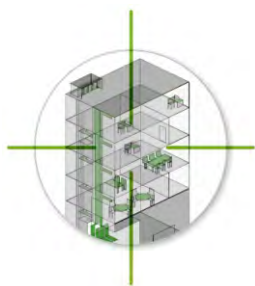


efficienergi

A whole new way to comprehensively manage and solve problems in
Modern industrial and commercial electrical networks



secqr is a whole new way to comprehensively manage and solve
problems in modern industrial and commercial electrical networks

Safety Efficiency Compliance Quality Reliability

In diagnoses conducted across 45,000+ electrical network locations
in 250+ industries, secqr[®] identified electrical faults in 8,000+ locations.



Data Acquisition



Remote analysis



Risk assessment



Actionable report & recommendations



Risk Mitigation

“

At a Glance

We offer expertise and tech applications that improve Reliability and Efficiency of Commercial and Industrial Electrical networks, while delivering Safety and Compliance.

”

Expertise & Traction

Pioneers, Policy enablers and Paradigm shifters

BIS Committee members, contributor to national regulation



Up-to-date Domain knowledge

Delivered > 20 workshops/training globally and authored 4 technical papers

The go-to-partner for Consultants, Electrical Contractors, End Users

efficienergi

Backed by leadership team with extensive IT product & solution development expertise for global clients

Pulse of Real Problems

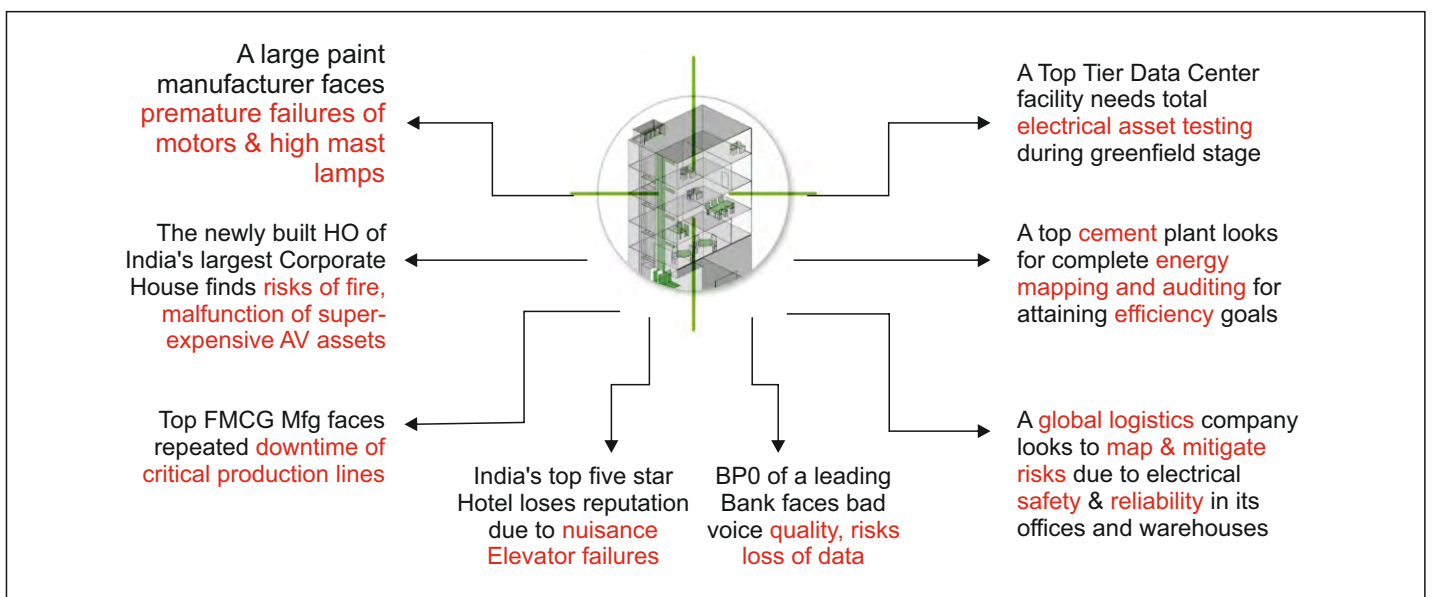


Experience of serving 500+ small and large facilities in 15+ sectors

Technology Vision & Imagination



Problems we solve...





A STORY

We believe that we are only as good as the good we do!

So people ask us, "What's different about Efficienergi?" the answers reside in the many specific examples of the studies where we have helped our Clients to achieve remarkable goals, solve complex problems or make meaningful progress.

Efficienergi's strengths, as recognized by the clients!

- Client's interest first, with vendor neutral advise
- Commitment to get to the root causes
- Identifying the problems & solutions faster than anyone else
- Complete solution capability- design simulation to predictive analysis

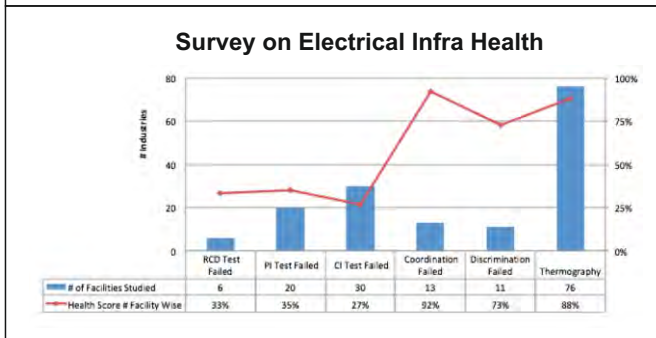
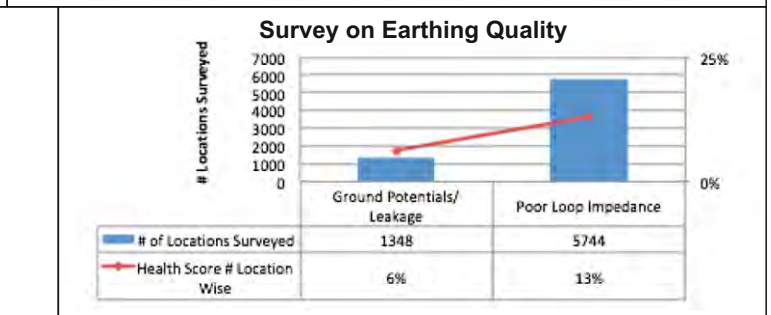
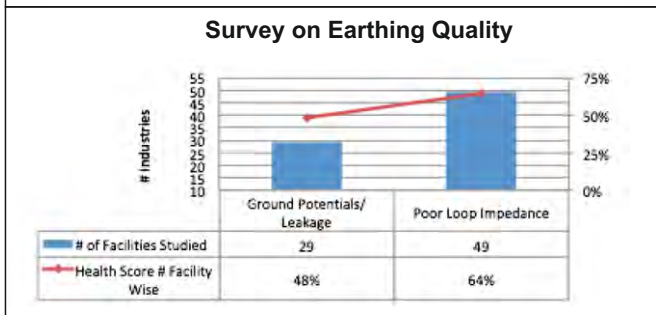
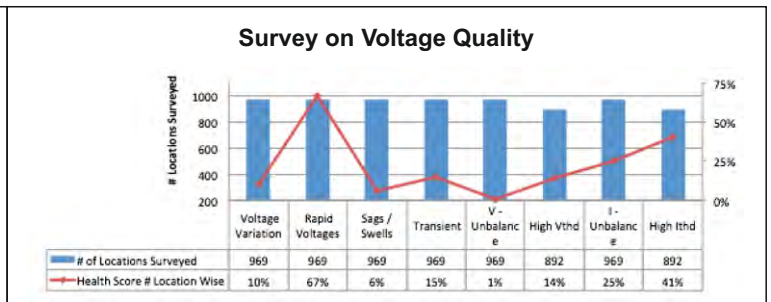
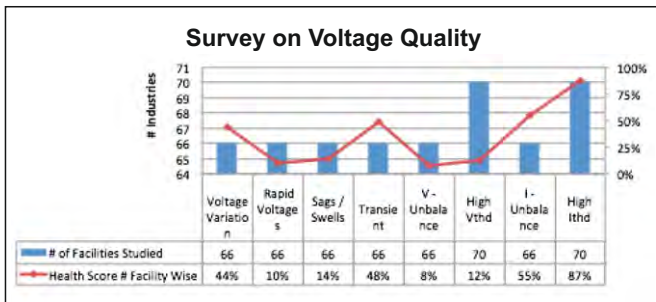
Unmatched benefits for Clients!

- Eliminates unpredictable downtime, equipment breakdown
- Longer equipment life and improved performance
- Reliable, Healthy electrical network
- Improved energy efficiency & safety

THAT MATTERS

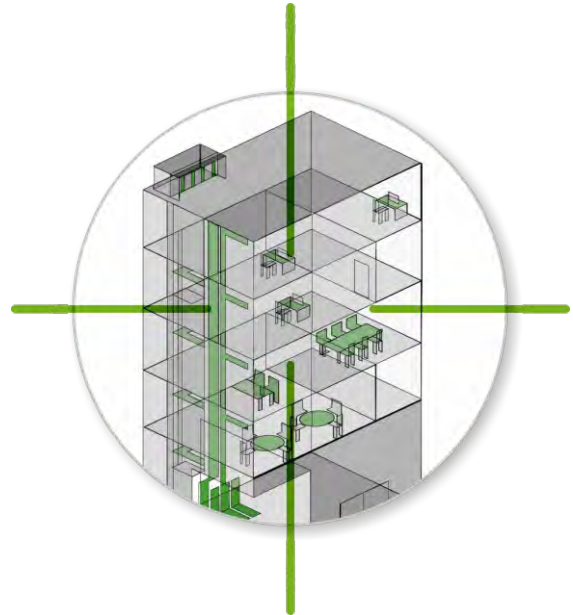


In our over a decade long endeavor of working towards the betterment of Commercial and Industrial Electrical Networks, we noticed that there are lakhs of facilities that are suffering due to poor health of the network, and so close to a major breakdown. The evidence was in the variety of issues and problems that were being conveyed to us in form of inquiries. Seemingly trivial issues are usually the indicators of highly fatal accidents, and a need for better management of Electrical Networks is beyond debate. And this is the solution we have developed to tackle this ever-growing problem. Following are the discoveries about Electrical Infrastructure Health from all the activities that are carried out by Efficienergi.



secqr® is a platform specially designed for electrical network testing and analysis, has automated tests that cover the entire electrical network - from power distribution to the last mile electrical equipment. It has the potential to revolutionize the way we manage electrical network

Our Solution



...a whole new way to spot and navigate the energy **berg**

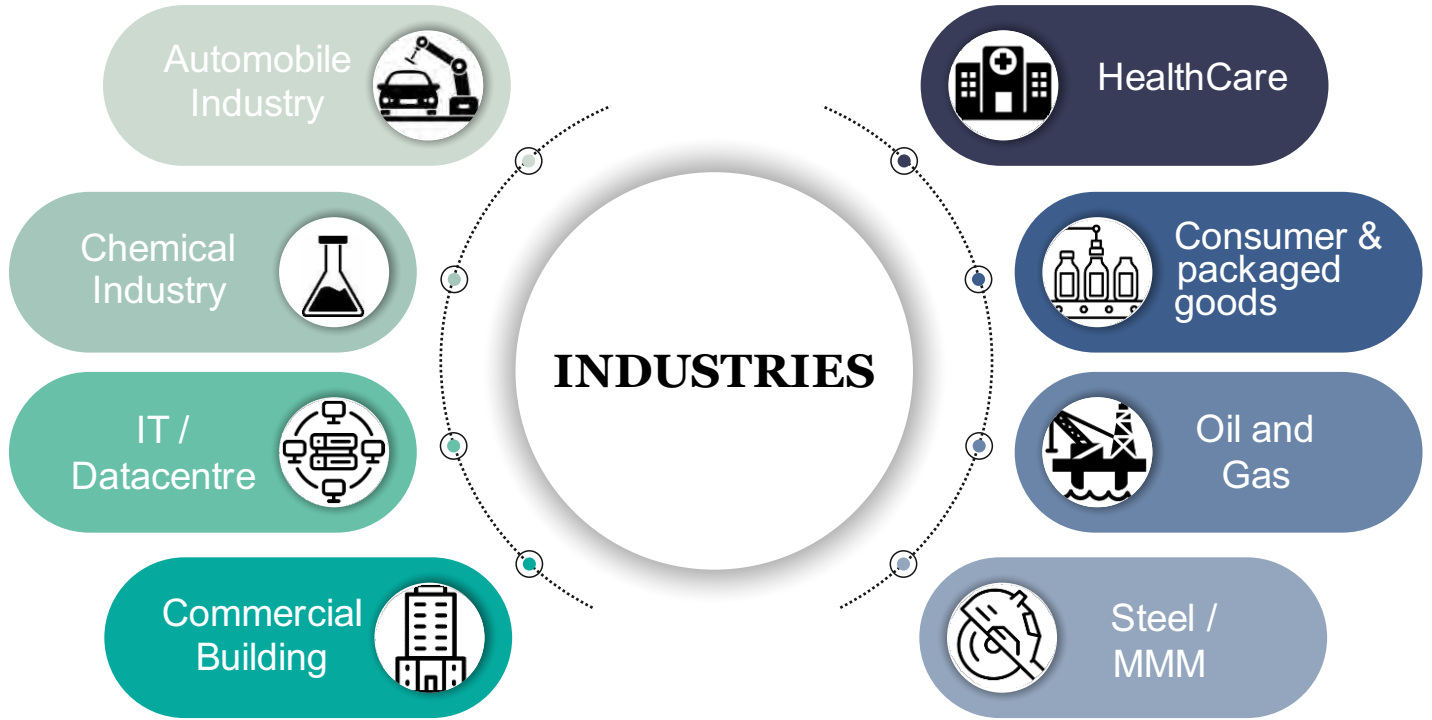
Safety Efficiency Compliance Quality Reliability
 secqr® is already used to monitor over 500 unique electrical health parameters. In diagnoses conducted across 60,000+ electrical locations in 250+ facilities, secqr® identified electrical faults in 12,000+ locations.

