VOLTA INSITE

Empowering You with Electrical Data

DATA INTRODUCTION

VOLTA INSITE

MONITOR AND OPTIMIZE YOUR ELECTRICAL ASSETS

Volta Insite actively monitors your electrical infrastructure - detecting issues before they become problems.

VOLTA INSITE

ADVANCED MONITORING SYSTEM

What InsiteAI Can Do For You

Volta Insite™ enables facility managers, engineers and operators to see electrical and mechanical equipment failures **before they happen.**

InsiteAI™ goes beyond traditional diagnostic systems, allowing customers the insight and ability to schedule maintenance on their timeline.

Our advanced monitoring system gives customers access to **real-time data 24/7 on their computer, tablet or smartphone.** They are supported by Volta Insite engineers and notified of any equipment performance issues, trending events, and power quality events.

VOLTA INSITE

WHAT WE DO

Benefits of InsiteAI Include:

- Continuous waveform capture on voltage & current
- Email alerts of predesignated critical faults
- Full digital access to real-time & historical data on a computer, tablet or smartphone
- Monthly email report detailing each asset's performance
- Monthly call with Volta Insite engineers to review each asset's performance & trends

We are committed to providing constant communication between our customers and our entire organization, giving you access to highly trained engineers with the utmost accountability that understand the criticality of your equipment and the surroundings that it is supporting.

Volta Insite gives you piece of mind that our staff and InsiteAI is monitoring your critical equipment 24/7 and will notify you of any risks in real time.

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REDUCING MAINTENANCE COST AND DOWNTIME

The Power of Volta InsiteAI

InsiteAI is capable of tracking anomalies that may interrupt operations and issues alerts with an understanding of how to proceed, leading to prevention of failure or costly downtime.

- Distribution Ground Fault
- Over Current / Voltage Events
- Phase Loss
- Current / Voltage Imbalance
- Intermittent Ground Faults
- Contactor Degradation
- Under Voltage Condition
- Increased Number of Events
- Power Drop
- Current / Voltage THD
- Bearing Wear/Failure
- Utility Power Quality
- Loose Belt Condition
- VFD Faults
- Exceeding Max Starts per Hour
- Increase / Decrease in Harmonic Amplitude

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OUR GOAL

ZERO Unexpected Downtime

At Volta Insite we take a proactive approach emphasizing uninterrupted operations with the goal of zero downtime.

Only you know the real cost of downtime in your facility:

- Loss of Revenue
- Increased Operating Costs
- Production Loss & Missed Deadlines
- Safety & Security Risks
- Decrease in Competitive Edge
- Unnecessary Stress for Staff

Cost of downtime for industries include:

- Light Manufacturing at $260k per hour
- Auto Manufacturing at $3M per hour
- Data Center at $336k per hour
- Healthcare at $636k per hour
- Telecommunications at $2M per hour
- Energy Industry at $2.48M per hour

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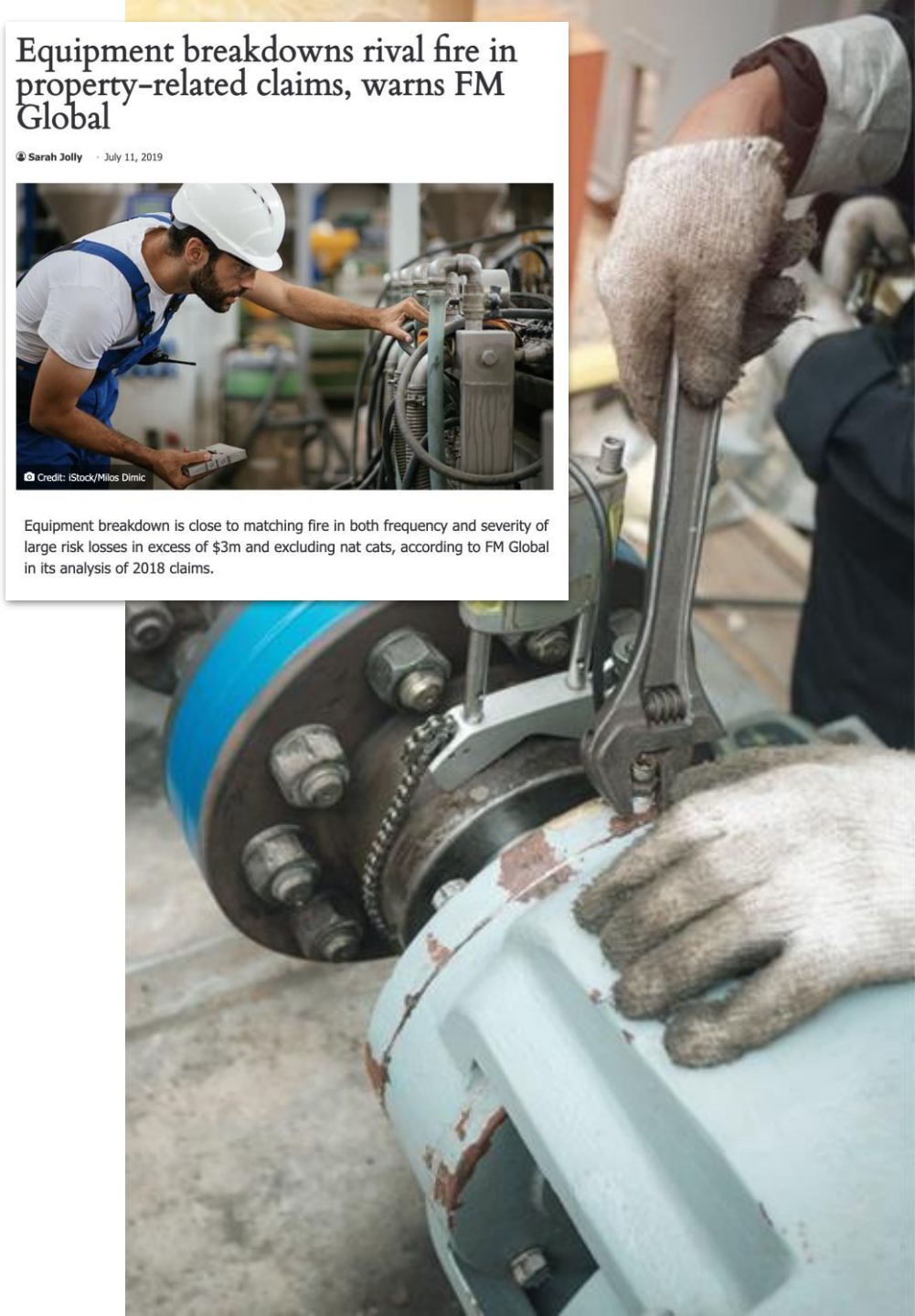
THE PROBLEM

Challenges our Customers are Facing

InsiteAI™ watches over your critical electrical assets so you can focus on what really matters, growing your business and serving your customers.

- Have you experienced equipment problems or failures in your facility?
- Are you being challenged to save dollars on maintenance / repair / replacement costs?
- Is it becoming increasingly difficult to keep operations running without interruption?
- Not enough personnel to maintain uptime?
- Do you need a Predictive Maintenance plan?



