

Power Quality and Grounding Audit

An analysis of power sources and grounding networks

Typical power and grounding issues

- Intermittent operation of equipment
- High failure rate of equipment
- Unplanned downtime and system malfunctions
- Data loss and system crashes
- Unsafe electrical practices or non-compliance with electrical codes and standards
- Console failures
- Processor lockups



Solution

An ABB Service Engineer will audit your installation for compliance with ABB Site Planning Manuals as well as National Electric Code, IEEE 1100 and other standards. Ground faults and power quality deficiencies are identified in the audit, and correction of these issues can improve overall system performance. A comprehensive report is provided, detailing the findings, and offering recommendations for improvement.

What's included

The audit includes an assessment of proper grounding and configuration for the control system and its power distribution back to a separately derived source, which is usually a transformer or a UPS (Uninterruptible Power Supply). In cases where the supply voltage is determined to be unstable or to have other quality issues, further checks in the distribution system may be made to find the cause.

In addition to proper grounding and other wiring practices, current, voltage, and impedance measurements are recorded. These often indicate conditions which need correction.

Comprehensive scope

An audit begins with a review of system grounding installation documentation. Using state of the art test equipment, a careful review of the installation is then performed on the following:

- Control system cabinets
- AC distribution panel

- Isolation transformer
- Uninterruptible power supply
- Bypass operations
- Connection to building grounding system
- Electrode to earth resistance where appropriate
- Power quality including transients and harmonics
- Ground loop problems

A careful disturbance analysis is conducted to monitor transient activity and its effects on your equipment. RFI (Radio Frequency Interference) and EMI (Electromagnetic Interference) reviews can be provided in cases where unusual operation has indicated the likelihood of such interference.

This audit may be performed as a preventive maintenance activity, as a part of initial commissioning of a system to ensure proper installation, or as part of troubleshooting where the symptoms listed above are already present.

In the case of a troubleshooting investigation, additional power disturbance monitoring can be performed over a period of time to look for a power quality issue that may not appear during the audit.

Reporting and recommendations

Upon completion, a findings report including detailed implementation recommendations to improve power and grounding related problems and associated cost is provided.

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By acting on these recommendations you have the opportunity to improve plant safety, eliminate transient power spikes, revalidate power quality, and increase mean time between failures.

Remediation

Issues requiring correction may be addressed by the customer. However, ABB personnel can be contracted to provide guidance or implement recommendations to correct issues uncovered by the audit.

In cases where ABB is contracted to provide corrective services for the power distribution system, the work is performed in accordance with NFPA-70E standards, the benchmark for safety of personnel servicing electrical equipment.

Our time-tested expertise in this area can help to revitalize electrical system efficiency to a level you may have considered to be out of reach.

What sets this solution apart

- ABB product installation requirements are based on standards and codes. Most requirements are best practices for safety and reliable performance of electronic equipment and are not specific to ABB.
- Recommendations are not opinions, but practical ways to bring your equipment into compliance with NEC and relevant IEEE standards.
- ABB personnel are issued proper personal protective equipment and tools for conducting testing. The test equipment is properly maintained including up to date calibration to NIST traceable standards.
- A professional report is provided with recommendations for any corrections needed.

References

The ABB Power Quality and Grounding Audit Services has successfully improved the performance of systems across the globe. Many customers have scheduled appointments as part of their ongoing annual service agreements, while others have taken advantage of this audit opportunity to improve power and grounding related problems.

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