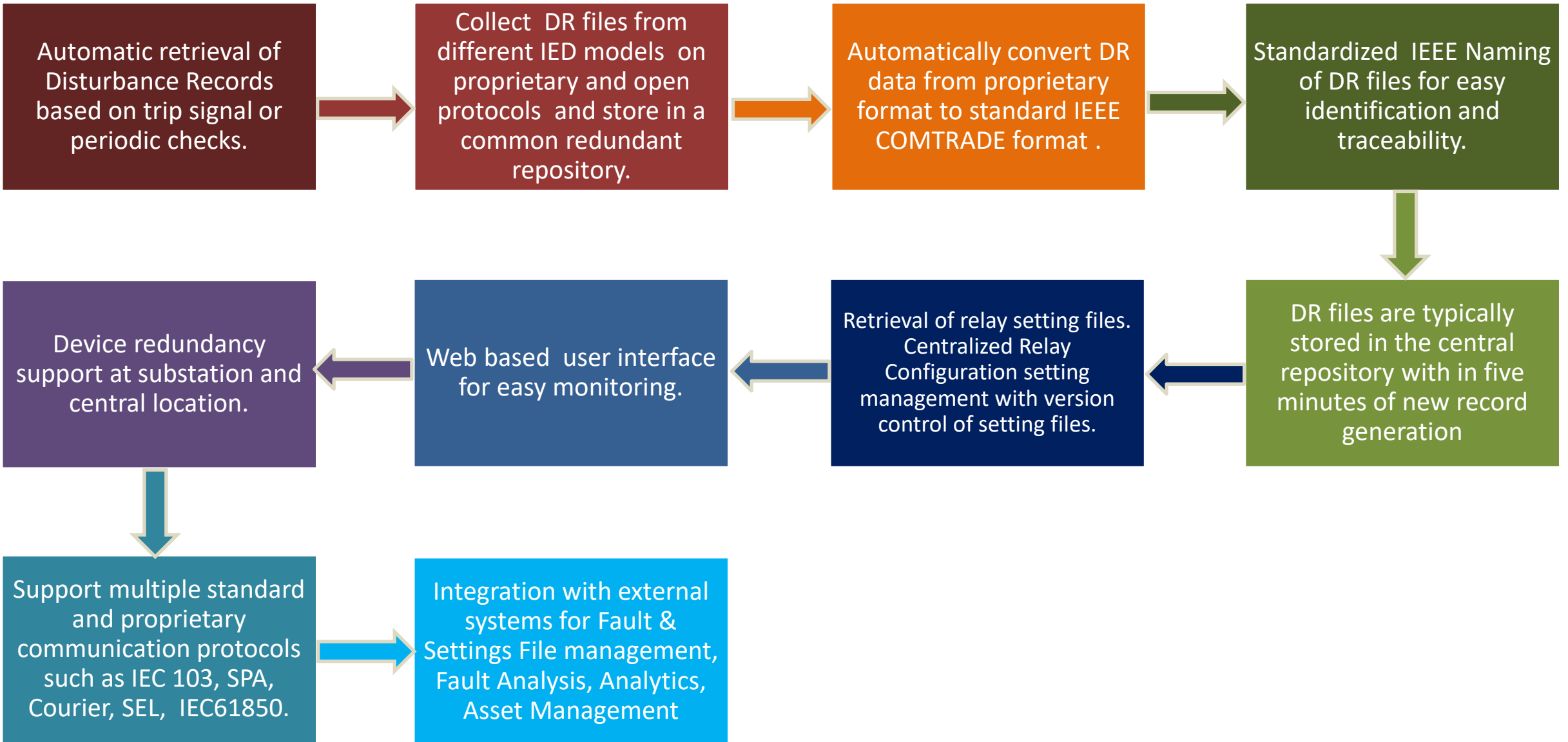


Our Offerings





Features of Protection Management & DR Collection Solution



DR Collection-Integrated and Tested Device List



10+ Major Projects
Across the Globe

Integrated 30K+
IEDs / Relays

Integrated 100+
Multi Vendor Relay
Variants and Versions

Supports 10+
Protocols and Custom
Fault File Formats for
DR Collection and
Conversion to
COMTRADE !!

ABB

ALSTOM | **AREVA**

SIEMENS

SEL



NARI



TOSHIBA

REL 511, REL 521, REL 531, REL 316, REL 513, REL 100, REL 650, REL 670,
RET 521, RET 670, REF 541, REF 615, REB 500, REB 103, RED 670

MICOM P141, P545K, P143, P545, P444, P643, P633, P632, P441, P443,
P437, P430, P14N, P127, P747, P14NB, P442, P122

7SA612, 7SA522, 7SJ62, 7UT613, 7SA612, 7SS52, 7VK61, 7SJ61, 7SJ8031,
7SA513, 7SA611, 7UT513, 7SJ600, 7RW600, 7SS523, 7SV600, 7SD522

SEL 421, SEL 451, SEL 321, SEL 311C, SEL 311L

GE D60, GE-T60, GE-F650, GE B90, GE D30

CSC211, CSC162, CSC101, CSC326,

ZIV, IDV

PCS-931, PCS-705, PCS-611, PCS-915, PCS-705, PCS-902,
PCS-921, PCS-978, PCS-924

Bitronics-M871, Qualitrol-IDM+, Alstom-C264, Alstom-S900,
Hathway/ABB-SER7000/7100, English Electric-PERM200

G200

SPA,
IEC61850

IEC60870-5-103
IEC61850
Courier

IEC61850,
IEC60870-5-103

SEL FM,
IEC61850

IEC61850,
Modbus

IEC61850

IEC61850










IEC61850

IEC61850
ASCII - Printer port

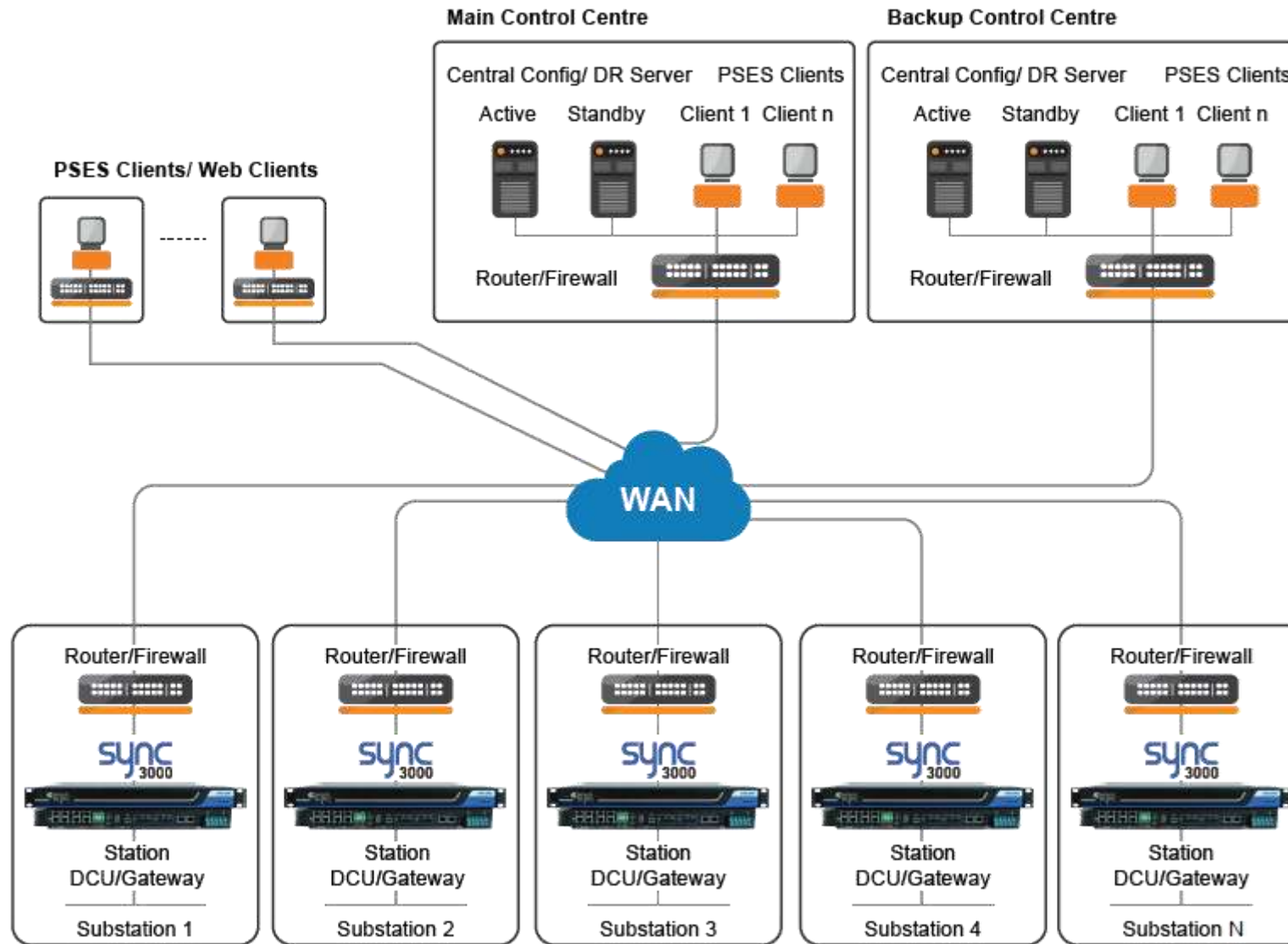
IEC61850

RAS/Gateway Solution References



	Customer	Summary	Scope
	REN , Portugal	Centralized Fault File collection	70 transmission substations
	EDP, Portugal	Centralized Fault File collection and Zloop calculation for Fault location	150 Distribution substations
	IPTO, Greece	Protection Management & Fault File collection	6 Nos of 400kV Tie substations
	Powergrid India	DR Collection and Remote Accessibility System	260 Nos. (520 units)
	TANTRANSCO, India	DR Collection and Remote Accessibility System	104 Nos. Transmission substations
	KPTCL, India	DR Collection and Remote Accessibility System	98 Nos. Transmission substations
	CODENSA, Columbia	Substation Gateway for transfer of data to control centre on IEC 104 Protocol	70 Nos (140 units). Transmission substations
	Ande, Paraguay	DR Collection and Remote Accessibility System	10 Substations
	Tata Power, India	DR Collection and Remote Accessibility System	More than 20 substations (40 units)

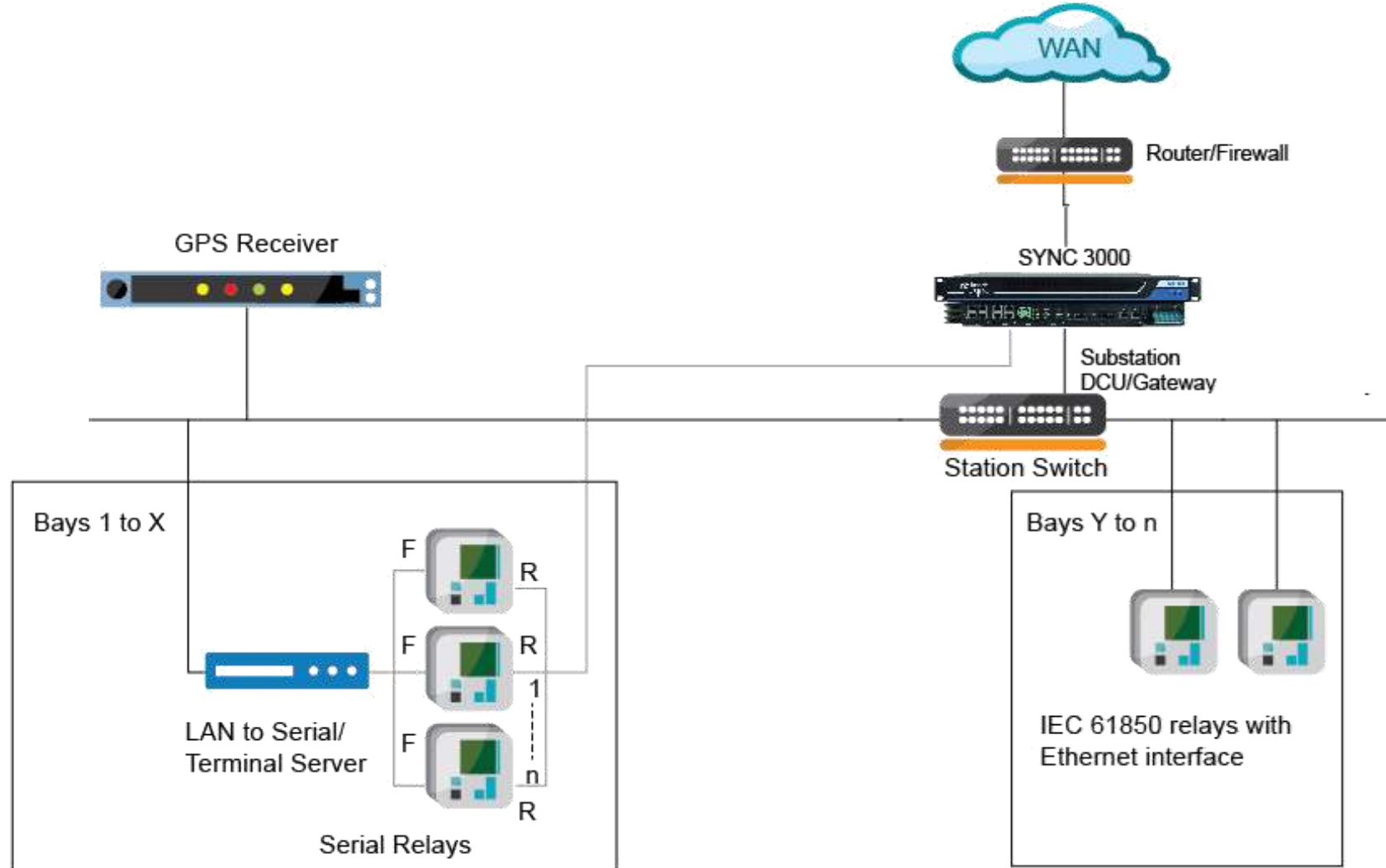
Disturbance Data Collection System - Overall Architecture



Disturbance Data Collection System - Substation



Substations with serial and IEC 61850 relays



Components of the System



DR Collection: Substation Disturbance Collectors (SDC) retrieve the disturbance data from all the vendor IEDs using respective protocol drivers. This retrieved DR will be in vendor file format.

Data Conversion: SDC has inbuilt mechanism to convert the vendor format to standard COMTRADE format with IEEE recommended file names.

Data to Central system: SDC shall push the COMTRADE files to the central system using secure FTP client protocol.

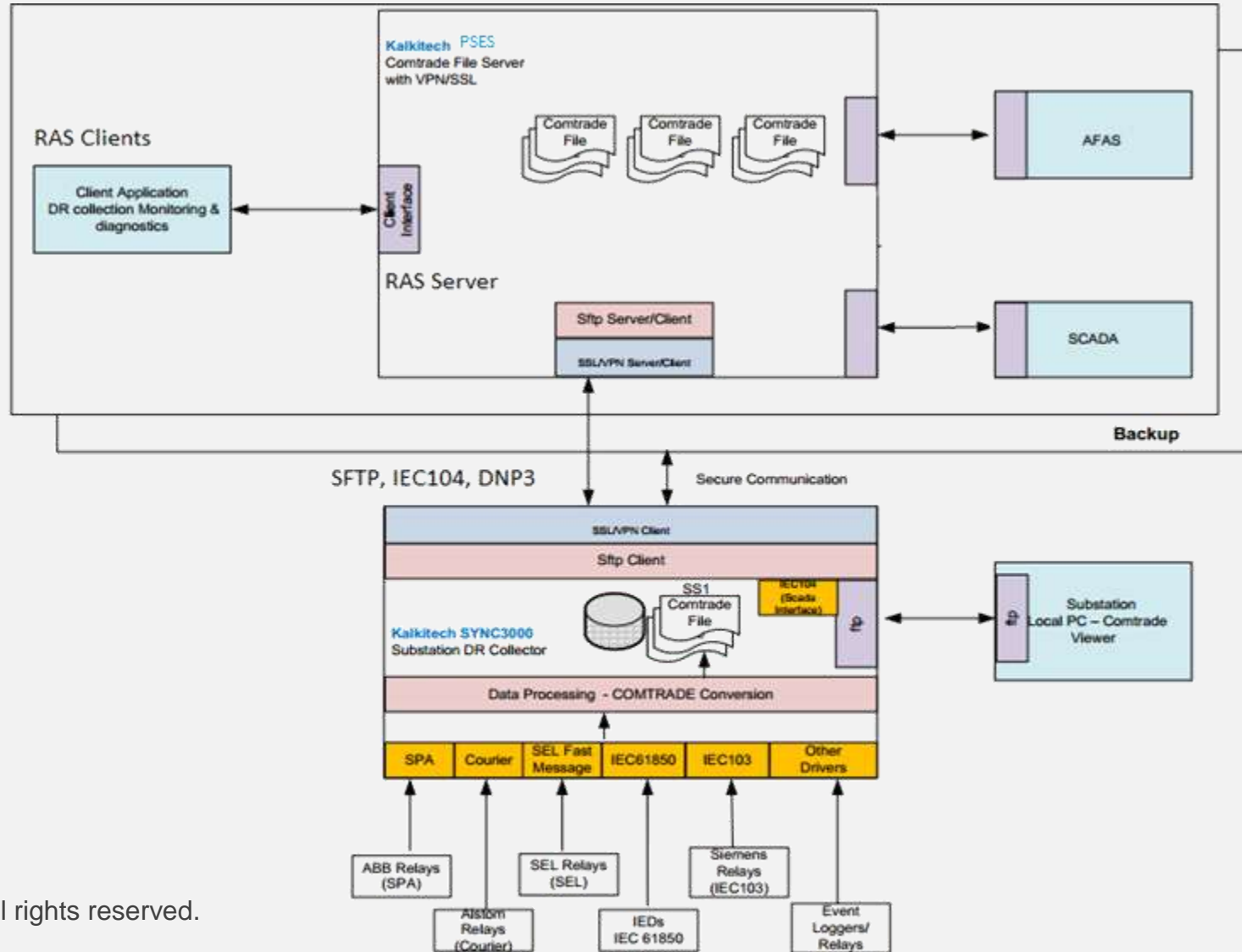
Central Application: A Remote Access Software that enable structured organization and substation profile for easy navigation and presentation of collected data. It shall also launch the vendor specific relay configuration tool with the specified version for setting/configuration.

Data Security: Security is provided through a VPN or TLS between SDC and central server/clients.