Equipment breakdowns rival fire in property-related claims, warns FM Global

Sarah Jolly · July 11, 2019

Credit: iStock/Milos Dimic

Equipment breakdown is close to matching fire in both frequency and severity of large risk losses in excess of $3m and excluding nat cats, according to FM Global in its analysis of 2018 claims.

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EFFECTIVELY DIAGNOSE ELECTRICAL ISSUES

Value Proposition

Traditional Building Automation Systems do not offer sufficient data resolution to effectively diagnose electrical issues.

InsiteAI is a cloud based solution that combines power quality monitoring with the concept of electrical signature analysis. To the user it is a powerful tool always operating in the back-end.

Transient events are recorded in a continuous manner with full waveform captures at a sampling frequency of 20kHz.

Our proprietary algorithms detect patterns and anomalies and transmit real-time alerts to you, offering both insight and oversight.

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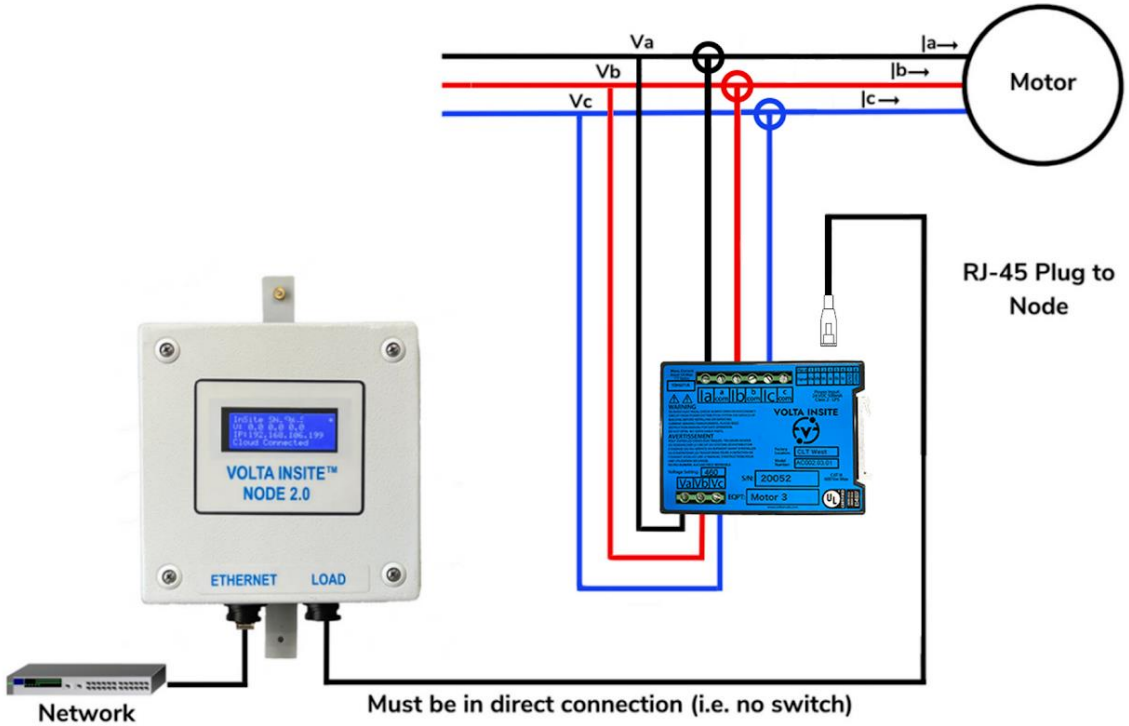
THE SOLUTION

Volta Insite Hardware

There are two components to the Volta Insite solution that require installation:



Node 2.0

The Node collects data for calculations and measurements. It sends this data to the cloud and shares it with the user interface when requested. It's typically placed in the MCC room but can also be located externally for easy access during operation

VI Module 4.0

Each Node comes with an UL listed VI-Module which mounts within a cabinet, fused disconnect, MCC bucket or other suitable location. The VI-Module has terminals for connecting current transformers and voltage taps.

VOLTA INSITE

INTELLIGENT MONITORING OF YOUR ASSETS

Continuous real-time data and analysis of an electrical asset's operating condition and efficiency

Data Collection

Once installed our Insite Node provides continuous real time voltage and current readings.

Intelligent Actions

Customers then have access to real-time intelligence, alerts and a database of equipment history. Together this creates a powerful predictive maintenance technology.

Data Analysis

Data is then pushed up to our Volta Insite software for analysis. Our software solution provides accurate diagnostics into a motor's electro-mechanical condition and the supply side power quality.

Scalable

Additional Insite Nodes can be networked within our architecture and entire electrical systems can be monitored.

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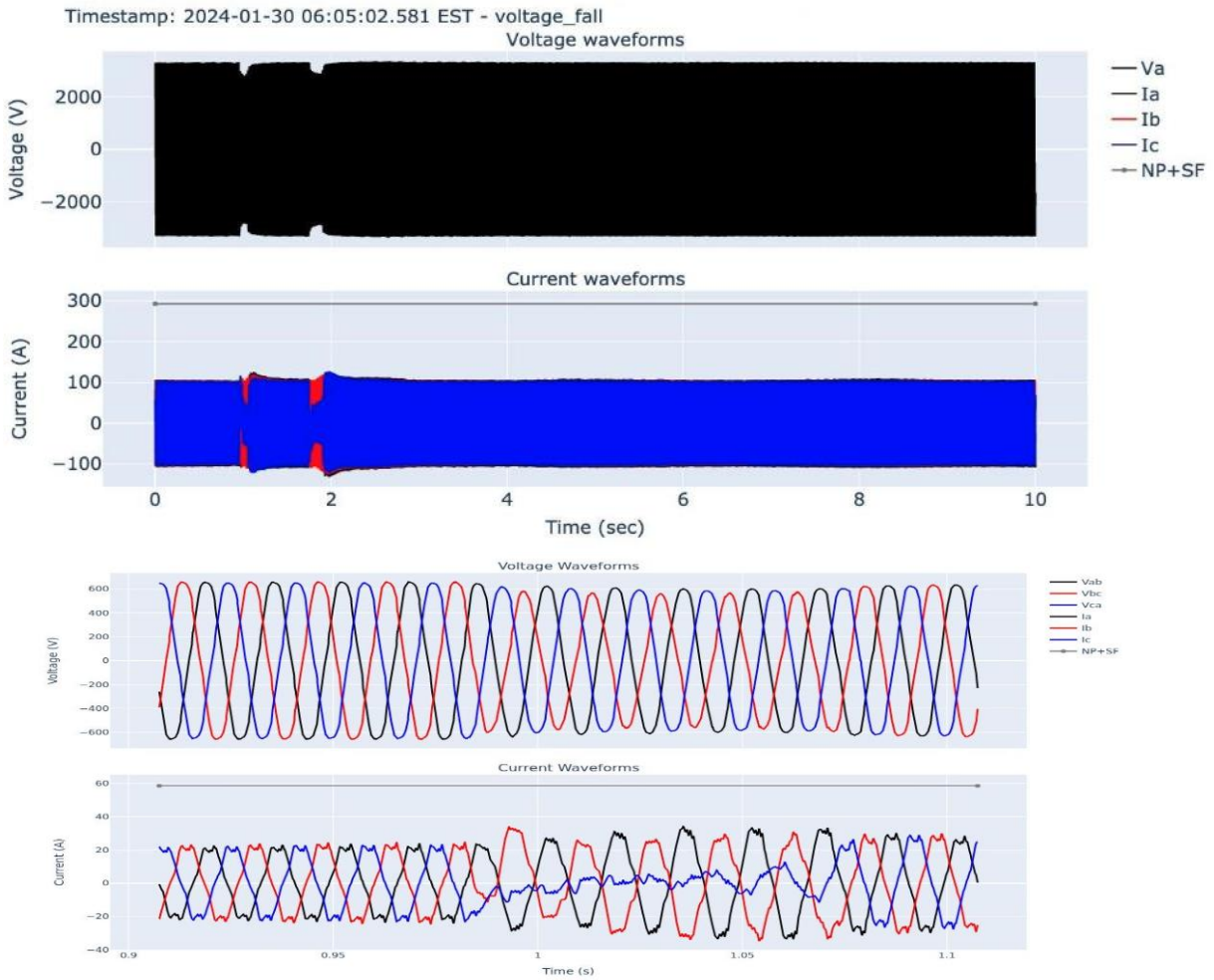
Power of InsiteAI

