



shaping tomorrow with you

Site grounding and bonding audit service

With an average peak current of about 30,000 amps, temperature around 15,000 °C and electrical potential of up to 200 million volts, lightning is one of nature's most destructive forces. Lightning strike damage to all types of communications sites and their associated equipment, such as radio and microwave towers and other antenna structures, results in losses of over \$225 million annually in North America, according to industry estimates. Not only is equipment harmed by lightning, but also personnel.

Over the continental 48 US states, 20 million cloud-to-ground flashes have been detected, on average, every year since 1989. Although lightning strikes cannot be avoided, damage prevention is essential, especially in lightning-prone areas such as Florida and other southern states. The Fujitsu Cell Site Grounding and Bonding Audit Service should be a cornerstone of your lightning protection plan.

Assess and minimize your risk

The Fujitsu Site Grounding and Bonding Audit service is a flexible service that consists of a detailed inspection and assessment of the lightning exposure at sites of your choice, including cell, core and regeneration sites, as well as small central offices and switching locations. These inspections frequently reveal problems such as violations of National Electrical Code (NEC) requirements, Occupational Health and Safety Administration (OSHA) regulations, and equipment manufacturers' installation specifications. Other common problems include:

- Harmonic currents
- Load unbalance
- Loose wiring connections
- Missing surge protectors
- Improper or absent grounds
- Improperly isolated grounds

Proper installation and maintenance of power and ground at cell sites protects your revenue stream by helping to prevent equipment damage and customer service disruption from lightning and other adverse events. Careful attention to power and grounding also reduces network outages and protects the useful life of your equipment. Power problems, such as fluctuations in the voltage level, can and do adversely affect sensitive electronic systems. Revenue is lost when outages, surges, sags, objectionable currents and low voltage cause loss of data or damage to components. Proper grounding and a proper relationship between the neutral and the ground are essential, not only to meet regulatory requirements but also for optimal equipment operation and workplace safety.

Typical report contents

- Power criteria and findings
- Grounding criteria and findings
- Transient criteria and findings
- Summary of findings and results
- Recommendations
- Supporting data and survey records
- Photographs



Essential damage protection

Thorough, methodical study and analysis

In carrying out the Fujitsu Site Grounding and Bonding Audit service, an engineer begins by studying the available documentation provided by the site equipment manufacturer, including power and grounding drawings, specifications and power quality data. The engineer then uses this information to perform a comprehensive electrical power, grounding and lightning protection inspection at each of the selected sites.

During the on-site inspections, the engineer gathers measurements and other data to support analysis:

- Verify proper electrical distribution wiring of the main entrance panel and subpanels
- Survey the grounding scheme for code compliance
- Check systems and equipment for compliance with accepted installation practices and manufacturer's specifications
- Measure selected impedances, voltages and currents and verify proper load balance
- View voltage wave shapes with an oscilloscope and verify significant amounts of harmonics distortion
- Survey electrical distribution and lightning protection schemes

After collecting the necessary data, the engineer performs a thorough analysis. The analysis is documented in a report detailing all findings and the root cause of those findings for each of the sites inspected. The report is issued as soon as possible after either completion of the survey or receipt of all requested data.

The report discusses any problem areas and also provides expert recommendations for correcting electrical problems and minimizing potential future damage and downtime.

Take action before lightning strikes

Many service providers carry out this type of study after a cell-site has been damaged by lightning. Fujitsu recommends a more proactive approach, in the form of a quarterly monitoring and analysis program for a number of sites, before lightning damage disrupts service to your customers and adversely affects your business. In some cases, cell sites are subject to theft or vandalism in addition to environmental wear and tear. With regular grounding and bonding inspections by Fujitsu experts, you have the assurance that comes with thorough, regular, scheduled preventive procedures. As with all Fujitsu services, we get to know your requirements and customize the service specifically for you.

Once we have completed a Grounding and Bonding Audit, we can also help you take action. Our experts can implement the recommendations and necessary changes to protect your sites.

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