BNN POWER · ELECTRICAL RELIABILITY & ENERGY CONSULTING

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ASSESSMENT SERVICE

INDUSTRIAL POWER RELIABILITY & FAULT IDENTIFICATION

IPRFA — Industrial Power Reliability & Fault Identification Assessment

Investigate the Cause. Not Just the Symptoms.

THE PROBLEM

Many industrial facilities continue experiencing recurring interruptions **despite multiple studies and corrective actions.**

The real challenge is not identifying symptoms. It is identifying the true cause.

ARE YOU FACING THESE?

01
VFDs failure/tripping during utility disturbances

02
PLCs restarting without apparent reason

03
Production interruptions from electrical events & unexplained downtime

04
Voltage sag/swell related shutdowns

05
Frequent nuisance tripping of protection systems

06
Repeated failures despite corrective measures

07
Higher neutral current or Higher Neutral to earth voltage

08
Equipment behaving differently under identical conditions

OUR APPROACH

We Investigate Cause & Effect

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Most studies measure electrical parameters. We correlate multiple data layers to answer what happened, why it happened, and how to prevent recurrence.

Utility Grid Events

External disturbances, sags & switching

Equipment Sensitivity

VFD ride-through, PLC tolerance, control power

Protection Behavior

Relay settings, coordination, nuisance trips

Voltage Disturbances

Duration, magnitude & frequency of events

Power Quality

Harmonics, imbalance, transients

Process Impact

Quantified production losses per event

7-PHASE ASSESSMENT FRAMEWORK

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01	02	03	04	05	06	07
Reliability Mapping	**Infrastructure Vulnerability**	**Event Correlation**	**Equipment Immunity**	**Long Duration Monitoring**	**Root Cause Attribution**	**Improvement Roadmap**
Historical events & patterns	Electrical architecture audit	Disturbance → impact analysis	VFD, PLC, UPS resilience	Capture intermittent events	4-category classification	Prioritised action plan

Phase 1–2: Diagnose

- Utility outage records
- Trip & fault history
- SCADA alarms
- HT/LT distribution audit
- Transformer & MCC review

Phase 3–5: Measure

- Disturbance–trip correlation
- Drive vs. non-drive behaviour
- Site resonance condition, Ferranti effect, Tr. circulating current etc.
- Power Quality test
- Long-duration power monitoring

Phase 6–7: Resolve

- 4-category root cause map
- Immediate: VFD & relay settings
- Mid-term: VFD,SERVER, UPS, load split
- Long-term: infrastructure redesign
- Digital monitoring deployment

ROOT CAUSE ATTRIBUTION

Every Issue Has an Origin

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Each identified issue is classified into one of four attribution categories for unambiguous corrective action.

01

Utility Originated

- External Grid Disturbances
- Voltage Sags / swell
- Utility Switching Events

02

Plant Originated

- Internal Faults
- Load side power quality Issues
- Capacitor Switching Events

03

Equipment Sensitivity

- VFD Configuration Issues
- Harmonics Interference
- Excess cable burden

04

Protection System Issues

- Incorrect Relay Settings
- Fault current
- Nuisance Tripping

RELIABILITY IMPROVEMENT ROADMAP

Structured Implementation. Prioritised Actions.

PHASE A

Immediate Actions

- → VFD Parameter Optimization
- → Protection Setting Review
- → Fault identification
- → Power Quality improvement

PHASE B

Medium-Term Improvements

- → Dynamic Voltage Restoration (DVR)
- → Fault recognition & correction
- → Critical Load Segregation & Feeder reconfiguration
- → Passive Harmonics Filters installation

PHASE C

Long-Term Reliability

- → Infrastructure Modernization
- → Reliability Architecture Redesign
- → Digital Monitoring Systems
- → Continuous Reliability Management

WHAT YOU RECEIVE

Assessment Deliverables

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01

Reliability Risk Map

Identification of vulnerable systems, equipment, and feeders across your facility's electrical infrastructure.

02

Disturbance Correlation Analysis

Detailed correlation between electrical events and operational losses with quantified production impact.

03

Root Cause Investigation Report

Technical determination of fault origins and contributing factors with engineering-grade evidence.

04

Monitoring Strategy

Recommendations for continuous monitoring deployment and long-duration event capture protocols.

05

Reliability Improvement Roadmap

Prioritised action plan with phased implementation across immediate, medium, and long-term horizons.

06

Management Summary

Business-focused assessment of operational risks, downtime impact, and reliability improvement opportunities.

SECTORS SERVED

Across all process-critical industrial environments where uptime matters.

- Steel & Metals
- Pharmaceutical & Research
- Cement Plants
- Chemical & Petrochemical

INDUSTRIES WE SERVE

- Textile Manufacturing
- Automotive Manufacturing
- Food & Beverage Processing
- Data Centers
- Commercial & Industrial Facilities

9 **Industries Serving Critical Electrical Infrastructure**

WHY BNN POWER

Integrated Expertise Across Every Layer

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- Power Quality Engineering
- Electrical System Audits
- Reliability Assessment
- Harmonic Analysis
- Energy & Electrical Resource Management
- Root Cause Investigation
- Electrical Infrastructure Consulting

Our objective: help facilities improve uptime, reduce operational risk, and enhance production continuity through evidence-based engineering.

WHY IPRFA IS DIFFERENT

Other Studies Measure. We Determine.

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OTHERS DO	BNN POWER IPRFA
Measure power quality parameters – Harmonics High	**Correlate events to production losses**
Identify symptoms – Heating in PCC panel	**Attribute root cause to origin category**
Short-term snapshot monitoring – 2 or 3 Day Quick assessment	**Long-duration capture across seasonal cycles**
Generic corrective recommendations – Install AHF/SVG	**Phased roadmap: 0–3 months to 1–3 years**
Single-discipline analysis	**Cross-layer: utility → protection → equipment → process**

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NEXT STEP

Let's Investigate the Cause,
Not Just the Symptoms.

Recurring electrical interruptions lead to significant production losses, increased maintenance costs, and operational uncertainty. Partner with BNN Power to identify the true source of electrical reliability issues and build a more resilient power infrastructure.

SCHEDULE A RELIABILITY ASSESSMENT CONSULTATION

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