Power Quality Events

Most power quality issues are not detected by normal information sensors, but their consequences include downtime, reduced capacity, production waste, premature equipment failure, and financial impact.

“Dirty power” is a term used to describe electricity that deviates from standard due to spikes, surges, and dips and is more commonplace than you would expect. We can pinpoint anomalies as they happen.

Event Timestamp	Alerts	Equipment Name
06:05:02.590 EST	Power Quality Event	Disc Drive
06:05:02.585 EST	Power Quality Event	RTO Fan 1
06:05:02.584 EST	Power Quality Event	RTO Fan 2



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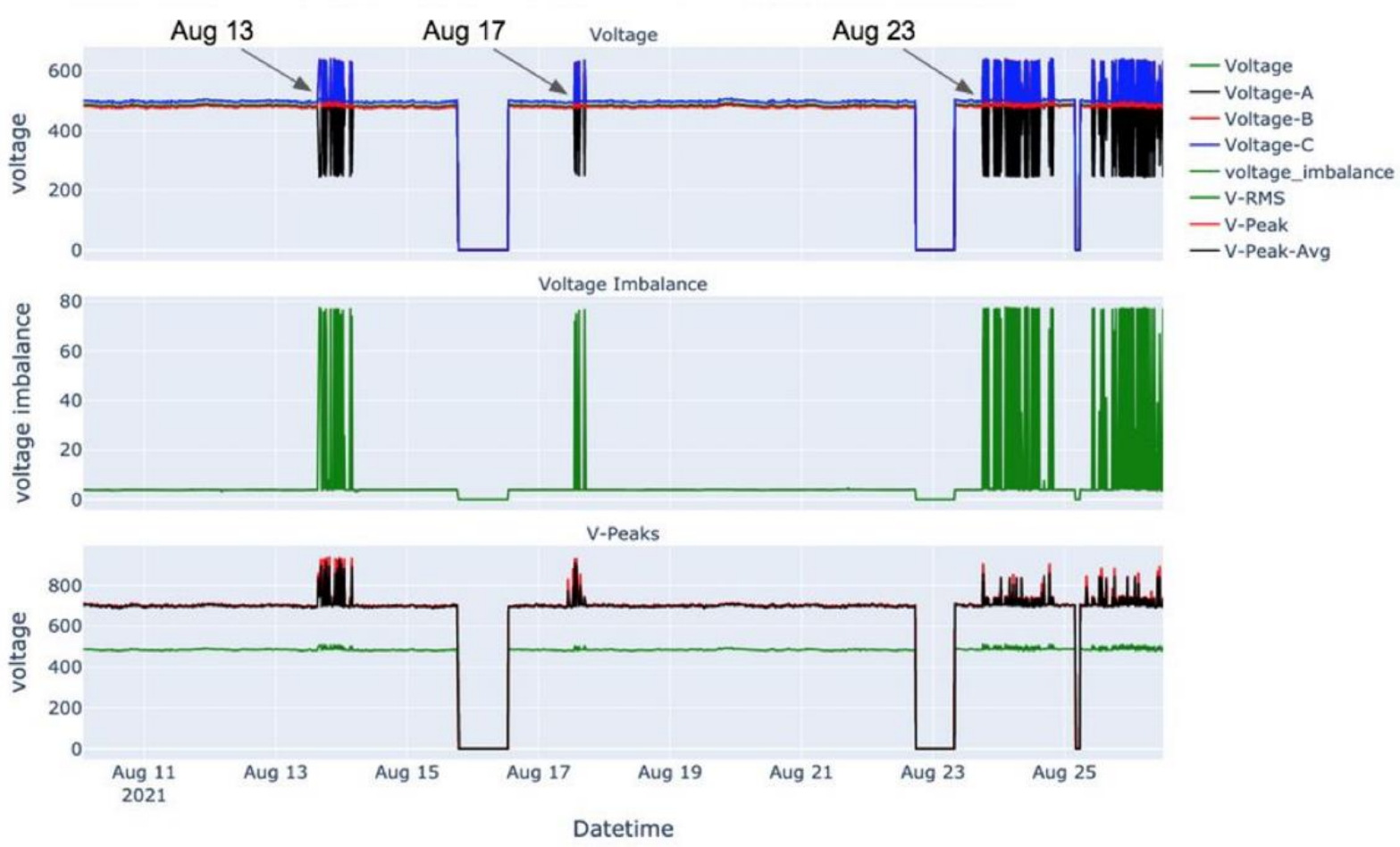
Distribution Ground Fault

A pattern of intermittent voltage imbalance was observed.

We alerted the facility and the issue was resolved without any unexpected downtime or loss of production.