Disturbance Collection – Components



- Internal Component interaction diagram for DR retrieval





Substation Data Collector – SYNC 3000

- Substation rugged Hardware (IEC 61850-3 Compliant/Type tested)
- No fans or other moving parts (not an industrial computer)
- 19" Rack Mountable, 1U height
- Serial port plug-in
 - 8 RJ45 Port: RS232/RS485 Mode (1 with full modem port)
- Ethernet port
 - 10/100 Mbps Ethernet with RJ45 connector: 1 Port
 - 10/100/1000Mbps Port with RJ45 connector: 2 ports (for M3N Variant)
 - 10/100Mbps Port with Fiber SC: 2 ports (for M12N Variant)
- Single or Dual Power Supply
 - 90-260VAC (47-63Hz), 100-360VDC
 - 38 - 68VDC





Substation Data Collector – SYNC 3000

- Vast protocol conversion capability
- Supports all major open protocols like IEC61850, DNP3.0, DLMS, IEC 101/104 etc, Proprietary protocols like SPA bus, Courier, SEL Fast messaging, OPC UA
- Adaptable for customization and additional protocols
- Support for PRP / HSR & IEC 61850 Ed2.0
- Non operation data: Retrieve fault, event data and disturbance records
- Remote management of substation IEDs from central location
- Advanced logic programming platform based on IEC 61131-3 engine
- Time synchronization and distribution using IEC 60870/DNP3/NTP/SNTP/ IEEE1588/NMEA
- Device management using standard protocol - SNMP
- Local/Remote configuration
- Open VPN Support
- Other Flexible features like NAT, Web HMI etc.





Substation Data Collector – SYNC 3000

- Device Redundancy
 - Hot-Standby Configuration
- Power supply Redundancy
 - Dual Power supply
- Communication redundancy
 - HSR
 - PRP
 - Application Link Redundancy (Protocol Dependent*)





Enhanced Device Security

(SYNC 3000)

- 6 Pillars of Device Security

1. Secured Device Access
2. Communication ports control
3. Encryption of communication link and data
4. Firmware and configuration update control
5. Authenticating device access (RBAC)
6. Logging of security alarms and events



Features of the System



Redundancy - Hot Standby configuration and synchronization available in SYNC Gateways ensure that there are no data loss during single point failure. Redundancy is implemented at Main and Backup control centers as well.

Simultaneous Access – Transparent / Pass-through channel support for accessing the ports simultaneously for configuration and DR collection.

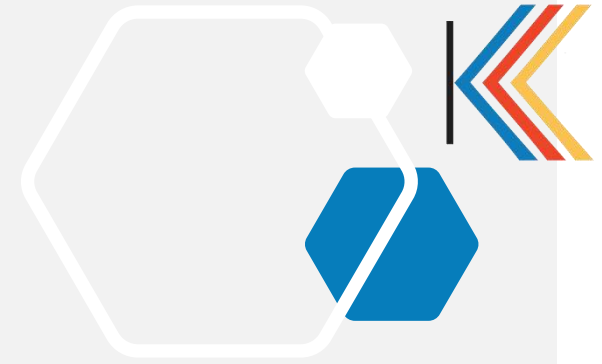
Preserving existing network settings – NAT support inside protocol gateways for preserving existing network settings and still able to manage complete system uniquely from Asset Management Center.

Settings/Configuration access – Online access to IED settings/ configuration with version control and archiving

Central Application – Power System Enterprise Suite (PSES)

PSES Helps you in

- Hierarchical modelling
- Configure IEDs from a central centre
- Backup and Version management of setting and configuration of IEDs
- Retrieval of Disturbance data collected from devices
- Storage of Disturbance for immediate and future analysis
- Online Health monitoring of devices
- Authentication and access control of assets based on roles
- Alarm and Event handling
- Advanced redundancy support to have geographically separated data mirrored control centre



Remote configuration of IEDs & Backup Management

- Configuration of IEDs are typically handled by vendor supplied configuration tools.
- PSES automatically archive the backup configuration whenever configuration is revised.
- Previous backups can be retrieved for any selected device at any point of time from the archive.
- Audit trail also stored along with the backups.
- Mirroring of configuration backup between redundant PSES servers.
- Seamless sharing of configuration backup between various locations.



Client Interface for PSES



PSES Remote Accessibility System

Project View Configuration Help

Home Clear Log Refresh Edit Mode Show Events

Kalkitech
Power System Enterprise Suite
Remote Accessibility System

System Structure

- ▶ Damoh_Substation
- ▶ Pirana_Substation
- ▶ Vapi_Substation
- ▶ Dehgam_Substation
- ▶ Khandwa_Substation
- ▶ Shujalpur_Substation
- ▶ Itarsi_Substation
- ▶ Navsari_Substation
- ▶ Jabalpur765kV_Substation
- ▶ Bina765kV_Substation
- ▶ Indore765kV_Substation
- ▲ SR01
 - ▶ Warangal_Substation
 - ▶ Hyderabad_Substation
 - ▶ N-Sagar_Substation
 - ▶ Kadapa_Substation
 - ▶ Gooty_Substation
 - ▶ Munirabad_Substation
 - ▶ Nellore_Substation
 - ▶ Vijayawada_Substation
 - ▶ Khammam_Substation
 - ▶ Raichur_Substation
 - ▶ NellorePS765_Substation

General

Name	Damoh_Substation
Description	CA1-III sub-station
IP Address	172.28.24.132
Configuration File Path	D:\FAS\Damoh\Damoh.ecc
Configuration Tool Path	D:\ProgramFiles\Easy Connect\EasyConnect.exe
External IP Address	10.6.2.41
Geographical location	
LocationName	
Latitude	0
Longitude	0
ZoomVal	4
SNMP Support	Yes
Station Code	PL25
SNMP OID	1.3.6.1.4.1.4295.1.3.2.1.0
Standby IP Address	172.28.24.133

Details

LINE	20
Transformer	8
Reactor	15
DR IED	43
Total connected IEDs	43
Connection status	Both Online
Last Status Updated	21-01-2016 13:17:26
Path	NTAMC-1/VR02/Damo...

Geographical Location

New Disturbance Events Received

Path	Count
pdes\Region-South\UK\ENDERBY\Wigston-Line\NEDSmart	1

OK

System Logs

TimeStamp	Type	Node	Message
21 Jan 2016 01:13 PM	Information	REL670	Updated REL670 successfully
21 Jan 2016 01:13 PM	Information	Damoh_Substation	Updated Damoh_Substation successfully

Last selected item from the structure: Damoh_Substation

Logged in as arvind

Client Interface for PSES



PSES Remote Accessibility System

Project View Configuration Help

Home Clear Log Refresh Edit Mode Hide Events

Kalkitech
Power System Enterprise Suite
Remote Accessibility System

System Structure

- 400KV_BHOPAL_L1M1
 - 7SA52
- 400KV_BHOPAL_L1M2
 - REL670
- 400KV_BHOPAL_L2M1
 - 7SA52
- 400KV_BHOPAL_L2M2
 - REL670
- 400KV_BIRSNGLUR_L1M1
 - 7SA52
- 400KV_BIRSNGLUR_L1M2
 - REL670
- 400KV_BIRSNGLUR_L2M1
 - 7SA52
- 400KV_BIRSNGLUR_L2M2
 - REL670
- 400KV_KATNI_L1M1
 - REL670
- 400KV_KATNI_L1M2
 - 7SA52
- 400KV_KATNI_L2M1
 - REL670

All Events Communication Events **Disturbance Events** Event Logger Events System Events Redundancy Events

Time Stamp	Description	Info	Severity	Node	Received Time Stamp
2016-01-21 04:38:56.033	COMTRADE File Retrieved: 160121.043856033,ST,P125,2041,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\220KV_DAMOHLIN-1_M1\REL670	2016-01-21 04:48:05.917000
2016-01-20 22:21:46.520	COMTRADE File Retrieved: 160120.222146520,ST,P125,2041,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\220KV_DAMOHLIN-1_M1\REL670	2016-01-20 22:33:14.723000
2016-01-20 18:32:50.025	COMTRADE File Retrieved: 160120.183250025,ST,P125,2041,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\220KV_DAMOHLIN-1_M1\REL670	2016-01-20 18:39:13.080000
2016-01-20 17:23:13.024	COMTRADE File Retrieved: 160120.172313024,ST,P125,4041,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\400KV_KATNI_L1M1\REL670	2016-01-20 17:25:42.139000
2016-01-20 17:23:00.846	COMTRADE File Retrieved: 160120.172300846,ST,P125,4041,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\400KV_KATNI_L1M1\REL670	2016-01-20 17:25:39.282000
2016-01-20 17:21:59.772	COMTRADE File Retrieved: 160120.172159772,ST,P125,4041,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\400KV_KATNI_L1M1\REL670	2016-01-20 17:25:55.469000
2016-01-20 14:17:35.476	COMTRADE File Retrieved: 160120.141735476,ST,P125,4068,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\400-220KV_ICT2_REF\RET570	2016-01-20 14:28:39.603000
2016-01-20 14:17:36.065	COMTRADE File Retrieved: 160120.141736065,ST,P125,4068,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\400-220KV_ICT2_REF\RET570	2016-01-20 14:28:30.027000
2016-01-20 03:59:02.561	COMTRADE File Retrieved: 160120.035902561,ST,P125,2041,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\220KV_DAMOHLIN-1_M1\REL670	2016-01-20 04:03:31.975000
2016-01-20 03:53:00.036	COMTRADE File Retrieved: 160120.035300036,ST,P125,4066,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\400-220KV_ICT2_HVOC\REL670	2016-01-20 03:58:39.277000
2016-01-20 03:53:00.032	COMTRADE File Retrieved: 160120.035300032,ST,P125,4036,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\400-220KV_ICT1_HVOC\REL670	2016-01-20 04:04:10.996000
2016-01-19 19:24:59.356	COMTRADE File Retrieved: 160119.192459356,ST,P125,2041,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\220KV_DAMOHLIN-1_M1\REL670	2016-01-19 19:33:22.236000
2016-01-19 09:35:11.977	COMTRADE File Retrieved: 160119.093511977,ST,P125,2041,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\220KV_DAMOHLIN-1_M1\REL670	2016-01-19 12:31:38.001000
2016-01-19 05:16:11.373	COMTRADE File Retrieved: 160119.051611373,ST,P125,4068,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\400-220KV_ICT2_REF\RET570	2016-01-19 09:10:02.617000
2016-01-19 04:07:32.934	COMTRADE File Retrieved: 160119.040732934,ST,P125,4036,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\400-220KV_ICT1_HVOC\REL670	2016-01-19 05:15:55.916000
2016-01-19 03:08:21.940	COMTRADE File Retrieved: 160119.030821940,ST,P125,4036,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\400-220KV_ICT1_HVOC\REL670	2016-01-19 04:17:29.019000
2016-01-19 03:02:13.664	COMTRADE File Retrieved: 160119.030213664,ST,P125,4041,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\400KV_KATNI_L1M1\REL670	2016-01-19 03:29:53.485000
2016-01-19 03:02:01.145	COMTRADE File Retrieved: 160119.030201145,ST,P125,4045,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\400KV_KATNI-1_LF_BU\REL670	2016-01-19 03:39:44.690000
2016-01-19 03:02:01.143	COMTRADE File Retrieved: 160119.030201143,ST,P125,4064,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\400-220KV_ICT2_DIFF\RET670	2016-01-19 04:03:17.017000
2016-01-19 03:02:01.114	COMTRADE File Retrieved: 160119.030201114,ST,P125,4041,WR02.DAT	Comtrade	HIGH	NTAMC-1\WR02\Damoh_Substation\400KV_KATNI_L1M1\REL670	2016-01-19 04:33:51.951000

System Logs

System Configuration Log System Event Log

TimeStamp	Type	Node	Message
-----------	------	------	---------

Last selected item from the structure: Damoh_Substation

Logged in as arvind

Remote Monitoring Portal – Web Client



Event Log Table

Timestamp	Description	Node Information	Severity
2016-01-21 13:58:27.325	Node Connection Status is Online	NTAMC-1\NR01\Gurgaon_Substation\UCT-1_REF\REF670	Low
2016-01-21 13:57:55.077	Node Connection Status is Online	NTAMC-1\ER01\Perne_Substation\TerminalServer\2\220KV_DUK-1_M1\P442	Low
2016-01-21 13:57:50.982	Node Connection Status is ACTIVE AND STANDBY OFFLINE Response Time 7.973 seconds	NTAMC-1\ER01\Ranch\765KV_Substation	High
2016-01-21 13:57:42.885	Node Connection Status is Online	NTAMC-1\WR01\Raigarh\765KV_Substation\765KV_TAMNAR_L2_IDR\M871	Low
2016-01-21 13:57:42.883	Node Connection Status is Offline	NTAMC-1\WR01\Raigarh\765KV_Substation\765KV_TAMNAR_L1_IDR\M871	High
2016-01-21 13:57:42.881	Node Connection Status is Online	NTAMC-1\WR01\Raigarh\765KV_Substation\765KV_CHAMPA_L1_IDR\M871	Low
2016-01-21 13:57:42.879	Node Connection Status is Online	NTAMC-1\WR01\Raigarh\765KV_Substation\765KV_RAIPUR_L2_IDR\M871	Low
2016-01-21 13:57:42.876	Node Connection Status is Online	NTAMC-1\WR01\Raigarh\765KV_Substation\765KV_RAIPUR_L1_IDR\M871	Low
2016-01-21 13:57:29.039	COMTRADE File Retrieved: 160121.135720039.1ST,P173,1031,NER1.DAT	NTAMC-1\NER1\Badarpur_Substation\132KV_Silchar-1_M1\P442	High
2016-01-21 13:57:11.124	COMTRADE File Retrieved: 160121.135711124.1ST,P173,1031,NER1.DAT	NTAMC-1\NER1\Badarpur_Substation\132KV_Silchar-1_M1\P442	High

Network Status Table

Sl.No	Group	Online	Offline
1	Substation	109	13
2	IED	2753	952
3	TerminalServer	182	51

DR Chart (Daily) Data

Date	Value
Jan 15	3,408
Jan 16	2,026
Jan 17	3,095
Jan 18	4,440
Jan 19	4,282
Jan 20	6,060
Jan 21	823

Active Server Info

- Server Number: 1
- Actual IP Address: 172.31.65.196
- Application Status:
 - SNMP Manager:
 - Disturbance Record Manager:
 - Application Monitor:
 - Redundancy Manager:
 - File Sync Manager App:
 - Event Log Manager:
 - Database Sync Manager:

PSES Users

User	Last Access	Message
kalkiadmin	2015-12-01 12:49:51	
pg01	2016-01-21 11:29:20	
pg02	2016-01-21 13:37:22	
pg03	2016-01-21 10:28:19	
pg04	2015-10-08 12:02:16	
pg05	2016-01-19 17:11:36	
mshhisar	2015-11-17 11:24:02	
vikas	2016-01-20 15:05:00	
kochi	2015-06-26 18:42:04	

Remote Monitoring Portal – Web Client



The screenshot shows a web browser window displaying the Remote Monitoring Portal. The page title is "Remote Monitoring Portal" and the user is logged in as "arvind". The interface includes a navigation menu on the left with "DR Events" selected, and a main content area showing a table of events for node "NTAMC-1".

Timestamp	Received Timestamp	Description	Node Details	Info	Severity
2016-01-21 13:57:28.039	2016-01-21 13:59:14.426	COMTRADE File Retrieved: 160121,135728039,IST,P173,1031,NER1.DAT	NTAMC-1\NER1\Badarpur_Substation\132KV_Silchar-1_M1\P442	Comtrade	High
2016-01-21 13:57:11.124	2016-01-21 13:59:00.652	COMTRADE File Retrieved: 160121,135711124,IST,P173,1031,NER1.DAT	NTAMC-1\NER1\Badarpur_Substation\132KV_Silchar-1_M1\P442	Comtrade	High
2016-01-21 13:57:01.381	2016-01-21 13:59:16.283	COMTRADE File Retrieved: 160121,135701381,IST,P173,1031,NER1.DAT	NTAMC-1\NER1\Badarpur_Substation\132KV_Silchar-1_M1\P442	Comtrade	High
2016-01-21 13:56:54.875	2016-01-21 13:58:06.623	COMTRADE File Retrieved: 160121,135654875,IST,P173,1031,NER1.DAT	NTAMC-1\NER1\Badarpur_Substation\132KV_Silchar-1_M1\P442	Comtrade	High
2016-01-21 13:56:51.337	2016-01-21 13:58:09.569	COMTRADE File Retrieved: 160121,135651337,IST,P173,1031,NER1.DAT	NTAMC-1\NER1\Badarpur_Substation\132KV_Silchar-1_M1\P442	Comtrade	High
2016-01-21 13:56:29.434	2016-01-21 14:00:30.034	COMTRADE File Retrieved: 160121,135629434,IST,P145,4097,ER01.DAT	NTAMC-1\ER01\Lakhisarai_Substation\400_132_BUSREACTOR_1_DIFF\P643	Comtrade	High
2016-01-21 13:55:31.313	2016-01-21 13:57:09.812	COMTRADE File Retrieved: 160121,135531313,IST,P145,4097,ER01.DAT	NTAMC-1\ER01\Lakhisarai_Substation\400_132_BUSREACTOR_1_DIFF\P643	Comtrade	High
2016-01-21 13:52:37.125	2016-01-21 13:54:24.704	COMTRADE File Retrieved: 160121,135237125,IST,P145,4097,ER01.DAT	NTAMC-1\ER01\Lakhisarai_Substation\400_132_BUSREACTOR_1_DIFF\P643	Comtrade	High
2016-01-21 13:46:45.435	2016-01-21 13:47:08.714	COMTRADE File Retrieved: 160121,134645435,IST,P145,4097,ER01.DAT	NTAMC-1\ER01\Lakhisarai_Substation\400_132_BUSREACTOR_1_DIFF\P643	Comtrade	High
2016-01-21 13:44:43.201	2016-01-21 13:46:35.43	COMTRADE File Retrieved: 160121,134443201,IST,P047,2112,NR02.DAT	NTAMC-1\NR02\Kishanpur_Substation\220Kv_Sarna-1_M2\P442	Comtrade	High
2016-01-21 13:44:43.201	2016-01-21 13:46:02.302	COMTRADE File Retrieved: 160121,134443201,IST,P047,2102,NR02.DAT	NTAMC-1\NR02\Kishanpur_Substation\220Kv_Sarna-2_M2\P442	Comtrade	High


Online Device Monitoring

The screenshot displays the Kalkitech Remote Monitoring Portal interface. The left sidebar shows a tree view of nodes under 'NTAMC-1', including sub-nodes like NR01, NR02, WR01, WR02, SR01, and ER01. The main content area shows a table of events for the selected node. The table has columns for Timestamp, Description, Node Details, Info, Event Type, and Severity. The events are filtered to show 'Node Connection Status is Online' or 'Offline'.