The new standard for improving electrical network health

Facilities	Greenfield	Operational	Expansion / Upgrade
Partners	<ul style="list-style-type: none"> • Design/EPC Consultants • T&C Consultants • Electrical Contractors 	<ul style="list-style-type: none"> • Facility Management Services • Internal Maintenance Teams • Electrical Contractors 	<ul style="list-style-type: none"> • Facility Management Services • Maintenance and Projects Teams • Consultants • Electrical Contractors
Studies / Tests	<ul style="list-style-type: none"> • Power System Studies • Site and Field Acceptance • Third Party testing for Critical Infrastructure • Site/Equipment commissioning Tests 	<ul style="list-style-type: none"> • Power Quality Audits • Advanced Diagnostics for Predictive Maintenance • Electrical Safety • Root Cause Analysis 	<ul style="list-style-type: none"> • Earthing Diagnostics and Compliance Review • Energy Audits • Advanced PQ/Electromagnetic studies

Industries we have served

At secqr®, we don't believe that one size fits all. That is why we provide tailor made rewarding solutions designed for each client's industry.



Benefits

Calculates RoI for suggested investments to improve network health

Gives Instant Reporting for immediate actions

Empowers with historical analysis to spot patterns and trends over long-term

Facilitates quick and exact retrieval from vast data through digital storage and search



First Cloud-based, mobile enabled application in its league

Provides risk quantification for the facility's reliability and safety

Converges insights in a central cloud, as opposed to site based registers

Enables self-servicing for electrical/ maintenance staff with easy structured procedures

Efficienergi's Offerings



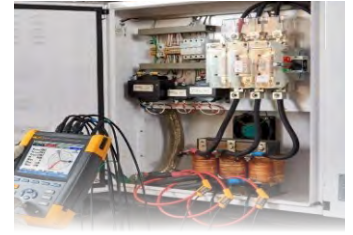
Greenfield Testing



Greenfield Power Quality



Electrical Safety Audit



Power Quality as a Service



Power System Studies



Electrical Network Health Analysis



Root Cause Analysis

1. FAT/SAT/Third Party Testing

a. Bus duct heat run test

When –

At the time of installation in any mission critical project, Bus ducts are loaded electrically to its full current carrying capacity in order to make sure they can withstand this loading scenario for a prolonged period of time, if need arises, as well as their capability to handle the heat generated during this process

Why Us –

- Efficienergi uses a unique, innovative and effective methodology to carry out this test, which is called LVHC method (Low Voltage High Current)
- Distribution Transformer of the facility itself is used to charge the Bus duct with the help of a Low Voltage and High Current Transformer
- This methodology consumes only 3% of what a conventional Heat Load test consumes
- No extra heavy cooling arrangement is required, thereby saving even more energy
- It is a much safer way to conduct Bus duct Heat Run

Benefits –

- Verify the capability of the bus duct installation to its full load condition before the electrical network is even online
- Doesn't depend on any other tests/connections apart from those of bus duct itself, therefore can be initiated ASAP
- Save up to 97% of Energy costs in comparison with the conventional method
- No external load banks required
- It's a 3 in 1 Package! Bus duct Heat Run, Primary Injection and Transformer losses tests done in one go.
- Complete Thermography report for the entire length of route, on hourly intervals
- Get Voltage drop along with watt losses at full load condition
- Bus duct impedance parameters compared with guaranteed specifications of OEM
- Complete voltage and current profile for the entire duration of the heat run test

12850 Meters of bus duct have already been tested through Low Voltage High Current Methodology

The longest length of busduct tested by is no less than 250 Meters!

As of now, a staggering Half a Million KWh of energy is saved due to this testing method!

That means 479 tonnes of CO2 prevented from being released in the Environment

Busduct Route Name	Busduct Route Description	Date & Time	Start Time	End Time	Busduct Rated Current (A)	Busduct Test Current (A)	Busduct Load Loss (kW) at Rated Current prorated from Test Current	Busduct Line Voltage Drop (V-LN) at Rated Current prorated from Test Current	Busduct Line Voltage Drop (%) at Rated	Busduct Route Length (Mtrs)	Nos. of joints across Length	Mat Hot Spot Temp (°C)	Reference Temp (°C)	Remarks/ Observation by Test Engineer
TX-L2/3 to Genset-L2/3 2.25MVA	TX-L2/3 to TX-PANEL-L2/3 1F2 to TX-PANEL-L2/3 2F2 to GENSET-L2/3 2.25MVA	10/9/2020 12:35:24	7:15:00PM	9:15:00PM	3200	1788.00	35.25	31.29	7.60	82	61	69	64	
TX-L2/3 to USB-L2-B2 to EMSB-L2/B2	TX-L2/3 to TX-PANEL-L2/3 1F2 to TX-PANEL-L2/3 3F2 to EMSB L2/3 MAIN INCOMER to ' USB-L2-A2 1F2 to GSB-L2-B2 to USB-L2-B2 to EMSB-L2/B2	10/9/2020 12:43:26	3:40:00PM	9:15:00PM	3200	2265.00	22.88	16.83	4.01	172	94	52	49	
TX-L2/3 to RM-TX-STBY-2-L2	TX-L2/3 to TX-PANEL-L2/3 1F2 to TX-PANEL-L2/3 3F2 to EMSB L2/3 MAIN INCOMER to ' USB-L2-B2 PNL-GSB-L2-B2 to RM-TX-STBY-2-L2	10/9/2020 12:50:52	3:50:00PM	9:10:00PM	3200	2371.00	19.96	13.80	3.44	166.1	25	45	40	

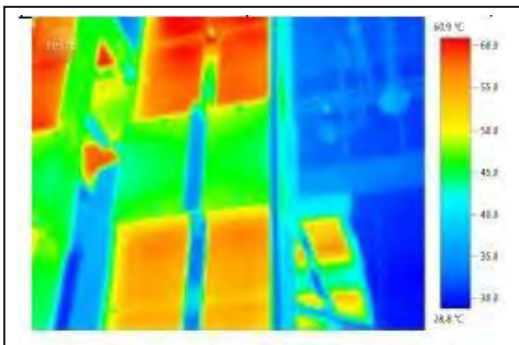


Bus Duct Heat Run Test

Images:

1. Joint Details:

Route Name	Joint Name
Busduct Rating(A)	Ambient Temperature (°C):
Thermal Image No	Visual Image No
Hotspot Temp (°C):	Ref Temp (°C):
load Current (A):	Date/Time of Image:
Hotspot / Issue if any	Distance from Object :



Thermal Image



Visual Image

b. Transformer Routine Test

When –

As Transformers are one of the most vital components of Electrical Network, extremely important for supplying quality power to the loads, it is necessary to test it thoroughly before it is included as part of the power system. That is why, as part of Site Acceptance Test (L2), the Transformer is made to go through various routine tests to check its health and adequacy.

Why Us –

1. Efficienergi has over a decade of experience in greenfield testing and has now poured it all into secqr® to bring forth a smoother, better, automated experience to the clients when it comes to third party testing
2. We possess the capabilities of performing all the required tests, including but not limited to
 - a. Voltage ratio test
 - b. Hi-pot test
 - c. Winding resistance test
 - d. Insulation resistance test
 - e. Magnetic Balance test
 - f. Vector group test
 - g. Magnetising current test
 - h. Tan delta test
 - i. Partial discharge test
 - j. No load and Full load losses test
3. Immediate on site results to spot abnormalities in time, especially on mission critical facilities

Benefits –

1. Checks against proper installation of the transformer on site
2. Get assurance on the health and capabilities of the transformer
3. Ensure it is manufactured exactly as per requirement
4. Make sure the Transformer can withstand fault conditions to expected levels
5. Peace of mind when it comes to charging the Transformer up

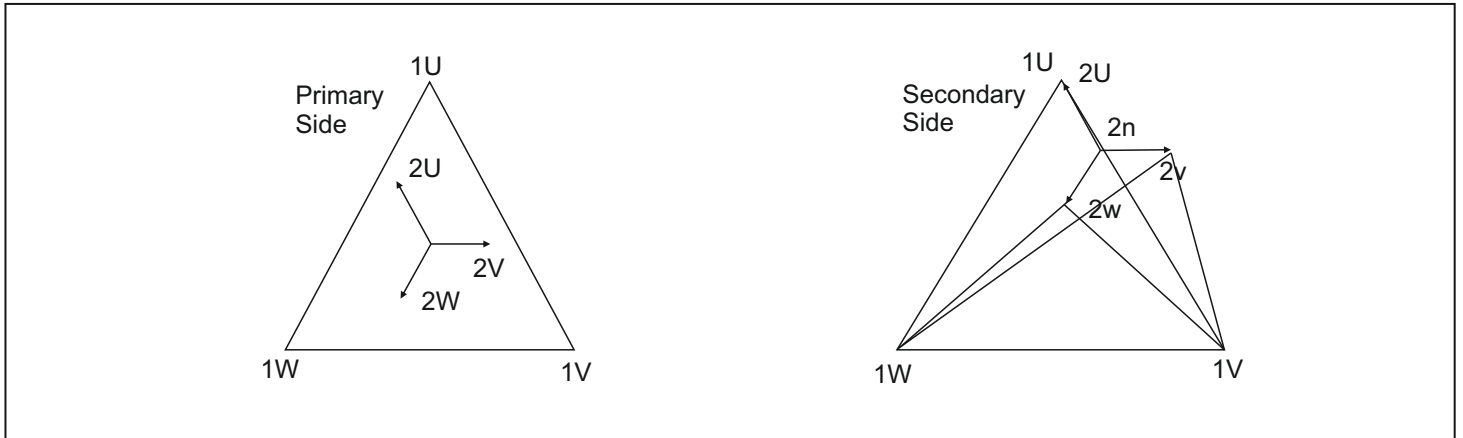
Name of the Test	Status of Test	Result
Winding Resistance Test		Good
Vector Group Test		Good
Insulation Resistance Test		Good
Voltage Ratio Test		Good
Magnetic Balance Test		Good
Magnetic Current Test		Good
Hi-Pot Test		Good

Note : ✓ = Test Conducted ; X = Test not Conducted

Serial Number	8501472	Number of taps	7	HV Current in Ampere	39.37	Manufacturer	SGB INDIA
KVA Rating	2250	Nominal Top	4	LV nominal Voltage in Volts	433	Date of Manufacture	2001
Impedance Percentage (%)	5.77	HV Voltage in Volts	33000	LV nominal Current in Ampere	3000.18	Vector Group	Dyn11

Transformer Name	Measurement Side	Test Condition	Measured Voltage_ Primary UV (Volts)	Measured Voltage_ Primary VW (Volts)	Measured Voltage_ Primary WU (Volts)	Measured Voltage_ Secondary uv (Volts)	Measured Voltage_ Secondary vw (Volts)	Measured Voltage_ Secondary wu (volts)	Measured Voltage_ Secondary uN (Volts)	Measured Voltage_ Secondary vN (Volts)	Measured Voltage_ Secondary wN (Volts)	Magnetic Unbalance (%)	Magnetic Unbalance (Volts)	Result	Remarks by Test Engineer
TX 26	Secondary	R-open	401	305	95	0.58	5.34	0.74	0.11	3.19	3.09		0.24	Good	
TX 26	Secondary	Y-open	-	-	-	0.67	0.7	5.37	3.11	0.14	3.1		-0.84	Good	
TX 26	Secondary	B-open	-	-	-	0.37	0.74	0.88	3.11	3.11	0.12		-0.85	Good	
TX 26	Primary	R-open	168	401	232	-	-	-	-	-	-		0.58	Good	
TX 26	Primary	Y-open	65	401	353	-	-	-	-	-	-		-14.97	Good	
TX 26	Primary	B-open	402	311	89	-	-	-	-	-	-		0.44	Good	
TX 26	Primary	B-open	402	310	88	-	-	-	-	-	-		0.88	Good	

Transformer Vector Test (Dyn11)



**Transformer
Routine Test**

c. HT/LT Panel and Panel components (Busbar, MFMs, Cables, CT & PT, Relays, VCBs, Switchgears, etc) Testing and inspection

When –

At the time of installation, it is crucial that every Electrical component that is to be a part of the Electrical Network is tested thoroughly from all aspects, to make sure it the risk of malfunctioning/faults/accidents/interruptions is minimised. It is also check if they are able to function for the task they are supposed to carry out perfectly, and their capability is more than what is expected of those components.