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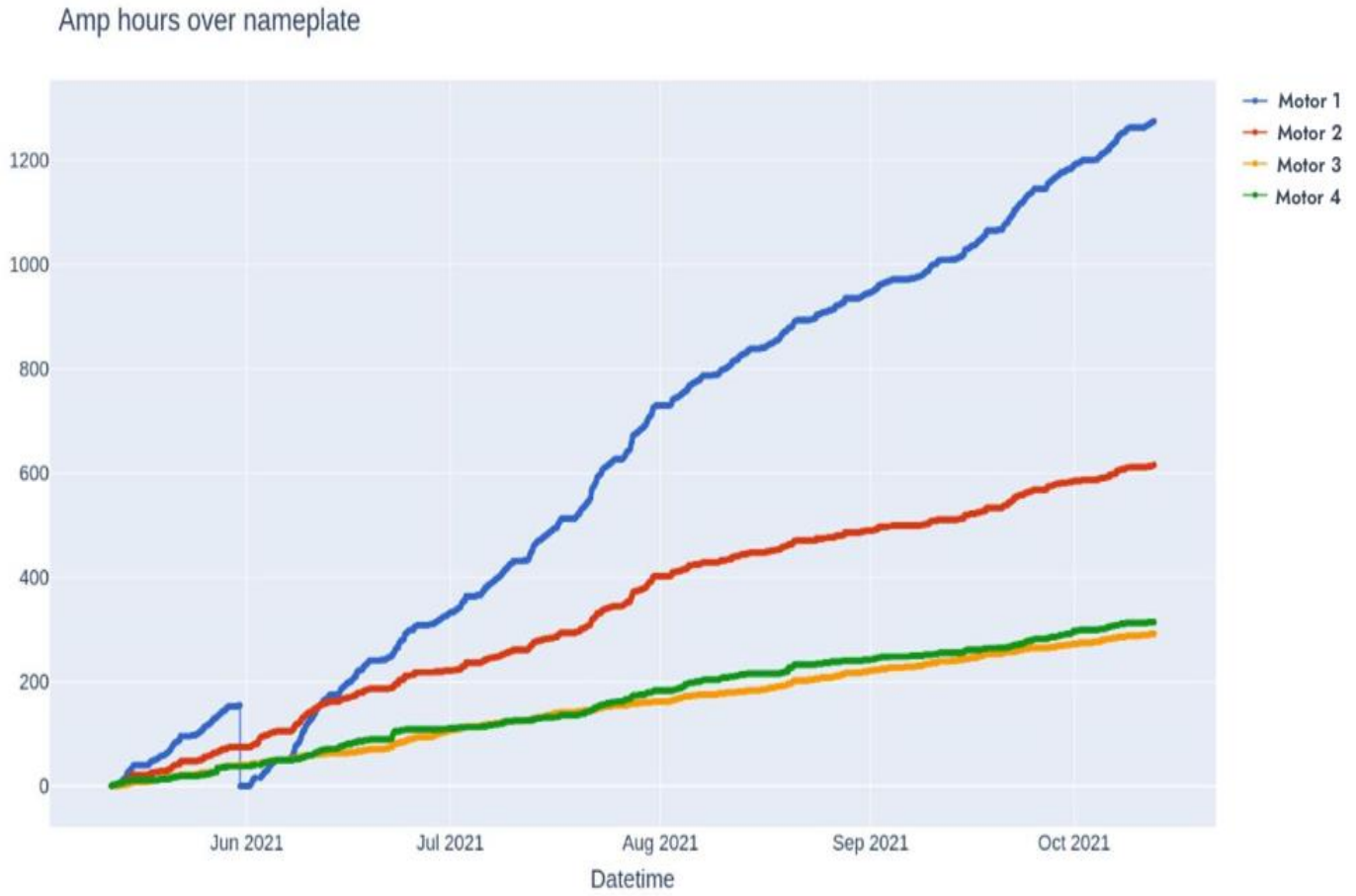
Current Overloading

Frequent Current Overloading was observed. In a conversation with the Facility it was determined that the overload condition could not be avoided during normal operation.

The solution is to track Amp Hours over Nameplate and determine when the unit needs replacing prior to end of life.



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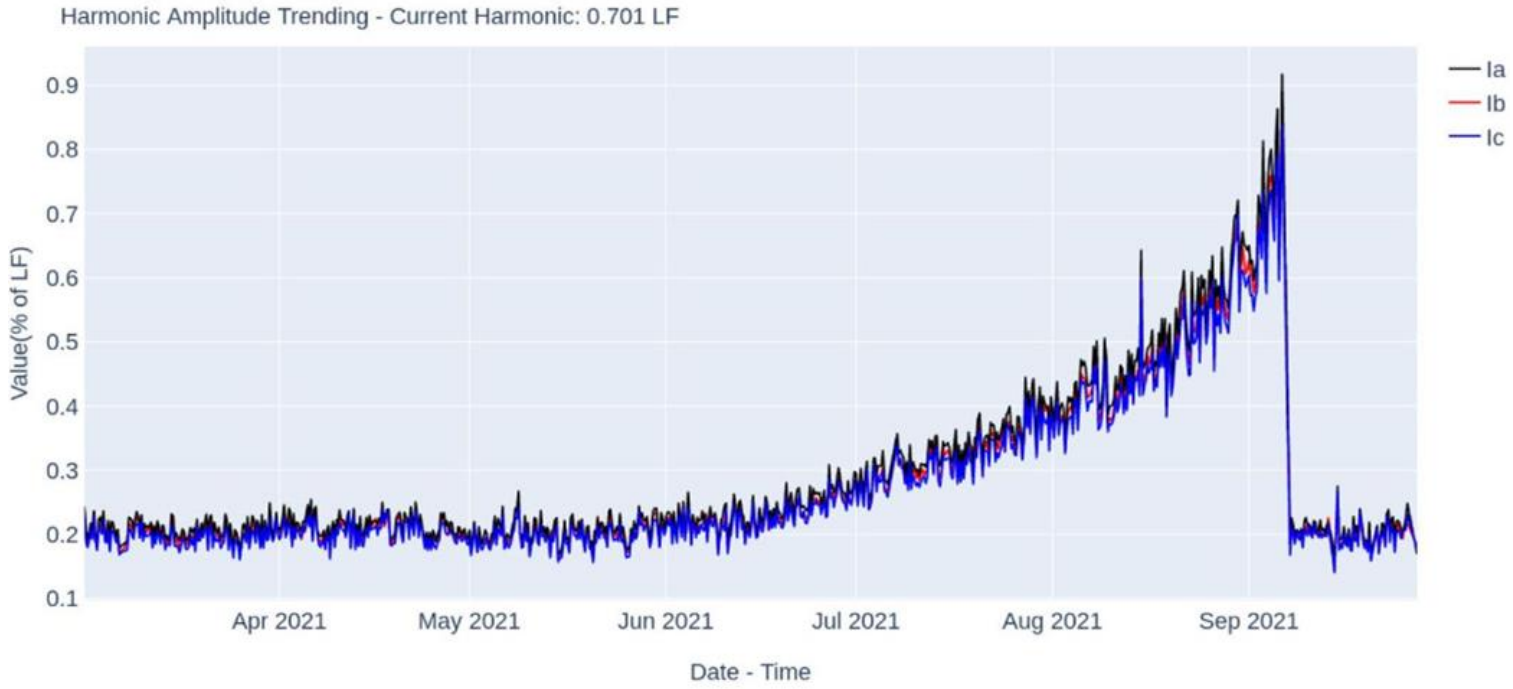
Loose Belt

A Harmonic Amplitude increase was observed at the Belt Passing Frequency.

The Facility was alerted of the increasing trend and the belt was replaced without any unexpected downtime or loss of production.

The Harmonic Amplitude returned to baseline after maintenance was performed.