Timestamp	Description	Node Details	Info	Event Type	Severity
2016-01-21 14:08:18.239	Node Connection Status is Online	NTAMC-1\WR02\Bina765kV_Substation \765kV_GWALIDR_3_1_DR\M1871	Online	Communication	Low
2016-01-21 14:08:03.816	Node Connection Status is Offline	NTAMC-1\ER01\Purnea_Substation\TerminalServer- 3\132KV_KISHANGAN\1P442	Offline	Communication	High
2016-01-21 14:08:03.814	Node Connection Status is Online	NTAMC-1\ER01\Purnea_Substation\TerminalServer- 2\220KV_DLK-1_M1\1P442	Online	Communication	Low
2016-01-21 14:08:03.812	Node Connection Status is Offline	NTAMC-1\ER01\Purnea_Substation\TerminalServer- 1\220KV_DLK-2_M1\1P442	Offline	Communication	High
2016-01-21 14:07:59.479	Node Connection Status is Online	NTAMC-1\ER01\Ranchi765kV_Substation \400KV_BUSREACTOR-2_BU\7SA522	Online	Communication	Low
2016-01-21 14:07:59.477	Node Connection Status is Online	NTAMC-1\ER01\Ranchi765kV_Substation \400KV_BUSREACTOR-2_DIFF\7UT613	Online	Communication	Low
2016-01-21 14:07:59.475	Node Connection Status is Online	NTAMC-1\ER01\Ranchi765kV_Substation \400KV_BUSREACTOR-1_BU\7SA522	Online	Communication	Low
2016-01-21 14:07:59.47	Node Connection Status is Online	NTAMC-1\ER01\Ranchi765kV_Substation \400KV_BUSREACTOR-1_DIFF\7UT613	Online	Communication	Low
2016-01-21 14:07:59.468	Node Connection Status is Online	NTAMC-1\ER01\Ranchi765kV_Substation \400KV_CHANDWA-1_M1\7SA522	Online	Communication	Low
2016-01-21 14:07:59.466	Node Connection Status is Online	NTAMC-1\ER01\Ranchi765kV_Substation \400KV_RANCHI-4_M2\REL570	Online	Communication	Low
2016-01-21 14:07:59.464	Node Connection Status is Online	NTAMC-1\ER01\Ranchi765kV_Substation \400KV_RANCHI-4_M1\7SA522	Online	Communication	Low
2016-01-21 14:07:59.462	Node Connection Status is Online	NTAMC-1\ER01\Ranchi765kV_Substation \400KV_RANCHI-3_M2\REL570	Online	Communication	Low
2016-01-21	Node Connection Status is Online	NTAMC-1\ER01\Ranchi765kV_Substation	Online	Communication	Low

Digital Events – Thick Client & Web Client





Power System Enterprise Suite
Remote Accessibility System

All Events			Communication Events			Disturbance Events			Event Logger Events			System Events			Redundancy Events			DIG Events		
Time Stamp	Description	Info	Category	Module	Received Time Stamp	Category	Module	Received Time Stamp	Category	Module	Received Time Stamp	Category	Module	Received Time Stamp	Category	Module	Received Time Stamp			
2017-06-28 11:31:27.619	M-2 CAR RECIEVE changed ...	Digital Events																		
2017-06-28 11:31:27.596	M-2 CAR RECIEVE changed ...	Digital Events																		
2017-06-28 11:31:27.002	DT RECIEVE CH-1 changed f...	Digital Events	11:31:27.002	15:31:27.596	TRUE				1\LINE-2\IED-1											
2017-06-28 11:31:27.001	DT RECIEVE CH-1 changed f...	Digital Events																		
2017-06-28 11:31:26.995	M-2 CAR RECIEVE changed ...	Digital Events	2017-06-28	2017-06-28	DT RECIEVE CH-1 changed from TRUE to FALSE				NTAMC-1\KPTCL\Substation-1\LINE-2\IED-1								Digital			
2017-06-28 11:31:26.994	M-2 CAR RECIEVE changed ...	Digital Events	11:31:27.001	15:31:27.596	FALSE															
2017-06-28 11:31:26.993	MAINCB R PH OPEN abc cha...	Digital Events																		
2017-06-28 11:31:26.993	BUS BAR PROT OPT chang...	Digital Events	2017-06-28	2017-06-28	M-2 CAR RECIEVE changed from FALSE to TRUE				NTAMC-1\KPTCL\Substation-1\LINE-2\IED-1									Digital		
2017-06-28 11:31:26.993	TIE A/R OPTD changed from...	Digital Events	11:31:26.995	15:31:27.596	TRUE															
2017-06-28 11:31:26.992	MAINCB R PH OPEN abc cha...	Digital Events																		
2017-06-28 11:31:26.992	BUS BAR PROT OPT chang...	Digital Events	2017-06-28	2017-06-28	M-2 CAR RECIEVE changed from TRUE to FALSE				NTAMC-1\KPTCL\Substation-1\LINE-2\IED-1									Digital		
2017-06-28 11:31:26.992	TIE A/R OPTD changed from...	Digital Events	11:31:26.994	15:31:27.596	FALSE															
			2017-06-28	2017-06-28	MAINCB R PH OPEN abc changed from FALSE to TRUE				NTAMC-1\KPTCL\Substation-1\LINE-2\IED-1									Digital		
			11:31:26.993	15:31:27.596	TRUE															
			2017-06-28	2017-06-28	BUS BAR PROT OPT changed from FALSE to TRUE				NTAMC-1\KPTCL\Substation-1\LINE-2\IED-1									Digital		
			11:31:26.993	15:31:27.596	TRUE															
			2017-06-28	2017-06-28	TIE A/R OPTD changed from FALSE to TRUE				NTAMC-1\KPTCL\Substation-1\LINE-2\IED-1									Digital		
			11:31:26.993	15:31:27.596	TRUE															
			2017-06-28	2017-06-28	MAINCB R PH OPEN abc changed from TRUE to FALSE				NTAMC-1\KPTCL\Substation-1\LINE-2\IED-1									Digital		
			11:31:26.992	15:31:27.596	FALSE															
			2017-06-28	2017-06-28	BUS BAR PROT OPT changed from TRUE to FALSE				NTAMC-1\KPTCL\Substation-1\LINE-2\IED-1									Digital		
			11:31:26.992	15:31:27.596	FALSE															

User Authentication

- PSES provides a mechanism of remote configuration of substation equipment. This warrants for mechanism to control unauthorized access into system.
- PSES provides configurable user roles that can be assigned to individual users.
- All the activity by the user is logged and shared by the system to track user activities.
- Custom reports generated from audit trail information.



User Authentication and Audit Trail



User Management

Logged-In User Group: Administrator [Show My Settings](#)

User Groups

Group Name

- Administrator
- RAS
- hisar
- Kochi
- RTAMCER2
- Ludhiana
- Bahadurgarh
- Ballaigarh
- Jalandhar
- trichy
- Bidadi
- Mandola
- RTAMCNR2
- Moga
- Wagooera
- Sonapat
- Fatehabad
- Nalagarh

Group Name: Administrator

[Add New](#) [Delete](#)

Users

User Name	Status
kalkiadmin	Offline
vikas	Online
maihw	Offline
abhishek	Online
jagmohan	Offline
praveen Kumar	Offline
arvind	Online
vikasbishnoi	Offline
manu4	Online
sonali	Offline
abhishek_anand	Offline
roopak	Offline

[Add New](#) [Delete](#)

Audit Trail

Retrieve Data

From: 08/01/2018 12:13:05

To: 09/27/2018 12:13:05

[Search](#)

Filter from Retrieved Data

Search in Description:

[Print](#) [Export to csv file](#) [Filter](#) [Reset Filters](#)

Time	Description	User	Machine ID	Node	Group	Source	Type	Module	Remark
09/27/2018 04:0...	Uploaded new version to S...	admin	PSESLAB-PC	UNAL/Bogo...	IED	Application	Information	NodeConfiguration	
09/27/2018 04:0...	Updated property values	admin	PSESLAB-PC	UNAL/Bogo...	IED	Application	Information	NodeEdit	Updated property va...
09/27/2018 04:0...	Updating property values.	admin	PSESLAB-PC			Application	Information	NodeEdit	Updating property v...
09/27/2018 04:0...	Initiating Edit Configuration	admin	PSESLAB-PC	UNAL/Bogo...	IED	Application	Information	NodeEdit	Initialising Edit Confi...
09/27/2018 04:0...	The communication object, ...	admin	PSESLAB-PC			Application	AppError	ConfigUtility	PSES Block Port Com...
09/27/2018 04:0...	The communication object, ...	admin	PSESLAB-PC			Application	AppError	ConfigUtility	RemoveFirewallRule
09/27/2018 04:0...	Stopped configuration of A...	admin	PSESLAB-PC	UNAL/Bogo...	IED	Application	Information	NodeConfiguration	configuration tool ha...
09/27/2018 04:0...	Closed configuration tool o...	admin	PSESLAB-PC	UNAL/Bogo...	IED	Application	Information	NodeConfiguration	Closed configuration ...
09/27/2018 03:5...	Launching configuration to...	admin	PSESLAB-PC	UNAL/Bogo...	IED	Application	Information	NodeConfiguration	Launching configurat...
09/27/2018 03:5...	The communication object, ...	admin	PSESLAB-PC			Application	AppError	ConfigUtility	Failed to add new rul...
09/27/2018 03:5...	The communication object, ...	admin	PSESLAB-PC			Application	AppError	ConfigUtility	PSES Block Port Com...
09/27/2018 03:5...	The communication object, ...	admin	PSESLAB-PC			Application	AppError	ConfigUtility	RemoveFirewallRule
09/27/2018 03:5...	Stopped configuration of A...	admin	PSESLAB-PC	UNAL/Bogo...	IED	Application	Information	NodeConfiguration	configuration tool ha...
09/27/2018 03:5...	Forcefully closed configura...	admin	PSESLAB-PC	UNAL/Bogo...	IED	Application	Information	NodeConfiguration	Closed configuration ...
09/27/2018 02:4...	Launching configuration to...	admin	PSESLAB-PC	UNAL/Bogo...	IED	Application	Information	NodeConfiguration	Launching configurat...
09/27/2018 02:4...	The communication object, ...	admin	PSESLAB-PC			Application	AppError	ConfigUtility	Failed to add new rul...
09/27/2018 02:4...	TCP Routing stopped. Rout...	admin	PSESLAB-PC			Application	Information	Communication	TCP Routing stopped...
09/27/2018 02:4...	The communication object, ...	admin	PSESLAB-PC			Application	AppError	ConfigUtility	PSES Block Port Com...
09/27/2018 02:4...	The communication object, ...	admin	PSESLAB-PC			Application	AppError	ConfigUtility	RemoveFirewallRule
09/27/2018 02:4...	Stopped configuration of S...	admin	PSESLAB-PC	UNAL/Bogo...	IED	Application	Information	NodeConfiguration	configuration tool ha...
09/27/2018 02:4...	TCP Routing stopped. Rout...	admin	PSESLAB-PC			Application	Information	Communication	TCP Routing stopped...
09/27/2018 02:4...	Closed configuration tool o...	admin	PSESLAB-PC	UNAL/Bogo...	IED	Application	Information	NodeConfiguration	Closed configuration ...
09/27/2018 02:4...	Launching configuration to...	admin	PSESLAB-PC	UNAL/Bogo...	IED	Application	Information	NodeConfiguration	Launching configurat...
09/27/2018 02:4...	Unable to send the RTM...	admin	PSESLAB-PC			Custom	Warning	NodeConfiguration	Unable to Ping '192.168...

[Send Mail](#)

PSES – Events & Fault Summary



Event Viewer

From: 02/01/2000 10:02:44 To: 01/13/2022 10:02:44
 Event Type: Disturbance Node:
 Severity: Search in:

Disturbance Event (COMTRADE) indicates files with TRIP. COMTRADE files can be selectively Saved to repository. Station Wide Events List can be configured for Events from all IEDs on multiple protocols

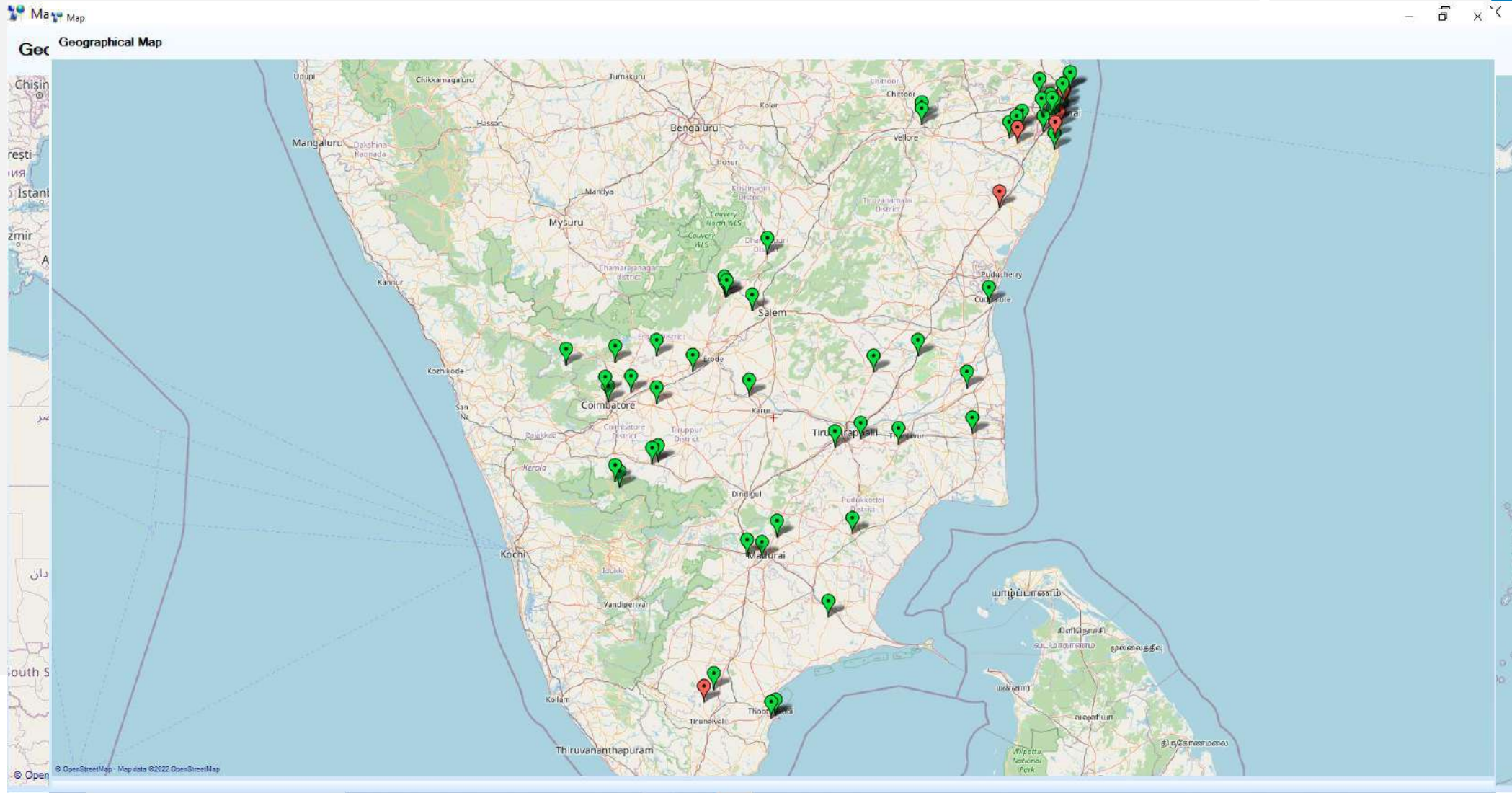
Disturbance Events

Time Stamp	Description	Info	Severity	Node	Received Time Stamp	Check DR Files to download	View DR File
2021-12-25 11:44:37.263	COMTRADE File Retrieved: 1...	Comtrade	HIGH	pses\Bangalore\Substation-...	2021-12-24 18:44:27.185000	<input type="checkbox"/>	View
2021-12-24 12:22:36.904	Fault Loop: Not Available , D...	DR Trigger	HIGH	pses\Bangalore\Substation-...	2021-12-30 10:41:39.879000	<input type="checkbox"/>	View
2021-12-24 12:22:36.904	[Trip][Saved]COMTRADE File ...	Comtrade	HIGH	pses\Bangalore\Substation-...	2021-12-30 10:41:40.879000	<input type="checkbox"/>	View
2021-12-23 21:29:13.560	[Trip][Saved]COMTRADE File ...	Comtrade	HIGH	pses\Bangalore\Substation-...	2022-01-03 13:30:11.993000	<input type="checkbox"/>	View
2021-12-23 21:29:13.560	Fault Loop: Not Available , D...	DR Trigger	HIGH	pses\Bangalore\Substation-...	2022-01-03 13:30:11.922000	<input type="checkbox"/>	View
2021-12-23 18:29:48.742	Fault Loop: Not Available , D...	DR Trigger	HIGH	pses\Bangalore\Substation-...	2022-01-03 12:14:07.958000	<input type="checkbox"/>	View
2021-12-23 18:29:48.742	[Trip][Saved]COMTRADE File ...	Comtrade	HIGH	pses\Bangalore\Substation-...	2022-01-03 12:14:08.037000	<input type="checkbox"/>	View
2021-12-21 12:45:12.915	[Trip][Saved]COMTRADE File ...	Comtrade	HIGH	pses\Bangalore\Substation-...	2022-01-03 18:32:14.426000	<input type="checkbox"/>	View
2021-12-21 12:29:04.839	Fault Loop: Not Available , D...	DR Trigger	HIGH	pses\Bangalore\Substation-...	2022-01-03 18:32:14.394000	<input type="checkbox"/>	View
2021-12-20 12:45:13.182	Fault Loop: Not Available , D...	DR Trigger	HIGH	pses\Bangalore\Substation-...	2022-01-03 18:32:14.478000	<input type="checkbox"/>	View
2021-12-20 12:45:13.182	[Trip][Saved]COMTRADE File ...	Comtrade	HIGH	pses\Bangalore\Substation-...	2022-01-03 18:32:14.572000	<input type="checkbox"/>	View
2021-12-20 12:26:03.615	Fault Loop: Not Available , D...	DR Trigger	HIGH	pses\Bangalore\Substation-...	2022-01-03 18:32:14.535000	<input type="checkbox"/>	View
2021-12-19 12:45:12.915	Fault Loop: Not Available , D...	DR Trigger	HIGH	pses\Bangalore\Substation-...	2022-01-03 18:32:14.618000	<input type="checkbox"/>	View
2021-12-19 12:29:04.839	[Trip][Saved]COMTRADE File ...	Comtrade	HIGH	pses\Bangalore\Substation-...	2022-01-03 18:32:16.088000	<input type="checkbox"/>	View
2021-12-19 12:26:03.615	[Trip][Saved]COMTRADE File ...	Comtrade	HIGH	pses\Bangalore\Substation-...	2022-01-03 18:32:16.045000	<input type="checkbox"/>	View
2017-06-01 14:47:23.346	COMTRADE File Retrieved: 1...	Comtrade	HIGH	pses\Bangalore\Substation-...	2017-06-01 14:48:24.178000	<input type="checkbox"/>	View
2017-06-01 10:57:22.496	COMTRADE File Retrieved: 1...	Comtrade	HIGH	pses\Bangalore\Substation-...	2017-06-01 10:58:22.437000	<input type="checkbox"/>	View
2017-05-26 16:58:50.215	COMTRADE File Retrieved: 1...	Comtrade	HIGH	pses\Bangalore\Substation-...	2017-05-26 17:00:14.763000	<input type="checkbox"/>	View