Why Us –

1. A Neutral, third party perspective is necessary especially in minute testing including individual equipment (L2 level) testing, as it becomes the foundation on which the entire commissioning of the Facility is built, and how the Electrical Network will perform as in integrated system.
2. Third party testing of electrical components helps accurate discovery of abnormalities, potential hazards and error in connections based on quick test results; therefore enabling clients to take immediate mitigation actions for the following tests

a. HT panel Testing

- i. Contact Resistance test of VCBs
- ii. Time interval test of VCBs
- iii. Primary injection of CTs
- iv. CT and PT ratio test
- v. Hi-pot test of HT panel
- vi. Insulation Resistance test of HT panel
- vii. Testing of MFM for accurate readings

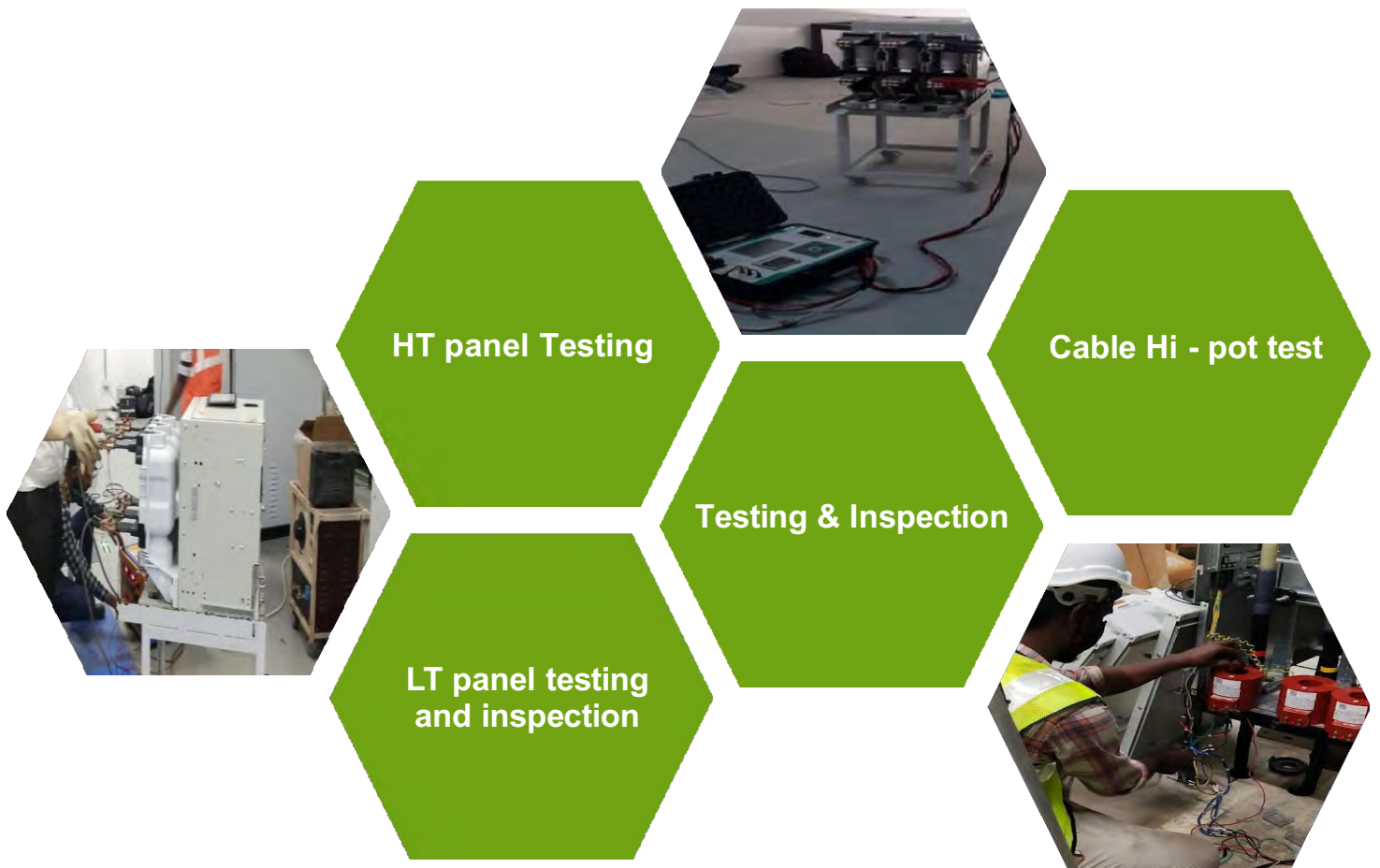
b. LT panel testing and inspection

- i. Primary Injection test of ACBs
- ii. Insulation Resistance test
- iii. CT polarity test
- iv. Visual Inspection

c. Cable Hi-pot test

Benefits –

1. Point by point visual inspection and summary, including specific actions to be taken for each panel
2. Verification of installation and functioning of each and every element that is tasted
3. Dedicated technical analysts for faster and more accurate data analysis as well as report generation
4. Ensure highly robust power system installation as per the design
5. Reduce margin of error and ensures seamless performance from commissioning to steady state operations



d. Thermography throughout commissioning

When –

Thermal scanning is required at multiple stages throughout commissioning, to be executed as repetitive checks to make sure that Electrical Components have the ability to withstand the heat generated as they go through various tests and operating conditions, and that there are no thermal anomalies that may later translate into fire hazards. It is a non-destructive test method that is used to detect poor Connections, unbalanced loads, deteriorated insulation, or other potential problems in energized electrical components.

Why Us –

1. Efficienergi has thermography experts and analysts that are Level 2 ASNT (American Society of Non -Destructive Testing) trained professionals who provide excellent capabilities when it comes to thermography test execution, reports and recommendations
2. We provide dynamic Standards selection in which the consultant will get compliance reports based on Standards requirement that includes ASTM E 1934-99A 2018, BIS IS 16168 2014, NFPA 70 2017 etc.
3. Coming from over a decade of experience, we seamlessly execute Thermal scanning on
 - a. Bus ducts
 - b. Panels
 - c. UPS terminals
 - d. PDUs
 - e. Batteries
 - f. Everything else required by the client/consultant

And provide timely, accurate, actionable insights in the form of reports to empower immediate improvement

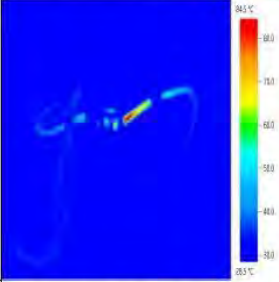

4. Efficienergi uses only the best Industrial Thermal Cameras from top technological innovators for supreme accuracy and precision when it comes to data collection

Benefits –

1. Minimize fire hazards during the commissioning stages and in operations
2. Prevent failure of electrical equipment due to thermal breakdowns or insulation failures
3. Integrated in the commissioning process right since charging of electrical assets/Heat run tests, a thermal anomaly free Electrical Network can be assured till the time of Integrated Systems Test (IST)
4. Move to predictive maintenance when the facility shifts to operations with the help of asset profiling



Loading Details						
Measured Load-R (A)	Measured Load-Y (A)	Measured Load-B (A)	Measured Load-N (A)	Max Loading % w.r.t Object Rating	Max Loading % w.r.t Conductor Rating	%Unbalance
1063.00	1075.00	1083.00	0.00	86.64%	138.85%	1.86%
Thermal and Visual Images of scanned Object						
Thermal Image1 Ref No. (Same Object)	Thermal Image1 (Same Obj)	Visual Image1 Ref No. (Same Object)	Visual Image1 (Same Obj)			
7118		7118				
Hotspot Location, Ambient Temperature, Hotspot Temperature and Reference Temperature Measurements						
Hotspot Location Phase ref if applicable	Hotspot Location Object Ref	(T1) Ambient Temperature (°C)	(T2) Hotspot Temperature (°C)	(T3) Reference Temperature (°C) of the same object		
B Phase	Lugs	28	67	58		
Priority Table						
Priority wrt Temp. Rise over Ambient Temp of the Object.						
Indicates possible sign of deficiency; Record and Continue to monitor.						

Loading Details						
Measured Load-R (A)	Measured Load-Y (A)	Measured Load-B (A)	Measured Load-N (A)	Max Loading % w.r.t Object Rating	Max Loading % w.r.t Conductor Rating	%Unbalance
14.45	14.20	14.00	0.00	23%	48%	36%
Thermal and Visual Images of scanned Object						
Thermal Image1 Ref No. (Same Object)	Thermal Image1 (Same Obj)	Visual Image1 Ref No. (Same Object)	Visual Image1 (Same Obj)			
33092		33092				
Hotspot Location, Ambient Temperature, Hotspot Temperature and Reference Temperature Measurements						
Hotspot Location Phase ref if applicable	Hotspot Location Object Ref	(T1) Ambient Temperature (°C)	(T2) Hotspot Temperature (°C)	(T3) Reference Temperature (°C) of the same object		
R Phase	Lugs	27	83	30		
Priority Table						
Priority wrt Temp. Rise over Ambient Temp of the Object.						
Undesirable-urgent discrepancy must be repaired immediately						

e. Greenfield testing of the Earthing network

When –

Earthing system is one of the most vital components of any electrical system, in terms of both personnel as well as equipment safety. It is crucial to make sure that the Earthing that is being installed in the Greenfield stage is adequate; properly set up and capable of providing protection to the personnel and the equipment that it has been connected to.

Why Us –

1. Efficienergi's secqr® is a perfect testing ecosystem for Earthing Tests during the Greenfield stage given it's features such as

- Quicker and efficient Data collection through Mobile App
- Instant on-site test results
- Automated report generation
- Actionable recommendations

So that the health of the Earthing system sockets/earth pits/panels that are being tested will be quickly determined, and next actions will be decided if deemed necessary.

2. Efficienergi's scope for Earthing Network tests is inclusive but not limited to

- Earth Pit Resistance Test
- Earth Continuity Test
- Earth Loop Impedance test for Breakers
- Earth Loop Impedance test for single Phase and 3 Phase Sockets

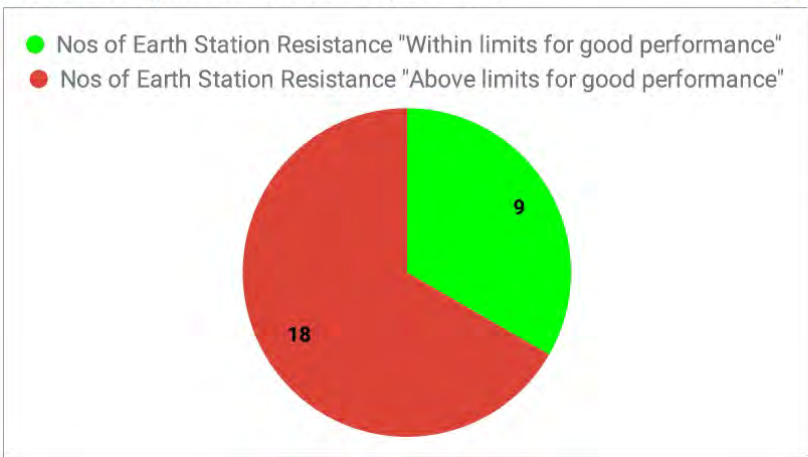
3. Supports multiple reference Standards so that the client/consultant demands are fulfilled

Benefits –




- Get instant compliance in consonance with standards Ensures safe path for fault current to be earthed
- Avoid fatal human/equipment related accident Avoid short circuit and Arc flashover Prevent failure of electronics/ sensitive equipment
- Ensures safety of humans/equipment during load side fault
- Reduces chances of nuisance tripping
- Ensures proper and timely working of RCD/RCCB/RCBO
- Ensure proper health of Earth Pits and Earthing installation

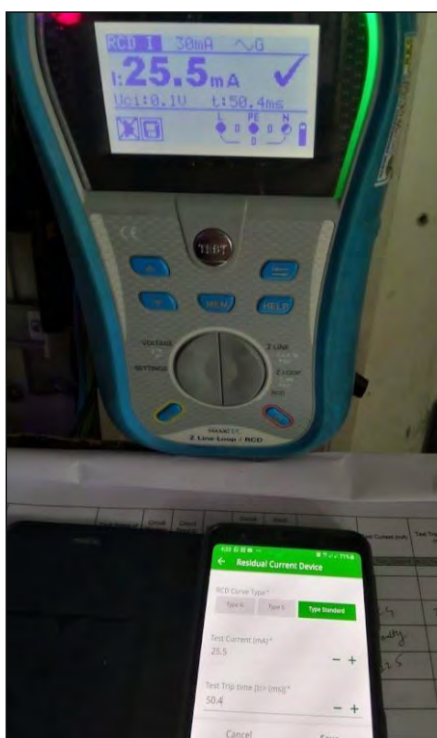
Summary

Total Nos of Locations for Earth Resistance Measurement	27
Nos of Earth Station Resistance "Within limits for good performance"	9
Nos of Earth Station Resistance "Above limits for good performance"	18
% of Earth Station Resistance Values "Within limits for good performance"	33%
Type of Industry where the Earthing Station Resistance is being monitored	Supply Chain



Earth Pit Resistance Test

Sr. No.	Location Name	Nos of Earth Electrodes Connected Parallel in Grid	Earth Pit No (EP#) as per Earthing SLD / GA	Individual Earth Pit / Earth Grid Detailed Name (as per Earthing SLD/GA)	Earthing Application	Type of Earthing	Depth of Individual Earth Electrode (Meters)	Distance of Nearest Earth Electrode (Meters)	Measured Earth Resistance Individual (Ω)	Measured Earth Resistance in Grid (Ω)	Test Engineer Remarks	Image	Final Result
1	Near Office	11	EP 01	EP 01	Bonding Earth	CU Plate Earthing	3	3	5	5	Earthing nut bolts are corroded.		Pass
2	Near Office	1	EP 02	EP 02	Bonding Earth	Pipe Electrode Earthing	3	3	3.3	3.3	Earthing nut bolts are corroded.		Pass
3	Near Office	1	EP 03	EP 03	Bonding Earth	Pipe Electrode Earthing	3	3	166	166			Fail



2. Power Quality during Commissioning Phases

When -

The Electrical equipment that is installed at Mission Critical facilities such as Data Centers is required to be verified for proper installation, functionality and its compatibility with other complimenting electrical systems as well as with the Electrical Network on a more comprehensive, in terms of Power Quality during the commissioning of the facility.

Why Us -

1. Efficienergi has special proficiency in executing Advanced Power Quality Analysis in the Greenfield and ommissioning stages from L3 testing to the final Integrated Systems Test (IST).
2. For the reports, customized Analysis is done with national and international standards specific to the particular industry and to the equipment and its role in the electrical network.
3. Our efficient and reliable execution is matched with most accurate and near automated report generation to match the client requirements and Project timeline.
4. All the reports are based on measurements done in accordance with IEC 61000-4-30 Class A instruments made by industry leaders which afford the highest level of accuracy and repeatability in terms of results.