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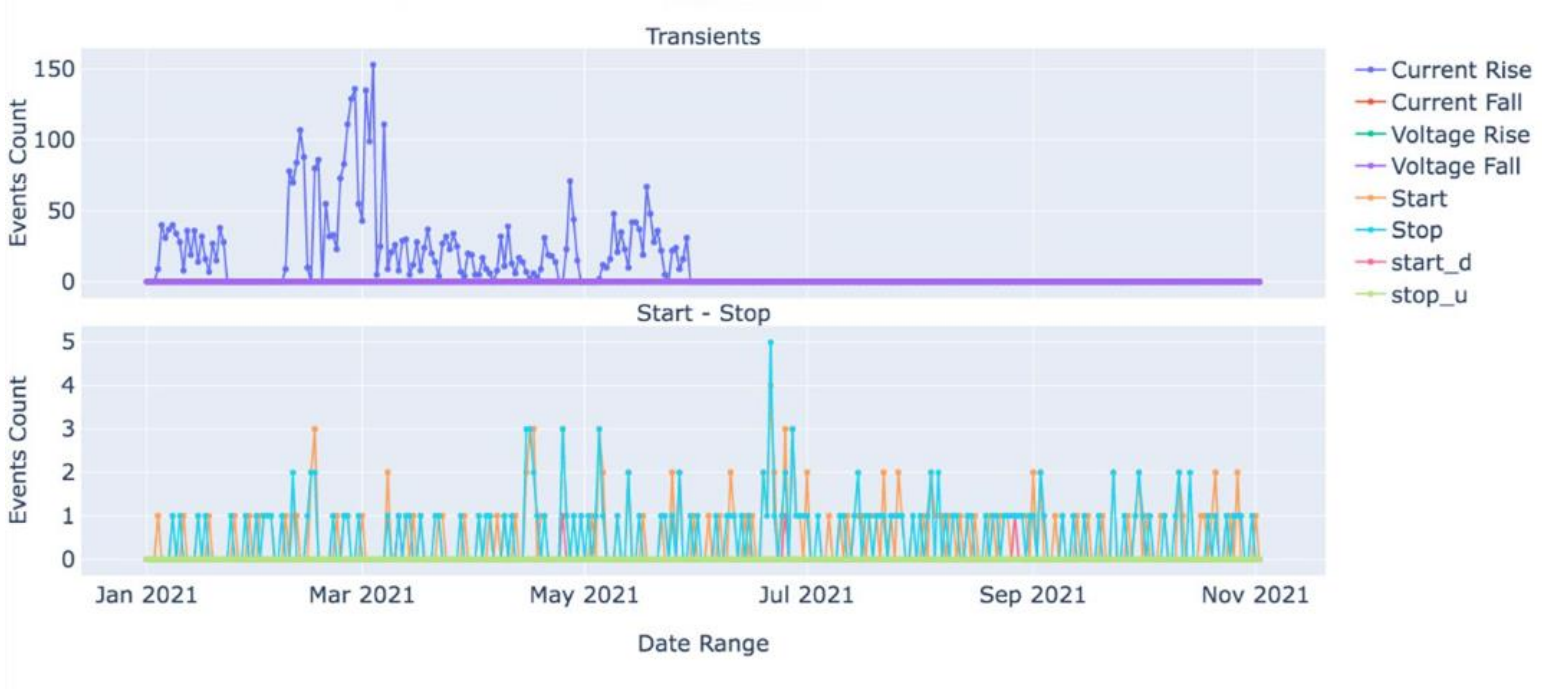
Current Transients

An abundance of Current Transients was observed.

A conversation with the Facility determined that material quality was the contributing factor to the issue.

This highlights how electrical data can be used to optimize an entire process.



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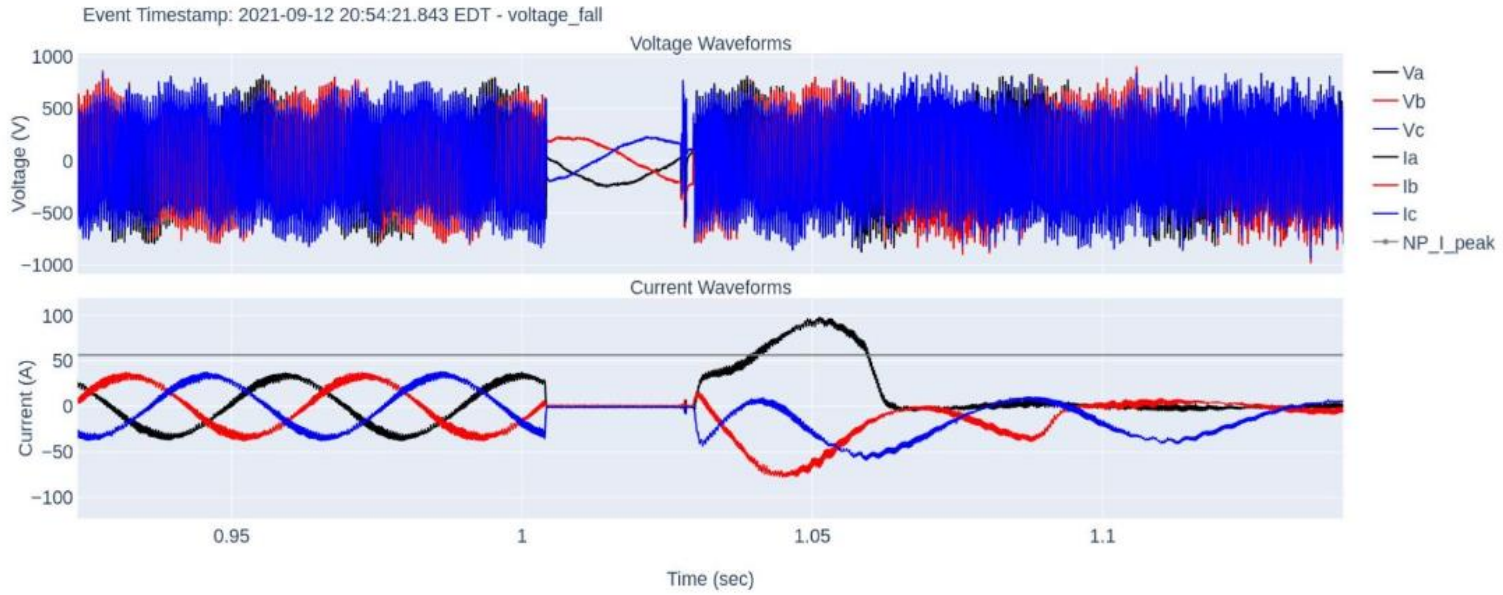
Voltage Transient

A Voltage Transient Event was observed.

While monitoring VFD output it shows a fault where power gating temporarily drops out.

This is an example of a fast diagnosis capability, avoiding downtime.