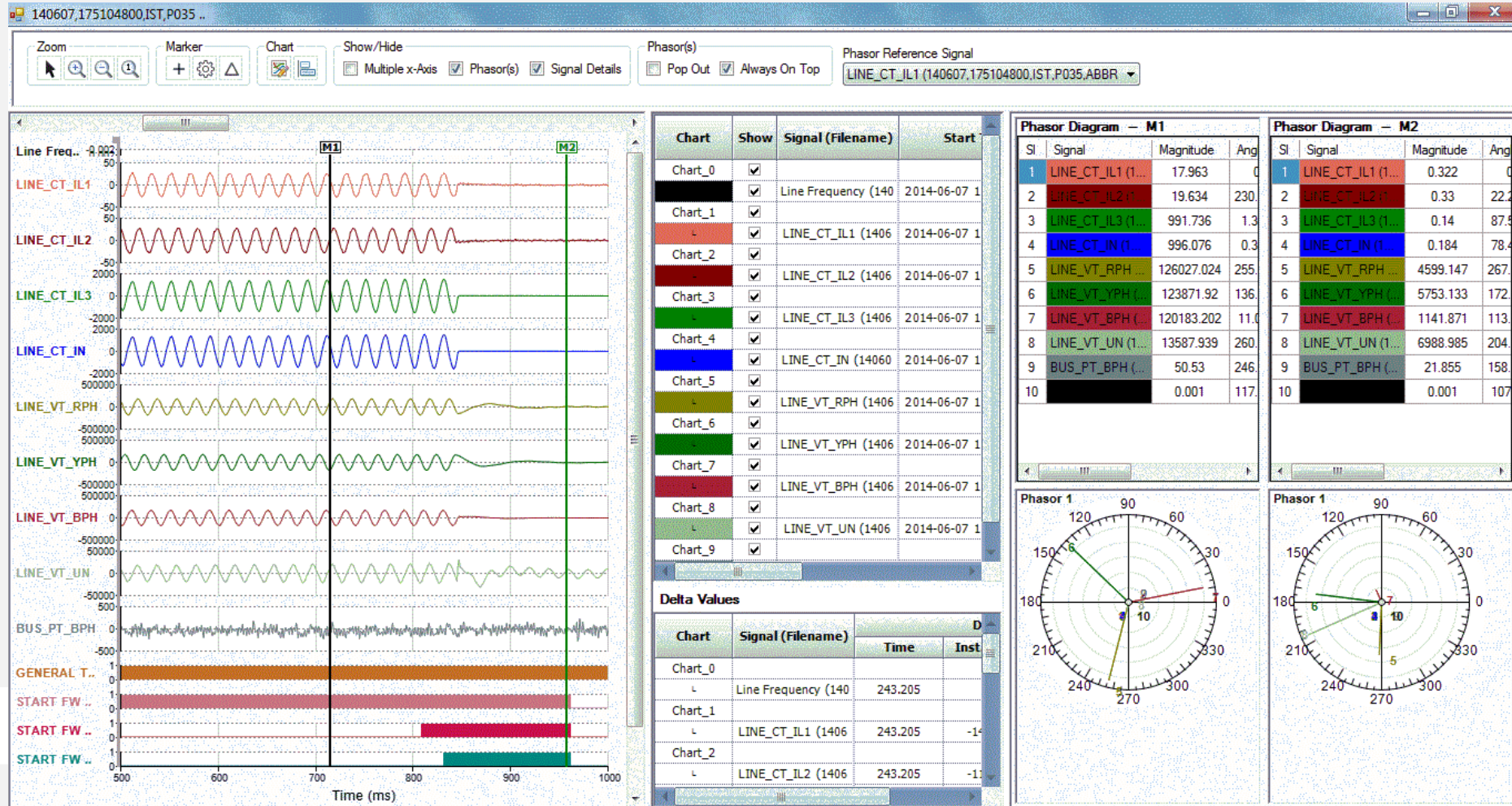
PSES – Fault Summary

DISTURBANCE SUMMARY				
Device Information				
Substation :	Substation-1			
IED Name :	IED-1			
Disturbance Information				
Trig Date(yy-mm-dd) :	16-05-11			
Trig Time(hh:mm:ss.mmm):	16:15:22.773			
Total Recording Time :	4.501 s			
System Information				
System Frequency :	50.000			
Sampling Frequency :	1000.000			
EVENT LIST				
Ch No	Name	Status	Date	Time
29	CARR_REC CH2	TRUE	16-05-11	16:15:22.773
37	DT_RECE CH2	TRUE	16-05-11	16:15:22.802
1	GENERAL TRIP	TRUE	16-05-11	16:15:22.806
2	TRIP-R	TRUE	16-05-11	16:15:22.806
3	TRIP-Y	TRUE	16-05-11	16:15:22.806
4	TRIP-B	TRUE	16-05-11	16:15:22.806
42	PROT_TRP_3_PH	TRUE	16-05-11	16:15:22.806
49	DT_RECE CH1	TRUE	16-05-11	16:15:22.809
37	DT_RECE CH2	FALSE	16-05-11	16:15:23.383
1	GENERAL TRIP	FALSE	16-05-11	16:15:23.388
2	TRIP-R	FALSE	16-05-11	16:15:23.388
3	TRIP-Y	FALSE	16-05-11	16:15:23.388

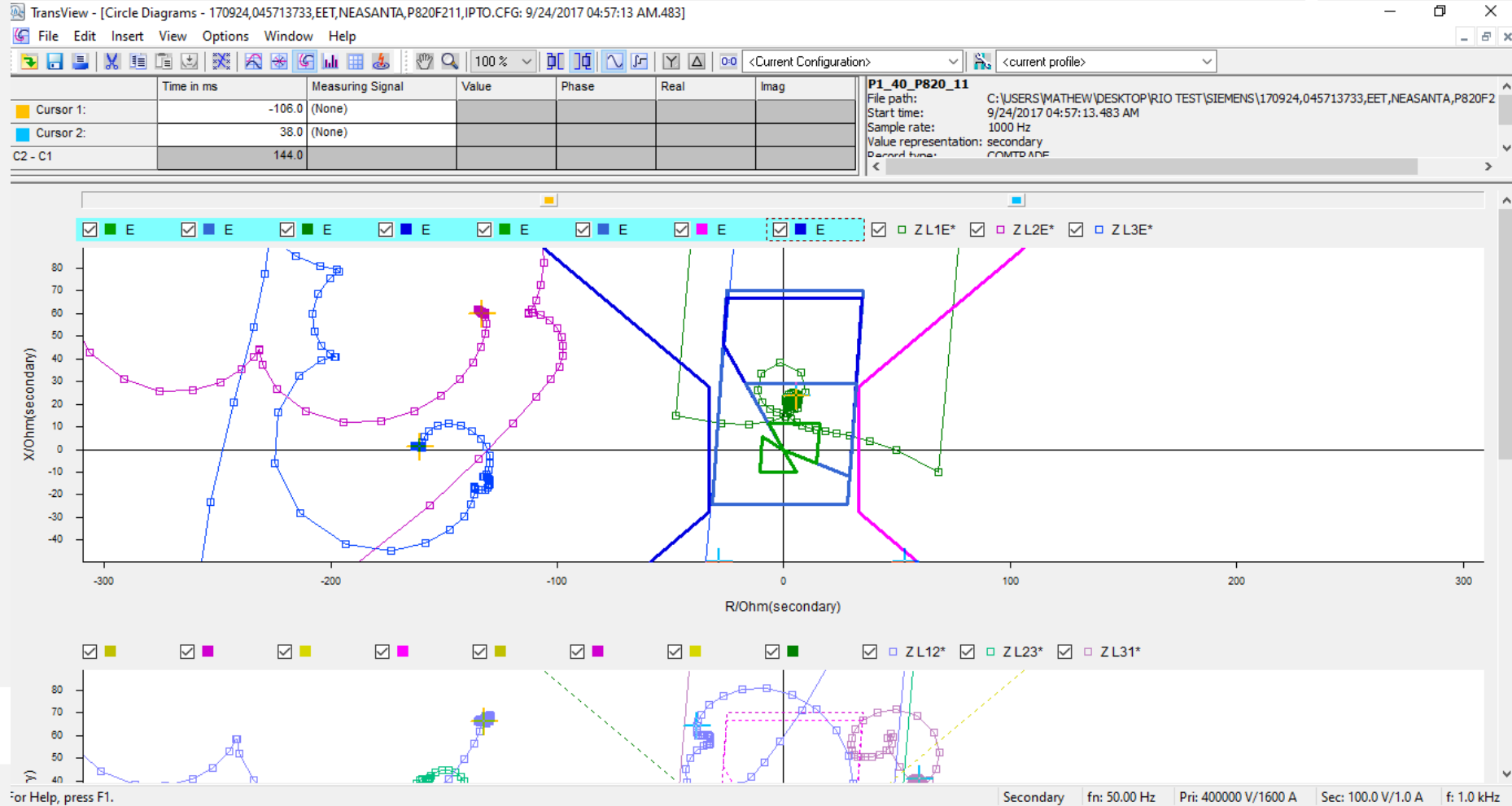
Geographical Positioning of Substations



Disturbance Viewing



Disturbance Analysis



PSES - Other Features



Notification

Both web and thick clients have notification when new DR files arrive at the central server

Incident Report

Template to create Incident reports and save to repository

DR Viewer

An inbuilt COMTRADE viewer for visualization with features to display measured values, phasors, delta time etc. Any external COMTRADE viewer like SIGRA, Transview, Wavewin can be linked to open the COMTRADE files

RIO File import

RIO files can be imported for impedance characteristic and trajectory plot

Files Classification

Identify COMTRADE files with TRIP and other important signals

Automatic Setting file Retrieval

IED configuration files will be scheduled and retrieved automatically

System - Summary



Performance:

Distributed/decentralized architecture: DR is always collected from IEDs even if the communication to control centre is lost.

Future Proof:

Upgrade can be done from remote

Reliable:

Substation hardened DR collector conforming to IEC 61850-3 with no moving parts; Local 1GB flash storage and up to 512 MB RAM

Scalable:

More devices and protocols can be added in future at substations

Automatic:

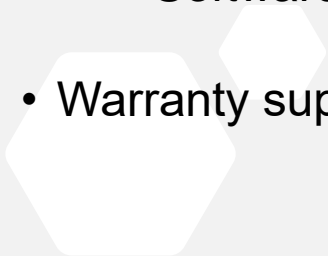
Once engineered and commissioned, the system automatically collects the records, transfers and stores in the central repository, without any manual intervention

AMR SYSTEM FOR NERPC 1 & 2



“SUPPLY, INSTALLATION, TESTING AND COMMISSIONING OF 0.2s CLASS ABT TYPE ENERGY METERS AND AUTOMATED METER READING (AMR) SOLUTION AS PER SAMAST GUIDELINES AT VARIOUS SUBSTATIONS OF STATE UTILITIES IN THE NORTHEASTERN STATES

- Supply, Installation, Testing and Commissioning of 0.2s Class ABT meters (Genus Scope)
- Supply, Installation, Testing and Commissioning of AMR system which would include the following parts
 - Data Concentrator Unit
 - Communication System
 - Centralized Data Collection System including servers at SLDC and Meter Data Acquisition Software.
- Warranty support for one year from “Go Live” date.



Supply DCU & MDAS Qty



Click to edit Master text styles

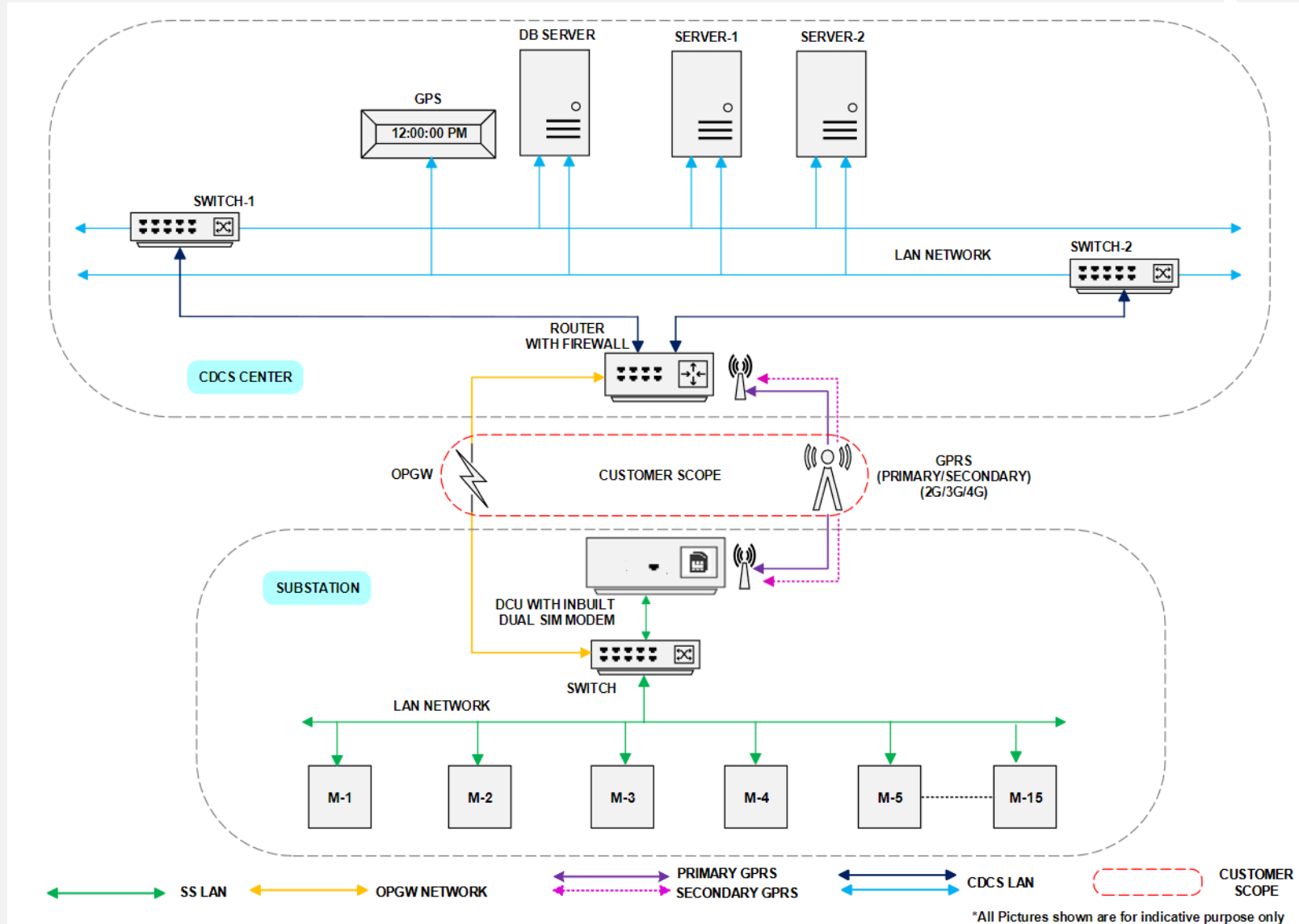
State	MDAS	DCU
Assam	1	100
Meghalaya	1	47
	2	147

Click to edit Master text styles

State	MDAS	DCU
Tripura	1	39
Arunachal Pradesh	1	9
Nagaland	1	23
Mizoram	1	61
Manipur	1	100
	5	232