Commissioning Stages	Electrical Tests	Sample Deliverables in terms of reports
Level 3 Testing	<ol style="list-style-type: none"> 1. UPS Burn in/Heat Load Test 2. PDU Burn in/Heat Load Test 3. DG Burn in/Heat Load Test 	<ul style="list-style-type: none"> ● Trends of various Electrical Parameters for Complete Duration of Test
Level 4 Testing	<ol style="list-style-type: none"> 1. UPS Function Tests (Eg. step load and transients) 2. PDU Function Tests (Eg. Step Load and Transients) 3. DG Function Tests (Eg. Step Load and Transients) 	<ul style="list-style-type: none"> ● Trends of various Electrical Parameters for Complete Duration of test ● Event analysis and waveforms for each individual test ● Equipment Power Quality Compliance against various relevant national and international Standards
Level 5 Testing	<ol style="list-style-type: none"> 1. Integrated Systems Test 	<ul style="list-style-type: none"> ● Trends of various Electrical Parameters for Complete Duration of test ● Event analysis and waveforms for each individual test scenario at microsecond resolution ● Power Quality Compliance against various relevant national and international Standards

Benefits

1. Ensure the equipment installed is Electrically capable and up to the industry standards to perform the functions that are expected out of it
2. Observations based on behaviour of each of the equipment and the comprehensive Electrical Network under various load/source generated scenarios and what improvements can be made to bring it to the standard if found non-compliant
3. Tailor made reports on various National/International Standards compliances for equipment/scenarios/events as demanded by the client
4. Faster and more accurate report generation on account of dedicated technical analyst team

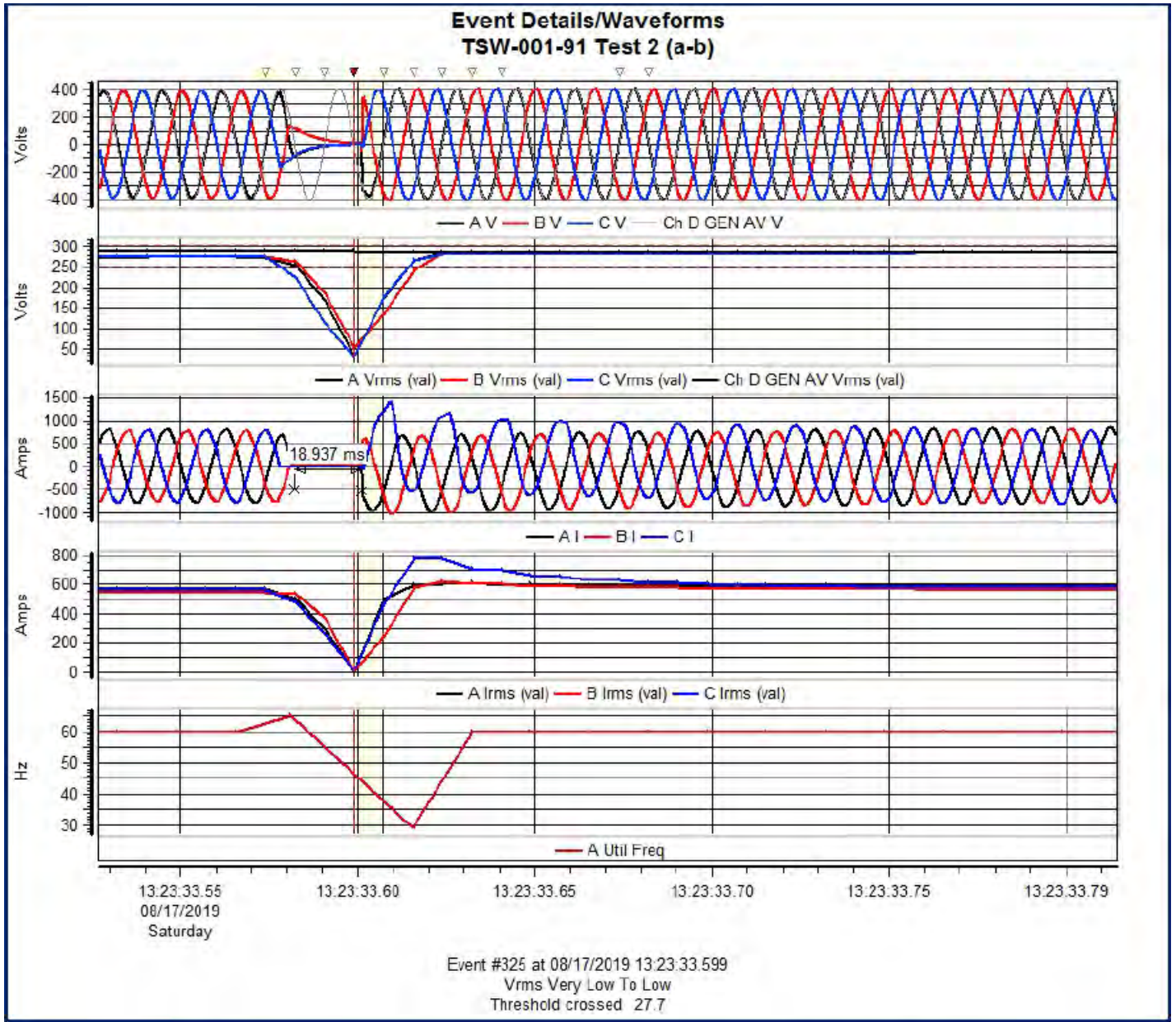


Figure 6 -- Waveform detail for TSW-001-91, Test 2, retransfer to utility (normal) supply.

Event Details/Waveforms TSW-001-91 Test 1 (a-e)

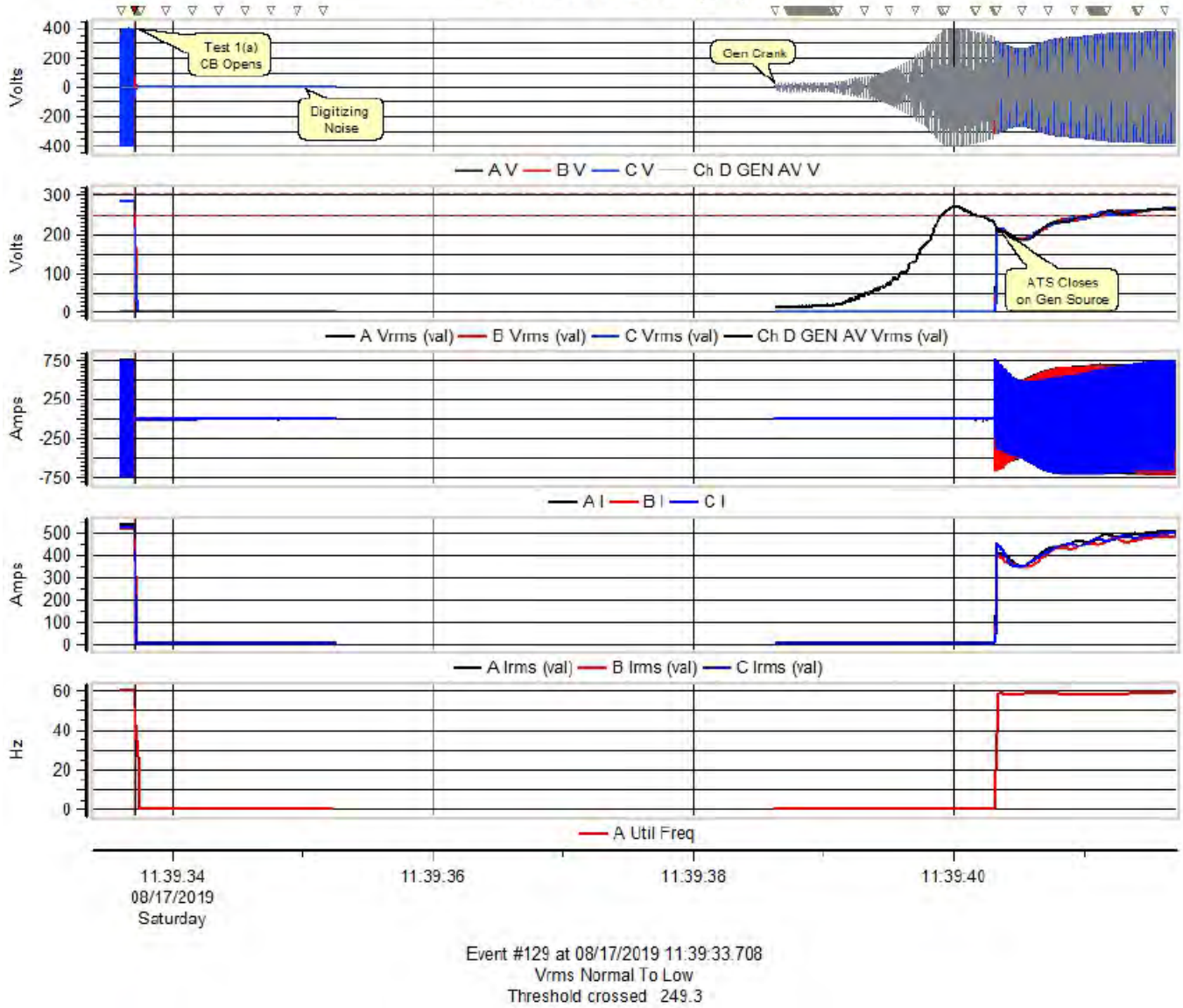
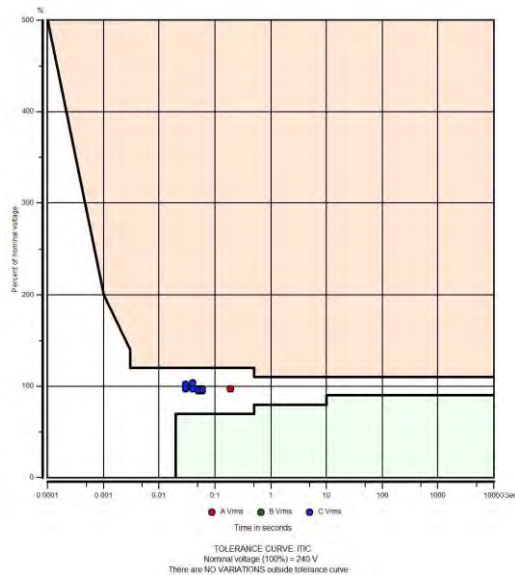
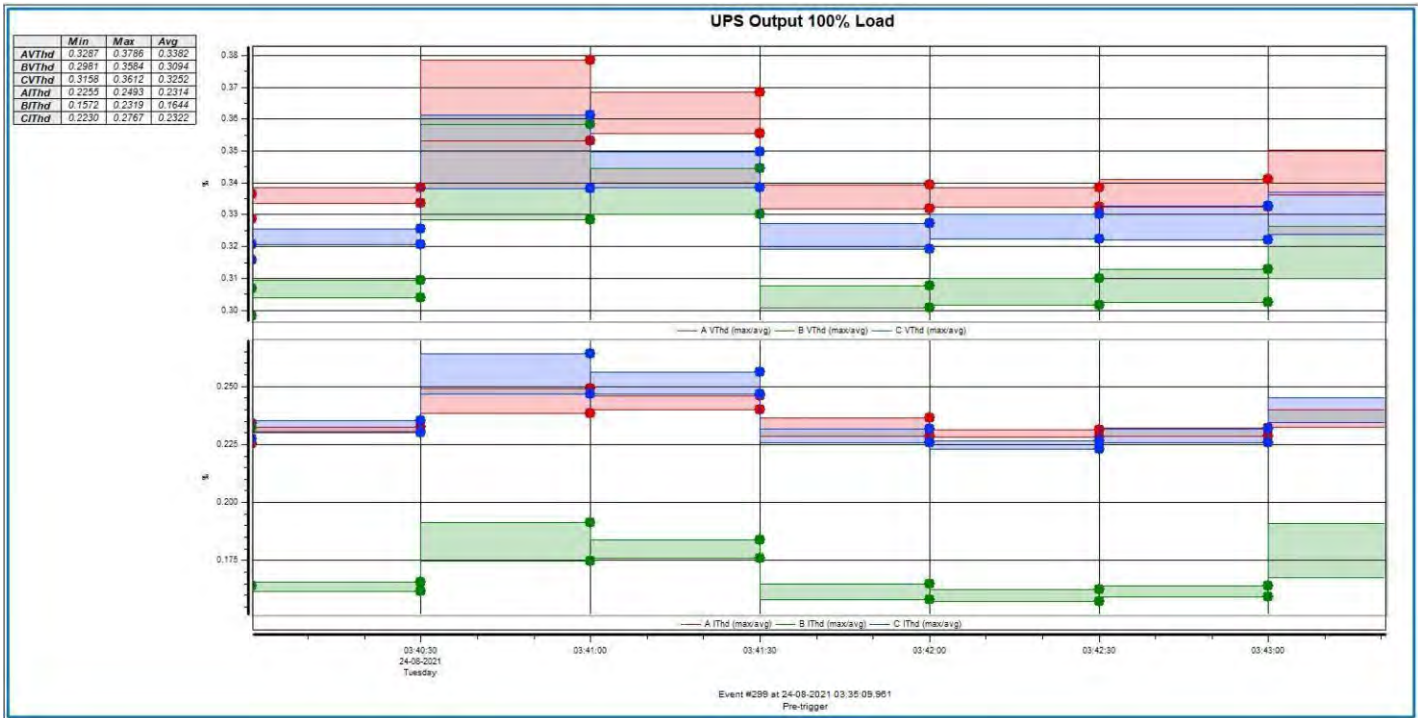


Figure 2 – Waveform detail for TSW-001-91 Test 1.





Advanced PQ Analyzers



3. Electrical Safety Audit

When -

1. Electrical Safety Audit is a physical examination of the safety of electrical installations of any industrial unit or organization. It is performed by enquiry, inspection, testing and verification.
2. Over 40% fire accidents across various Electrical Networks happen due to fault in electric circuits, connections and always electrical system is a threat to safety of people and their property in the form of shocks, burns, injury, fire and explosion which cause damage to expensive communication equipment, loss of data, fire in cable gallery, etc.
3. This is conducted to assist clients in reducing risk towards electrical safety hazards and help to ensure compliance with applicable National/International Safety Standards and Regulations.

Why Us?

1. Secqr[®] powered Data collection based on various modules/facets of an Electrical Network to accurately represent current Safety Scenario
2. Automated report generation consisting of Risk Assessment to help prioritize actions to be taken up
3. Gap analysis in between what is required as per safety regulations, applicable statutory rules, standards & what is existing as of today in the facility electrical installation
4. The executable recommendations as per Safety Regulations and Indian Standards to be followed in the electrical installations shall be given in the audit report.
5. Industry specific Modules and questionnaires based on different risk factors and Standards for effective assessment
6. Electrical Safety Audit with Efficienergi -
 - a. Electrical Safety Walkthrough a walkthrough and visual inspection in the facility to determine general safety scenario
 - b. Advanced Electrical Safety Audit in depth visual audit and measurements to find various risk elements in the facility, facility's compliance or non-compliance with relevant safety standards, and actionable recommendations to make that compliance

Benefits

1. Minimizes the risk of accidents and Safeguard your business:

In the audit process safety issues are identified and client takes preventive measures as per the audit recommendations by complying with legislation, regulatory requirements and standards of our country. The accidents are prevented well before they actually take place, rather than removing risks afterwards.