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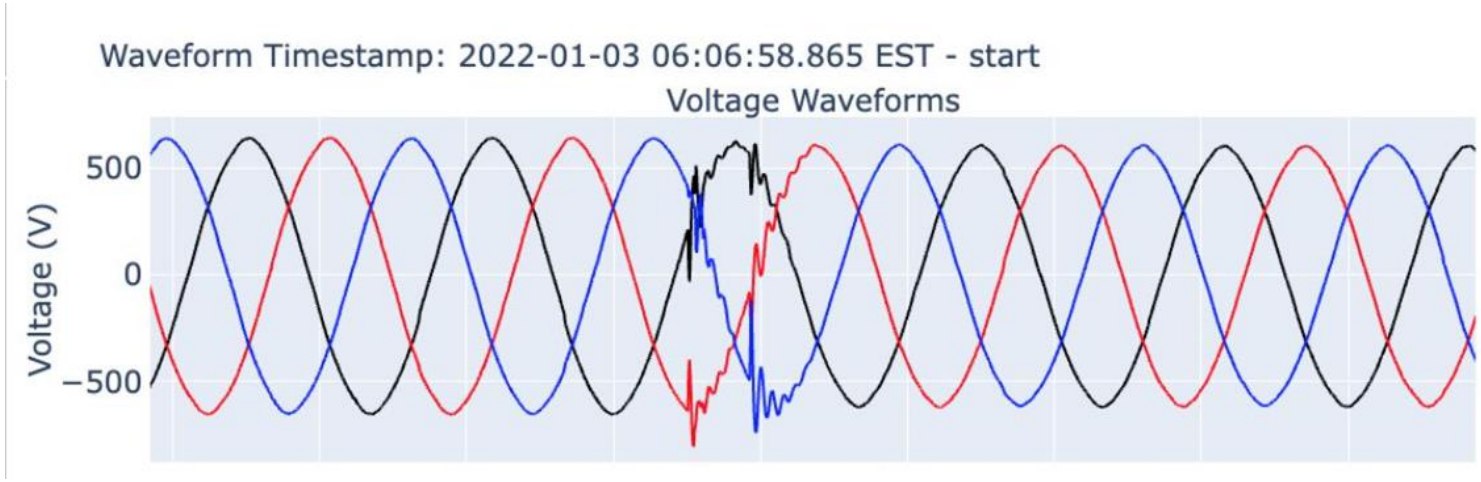
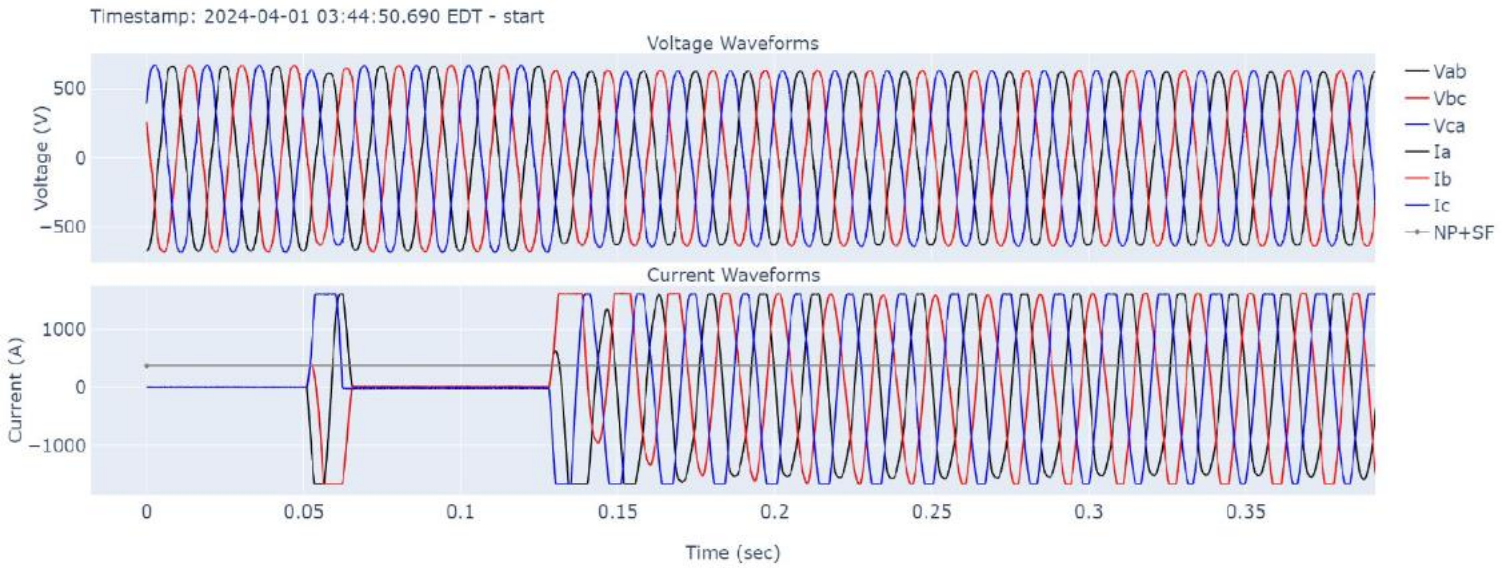
Contactor Failure

A Facility experienced a failing contactor. Volta Insite observed trending data and noticed an increase in Voltage Transients indicating the problem.

InsiteAI alerts include:

- Loss of Phase Transients
- Current Single Phasing





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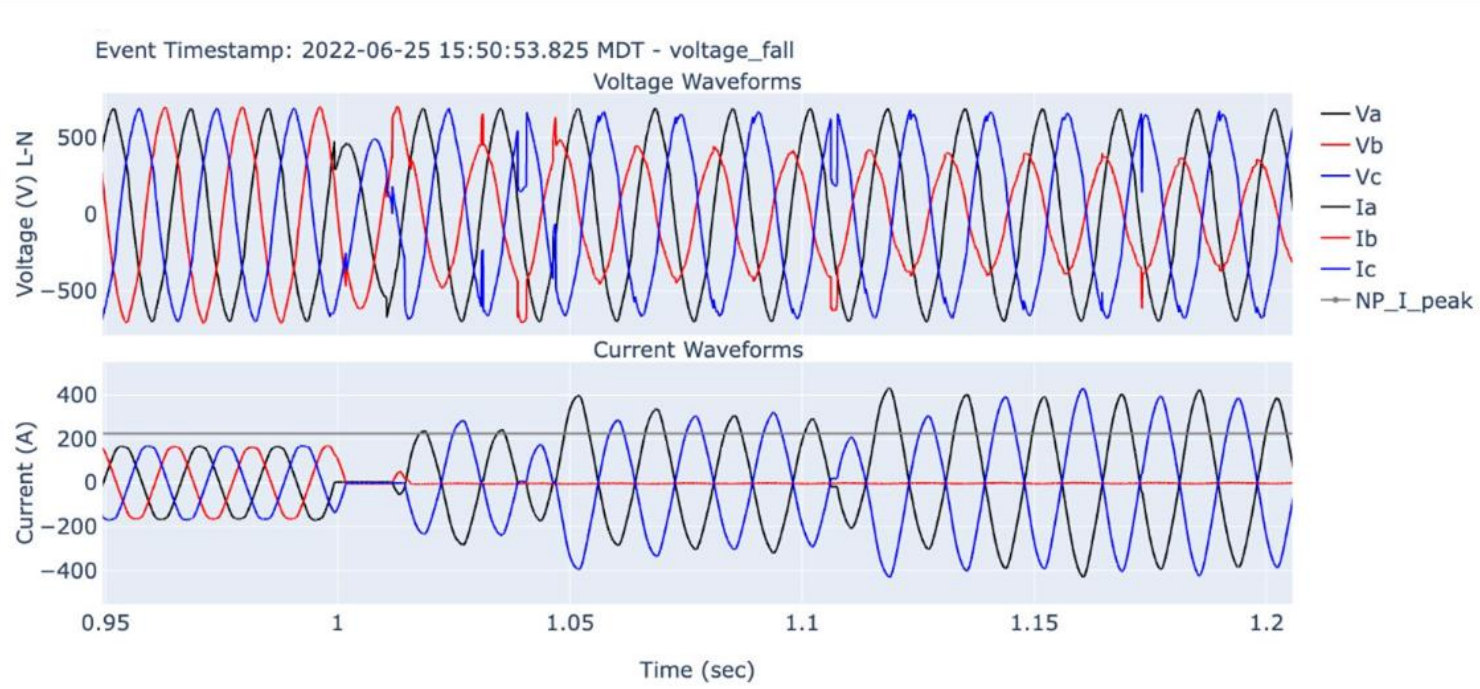
Single Phasing

A piece of equipment failed catastrophically without any prior indication. Troubleshooting found the problem was a casing degradation (broken plastic) wedged into a contactor, that resulted in a single phasing event.