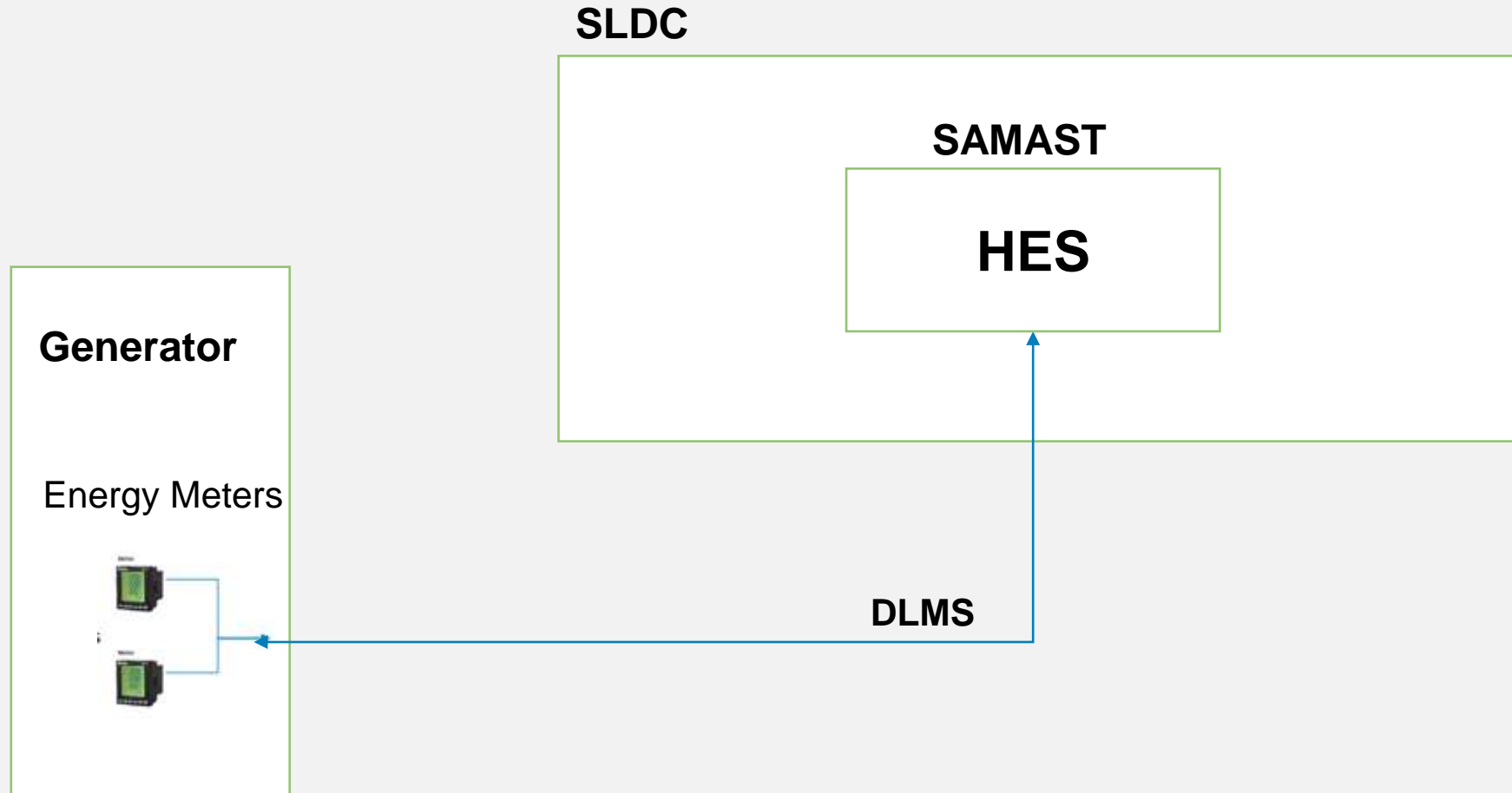


SYSTEM ARCHITECTURE



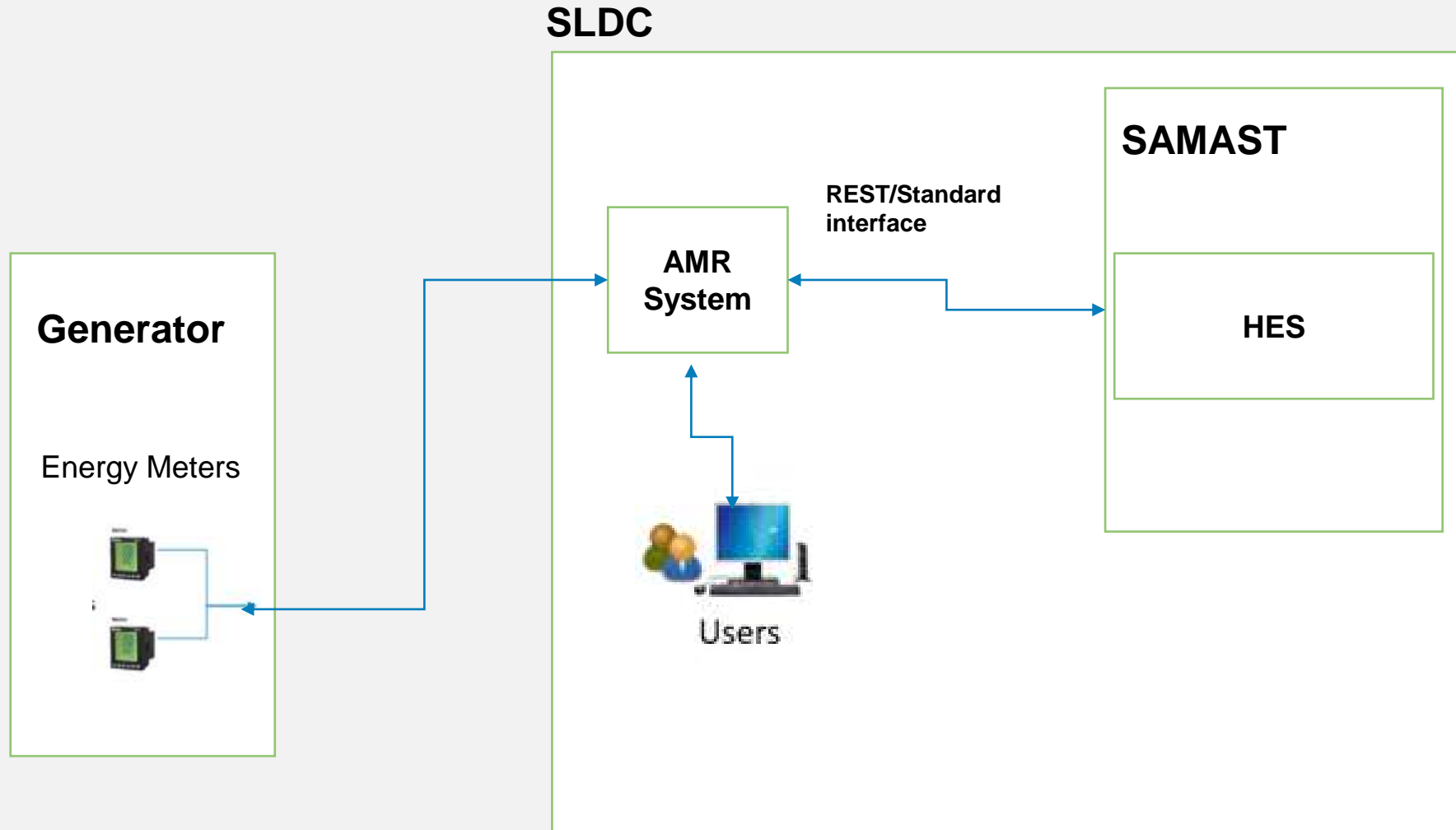


New Open Access Customers





Existing OA Customers





About Us

Kalkitech together with ASE have more than 35 years of experience helps industries and utilities across the globe to achieve energy efficiency. Our solutions enable customers to implement mission-critical applications across the smart grid, industry4.0 solution spectrum.



उ.पू.क्षे गिड प्रदर्शन

Annexure B.1



NER GRID PERFORMANCE

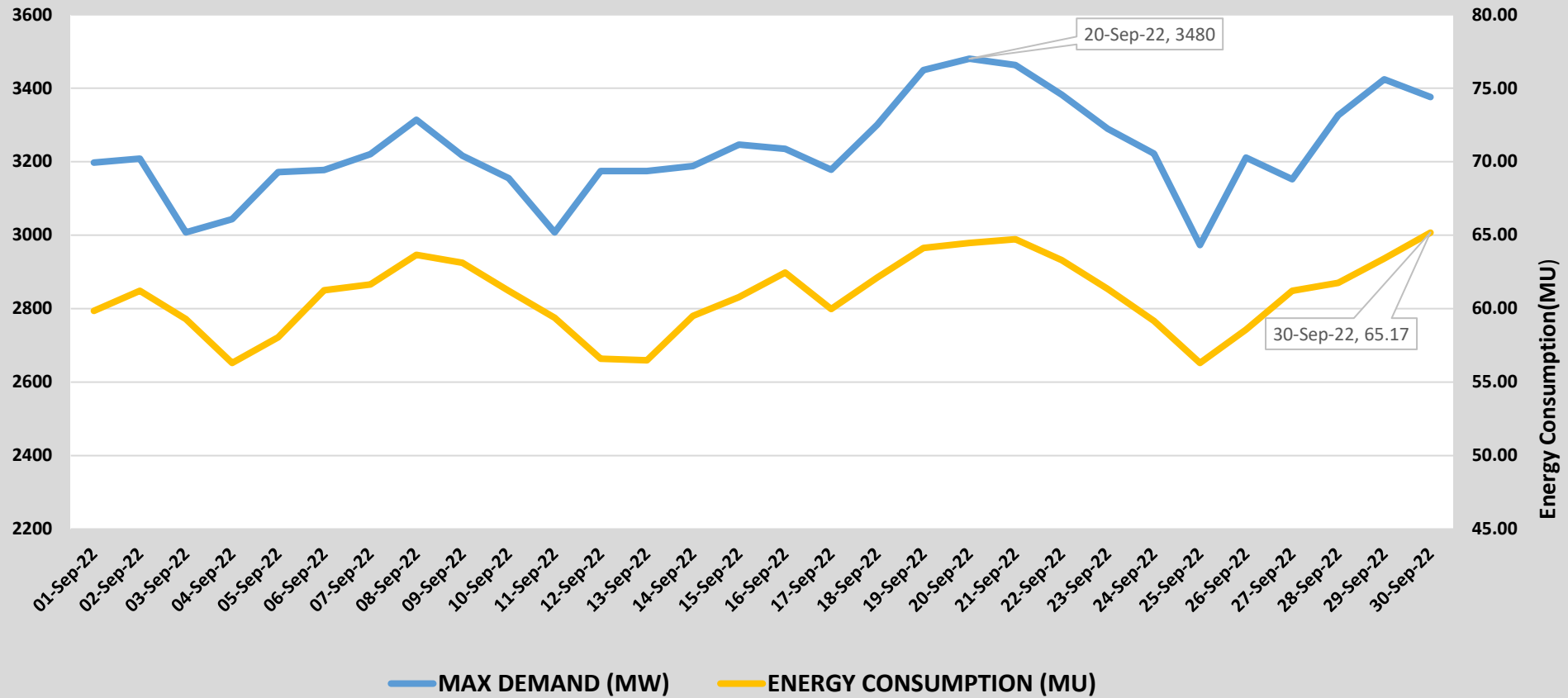
For the month September 2022

North-Eastern Regional Load Despatch Centre

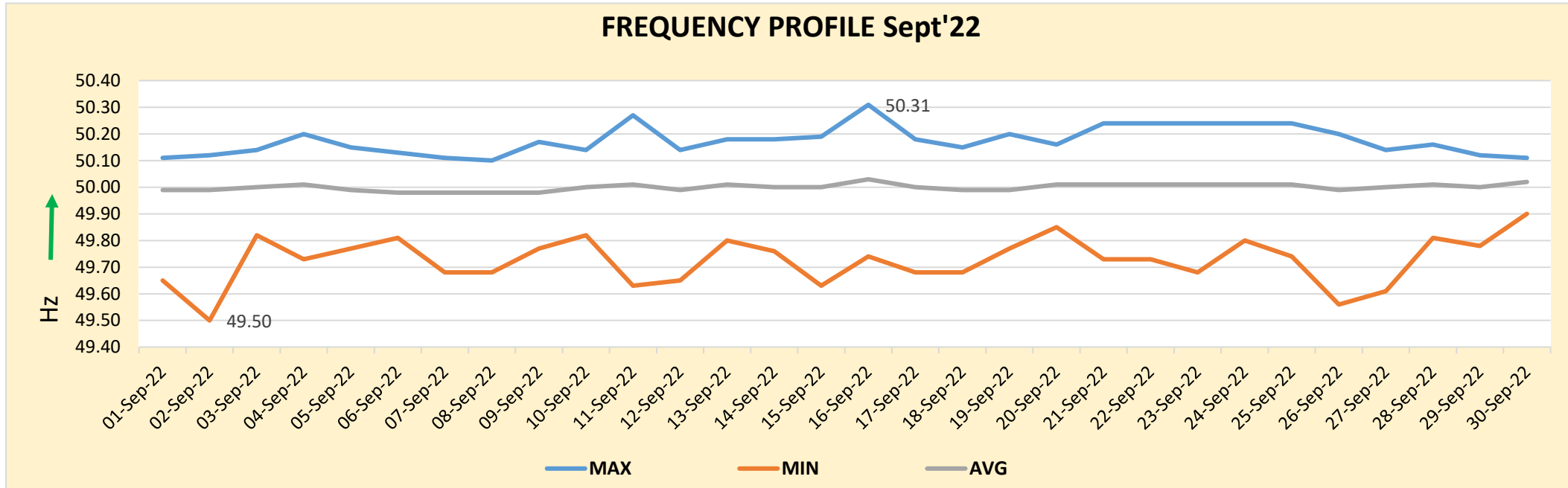
POSOCO, Shillong

Maximum MW and MU in NER: September 2022

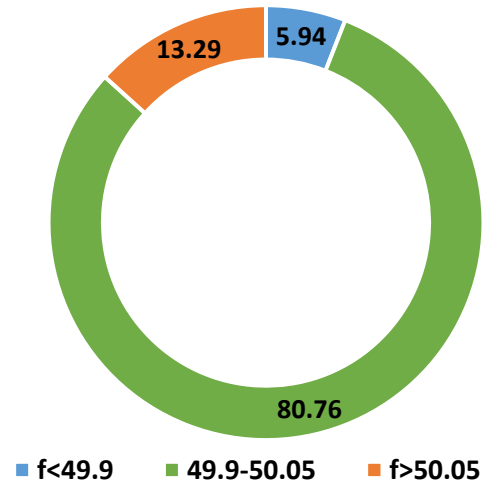
Maximum Demand (MW) and Energy Consumption (MU)