2. Reduces facility downtime and improve facility productivity :

The compliance to safety audit executable recommendations definitely reduces the facility down time causing due to accidents, wrong working practices taking place in the facility operation and other existing safety hazards. This improves over all facility equipment and manpower availability thereby improving the facility productivity. Importantly this results in to better product quality and faster delivery.

3. Savings in the facility operating cost :

Unsafe working by employees in operations and wrong electrical installation practices in the facility are identified during the safety audit. The corrective action is taken based on safety audit recommendations by client. This considerably reduces facility equipment breakdowns and expenditure thereon. However this also eliminates the possibility of some dangerous occurrence which might take place in the future. This prevents money leakage in day to day operations and may be very huge for one time occurrence of accident.

4. Add value to your money:

Observance for the safety and expenditure thereon improves the employee awareness and morale. This results into improvement in employee and employer relations. Employees feel secured and excel in their performance.




5. Enhance Your Reputation:


The organization's safety culture reputation and the respect both will gradually build up in the industrial world. Then they start getting the sincere, good class of employees, vendors and contractors too.

6. Bottom Line:

Safety is a key component for any organization to have a sustainable growth and in a nutshell the safety culture of an organization results in a happy customer and adequate profitability

Observations & Recommendations

Sr. No	Image	Observation, Recommendation & Regulation	Risk Level
1.	 <p>Dialysis Department - Medical Facility</p> <p>Auditor Observations : No fire extinguisher are provided as well as D.B is provided inside the group2 medical location</p>  <p>4th Floor Medical facility</p>	<p>Observations : Distribution boards are installed inside the group 2 medical locations</p> <p>Locations : #Dialysis Department - Medical Facility #4th Floor Medical facility</p> <p>Recommendations : As per IS:17512 Regulation-6 which state that in medical location of group 2 distribution board shall be installed outside the medical location in order to reduce the chance of human shock for critical patience</p> <p>Regulations : IS:17512, Regulation No- 7.1.Common Rules 7.1.1.1.1 Transformer for Medical IT system It is recommended that in group 2 ,distribution board shall be installed outside the medical location in order to reduce the chance of human shock for critical patience</p>	High
2.	 <p>4th Floor - Medical Facility</p>	<p>Observations : Distribution boards, installed outside the group 2 medical locations is not safely guarded against unauthorized person</p> <p>Locations : #4th Floor - Medical Facility</p> <p>Recommendations : As per IS:17512 Regulation-6 which state that in medical location of group 2 It is recommended that distribution board ,installed outside the medical location should be safely guarded against unauthorized persons</p> <p>Regulations : IS:17512, Regulation No- 7.1.Common Rules 7.1.1.1.1 Transformer for Medical IT system It is recommended that group 2 with distribution board ,installed outside the medical location should be safely guarded against unauthorized persons</p>	High

<p>3.</p>	 <p>Dialysis Department - Medical Facility Auditor Observations : TN-C Earthing system is used in electrical system</p>	<p>Observations: The Earth-Neutral combine (TN-C) Earthing system is used in medical locations and medical buildings downstream of the main distribution board.</p> <p>Locations : #Dialysis Department - Medical Facility</p> <p>Recommendations : As per IS:17512 Regulation-5.5.1-Types of System Earthing which state that "The TN-C system is not allowed in medical locations and medical buildings downstream of the main distribution board "if this type of system are used in hospital then it lead to patient life on risk</p> <p>Regulations : IS:17512,Chapter No-5 Regulation No- 5.1 The TN-C system is not allowed in medical locations and medical buildings downstream of the main distribution board.</p>	<p>High</p>
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4. Power Quality Analysis as a Service (PQaaS)

When -

1. Every load profile requires Power Quality that is uniquely suitable to its necessity, in order to achieve safe and reliable power in the network. Usually, minor issues are ignored as a onetimething, but they are the early indicators of Poor Power Quality. Actions taken in due time can reduce the risks of hazards/accidents that may occur otherwise, and further optimize network health drastically.
2. Power Quality Analysis using a PQ Analyser helps to understand issues deep inside your electrical network and how they affect the facility and equipment performance, safety and reliability; thereby preventing potential faults and hazards from taking place and ensuring smooth, continual operations of the Electrical Network

Why Us-

1. Efficienergi is a third party Electrical Testing Consultancy with primary its focus being Power Quality
2. It's founders and directors are thought leaders and pioneers for Power Quality in India, BIS committee members and recognized contributors to national regulations
3. Given the more than two decades of cumulative experience in Power Quality; Efficienergi not only holds expertise in various domains of Power Quality and in various industries, but also uses cutting edge technologies to further raise the ceiling of Power Quality and its applications
4. secqr[®], our flagship cloud analytics platform integrates seamlessly with IEC 61000-4-30 Class A Advanced Power Quality Analysers for remote monitoring and control as well as automated data collection
5. For long term monitoring, We use PQube3 which is an advanced Power Quality analyser used for precise data recording and high-end cloud communication in integration with secqr[®]; for automated event alerts and daily/weekly/monthly/yearly reports can be automatically generated as per client requirement and sent to the client in form of E-mail

6. Efficienergi offers services in various activities related to Power Quality, including but not limited to

- a. Power Quality Compliance studies uses data collected for a 24 hour to a weeklong cycle by PQ analyser to check the voltage compliance with IS and IEEE standards. The PQ analysers are remotely controlled and monitored thereby making the execution extremely convenient; can be done even by the client technician as plug and play.
- b. Electricity Bill Analysis 12 months of latest Electricity Bills per meter are collected and analysed to determine if there is scope for direct/indirect cost savings based on current energy consumption and billing pattern for that particular facility
- c. For facilities that have issues related to maintaining Power Factor or if it is determined from the Electricity Bill Analysis that the Power Factor of the facility needs to be better maintained, Power Factor and Harmonics Assessment is an ideal PQaaS activity to find out the exact actionable recommendations required to do so.

It is also extremely effective for the improvement of current reactive power compensation scenario - specific harmonic data to be recorded by the PQ analyser to determine severity of harmonics in the network and effective methods to mitigate the same; to ultimately improve reactive power compensation.

- d. Event Analysis utilises the technology of Advanced Class-A Power Quality Analysers to detect Power Quality Events such as Voltage Sags, Swells, Flickers, High frequency transients, Interruptions and Disturbances.

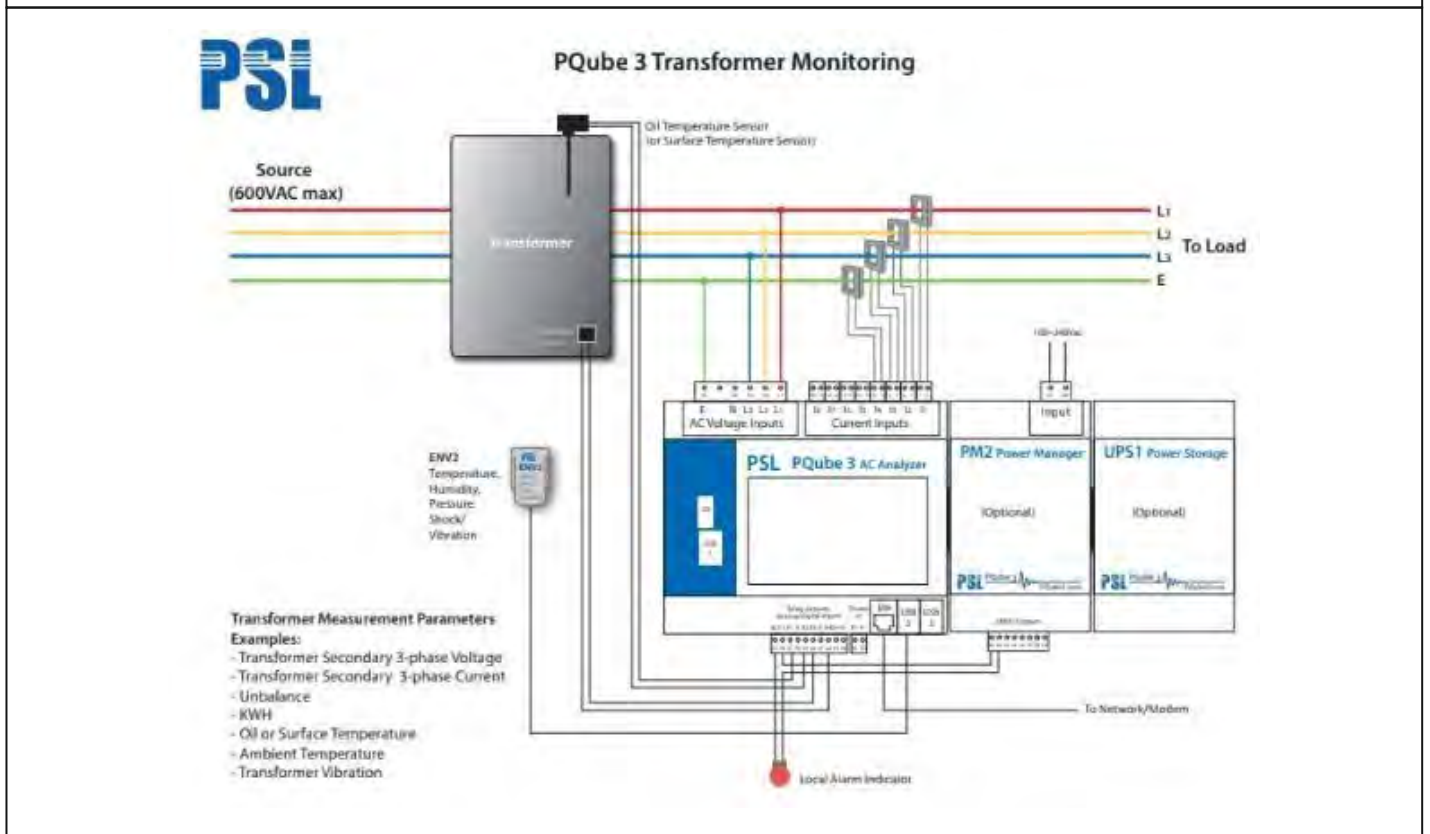
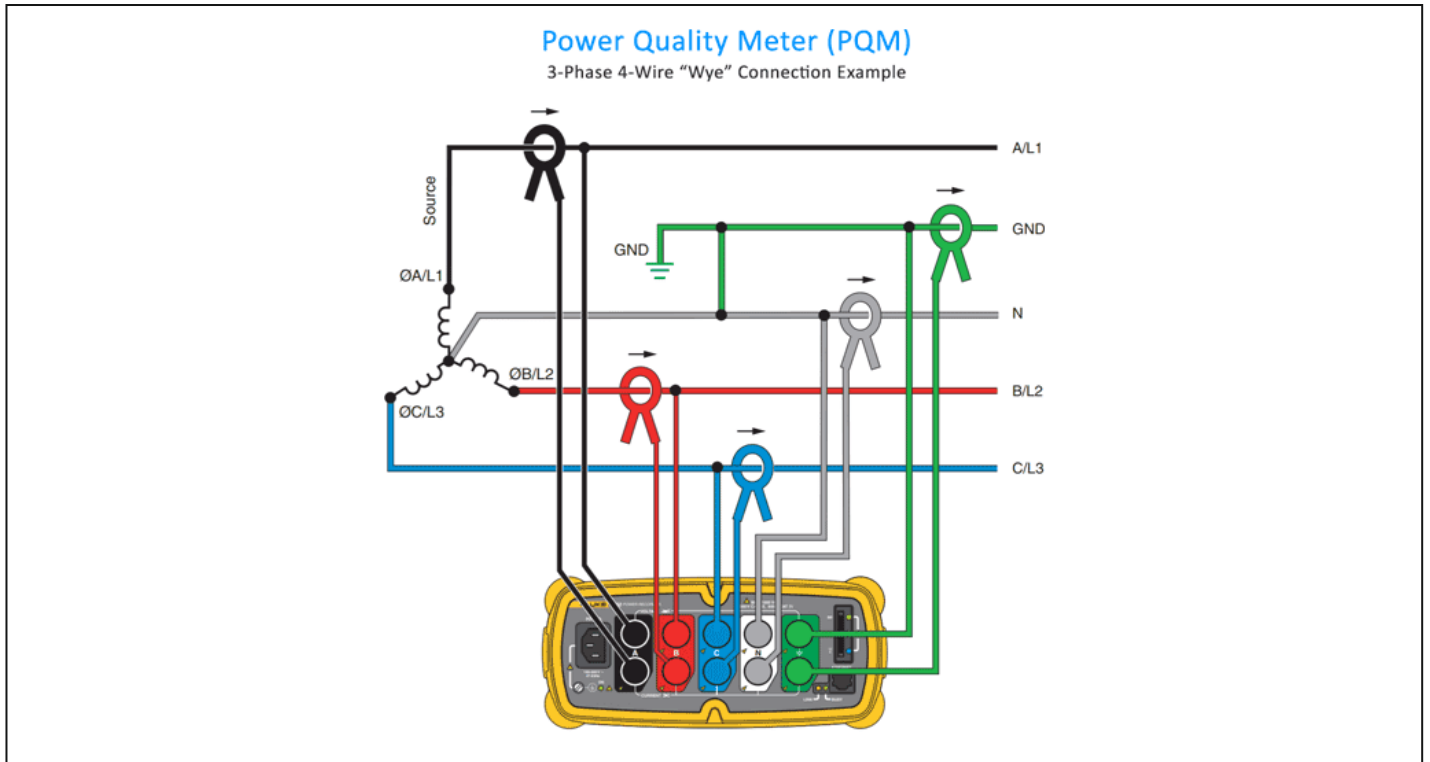
Efficienergi on account of its experience and expertise provides Classification based on the direction of these events so that the source of the events can be discovered. The severity of these Events and potential of damaging the Electrical equipment is gauged in the reports with the help of various compliance standards such as SEMI F-47, CBEMA/ITIC curve, etc

- e. Equipment Performance Assessment uses Advanced PQ analysers to record the data from the electrical equipment while putting the equipment under various loading scenarios to determine its efficiency, electrical behaviour, performance and compliance to national/international standards
- f. Power Import/Export Optimisation Studies are there to optimise energy management in the facilities that have their own power generation plants (Solar, Thermal, Diesel, etc.) and feed into the EB grid. The study involves an advanced PQ Analyser installed on all the critical points, and the Power Quality data is collected for an extensive period of time to determine the energy generation, consumption and exchange patterns to analyse and optimise the energy management methodology with the point of view of cost saving and efficient energy utilisation.