Data is important to understand the sequence of events in complex failures. Correctly identifying the initial mechanism can help prevent future issues.



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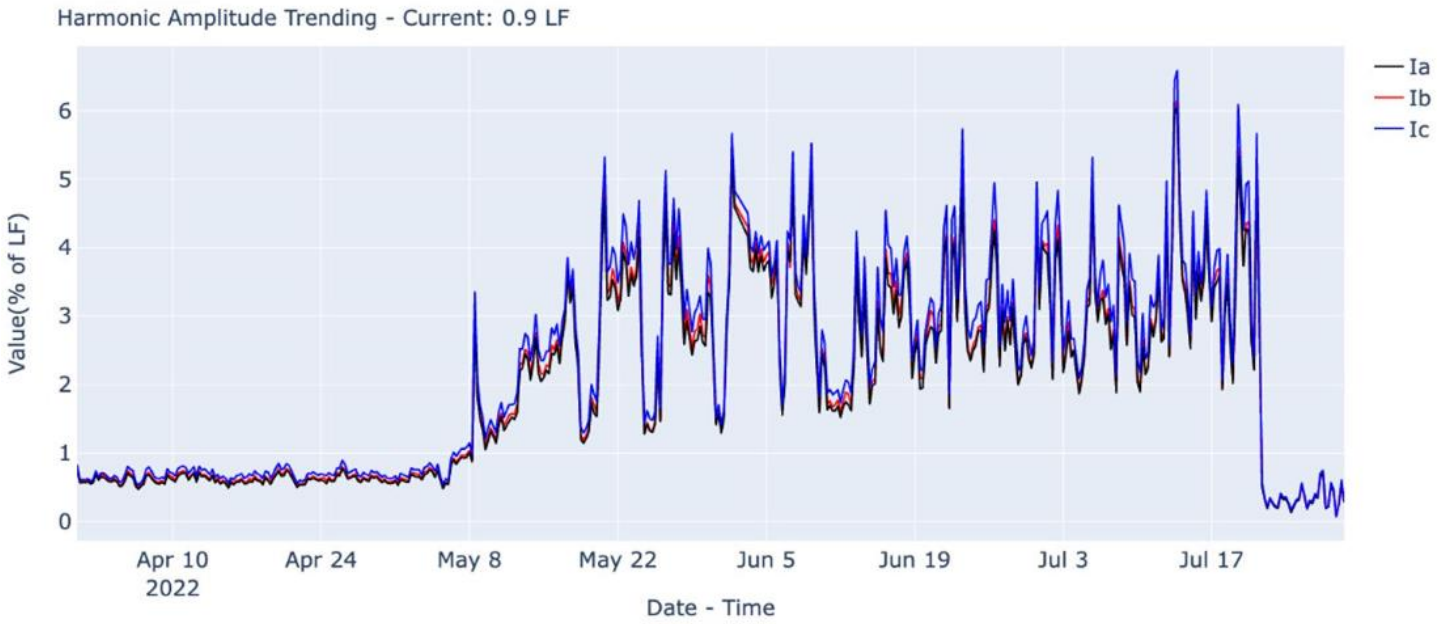
Preventive Maintenance

A Harmonic Amplitude increase was observed at a frequency of 6Hz. The Facility received an alert of this increasing trend.

Maintenance was scheduled to clean and balance the fan. The Harmonic Amplitude returned to baseline after maintenance was performed.



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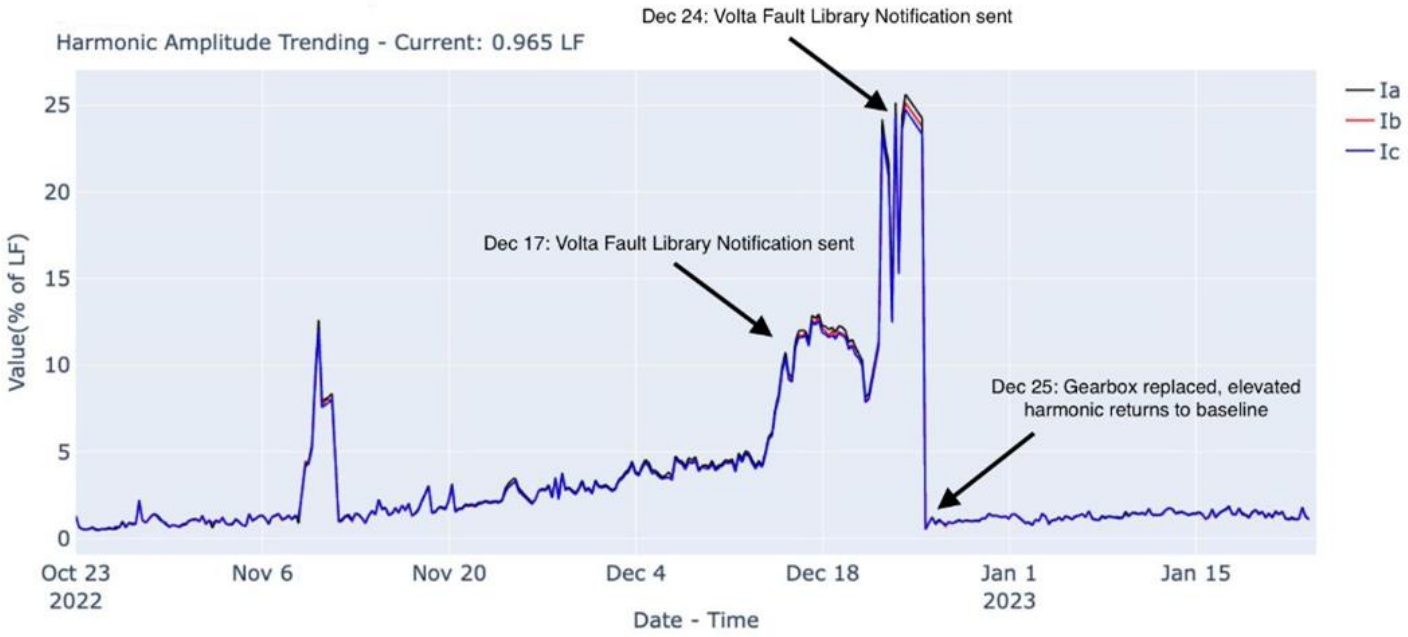
Prevent Downtime

InsiteAI observed a Harmonic Amplitude increase at 126 RPM. This speed indicated an issue with the gearbox. The Facility was alerted to the increasing trend and re-notified as the trend progressed.

The Harmonic Amplitude returned to baseline after maintenance was performed and the gearbox was replaced. This alert avoided unexpected downtime for the customer.