Frequency Profile



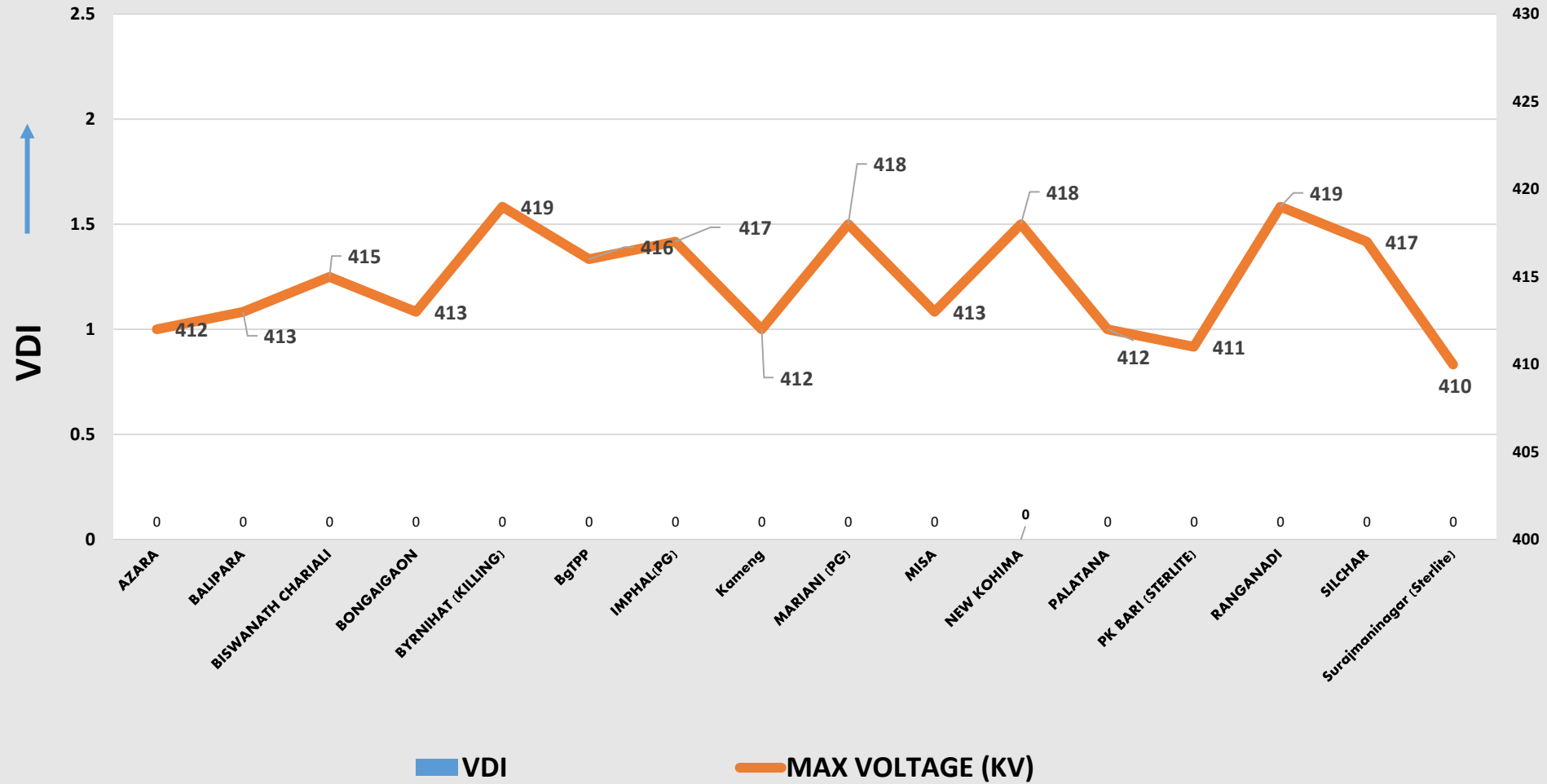
FREQ PROFILE FOR Sept'22





VDI (400 KV) FOR September 2022

No. of 400 kv lines kept open for over voltage : NIL



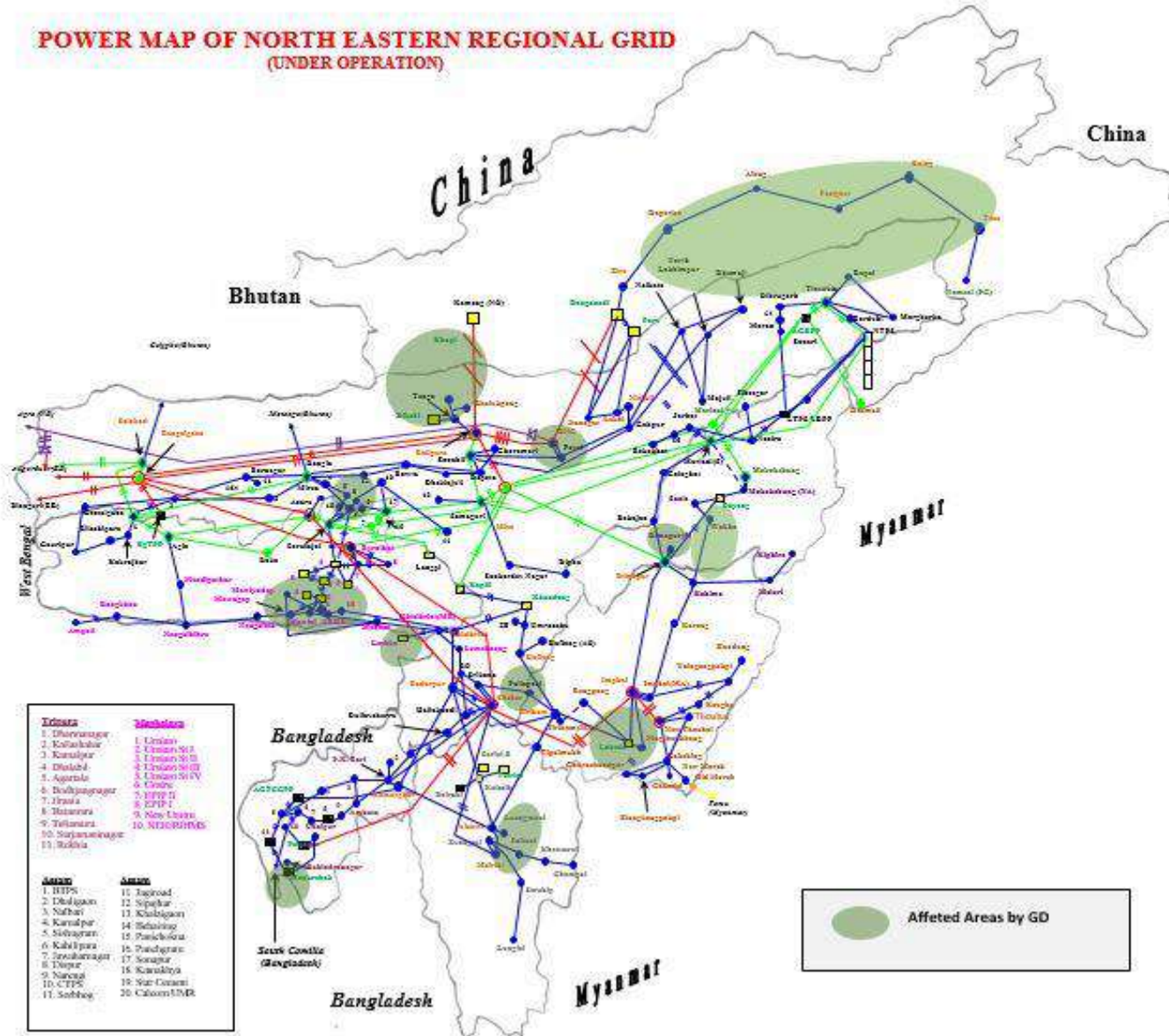
Grid Disturbance during September 2022



No. of GD 20

No. of GI 6

**POWER MAP OF NORTH EASTERN REGIONAL GRID
(UNDER OPERATION)**

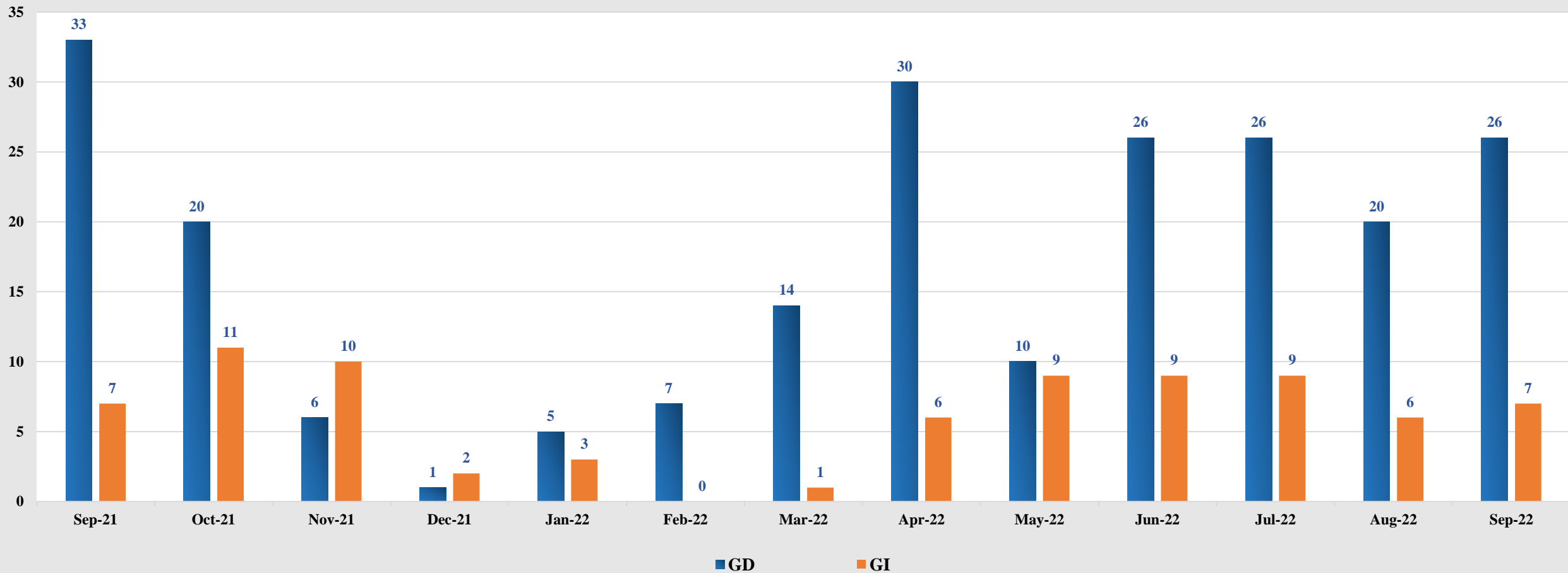


Sl. No.	Element	Number of times
1	132 kV Balipara-Tenga	caused GD 3 times
2	132 kV Gophur-BNC(Pavoi) D/C	caused GD 1 times
3	132 kV Myntdu Leshka - Khliehriat D/C lines	caused GD 3 times
4	132 kV Monarchak - Rokhia and 132 kV Rokhia - Agartala D/C	caused GD 1 time
5	132 kV Monarchak - Rokhia	caused GD 1 time
6	132 kV Monarchak - Udaipur and 132 kV Monarchak - Rokhia	caused GD 1 time
7	132 kV Aizawl(PG) - Melriat(PG) and 132 kV Melriat(PG)-Zuangtui lines	caused GD 1 time
8	132 kV Along - Pasighat Line	caused GD 2 time
9	132 kV Daporijo - Along line	caused GD 1 time
10	132 kV LTPS -NTPS, 132 kV LTPS - Sonari, 132 kV LTPS - Moran, 132 kV LTPS - Nazira D/C and 132 kV Nazira - Teok lines	caused GD 1 time
11	132 kV PK Bari (ST) -Ambassa, 132 kV Ambassa - Kamalpur and 132 kV Ambassa - Gamaitilla lines	caused GD 1 time
12	132kV Uiam Stage I - Uiam Stage III line 2, 132kV Uiam Stage I - Uiam Stage II, 132kV Umaim Stage I-Mawphlang D/C, 132kV Umiam Stage I - Mawlai, 132kV Umiam Stage I-Umiam, 132kV Umiam-NEHU, 132kV NEHU-NEIGRIHMS, 132kV NEHU-Mawlai, 132kV Khliehriat-Mustem 132kV Khliehriat-NEIGRIHMS lines	caused GD 1 time
13	132 kV Dimapur(PG) - Dimapur(DoP, Nagaland) 1 line	caused GD 2 time
14	132 kV Sonabil - Depota and 132 kV Sonabil -Ghoramari lines	caused GD 2 time
15	132 kV Kahelipara - Sarusajai 2 & 4 line	caused GD 1 time
16	132 kV Narengi-Sonapur line	caused GD 1 time
17	132 kV Sarusajai-Kamakhya line	caused GD 1 time
18	132 kV Kohima-Chiephobozou, 132 kV Kohima-Meluri and 132kV Karong-Kohima lines	caused GD 1 time
19	132 kV Jiribam-Pailapool and 132 kV Srikona Pailapool lines	caused GD 1 time



Grid Disturbance/Incidences for last 12 Months

GD and GI :September 21 to September 22





Projected Hydro Generation Availability

Plants	Reservoir Level in meters (as on 16/10/2022)	MU Content	Present DC (MU)	No of days as per current Generation
Khandong + Kopili STG II	-	-	-	-
Kopili	-	-	-	-
Doyang	319.81	24.3	0.381	64
Loktak	766.63	16.3	1.251	13



OCC approved shutdown availing status for the month of September 2022

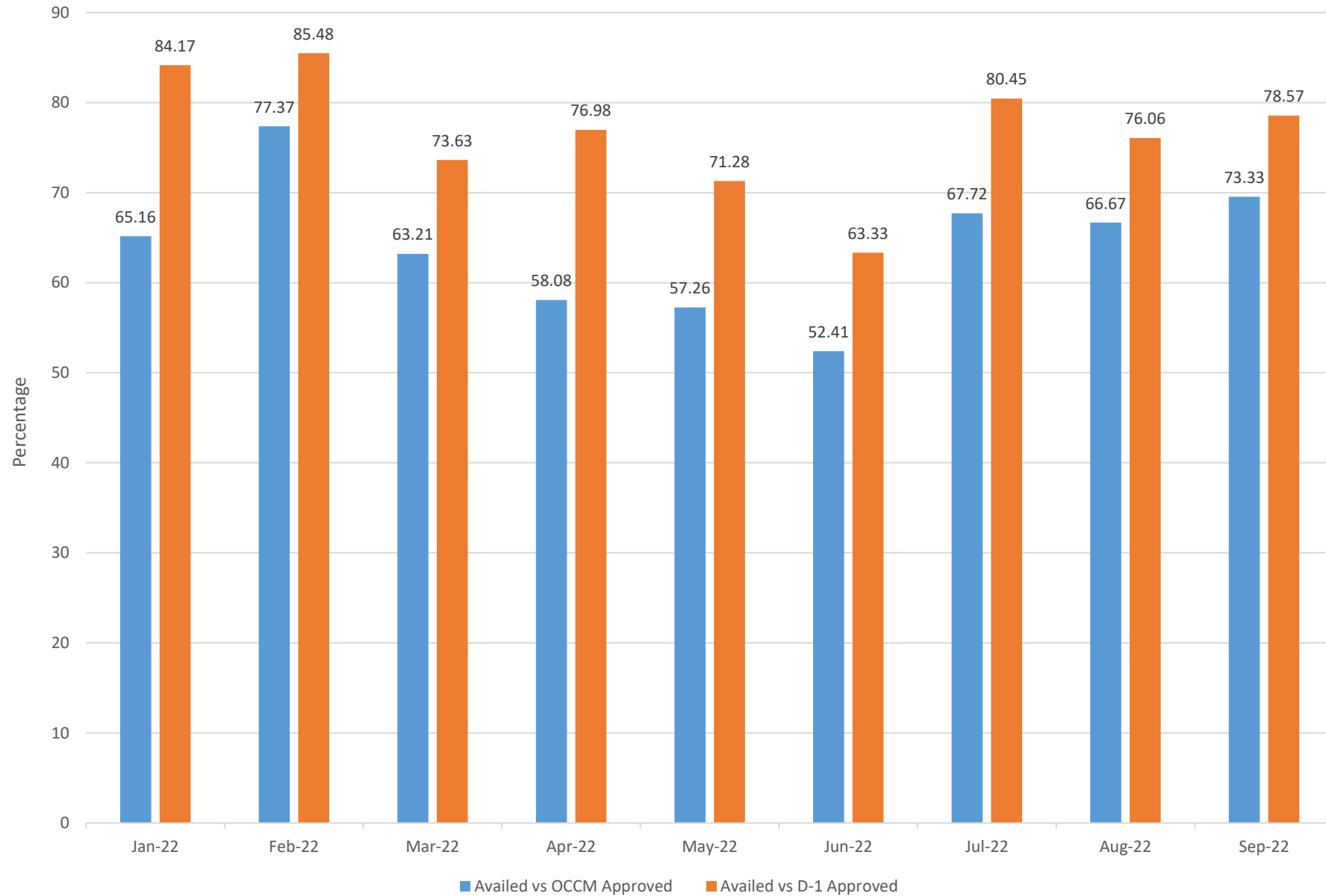
SUMMARY OF NER OUTAGE

MONTH	PLANNED IN OCC	APPROVED IN D-1	AVAILED IN REAL TIME	AVAILED VS PLANNED	AVAILED VS APPROVED	DEFERRED BY RLDC DUE TO SYSTEM CONSTRAINT
September-22	165	154	121	73.33%	78.57%	5



	OCC Approved	D-1 Approved	Availed	Not Availed	RLDC Deferred
NER	165	154	121	33	5
NERTS	57	49	40	9	2
ASSAM	53	47	38	9	1
MANIPUR	0	0	0	0	0
MEGHALAYA	8	7	7	0	0
NAGALAND	2	7	7	0	1
MIZORAM	0	0	0	0	0
TRIPURA	44	43	28	15	1
Arunachal Pradesh	0	0	0	0	0
NETC	0	0	0	0	0
KMTL	0	0	0	0	0
NEEPCO	0	0	0	0	0
NTPC	0	0	0	0	0
OTPC	1	1	1	0	0
INDIGRID	0	0	0	0	0
NHPC	0	0	0	0	0

Approved Shutdown availing trend in percentage



RMSE of Load forecast for Sept'22



RMSE of the forecasted Demand by SLDCs Vs Actual Demand met as per SEM by SLDCs (as per IEGC c1.5.3):

$$RMSE = \sqrt{\frac{\sum_{i=1}^N (Predicted_i - Actual_i)^2}{N}}$$

Where,

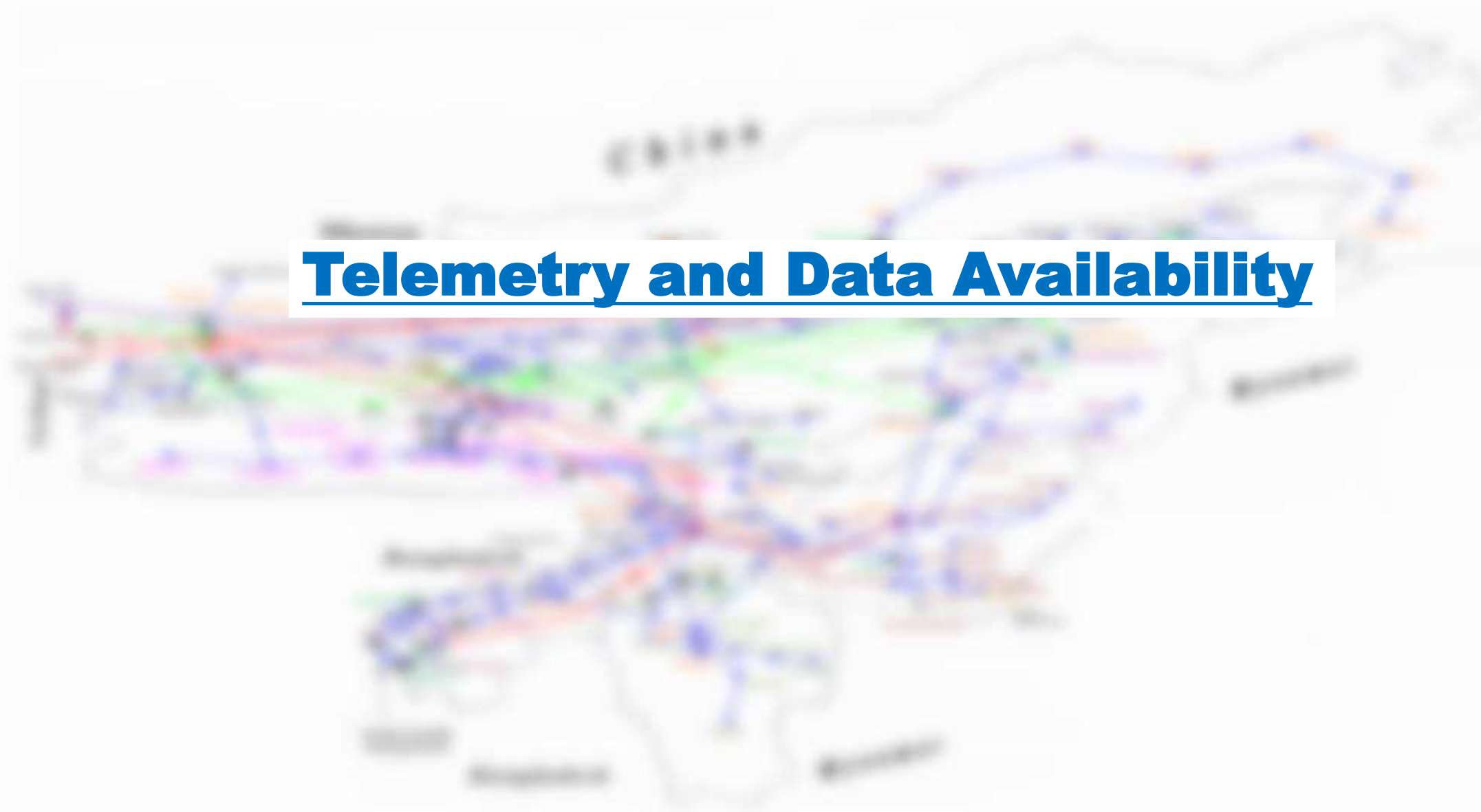
Predicted_i = Forecasted Value

Actual_i = Actual value

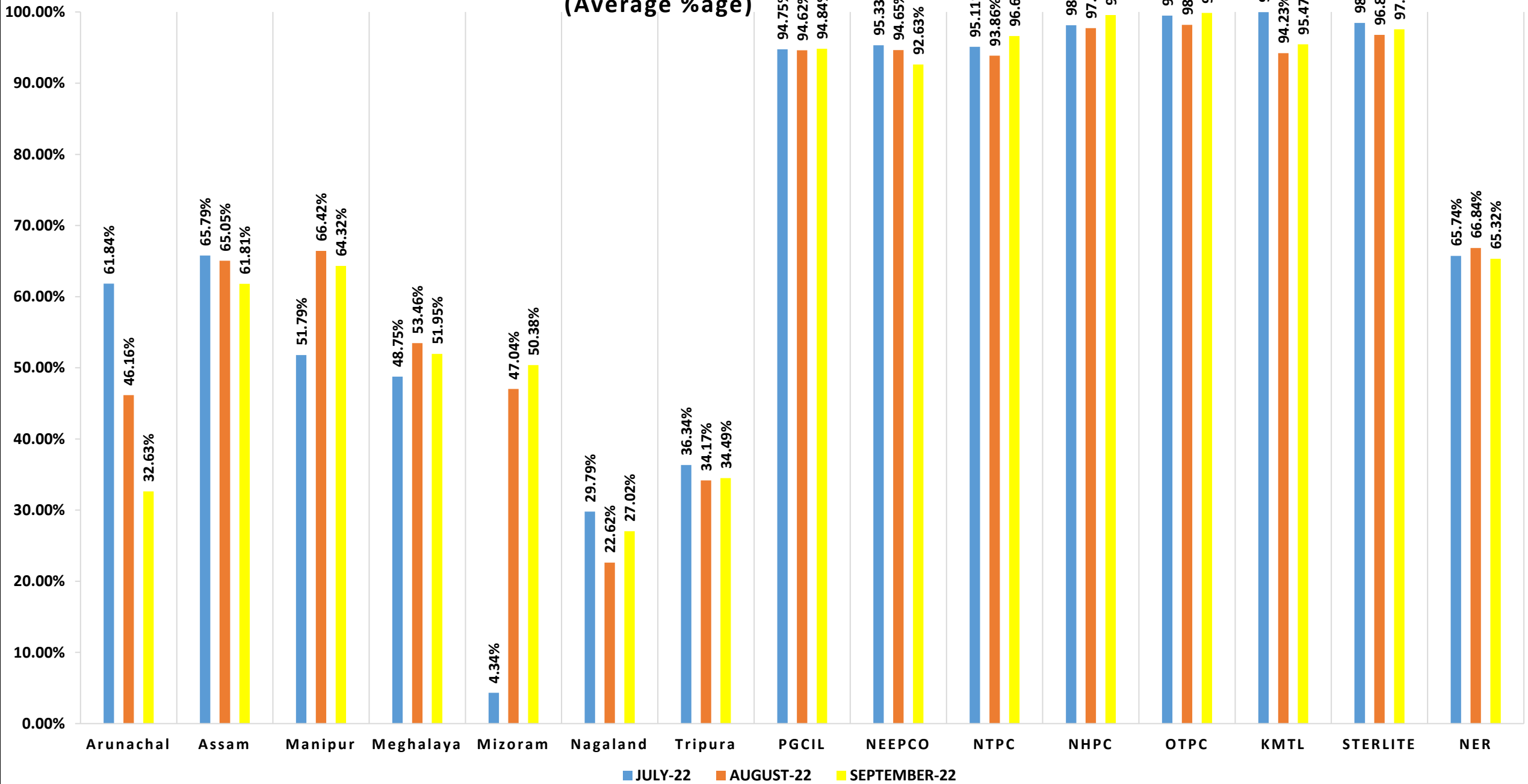
N = Total number of observations.