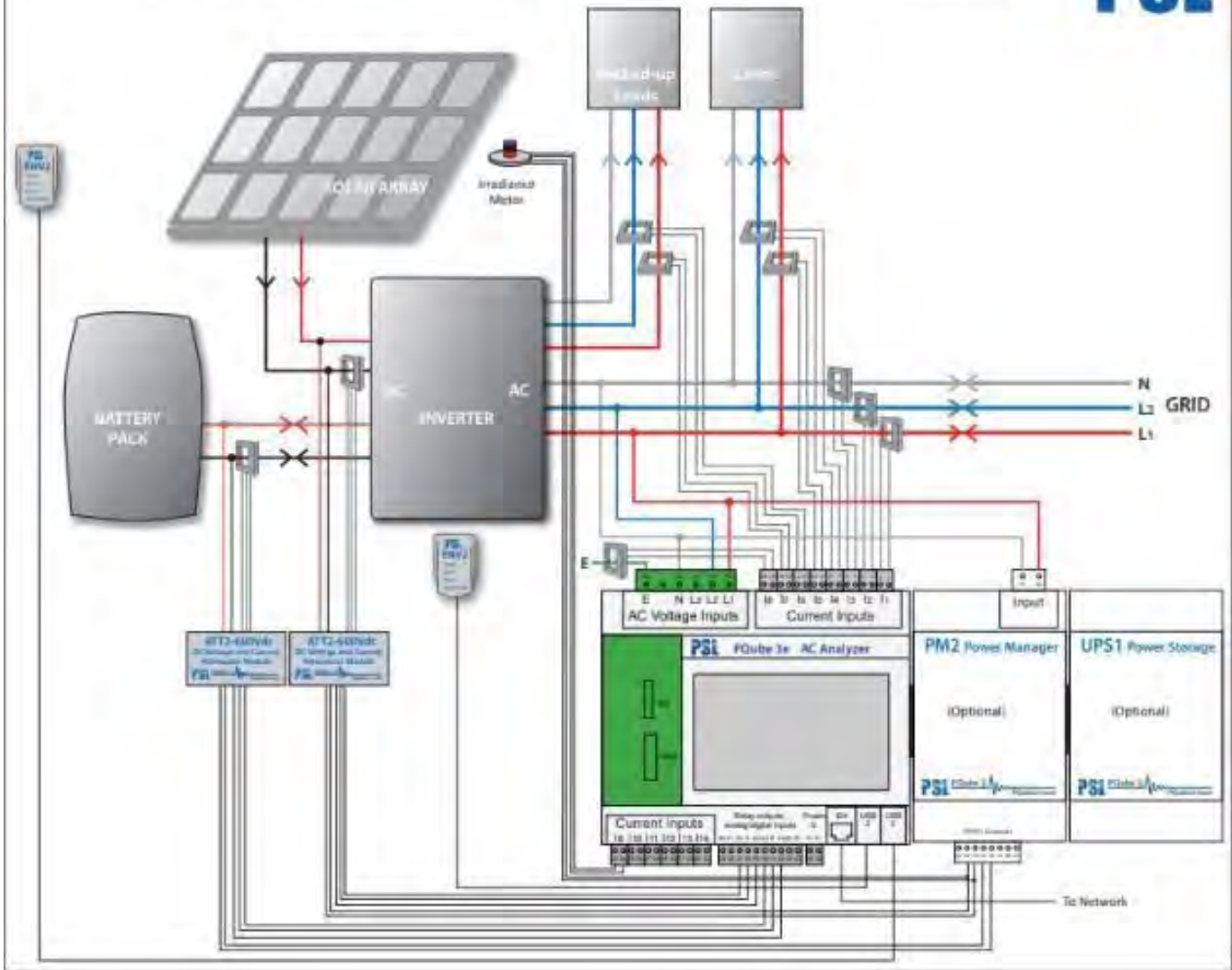
7. Efficienergi provides PQ compliance for standards including but not limited to EN 50160 / IS 17036 / IEEE 1159 /IEEE 519-2014 / IEC 61000-4-30, CBEMA / ITIC, SEMI F-47

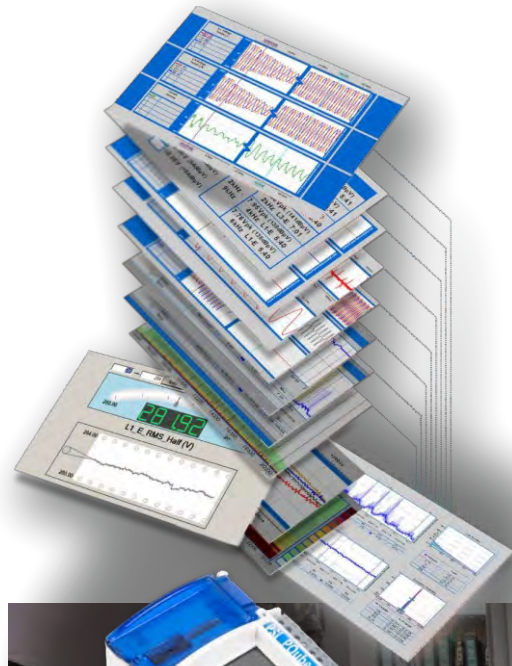
Benefits -

1. Eradicate reoccurring issues and increase the stability of the network
2. Increase the savings in electricity bills by reducing energy losses
3. Optimise the performance and improve the health of equipment and machinery
4. Reduce electrically induced electronic disturbances and unexpected downtime
5. Create a safer environment for operations personnel
6. Increase the compatibility between Power Quality and load on the network
7. Increase overall efficiency of the electrical network



PQube 3e Photovoltaic Power Quality, Energy, and Environment Monitoring





FLUKE®

ELSPEC
When Power Meets Quality

KRYKARD

DRANETZ
THE STANDARD FOR ENERGY & POWER MEASUREMENT



PSL

POWER STANDARDS LAB

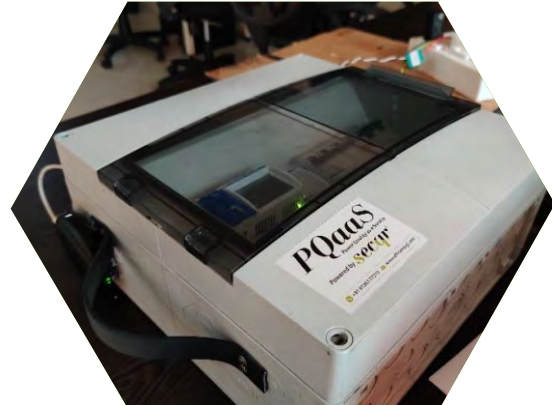
**Bills from
the last
12
months**



**Significant
Savings**

(Demand, Reactive Power
Compensation Details,
Energy consumption, tariff
structures etc)

(Recommendations for Contract
Demand Optimisation, Max Demand
Reduction, Reactive Power
Compensation, Reduced Losses &
Increased Incentives)



5. Electrical Network Health Analysis

When –

Electrical Network is a complex entity that is ever evolving. With changes in installation, loading scenarios, deterioration and aging of Electrical Network components, Lack of routine maintenance and preventive testing, unchecked Power Quality, the risk of a gamut of potential hazards such as insulation failure, equipment breakdown, unplanned interruptions, shock hazard to personnel, electrical fire keeps on rising.

Usually, there are minor issues that are taken only for their face value, such as nuisance tripping, sparking, flickering, busbar humming, which are in reality just symptoms of much deep-rooted problems that may lead to cause massive damage to the Electrical Network, to human life, to company reputation and finances.

For an efficient, safe, and reliable Electrical Network, a proactive approach is necessary to be adopted, empowered by periodic preventive testing and mitigation of potential health risks.

Why Us –

1. Efficienergi has been observing, studying and solving Electrical Network related issues for Commercial and Industrial Electrical Network since over a decade. To provide a comprehensive, innovative, one stop solution backed up by cutting edge technology and ultimately help facilities manage their Electrical Network better than ever, we have poured all our accumulated knowledge and expertise in secqr®, and it keeps on evolving with every new discovery and experience to be as accurate and repeatable as possible.
2. secqr® has an integrated dashboard dedicated to Client Facility's Electrical Network, its current health score, previous reports, recommended actions, predictive analysis insights and much more.
3. The results of each preventive testing that is done on client facility are directly added as inputs to the dashboard
4. All the secqr® features including instant on site results, automated report generation and recommendations, risk based executive summary are available to make the activity seamless and efficient

5. Electrical Network Health Analysis consists of following tests

- a. Thermography
- b. Capacity Assessment
- c. Leakage Currents and Ground Potential test
- d. Earthing Network tests
 - i. Earth Loop Impedance test (Breakers/Sockets)
 - ii. Earth Pit Resistance test
 - iii. Earth Continuity test
- e. Residual Current Device test
- f. Cable Insulation test
- g. Standby Equipment checks

3. Equipment Health Assessment

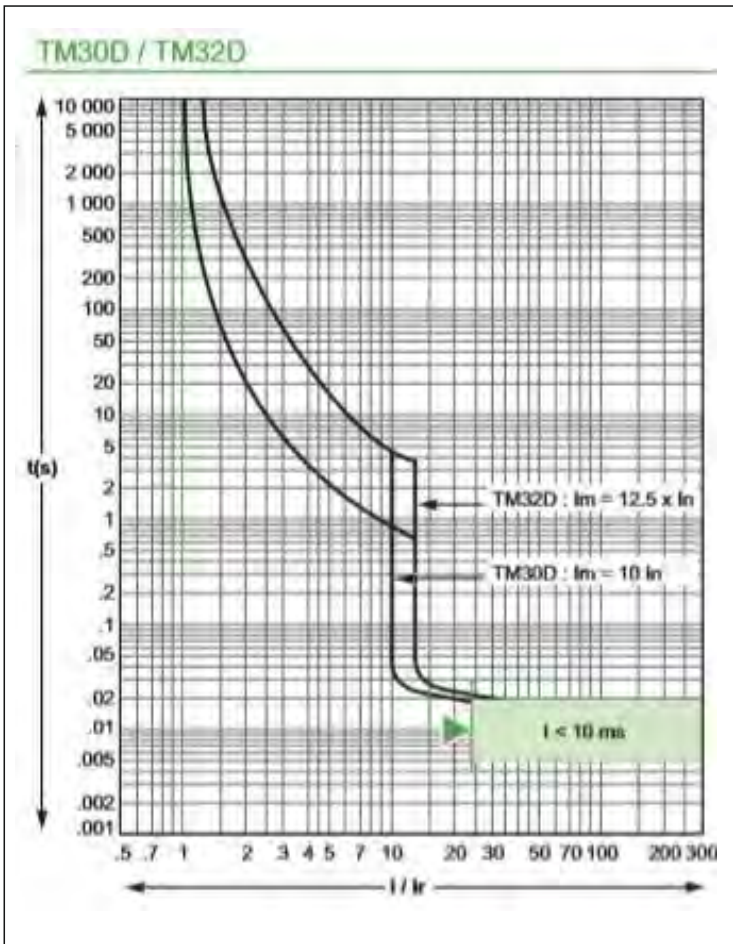
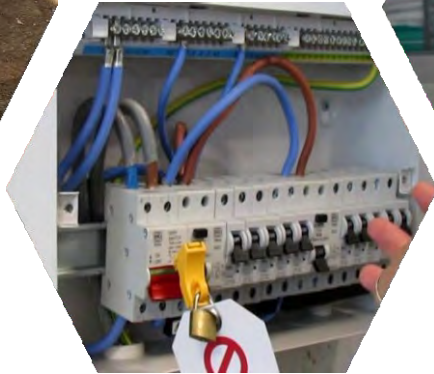
- a. Transformer Routine Tests
 - i. Hi-pot test
 - ii. Magnetic Balance test
 - iii. Voltage ratio test
 - iv. Winding resistance test
 - v. Insulation resistance test
 - vi. Vector group test
 - vii. Partial discharge test
 - viii. Tan delta test
 - ix. Oil Breakdown Voltage test
 - x. Alarm tests
- b. Primary and Secondary Injection of ACBs/MCCBs
- c. HVVCBs and HV/LV Relay Tests
- d. CT/PT health tests
- e. Capacitor Health Assessment
- f. UPS Efficiency test
- g. Battery Impedance test
- h. Motor health checkups

Benefits –

- 1. Ensure that the Electrical Network is at its peak when it comes to Safety, Reliability and Compliance
- 2. Move to predictive maintenance with asset profiling and historical insights on equipment and network performance
- 3. Manage your Electrical Network easily, accurately and conveniently with the help of secqir[®]'s cutting edge technology
- 4. Prevent nuisance tripping, unplanned interruptions, and hazardous incidents
- 5. Ensure electronic devices that are installed in the Electrical Network are operating as intended and aren't causing any impact on the Reliability and Power Quality
- 6. Ensure a reliable and safe electrical environment needed to sustain critical and sensitive equipment as well as prevention of safety hazards
- 7. Ensure safe and capable Earthing paths for fault current to be earthed, thereby avoiding fatal human/equipment related accidents
- 8. Identify overload on components due to load additions, system-wide unbalances in loading and spare capacity available in the system
- 9. Reduce leakages and circulating currents throughout the Electrical Network
- 10. Get practical insights in Capex decisions on augmentation of system elements



Electrical Network Health Analysis



← Details

Has any new load been added post commissioning of this breaker?
No

Has any failure/trip/malfunction/overheating event occurred at this location in the past?
No