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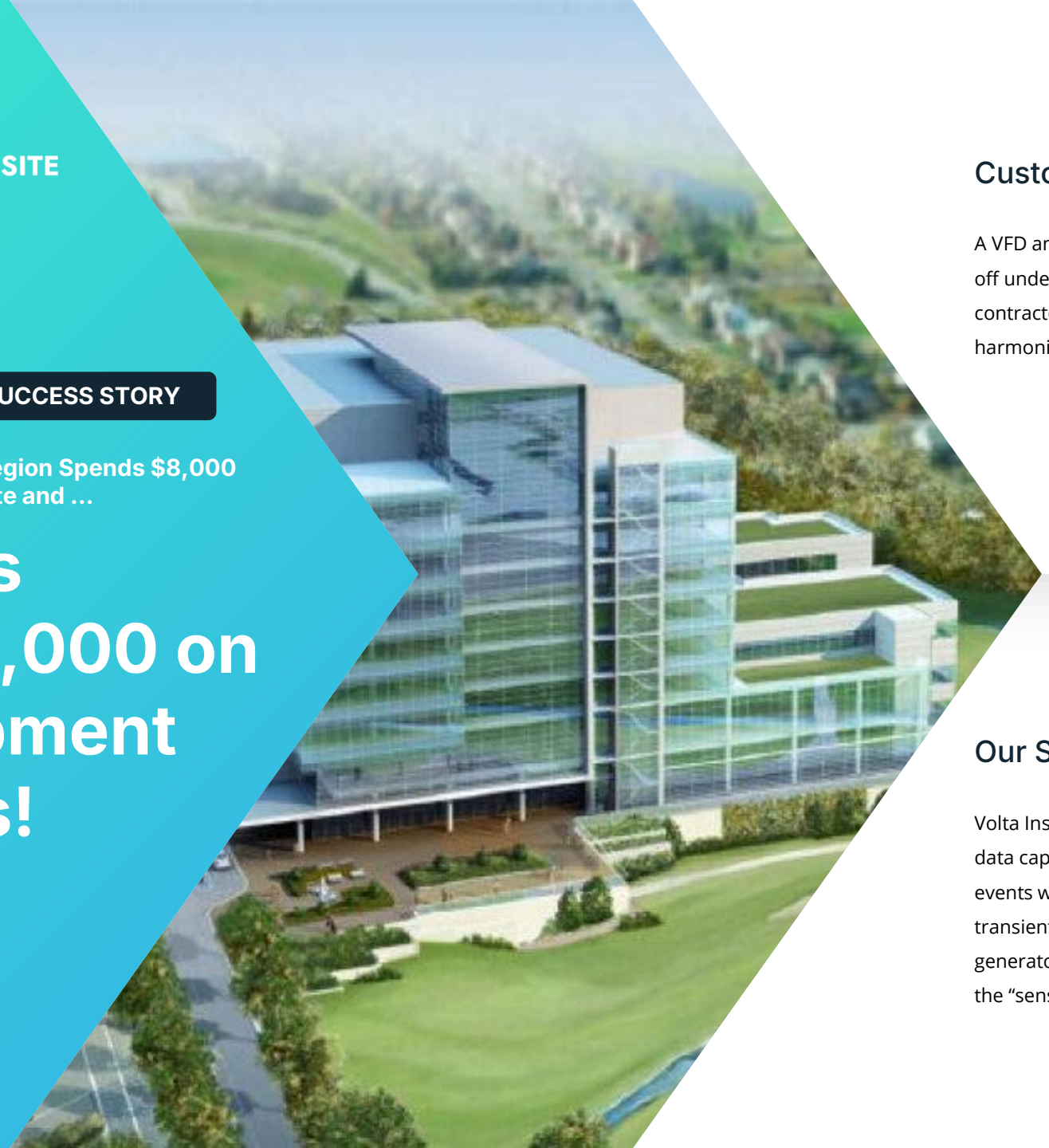
CUSTOMER SUCCESS STORY

City of York Region Spends $8,000 with Volta Insite and ...

Saves $200,000 on Equipment Costs!



Customer Problem

A VFD and pump operated normally under utility power but would kick off under generator power. Multiple technicians and an electrical contractor recommended to the customer that a $200,000 power harmonic filter was required to address the problem.

Our Solution

Volta Insite was called in to determine the root cause of the issue. Through data captures and continuous monitoring we were able to observe transient events when utility power switched over to back-up generator power. The transient events on power switch-over showed that the voltage from the generator was oscillating significantly. The Solution was a small signal filter on the “sense side” of the V-regulator and the system began working correctly.

York Region

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CUSTOMER SUCCESS STORY

Stackpole Spends $4,000 with Volta Insite and ...

Saves $100,000 on Equipment Costs!

Customer Problem

A 750 Ton Hydraulic Press, Motor and VFD had failed catastrophically two times, at a cost of $100,000 per incident with multiple days of downtime during a high-priority production run.
Volta Insite was called in to determine if the motor rebuild was at fault for the previous failures. During equipment operation, we used our continuous waveform capture to monitor the complete work cycle of the motor. After analyzing the captured data, we determined that the motor was being overloaded across the full seven-second work cycle, which led to the overheating of the motor and its eventual failure.

Our Solution

The simple solution to the problem was to slow the work cycle down to nine seconds. This change enabled the motor to cool down to its correct operating temperature, allowing production to continue without any additional failure. The customer fulfilled their contract on time and on budget.

Stackpole International

VOLTA INSITE

CUSTOMER SUCCESS STORY

Cortellucci Vaughan Hospital Spends $13,000 with Volta Insite and ...

Saves $150,000 on Equipment Costs!

Customer Problem

During multiple black-out tests, incidents of motor and VFD failures on air recirculation fans occurred.

Volta Insite was called in by Johnson Controls during the commissioning phase of the new hospital. They were concerned about transients and over-voltage conditions due to the number of harmonic filters in the facility. These conditions adversely affected the current and voltage in the power distribution system.

Our Solution

We were able to prove that voltage transients were minimal in nature and not the underlying issue. This was supported by Volta Insite's Continuous Waveform and Transient Capture System. Volta Insite's further inspection and diagnostics identified that the cause of failure was the faulty manufacturing of the air recirculation fan motors.

Cortellucci Vaughan Hospital

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CUSTOMER SUCCESS STORY

Princess Margaret Hospital Spends $11,000 with Volta Insite and ...

Saves $100,000 on Equipment Replacement Costs!

Customer Problem

Frequent tripping of motor VFDs running critical equipment resulted in Volta Insite being called in by Black & McDonald to monitor two exhaust fans. They had been prone to frequent service calls for VFD error codes and parameter settings.

Our Solution

Upon installation of our Nodes, we immediately identified an abnormal current imbalance. Our technician investigated further and found that one phase in the motor junction box was arcing to ground. Volta Insite's analysis enabled an accurate diagnosis preventing potential equipment failure.

UHN Princess Margaret Cancer Centre

VOLTA INSITE

VOLTA INSITE INC

87 Thornmount Dr.
Unit 16
Toronto, ON M1B 5S5
www.voltainsite.com

Information Requests

info@voltainsite.com
Tel: 833-227-5888