	Arunachal Pradesh	Assam	Manipur	Meghalaya	Mizoram	Nagaland	Tripura
Median	15	9	7	14	22	10	11

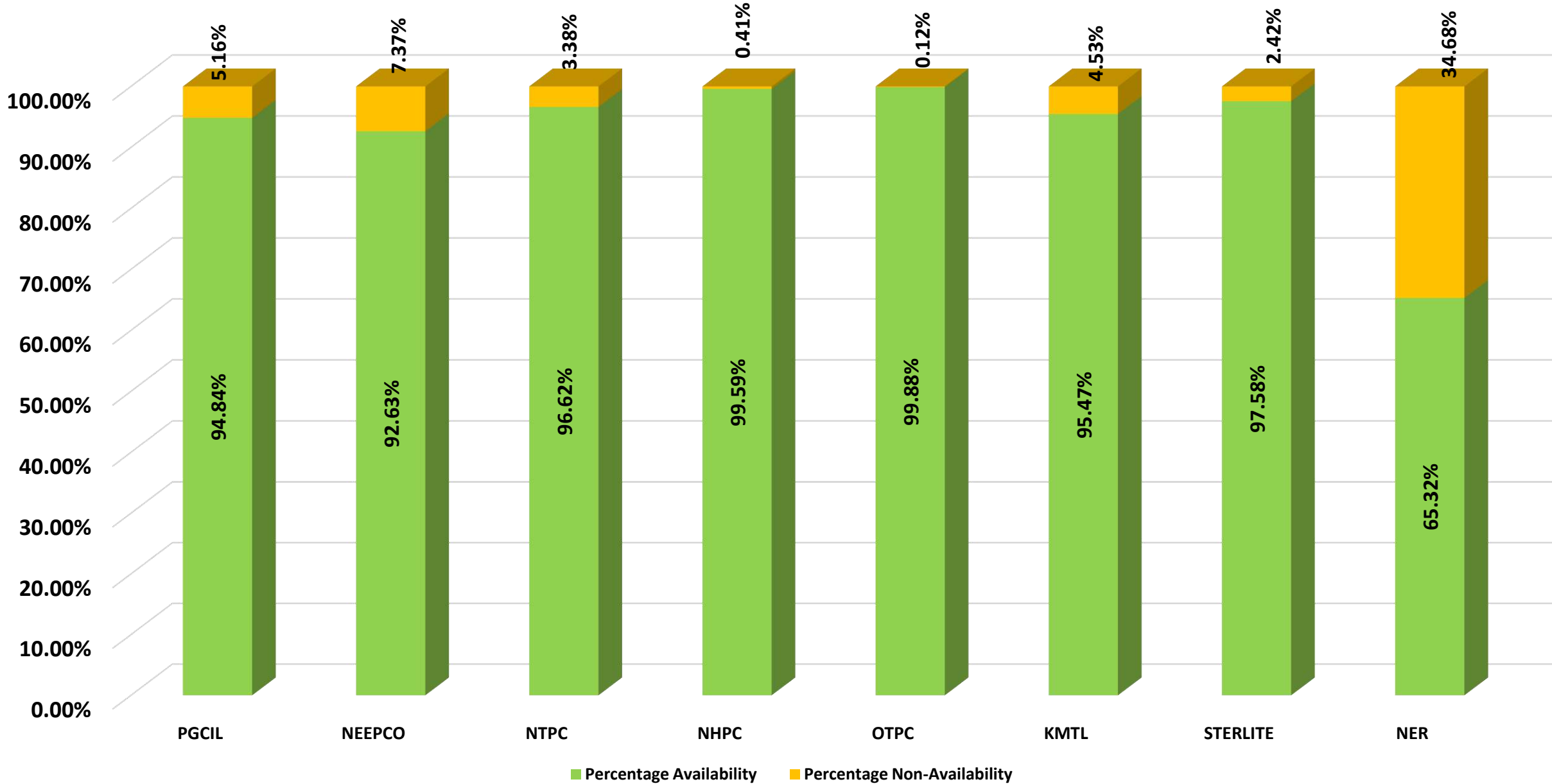
Telemetry and Data Availability



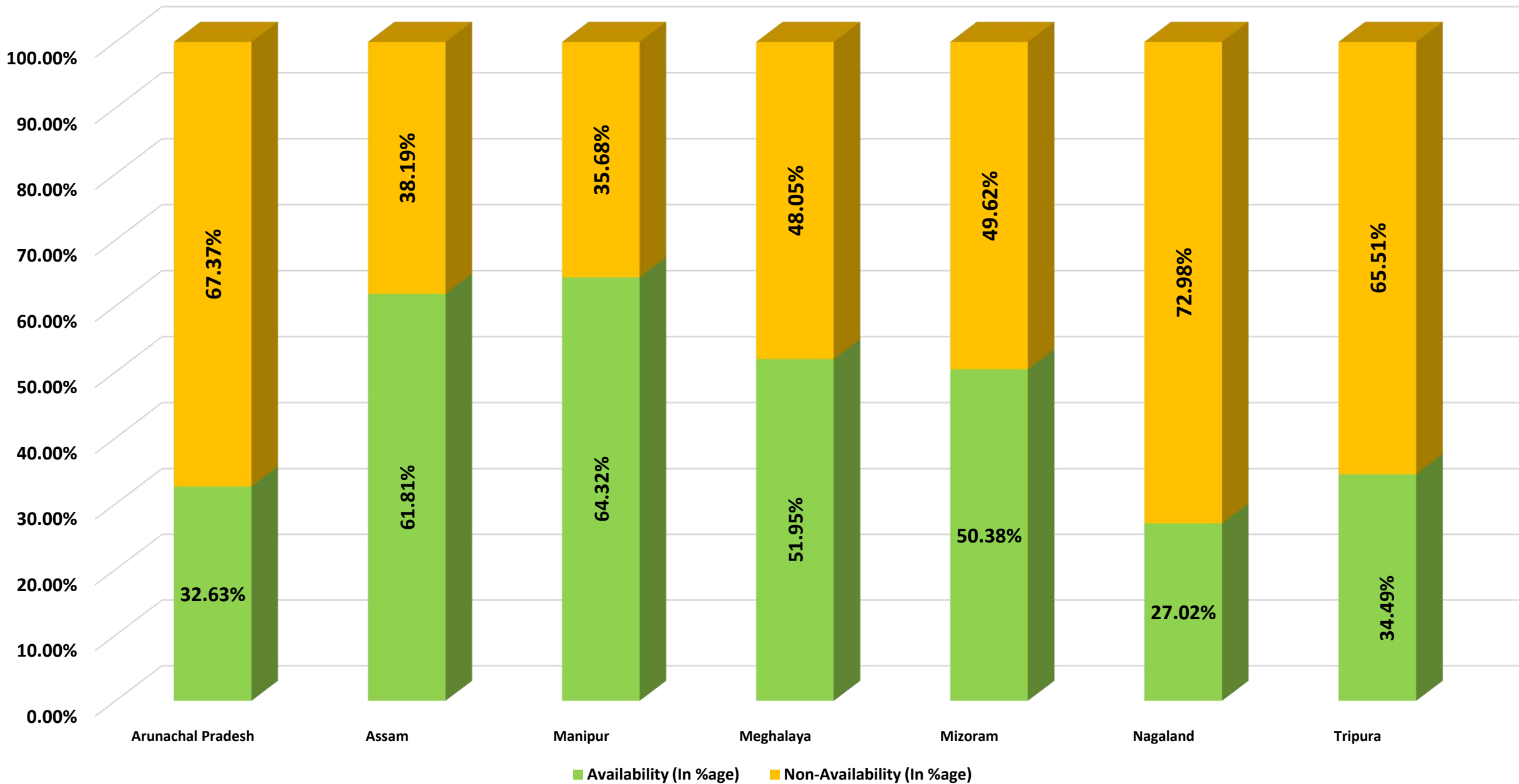
Comparsion of Telemetry Availability Statistics (Average %age)



Telemetry Statistics for Central Sector of NER (Average availability of data for the Month of SEPTEMBER 2022)



Telemetry Statistics for NER States (Average availability of data for the Month of SEPTEMBER '22)





Thank You

Shutdown Approved in 195th OCC NERPC for the month of Nov 2022																																			
Sl. No.	Name of Element	Nov-22																														Time	Reason	Category	Remarks
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30				
SHUTDOWNS PROPOSED BY PGCIL																																			
132kV Transmission lines																																			
1	132kV Badarpur-Jiribam TL																														0800Hrs to 1600Hrs	Conductor fixing at loc 201-202 and infringing clearing at loc 190-197	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132kV Silchar-Badarpur DC.	
2	132kV Dimapur-Doyang # 2 TL																														0800Hrs to 1600Hrs	For product Warranty confirmatory test of bay equipments before completion of one year.	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132kV Dimapur - Doyang - 1 line.	
3	132kV Dimapur-Dimapur # 1 TL																														0800Hrs to 1600Hrs	For product Warranty confirmatory test of bay equipments before completion of one year.	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132kV Dimapur - Dimapur - 2 line. Consent from SLDC Nagaland is to be taken.	
4	132kV Dimapur-Bokajan TL																														0800Hrs to 1600Hrs	For product Warranty confirmatory test of bay equipments before completion of one year.	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132 kV Bokajan-Sarupathar line. RELIABILITY OF THE SYSTEM IS REDUCED.	
5	132kV Khliehriat - Khandong # 2 TL																														0800Hrs to 1600Hrs	LBB relay retrofiting works	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132 kV Khliehriat-Khandong 1.RELIABILITY OF THE SYSTEM IS REDUCED.	
6	132kV Khliehriat - Khandong # 1 TL																														0800Hrs to 1600Hrs	LBB relay retrofiting works	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132 kV Khliehriat-Khandong 2.RELIABILITY OF THE SYSTEM IS REDUCED.	
7	132kV Khliehriat - Badarpur TL																														0800Hrs to 1600Hrs	LBB relay retrofiting works	Normal Maintenance related shutdown.	SD may only be availed after restoration of Jiribam-haflong line. Meghalaya Internal generation has to be maximised during the SD period. RELIABILITY OF THE SYSTEM IS REDUCED.	
8	132kV Khliehriat - Khliehriat # 1 TL																														0800Hrs to 1600Hrs	LBB relay retrofiting works at both ends	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132kV Khlerhat - Khlerhat II line	
9	132kV Lekhi - Nirjuli TL																														CSD 0800Hrs to 1600Hrs	Dismantling of existing foundations of LA & CVT and construction of new foundation and erection of support structure for LA & CVT in 132kV Lekhi-Nirjuli at Nirjuli Substation under package-SS74 associated with (i) Extension of 132/33kV Nirjuli Substation under NERSS-IX & (ii) Augmentation of 132/33kV Nirjuli Substation under NERSS-XIII.	Construction Related Shutdown	SD may be availed. During the period of the shutdown, the loads of Nirjuli to be fed from Golpur side. Consent from SLDC Assam is required to be taken for supplying power to Nirjuli (about 20-25 MW Load)	
Nov-22																																			
10	132kV Silchar - Sricona-1 TL																														0900Hrs to 1500Hrs	AMP of Bay equipments	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132 kV Silchar - Sricona-2& 132kV Jiribam - Pallapool-Sricona link.	
11	132kV Silchar - Sricona-2TL																														0900Hrs to 1500Hrs	AMP of Bay equipments	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132 kV Silchar - Sricona-1& 132kV Jiribam - Pallapool-Sricona link.	
12	132kV Silchar - Melriat -2 TL																														0800Hrs to 1600Hrs	Infringing clearing between loc 101-102	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132kV Silchar - Melriat - 1 line.	
13	132kV Loktak - Jiribam TL																														CSD 0700Hrs to 1500Hrs (till Jan 2023)	For conductor restringing to HTLS under NERSS project.	Construction Related Shutdown	SD may be availed. Consent from Loktak and SLDC manipur is required.Considering N-1 contingency, Loktak generation to be kept within 70 MW since 132kV Loktak - Rengung is highly unreliable. Otherwise, An SPS can be proposed to trip one unit of Loktak in case of tripping of 132 kV Loktak-Melghal line.	
14	132kV Khliehriat - Khliehriat - 1 TL																														0800Hrs to 1600Hrs	New PLCC installation at both end	Existing system improvement related shutdown.	SD may be availed subject to availability of 132kV Khlerhat - Khlerhat II line	
15	132kV Khliehriat - Badarpur TL																														0800Hrs to 1600Hrs	New PLCC installation at both end	Existing system improvement related shutdown.	SD may only be availed after restoration of Jiribam-haflong line. Meghalaya Internal generation has to be maximised during the SD period. RELIABILITY OF THE SYSTEM IS REDUCED.	
16	132kV Khliehriat - Khandong - 2 TL																														0800Hrs to 1600Hrs	AMP of Bay equipments	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132 kV Khliehriat-Khandong 1.RELIABILITY OF THE SYSTEM IS REDUCED.	
17	132 KV Balipara- Khapi TL																														0800Hrs to 1200Hrs	RLDC Related RTU MFT Installation Works	Existing system improvement related shutdown.	SD may be availed. Blackout in Khapi & Tenga area of Arunachal Pradesh. Consent from AP required.	
18	132kV Ziro daporjo																														0800Hrs to 1600Hrs	LBB relay retrofiting works	Normal Maintenance related shutdown.	SD may be availed. Daporjo, Along, Painghat-Rong-Tezu & Namsai area of AP will become dark.Consent from SLDC AP required	
19	132kV Ranganadi Ziro																														0800Hrs to 1600Hrs	LBB relay retrofiting works	Normal Maintenance related shutdown.	SD may be availed. Ziro,Daporjo, Along, Painghat-Rong-Tezu & Namsai area of AP will become dark.Consent from SLDC AP required	
Nov-22																																			
220kV Transmission lines																																			
20	220kV Old Mariani - Kathalguri																														0800Hrs to 1600Hrs	AMP of Bay equipments	Normal Maintenance related shutdown.	SD may be availed.	
21	220kV New Mariani - Kathalguri																														0800Hrs to 1600Hrs	AMP of Bay equipments	Normal Maintenance related shutdown.	SD may be availed.	
22	220kV Misa - Kopili # 1 TL																														0900Hrs to 1700Hrs	Auto reclosure to be kept at non auto mode for OPGW works	Existing system improvement related shutdown.	Auto Reclosure may be kept in Non-Auto Mode .	
23	220kV Misa - Kopili # 2 TL																														0900Hrs to 1700Hrs	Auto reclosure to be kept at non auto mode for OPGW works	Existing system improvement related shutdown.	Auto Reclosure may be kept in Non-Auto Mode .	
24	220kV Misa - Kopili # 3 TL																														0900Hrs to 1700Hrs	Auto reclosure to be kept at non auto mode for OPGW works	Existing system improvement related shutdown.	Auto Reclosure may be kept in Non-Auto Mode .	
25	220kV Misa - Dimapur # 1 TL																														0800Hrs to 1600Hrs	Repairing and replacement of lightning damaged insulator at various location to prevent breakdown of line	Normal Maintenance related shutdown.	SD may be availed. 220 kV Misa - Dimapur II to be kept in service, atleast 2 no of ICTs at Mokokchung to be kept in service, 132 kV Yurembim - Karong - Kohima line to be kept in service.	
26	220kV Misa - Dimapur # 2 TL																														0800Hrs to 1600Hrs	Repairing and replacement of lightning damaged insulator at various location to prevent breakdown of line	Normal Maintenance related shutdown.	SD may be availed. 220 kV Misa - Dimapur I to be kept in service, atleast 2 no of ICTs at Mokokchung to be kept in service, 132 kV Yurembim - Karong - Kohima line to be kept in service.	
27	220kV Salakati - Bongaigaon - 1 TL																														CSD 0900Hrs to 1600Hrs	For upgradation works under add cap	Construction Related Shutdown	SD may be availed subject to availability of 400/220 kV ICTs at BGTTP(NTPC) and 220kV Salakati - BTPS - II, 220 kV Azara-Agisa & 220 kV Azara-Boko - Agia link.	
28	220kV New Mariani - Old Mariani																														0700Hrs to 1500Hrs	LBB relay retrofiting works at AEGCL end	Existing system improvement related shutdown.	SD may be availed. At present, the Upper Assam power system is connected with 220 kV Samaguri-Mariani(AS) line, 220 kV Mariani(AS) - Mariani (PG) line.	
29	220kV BALIPARA- Souabli																														0800Hrs to 1200Hrs	RLDC Related RTU MFT Installation Works	Existing system improvement related shutdown.	SD may be availed after reconductoring of 220 kV BTPS-Salakati DC.	
30	220kV Salakati- BTPS Circuit 1																														0800Hrs to 1600Hrs	Auto Reclose Auto to Non-Auto for HTLS reconductoring	Existing system improvement related shutdown.	AR to be kept in non-auto mode	
31	220kV Salakati- BTPS Circuit 2																														CSD 0800Hrs to 1600Hrs	HTLS Reconductoring Works	Construction Related Shutdown	SD may be availed subject to availability of 400/220 kV ICTs at BGTTP(NTPC) and 220kV Salakati - BTPS - I, 220 kV Azara-Agisa & 220 kV Azara-Boko - Agia link.	
Nov-22																																			
400kV Transmission lines																																			
32	400kV Bongaigaon - Azara TL alongwith LR																														0800Hrs to 1600Hrs	For modification in OTIWTI circuit to reduce maloperation of the equipments.	Normal Maintenance related shutdown.	NER-ER TTC/ATC will be revised.SD may be availed after reconductoring of 220 kV BTPS-Salakati DC.	
33	400 kV Bongaigaon - Bymhat TL																														CSD 0800Hrs to 1600Hrs	Shutdown of Line is required for replacement of B phase Bushing in Bymhat LR (due to safety clearance, system constraints). Line will come into service without line reactor after replacement of bushing however reactor will remain out till healthiness of reactor is ascertained.	Normal Maintenance related shutdown.	NER-ER TTC/ATC will be revised.SD may be availed after reconductoring of 220 kV BTPS-Salakati DC.	