What is the ambient temperature (°C) ?
25 to 35

Site is Over ?
No

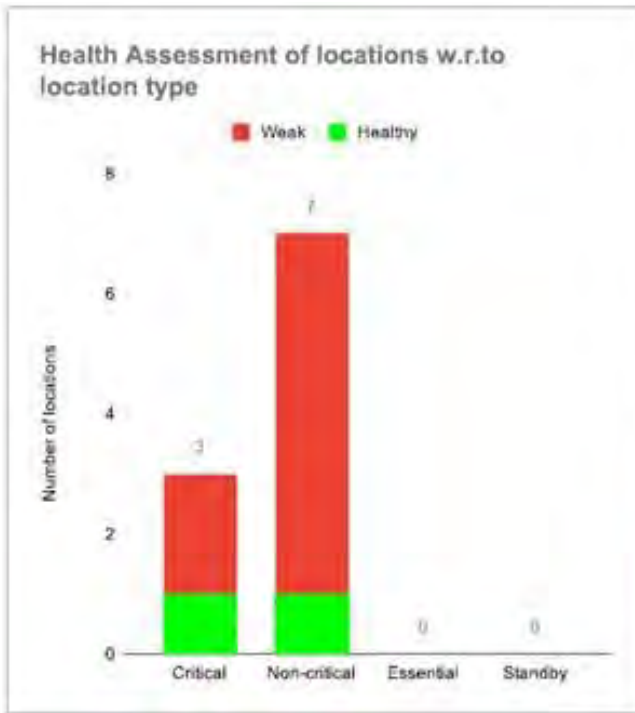
Long Delay Test - Min Trip time (Seconds)
↑ 5.48

Long Delay Test - Max Trip time (Seconds)
↓ 115.03

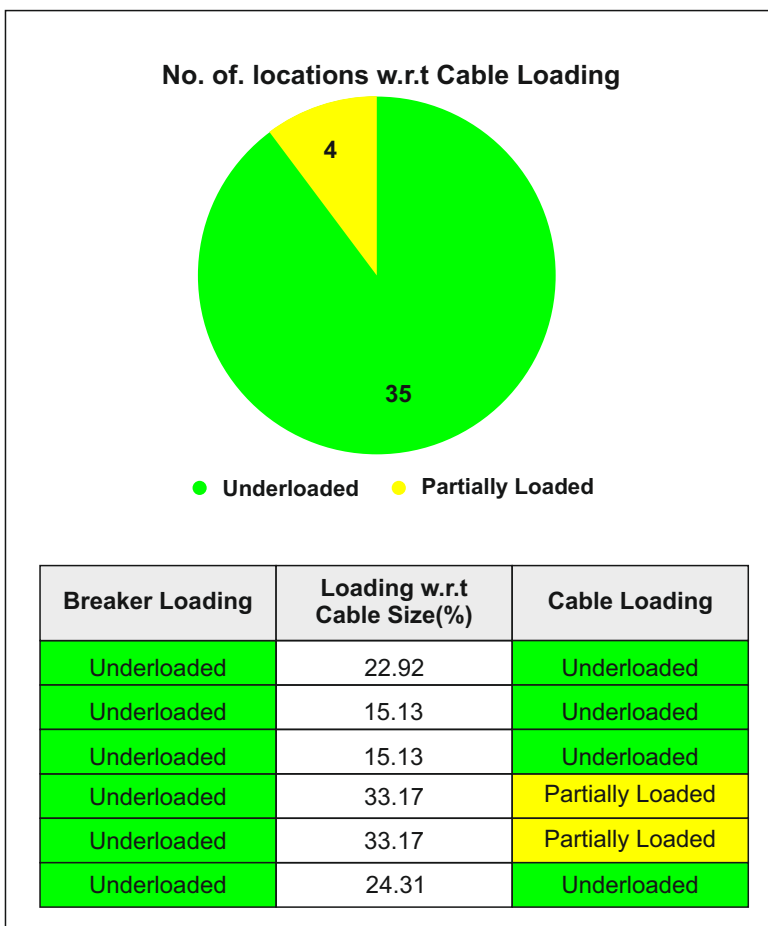
Long Delay Test Result
✓ PASS

Remarks for Result
PASS as per OEM TI Curve

Partners Support Refresh



Long Delay Test - Trip time (Seconds)	Long Delay Test - Min Trip time (Seconds)	Long Delay Test - Max Trip time (Seconds)	Long Delay Test Result
8.44	5.5	115.0	PASS
7.4	6.0	14.8	PASS



CAT Test Location Details

Measured Load (kVA)
5.30

Circuit Breaker Rating (In) (A)
63

How old is the installation? (years)
1

What is the frequency of maintenance of switchgear?
No maintenance

Has any new load been added post commissioning of this breaker?
No

Has any failure/trip/malfunction/overheating event occurred at this location in the past?
No

Site is Over?
No

Test Result
>Loading % w.r.t Breaker size :20.96
>Loading % w.r.t Cable size :13.97

Ref. Std.	
ASTM E1934-99A, 2018	
Table 1 : Priority Table with Recommended Actions	
Priority	Recommended Action
0	Indicates normal temperature;
4	Indicates possible sign of deficiency;
3	Indicates minor deficiency;
2	Indicates moderate deficiency,
1	Indicates major discrepancy;

6. Power System Studies (on existing network / in Greenfield at Design stage)

When –

1. Greenfield Stage The Electrical Network that has been designed needs to be tested in multiple scenarios before the ground work even begins, to make sure what the installation is going to be about is a viable and reliable Electrical Network that is apt for the load profile requirements; the Power System Studies are then carried out on the proposed Electrical Network Design
2. Existing Facilities in Operation Once the Electrical Network is commissioned and moved to be an operational Facility, it is necessary to carry out the Power System Studies based on the actual Electrical Network data, and replicating the Electrical Network from that data so that the results of simulating various scenarios on that Electrical Network are accurate so that correct actions can be taken to make the Electrical Network Safe and Reliable

Why –

1. We at Efficienergi use the latest version of Etap or equivalent software to model the complete Electrical Network
2. More than 50 years of cumulative experience of practical implementation in Electrical relays and protective devices
3. Provide services across various industries including FMCG, Petrochemical industries, Pharmaceutical Companies, Paper Mills and so on
4. Expertise in various fault scenarios and test cases that helps us provide accurate, comprehensive and well rounded recommendations
5. Power System Studies consist of
 - a. Short Circuit Analysis - carried out to determine available fault current at every point of an electrical network and to determine how the fault current carrying capacity of system components is such as cables, fuses, bus bars, switchgear compare to the determined value of network fault current
 - b. Load Flow Studies - is the analysis of the entire Electrical Network based on the flow of Electrical Energy at each and every network component, in various loading scenarios. This Study determines and simulates the exact behaviour of the Electrical Network in multiple operating conditions, thereby enabling us to ensure optimum network performance
 - c. Protective Device Coordination - Coordination is what gives the breakers uniformity and discipline in operation, without coordination between breakers on various positions of the system and on various buses, in case of fault, any random breaker either upstream or downstream may trip, causing unexpected shutdowns on important systems. To avoid unpredictable consequences of a fault on a system, it is absolutely necessary that the breakers of the systems are in coordination with each other. This study makes sure that correct breaker trips in response to a fault at a certain location and thus reduces chaos at the times of fault drastically
 - d. Arc Flash Studies - Arc Flash hazard is the danger of excessive heat exposure and serious burn injury due to possible arcing faults in the electrical power system. These hazards can only be identified with a technical assessment, which is called Arc Flash Studies. To know what are the Arc Flash hazards exist in a running electrical network, a technical assessment is required taking into account the fault levels, coordination settings, construction of the panels, clearances between various live parts and ground elements, working distances etc. And it is equally true that any power system will have some inherent arc flash hazard in its system. The extent and intensity of the hazard may vary depending on some or all of the above parameters. Hence it is only possible thorough arc flash study to provide guidelines taking into account employee and other stakeholder safety that are responsible for operating electrical devices/assets in the facility

- e. Harmonic Analysis - allows simulating the harmonic frequencies that will propagate in the network due to various non-linear loads that are projected to be/are being used in the system. It provides estimated harmonic voltage and current distortion in compliance with IEEE 519-2014/IEC standards and allow for designing of appropriate mitigation measures in case of excess of harmonic compliance limits. The same will also allow for understanding cable sizing impacts due to harmonic overloading if any. Thus harmonic analysis can be a great tool to understand and plan capital expenditure on harmonic mitigation equipment at both the Greenfield and operation stages of a project and avoid costly investments without actually understanding the system and resonance behaviour with the various non-linear loads
- f. Motor Inrush Analysis - allows understanding the impact of Motor acceleration and motor starting on performance of the electrical network. It can help to understand if the same has any impact on voltage variation that is significant enough to cause flicker or rapid voltage changes. It also allows coordinating the starting of multiple motors while analysing its impact at the feeding bus. It can also help to understand impact of different starting mechanisms like VFDs and soft starters and evaluate different states of the system
- g. Transient Stability Analysis - helps large users of Power to understand the power system response in the first few seconds to faults/disturbances which are typically swinging in nature, such as loss of generation or switching of upstream power lines, any sudden load drop/start. The disturbances are typically large in nature and not routine small system variations. The purpose here is to establish that the synchronism is maintained without any major loss in the characteristics of the power waveforms during the several seconds post the actual disturbance that occurs. Typically many methods can be used to improve the system stability such as strengthening the system voltage, using automatic reclosers or faster fault clearing devices, use of braking resistors and so on

Benefits –

1. Validate design calculations using advanced software based tools
2. Verify if that capability of switchgear/buses/cables is enough to isolate faulty circuits without loss of power to any other parts of the system, avoid equipment damage or failure through increased system protection and get the right sizing of switchgear, cables based on network fault levels if deemed necessary
3. Ensure the Electrical Network Infrastructure remains robust and resilient by optimising the system to be more efficient in terms of fault handling
4. Recommended/Revaluated settings for all adjustable devices – relay, ground fault equipment, etc. and corrective actions for under-protected equipment
5. Minimize fault damage inflicted on equipment
6. Minimise downtime of peripheral networks; thereby reducing financial losses
7. Verify/establish relations between devices for fault time operation
8. Ensure service continuity with good quality supply voltage
9. Quantify the Arc Flash hazards at various levels in the Electrical Network and avoid dangerous incidents by taking necessary actions to mitigate these hazards
10. Introduce a more safe and stable electrical environment for the operations personnel as well as electrical equipment

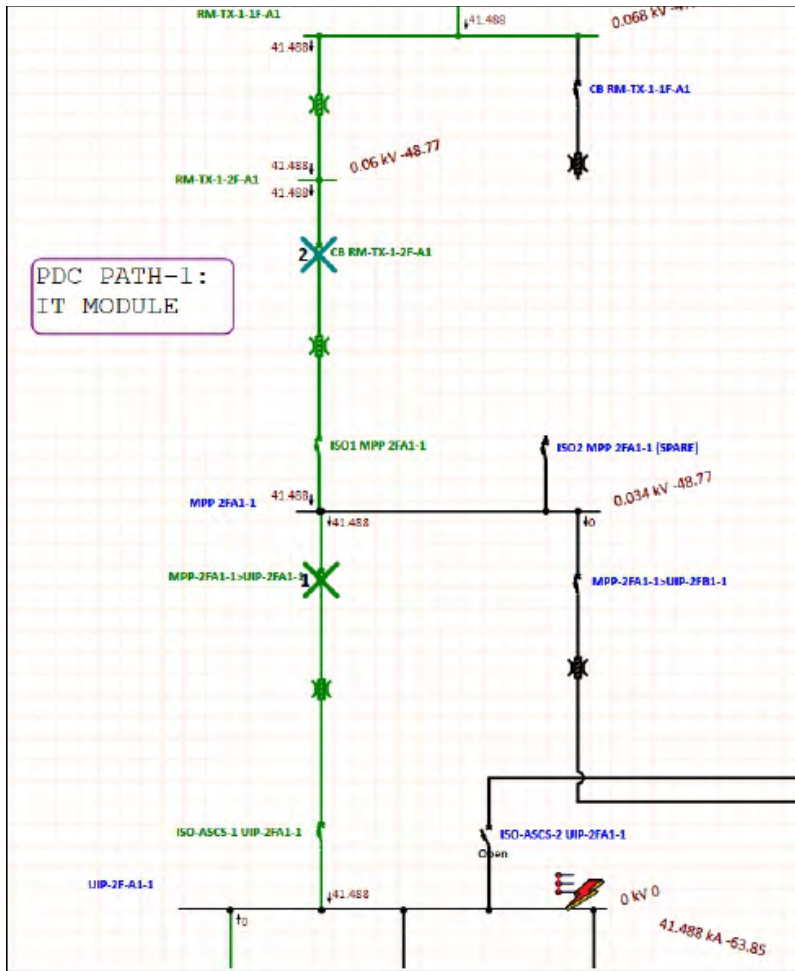




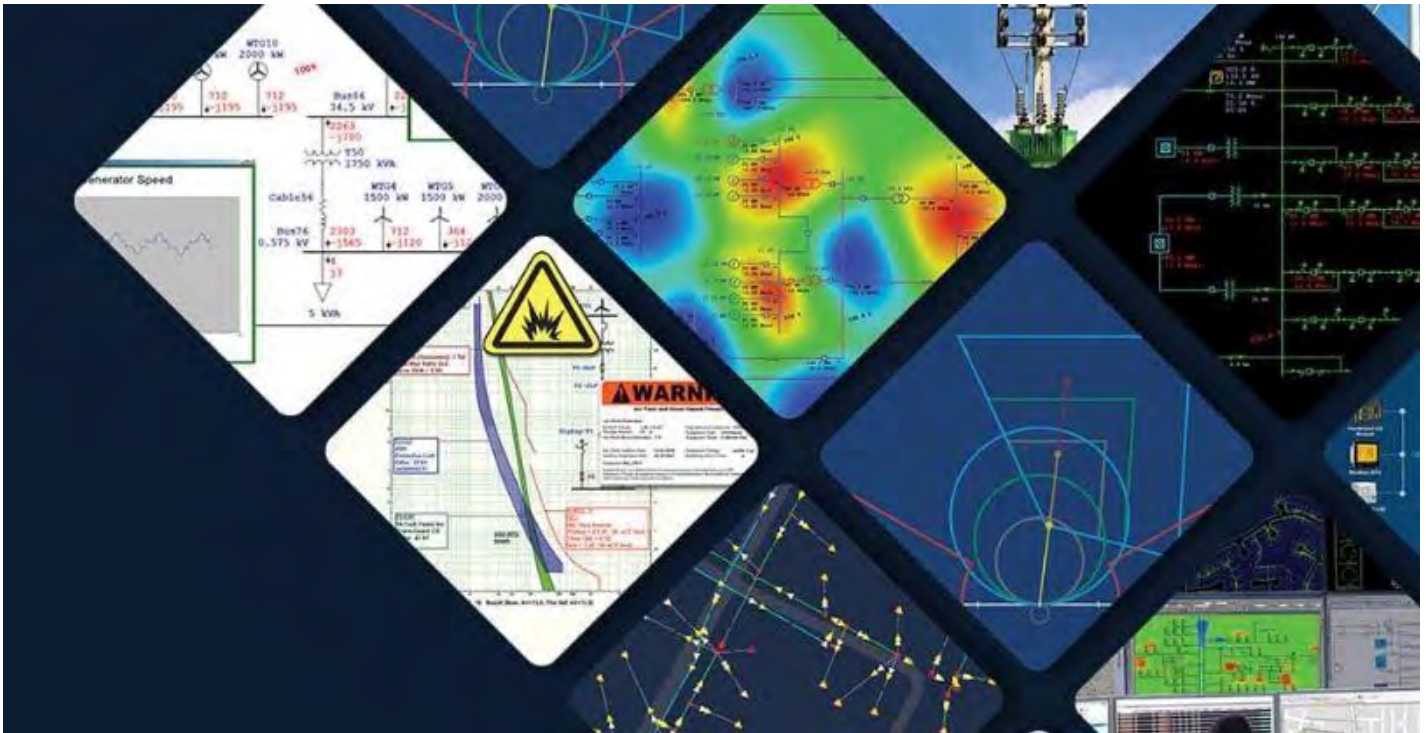
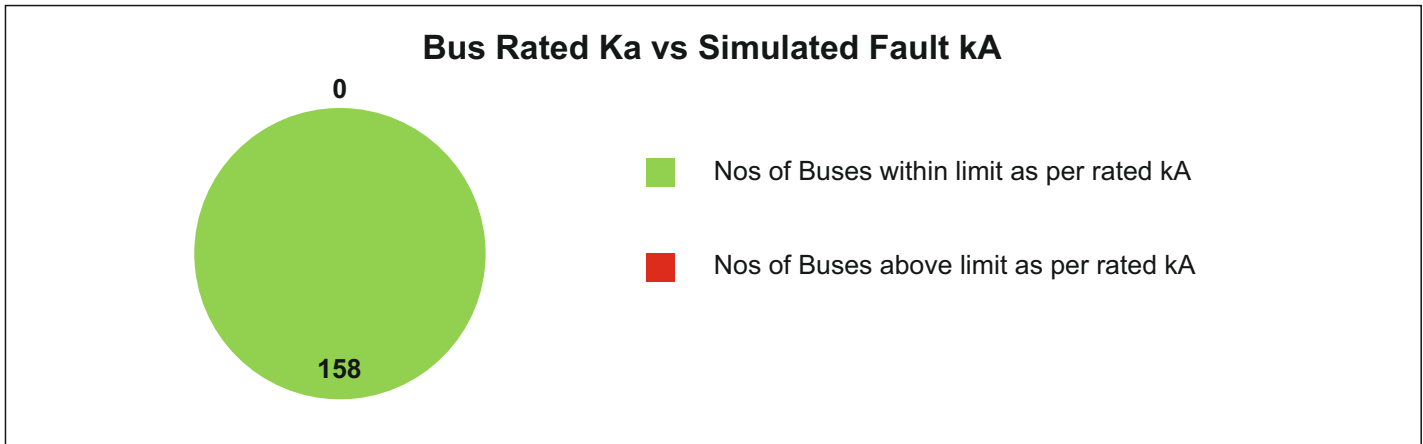
Figure 14: Fault Location-UIP-2FA1-1

Branch ID	Type	Across all scenarios Max Branch Loading (%)	1_LF_Normal Branch Loading %	2_LF_SUDB1A_2A Branch Loading %	3_LF_DG Branch Loading %	4_LF-R3-1-TX-TO-E1-1 Branch Loading %
0-1-MLTX-E1.1.1-1'	Transf. 2W	93.1	93.1	86.3	0	0
BB-1-1-ST5-A-E1.1.1-1'	Busway	50.3	0		0	48.5
BB-E1.1-IP-001'	Busway	77.8	77.8	72.3		
BB-E1.1-IP-002'	Busway	77.5	0	0	77.5	0
BB-E1.1-IP-003'	Busway	77.5	0	0	77.5	0
BB-E1.1-IP-004'	Busway	91.9	91.9			
BB-E1.1-IP-005'	Cable	88.9		83.1	85.1	
BB-E1.1-OP-002'	Busway	50.4	49.3	47.1	48.3	
BB-E1.1-OP-003'	Busway	50.4	49.2	47.1	48.3	
BB-E1.1-OP-004'	Busway	50.4	49.3	47.1	48.3	48.5
BB-E1.1-OP-005'	Busway	50.4	49.2	47.1	48.3	48.5
BB-E1.1-UPS-001'	Busway	86.9	86.9			
CBL-E1.1-IP-001'	Cable	57	53.3	53.2	54.5	
CBL-E1.1-IP-002'	Cable	64.3	38.9	38.9	64.3	
CBL-E1.1-OP-003'	Cable	89	86.9	83.1	85.2	
CBL-E1.1-OP-004'	Cable	40.9	39.9	38.2	39.1	

		Across all scenarios	1_LF_Normal	2_LF_SUDB1A_2A	3_LF_DG	4_LF-R3-1-TX-TO-E1-1
Branch ID	Type	Max Branch Loading (%)	Branch Loading %	Branch Loading %	Branch Loading %	Branch Loading %
CBL-Line-1	Cable	71.5	40	71.5	1.5	31.4
CBL-Line-2	Cable	32	31.7	1.3	1.4	32
CBL-Line-3	Cable	107.4	51.6	107.4	1.4	52
CBL-Line-4	Cable	55.3	55.3	1.2	1.3	55.3
CBL-MV-1A-001	Cable	71.5	40	71.5	0.2	31.4
CBL-MV-1B-001	Cable	32	31.7	71.5	0.1	32
CBL-MV-1B-002	Cable	32.1		32.1		
CBL-MV-2A-001	Cable	107.4	51.6	107.4	0.3	52
CBL-MV-2B-001	Cable	55.3	55.3	0	0.1	55.3
CBL:E1.1-IP-004'	Cable	27.4	25.6	25.6	26.2	
CBL:E1.1-IP-005'	Cable	37.7	35.2	35.2	36.1	
CBL:E1.1-IP-006'	Cable	37.6	35.2	35.2	36.1	
CBL:E1.1-IP-008'	Cable	15.3	14.3	14.3	14.6	
CBL:E1.1-IP-009'	Cable	86.1			86.1	
TO RPP-A1-L1P1	Cable	39.6	38.7	37	37.9	38
TO RPP-A8-L12P12	Cable	40	39.1	37.3	38.3	38.4

	<h1 style="color: red; margin: 0;">WARNING</h1> <p style="margin: 0; color: white; background-color: black; padding: 5px;">Flash & Shock Hazard with Covers or Doors Open Appropriate PPE Required</p>	
<p>Flash Protection Level A</p> <p>Incident Energy (cal/cm²) 1.2</p> <p>Working Distance 61.0cm</p> <p>Arc Flash Boundary 0.61 m</p> <p><small>Non-melting or untreated natural fiber long-sleeve shirt and long pants</small></p>	<p>Shock Protection 415 VAC</p> <p>Shock Hazard when covers removed</p> <p>Limited Approach 1.07 m</p> <p>Restricted Approach 0.30 m</p> <p style="text-align: center;">PPE Glove Class 00 V-Rating 500 VAC</p>	
<p>Equipment: 20 KVA ISOTX</p> <p>Equipment Name:</p>		<p>Source Protective Device: 20kVA ISOTX IC</p>
Contact #	Engineer	Date: 10-11-2021
<p>Changes in equipment settings or system configuration will invalidate the calculated values and PPE requirements which may result in a hazardous condition.</p>		

AF Level	Incident Energy (Cal./cm ²)	Personal Protective Equipments
Level A	≥ 1.2 to 2	PPE Category 1: Minimum Arc Rating 4 Cal./cm ² Required Clothing: Long Sleeve Shirt (or Jacket) and Pants or AR Coverall with minimum arc rating of 4 Cal./cm ² Required Face and Head Protection: Face Shield (with "wrap around" guarding...i.e balaclava) or Arc Flash Suit Hood
Level B	≥ 2 to 4	As Needed: Arc Rated Jacket, Rainwear, Parka, Hard Hat Liner In addition to AR clothing, the following products are required or to be used as needed: Required Hand Protection: Heavy-Duty Leather Gloves Additional PPE: Hard Hat, Eye Protection (Glasses, Goggles), Hearing Protection Footwear: Leather Footwear (as needed)



7. Root Cause Analysis

When –

As Electrical Network is an ever-evolving phenomenon, there are usually issues that are present in the system, inflicting erratic behaviour in Electrical Equipment/Process Interruptions/Safety hazards/Financial loss. The root cause of these issues is often difficult for the facilities to find, and so the damage keeps on occurring in such Electrical Networks. Root Cause Analysis is an activity in which the Electrical Network tests are customized and combined for the specific facility, orienting it to find out the root of the issue and provide mitigating recommendations.

Why Us –

1. Efficienergi's decades of testing expertise works perfectly to undertake a Root Cause Analysis. Drawing insights from past experiences, our technical analysts are capable of analysing the data, identifying the possibilities and points of failure, getting to the root cause and providing recommendations to successfully mitigate the same in a short period of time
2. The Power Quality Analysers used by Efficienergi are best in class, advanced instruments that are especially designed to find abnormalities in the Electrical Network, and as our engineers are skilled in utilizing those instruments to the best of their capabilities, test execution and data collection is on point
3. As we are a third party testing consultancy with a vendor neutral approach towards the analysis and recommending actions, we pay special attention to how the already existing infrastructure can contribute to the mitigation of the Root Cause

Benefits –

1. Eradicate issues at root level, thereby preventing any more damage that it has been inflicting on the facility's Electrical Network
2. Comprehensive, Priority based, clear actionable insights increase the health and performance of Electrical Network Recommendations that are vendor neutral in nature, prioritizing the effective, low cost/no cost solutions

Section 2 :Findings,Impact, Recommendation & Priority:

Findings, Impact, Recommendation's & Priority						
Sr. No	Location	PQ Parameter	Findings	Impact	Recommendation	Priority
1						To rectify immediately
2						To rectify in next maintenance
3						To rectify in next shut down period
4						Keep monitoring

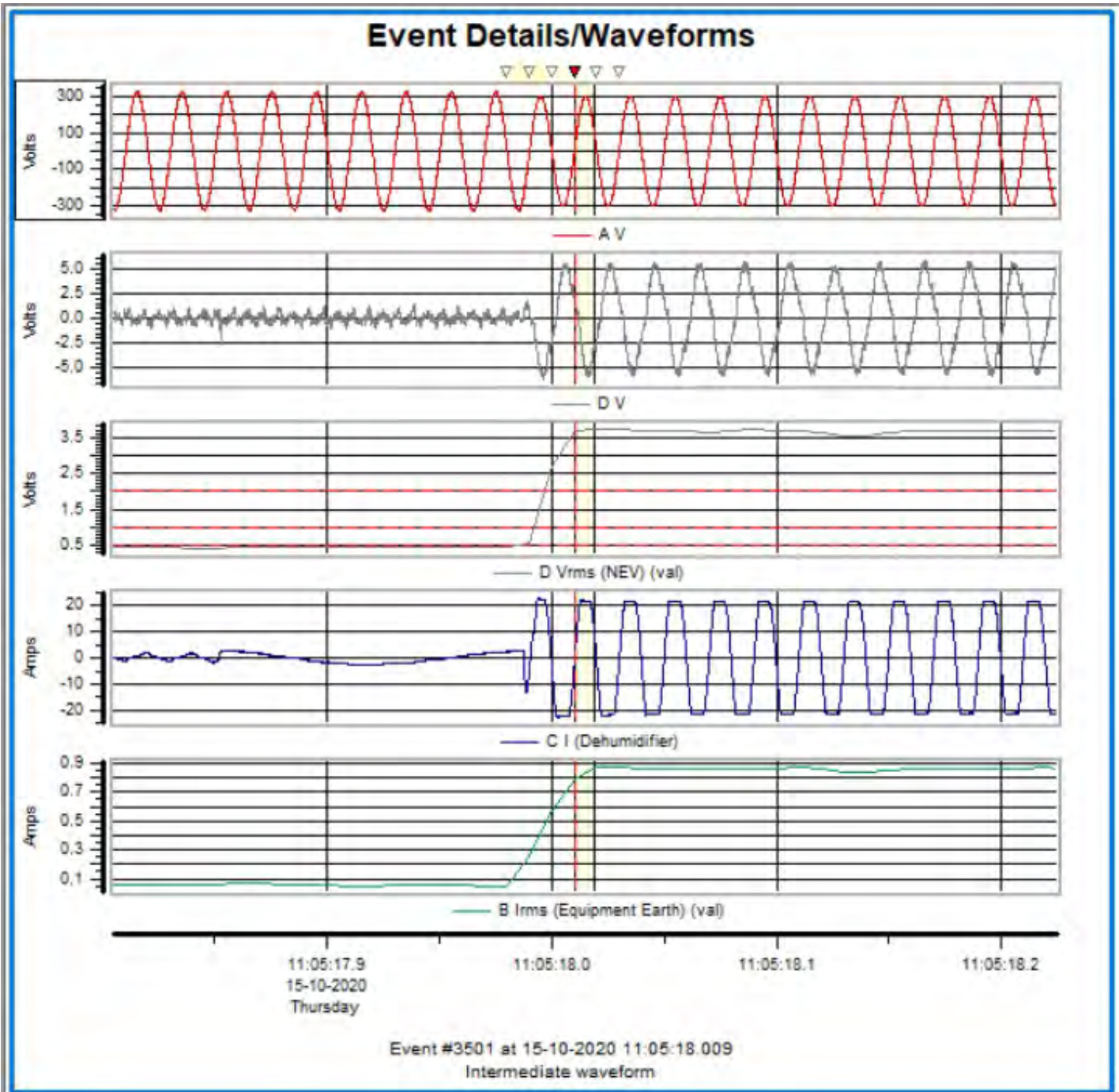


Figure 2: Event Type 1- NEV Generated by the Dehumidifier