Name of Element	Nov-22																														Time	Reason	Category		
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30					
20 132 KV PANCHGRAM-HAILAKANADI																																8:00-16:00	PREVENTIVE MAINTENANCE & INSPECTION WORK	Normal Maintenance related shutdown.	SD may be availed
21 132 KV DULLAVCHERRA-DHARMANAGAR																																8:00-16:00	LINE MAINTENANCE & CORRIDORE CLEANING WORK	Normal Maintenance related shutdown.	Consent from SLDC Tripura is required. SD may be availed. 132 kV PK Bari - Dullavcherra line and 132 kV Hailakandi - Dharmnagar line to be kept in service. RELIABILITY OF THE SYSTEM IS REDUCED.
22 132 KV DULLAVCHERRA-DHARMANAGAR																																8:00-16:00	LINE MAINTENANCE & CORRIDORE CLEANING WORK	Normal Maintenance related shutdown.	Consent from SLDC Tripura is required. SD may be availed. 132 kV PK Bari - Dullavcherra line and 132 kV Hailakandi - Dharmnagar line to be kept in service. RELIABILITY OF THE SYSTEM IS REDUCED.
23 132 KV PANCHGRAM-LUMSHINONG																																8:00-16:00	PREVENTIVE MAINTENANCE & INSPECTION WORK	Normal Maintenance related shutdown.	SD may be availed . Consent from Meghalaya to be obtained.
24 220KV SAMAGURI-JAWAHARNAGAR																																8:00-16:00	CORRIDOR CLEANING	Normal Maintenance related shutdown.	SD may be availed subject to availability of 220 kV Sarusajai-Jawaharnagar line. RELIABILITY OF THE SYSTEM IS REDUCED.
25 220KV SAMAGURI-JAWAHARNAGAR																																6:00-15:00	PREVENTIVE MAINTENANCE	Normal Maintenance related shutdown.	SD may be availed subject to availability of 220 kV Sarusajai-Jawaharnagar line. RELIABILITY OF THE SYSTEM IS REDUCED.
26 220KV SONAPUR-SAMAGURI																																8:00-16:00	CORRIDOR CLEANING	Normal Maintenance related shutdown.	SD may be availed subject to availability of 220 kV Sarusajai-Sonapur line. RELIABILITY OF THE SYSTEM IS REDUCED.
27 220KV SONAPUR-SAMAGURI																																6:00-15:00	PREVENTIVE MAINTENANCE	Normal Maintenance related shutdown.	SD may be availed subject to availability of 220 kV Sarusajai-Sonapur line. RELIABILITY OF THE SYSTEM IS REDUCED.
28 220KV SONAPUR-SARUSAJAI																																8:00-16:00	CORRIDOR CLEANING	Normal Maintenance related shutdown.	SD may be availed subject to availability of 220 kV Samaguri-Sonapur line. RELIABILITY OF THE SYSTEM IS REDUCED.
29 132KV Païlapool- Jiribam Line																																8:00-16:00	Maintenance of line & corridor cleaning works	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132 kV Srikona-Païlapool line. RELIABILITY OF THE SYSTEM IS REDUCED.
Name of Element	Nov-22																														Time	Reason	Category		
30 220 KV Rangia-Salakati (BTPS) Ckt-1																																8:00-16:00	For preventive maintenance	Normal Maintenance related shutdown.	SD may be availed subject availability of 220kV BTPS-RANGIA CKT II. Under N-1 contingency, i.e outage of 220 kV BTPS-Rangia II line, under N-1 contingency, the Rangia area will become dark. Thus, connectivity with the SD may be availed subject availability of 220kV BTPS-RANGIA CKT I. Under N-1 contingency, i.e outage of 220 kV BTPS-Rangia I line, under N-1 contingency, the Rangia area will become dark. Thus, connectivity with the
31 220 KV Rangia-Salakati (BTPS) Ckt-2																																8:00-16:00	For preventive maintenance	Normal Maintenance related shutdown.	SD may be availed subject availability of 220kV BTPS-RANGIA CKT II. Under N-1 contingency, i.e outage of 220 kV BTPS-Rangia II line, under N-1 contingency, the Rangia area will become dark. Thus, connectivity with the SD may be availed subject availability of 220 kV BTPS-RANGIA CKT I. Under N-1 contingency, i.e outage of 220 kV BTPS-Rangia I line, under N-1 contingency, the Rangia area will become dark. Thus, connectivity with the
32 220KV NTPS-AMGURI SOLAR																																8:00-16:00	For preventive maintenance	Normal Maintenance related shutdown.	SD may be availed subject to availability of 220 kV Amguri-Mariani. RELIABILITY OF THE SYSTEM IS REDUCED.
33 220KV AMGURI-MARIANI																																8:00-16:00	For preventive maintenance	Normal Maintenance related shutdown.	SD may be availed subject to availability of 220 kV Amguri-NTPS. RELIABILITY OF THE SYSTEM IS REDUCED.
34 220KV MAIN BUS 1 AT SAMAGURI																																9:00-15:00	PREVENTIVE MAINTENANCE	Normal Maintenance related shutdown.	SD may be availed.All elements to be kept in service via Bus-2.No outage of elements is expected
35 220KV MAIN BUS 2 AT SAMAGURI																																9:00-15:00	PREVENTIVE MAINTENANCE	Normal Maintenance related shutdown.	SD may be availed.All elements to be kept in service via Bus-1.No outage of elements is expected
Name of Element	Nov-22																														Time	Reason	Category		
SHUTDOWNS PROPOSED BY MEGHALAYA																																			
1 132KV Untru-Kahlipara DC line																																09:00-16:00	Jungle clearance & line maintenance works	Normal Maintenance related shutdown.	SD may be availed . Consent from SLDC Assam to be obtained.
2 132KV Untru-Sarusajai DC line																																09:00-16:00	Jungle clearance & line maintenance works	Normal Maintenance related shutdown.	SD may be availed . Consent from SLDC Assam to be obtained.
3 220KV Misa-Bymihat DC line																																09:00-16:00	Jungle clearance & line maintenance works	Normal Maintenance related shutdown.	SD may be availed
4 132KV Nongalibra-Agia II feeder																																9:00 - 14:00	Jungle clearance and tree trimming between T/Loc 51-52	Normal Maintenance related shutdown.	SD may be availed. 132 kV Agia -Mendipathar - Nangalibra link to be kept in service.
5 132KV Mendipathar-Agia feeder																																9:00 - 14:00	Jungle clearance at T/Loc 212-214 and T/Loc 256 to 258	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132 kV Agia- Nangalibra line. Consent from SLDC Assam required
6 315MVA 400/220/33kV ICT#3 at Killing S/s																																09:00-16:00	Preventive Maintenance work of Terminal Equipments ICT#3	Normal Maintenance related shutdown.	SD may be availed subject to availability of other 400/200 kV ICT
7 132/33kV Khlichriat Bus																																09:00-16:00	To replace (i) the Y-phase Panthar Bus of Leshka line-II, (ii) deteriorated clamps of the R-phase main bus. (iii) Cleaning and Tightening of all Bus side equipment. (iv) Maintenance works for the station service.	Normal Maintenance related shutdown.	SD may be availed.Blackout will occur in Mustem area of Meghalaya
8 315MVA 400/220/33kV ICT#4 at Killing S/s																																09:00-16:00	Preventive Maintenance work of Terminal Equipments ICT#4	Normal Maintenance related shutdown.	SD may be availed subject to availability of other 400/200 kV ICT
9 132kV Khlichriat PG Line II																																10:00-16:00	Bay Maintenance work	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132 kV Khlichriat-Khlichriat-1
Name of Element	Nov-22																														Time	Reason	Category		
SHUTDOWNS PROPOSED BY NAGALAND																																			
1 132kV Doyang - Sanis TL																																08:00 hrs - 15:00 hrs	Vegetation clearing	Normal Maintenance related shutdown.	SD may be availed. 132 kV Kohima - Wokha - Sanis link to be kept in service
2 132kV Sanis to Wokha TL																																08:00 hrs - 15:00 hrs	Vegetation clearing	Normal Maintenance related shutdown.	SD may be availed. 132 kV Doyang - Sanis line and 132 kV Kohima - Wokha line to be kept in service
3 132kV Wokha-Chiephobozon-Kohima TL																																08:00 hrs - 15:00 hrs	Vegetation clearing	Normal Maintenance related shutdown.	SD may be availed.
4 132kV Kohima - Karong TL																																08:00 hrs - 15:00 hrs	Vegetation clearing	Normal Maintenance related shutdown.	SD may be availed. 132 kV Dimapur - Kohima line to be kept in service.
5 132kV Kiphire to Meluri TL																																08:00 hrs - 15:00 hrs	Vegetation clearing	Normal Maintenance related shutdown.	SD may be availed.
6 132kV Meluri to Kohima TL																																08:00 hrs - 15:00 hrs	Vegetation clearing	Normal Maintenance related shutdown.	SD may be availed.
7 132kV Doyang-Mokokchung																																08:00 hrs - 16:00 hrs	Vegetation clearing	Normal Maintenance related shutdown.	SD may be availed subject to availability of 220 kV Mariani-Mokokchung D/C.

Sl. No.	Name of Element	Nov-22																														Time	Reason	Category	Remarks		
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30						
SHUTDOWNS PROPOSED BY TRIPURA																																					
1	132 KV Agartala - Rokhia Line II																																	0900Hrs to 1600Hrs	with routine maintenance and work under NERSIP project.	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132 KV Agartala - Rokhia I and 132 kV Monarchak-Udaipur line. Flowgate of 132 KV Agartala - Rokhia I and 132 kV Monarchak-Udaipur line to be maintained below 70 MW during the SD
2	132 KV P.K. Bari - Missionilla (Dharmnagar)																																	CSD 0900Hrs to 1600Hrs	with routine maintenance and work under NERSIP project.	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132 kV Hailakandi-Dullavcherra-Dharmnagar link. RELIABILITY OF THE SYSTEM IS REDUCED.
3	132 KV Monarchak - Udaipur																																	0900Hrs to 1600Hrs	with routine maintenance and work under NERSIP project.	Normal Maintenance related shutdown.	SD may be availed. SPS at Monarchak to be in off condition. Combined Flowgate of 132 kV Monarchak-Rokhia line to be maintained below 70 MW during the SD period.
4	132 KV Ambassa - P.K Bari (ISTS)																																	0900Hrs to 1600Hrs	with routine maintenance and work under NERSIP project.	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132 kV Gamaitilla-Ambassa line. Outage of 132 kV Gamaitilla-Ambassa line will lead to blackout in Ambassa area of trimura power system. RELIABILITY OF THE SYSTEM IS REDUCED.
5	132 KV Agartala - Rokhia Line I																																	0900Hrs to 1600Hrs	with routine maintenance and work under NERSIP project.	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132 KV Agartala - Rokhia II and 132 kV Monarchak-Udaipur line. Flowgate of 132 KV Agartala - Rokhia II and 132 kV Monarchak-Udaipur line to be maintained below 70 MW during the SD
6	132 KV P.K. Bari (TSECL) - P.K. Bari (ISTS)																																	0900Hrs to 1600Hrs	with routine maintenance and work under NERSIP project.	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132 KV Ambassa(TSECL) - P.K. Bari(ISTS) line. RELIABILITY OF THE SYSTEM IS REDUCED.
7	132 KV Monarchak - Rokhia																																	0900Hrs to 1600Hrs	with routine maintenance and work under NERSIP project.	Normal Maintenance related shutdown.	SD may be availed subject to availability of 132 kV Monarchak-Udaipur line. SPS at Monarchak to be in off condition. Flowgate of 132 kV Monarchak-Rokhia to be maintained below 70 MW during the SD period.
SHUTDOWNS PROPOSED BY NEEPCO																																					
1	Kameng HPS Unit # I																																	CSD 00:00 Hrs of 01.11.2022 till 23:59 Hrs of 15.06.2023 (7.5 months)	for completion of E & C works.	Normal Maintenance related shutdown.	SD may be availed
2	Doyang HPS Unit # I, II & III																																	CSD 00:00Hrs of 01.11.2022 to 23:59Hrs of 10.11.2022	Plant Shutdown MIV seal replacement of 3 m/cs	Normal Maintenance related shutdown.	SD may be availed subject to availability of 220 kV Mariani-Mokokchung D/C
3	Doyang HPS Unit # III																																	CSD 00:00 Hrs of 11.11.2022 till 23:59 Hrs of 05.12.2022 (25 days)	APM	Normal Maintenance related shutdown.	SD may be availed
SHUTDOWNS PROPOSED BY NTPC																																					
1	BgTPP Unit # I																																	CSD 00:00 Hrs of 05.11.2022 till 23:59 Hrs of 19.12.2022	U#1 Overhauling	Normal Maintenance related shutdown.	SD may be availed
SHUTDOWNS PROPOSED BY OTPC																																					
1	132 KV Palatana-Udaipur																																	0900Hrs to 1600Hrs	Attending wave trap hot spot	Normal Maintenance related shutdown.	SD study could not be added due to late submission
2	132 KV Palatana- SM nagar																																	0800Hrs to 1600Hrs	Attending dropper clamp hot spot	Normal Maintenance related shutdown.	SD study could not be added due to late submission
1	Unit I																																	CSD 0000 hrs of 28 OCT to 2359hrs of 03 Nov	for Annual Baroscopic inspection of GT-1 and annual NDT of GT-1 followed by line water wash of GT-1	Normal Maintenance related shutdown.	SD may be allowed after reconditioning of 220 kV BTPS -Sakhati DC for reliable and secure grid operation
SHUTDOWNS PROPOSED BY NETC																																					
1	400 kV Palatana-Sitchar TL (CKI-I)																																	0800Hrs to 1600Hrs	Replacement of insulator string in middle phase of tower no. 673. Two nos. discs are completely broken in a single string.	Normal Maintenance related shutdown.	SD study could not be added due to late submission
2	400 kV Palatana-Sitchar TL (CKI-II)																																	0800Hrs to 1600Hrs	Rectification of jumper in tower nos. 645.	Normal Maintenance related shutdown.	SD study could not be added due to late submission



Installation of AWS in Northeast

भारत मौसम विज्ञान विभाग
INDIA METEOROLOGICAL DEPARTMENT

AWS Installation - Tripura

❖ **AWS Installation is completed in Tripura. 7 New AWS have been installed either in Power stations or nearby to proposed locations.**

S NO.	STATE	DISTRICT	STATION	PROJECT
1	TRIPURA	DHALAI	AGARTALA_KVK	DAMU_200
2	TRIPURA	DHALAI	GANDACHARA	AWS400
3	TRIPURA	NORTH_TRIPURA	ASHAPARA	AWS400
4	TRIPURA	NORTH_TRIPURA	KAMALPUR	P550
5	TRIPURA	SIPAHIJALA	SIPAHIJALA	AWS400
6	TRIPURA	SOUTH_TRIPURA	GOKULPUR	P550
7	TRIPURA	UNAKOTI	KAILASHAHAR	AWS400
8	TRIPURA	WEST_TRIPURA	A_D_NAGAR_AMFU	P550
9	TRIPURA	WEST_TRIPURA	KHOWAI	P550
10	TRIPURA	WEST_TRIPURA	MET_AGARTALA	AWS400



AWS Installation - Mizoram

❖ AWS Installation is going in Mizoram. 8 New AWS have been installed covering 8 districts of Mizoram.

S NO.	STATE	DISTRICT	STATION	PROJECT
1	MIZORAM	AIZAWL	AIZAWL	P550
2	MIZORAM	AIZAWL	MIZORAM_UNIVERSITY	AWS400
3	MIZORAM	CHAMPHAI	CHAMPHAI	P550
4	MIZORAM	CHAMPHAI	CHAMPHAI_AWS	AWS400
5	MIZORAM	HNATHIAL	HNATHIAL	AWS400
6	MIZORAM	KHAWZAWL	KHAWZAWL	AWS400
7	MIZORAM	KOLASIB	KOLASIB	AWS400
8	MIZORAM	KOLASIB	KOLASIB_AMFU	P550
9	MIZORAM	LAWNGTLAI	CHAWNHU	AWS400
10	MIZORAM	LAWNGTLAI	LOWNGTLAI	P550
11	MIZORAM	LUNGLEI	LUNGLEI	P550
12	MIZORAM	MAMIT	LENGPUI_KVK	DAMU_200
13	MIZORAM	MAMIT	MAMIT	P550
14	MIZORAM	SAIHA	SAIHA	AWS400
15	MIZORAM	SERCHHIP	SERCHHIP	AWS400
16	MIZORAM	SERCHHIP	SERCHIP	P550



AWS Installation - Meghalaya

- ❖ AWS Installation will begin from first week of November.
- ❖ Among the 4 sites whose NOC is available, 3 AWS are already installed in nearby location. 4th one will be installed at Mynkre by November end. 3 more will be installed in Mawkyrwat, Resubelpara and Ampati by Nov'22

S NO.	STATE	DISTRICT	STATION	PROJECT
1	MEGHALAYA	EAST_GARO_HILLS	WILLIAMNAGAR	P550
2	MEGHALAYA	EAST_KHASI_HILLS	SHILLONG	P550
3	MEGHALAYA	JAINTIA_HILLS	JOWAI	P550
4	MEGHALAYA	RI_BHOI	UMIAM_AMFU	P550
5	MEGHALAYA	SOUTH_GARO_HILLS	BAGHMARA	P550
6	MEGHALAYA	WEST_GARO_HILLS	TURA	P550
7	MEGHALAYA	WEST_GARO_HILLS	TURA_KVK	DAMU_200
8	MEGHALAYA	WEST_KHASI_HILLS	NONGSTOIN	P550
9	MEGHALAYA	WEST_KHASI_HILLS	NONGSTOIN_KVK	DAMU_200



AWS Installation

- ❖ **AWS Installation is undergoing in Nagaland and Manipur.**
- ❖ **AWS Installation in Assam and Arunachal Pradesh is yet to be started.**



MoU and Data Sharing

- ❖ As informed by Head, RMC Guwahati, MoU to be signed with states has been sent to IMD HQ, New Delhi for vetting. Same will finalized and signed at earliest.
- ❖ Data sharing of existing AWS either in power stations or nearby area will be done with concerned Power Corporations.



Thank You



भारत मौसम विज्ञान विभाग
INDIA METEOROLOGICAL DEPARTMENT



Memorandum of Understanding

Between

Indian Metrological Department, Govt of India

And

Power Utility

**This memorandum of understanding entered into this day of Two Thousand
Twenty-Two Between:**

**Indian Metrological Department, Ministry of Earth Science, Government of India having its
office in Mausam Bhawan, Lodhi Road, New Delhi – 110003 as party of First part**

AND

**Power Utility, a company incorporated under companies Act,1956 having its registered
office at as party of Second part**

And Whereas Indian Metrological Department intend to set up Automatic Weather Stations in the premises of Grid Substations of Power utility in the state of for collection of local weather data for improving weather forecasting and for early warning of severe weather conditions and that improved weather forecasting shall help in load forecasting for the power system operator and accordingly approached

And WHEREAS the Second party is the absolute owner of the Grid Substations and has agreed to let space inside the premises of Grid substations to be utilized for setting up Automatic Weather Stations by the first Party.

NOW THEREFORE, it is hereby agreed between the first party and second party as per following terms and conditions: -

- 1. That the Second Party is allowing the First Party to use the said space of size 10m X 10m or lesser for setting up Automatic Weather Stations (AWS) and that the first party shall never claim any right to the interest over the property.**
- 2. That the Second party shall not claim any rents after execution of the MoU and commencement of lease period. The commencement of lease period shall be from the date of execution of this MoU.**
- 3. The MoU will be valid for a period of years from the date of signing of the agreement which can be further extended on mutually agreed terms and conditions.**
- 4. That the first party shall arrange electricity connection at his own cost without any obligation to the second party and the first party shall pay the bill for the electricity consumed.**
- 5. That second party shall allow the employees/contractor of the first party to access the site/land for repairing, maintenance, renovation etc. whenever necessary. For that, the valid identity proof of the employees of first party is to be produced to the second party's authority.**
- 6. That the second party shall not allow any obstruction to be made to the full view of the AWS. However, the second Party will not be liable for any damages due to unavoidable or natural reasons.**

7. That the first party will not enter into any agreement with any third party for the same purpose on the said space under any circumstances.
8. That the first party will take the responsibility in case of any damage caused to the said Grid substation due to any incidents/damage in the AWS which directly or indirectly led to loss of property of the second party.
9. That it is the duty of the first party to maintain and keep the AWS in good condition and ensure safety and security as per norms.
10. That any activity of first party shall never cause any obstruction/hindrance/harm to second party's activities.
11. That the first party has to remove his garbage from the site at his own cost and should keep the space clean.
12. That the first party will remove the AWS in case the second party has to construct additional facilities or extend the Grid station infrastructure during the contract period and may reinstall the AWS in alternate space provided by the second party.
13. The first party shall provide real time weather condition data/analyzed results/forecast/early warning/warning of weather conditions of the local area/ whole state to the second party without any financial implications to the second party.
14. That the first party shall allow access to the second party real time weather condition data/analyzed results/forecast/early warning/warning of weather conditions of the local area/ whole state as and when required by means to be decided mutually and shall also push such required data to suitable system of the second party without any compensation.
15. That the MoU is subject to the jurisdiction of the court in Guwahati.
16. That during this agreement period if any of the parties want to remove the AWS or the second party needs the place for own purpose or for any unavoidable reason, a notice giving Ninety (90) days' time ahead must be served by either party over the other, for such removal.
17. No variation of this agreement shall be effective unless it is in writing and signed by competent authorities on behalf of both first and Second Party.

18. The agreement can be terminated at the option of first or Second party by giving advance notice of 06 (six) months from either side. Upon termination, both parties will not seek any compensation from each other.

IN witness whereof the parties have executed these presents through their authorized representatives at Shillong

Signed by,
for and on behalf of the First Party

Signed by
for and on behalf of the Second Party

Witness 1

Witness 1

Witness 2

Witness 2