



Technical Guidance Document

Lightning and Surge Protection

Lightning strikes and power surges can cause severe damage to electrical systems, electronic equipment, and building structures. Implementing effective lightning and surge protection measures is crucial for ensuring the safety of personnel, protecting valuable assets, and maintaining operational continuity. By adopting some of these practices, facilities can significantly reduce the risk of damage from lightning strikes and power surges, ensuring the safety of occupants and the reliability of critical systems.

Prior to Lightning Season/Severe Weather

1. Lightning Protection Systems (LPS)

- Ensure that lightning protection systems are designed, installed, and inspected in accordance with applicable standards (e.g., NFPA 780, IEC 62305).
- Verify that air terminals (lightning rods), conductors, and grounding systems are in good condition and free from corrosion or damage.
- Check the integrity of all connections in the LPS to ensure a low-impedance path to ground.
- Confirm that surge protective devices are properly coordinated with the LPS.
- Conduct regular inspections of LPS components, especially after severe weather events.
- Ensure that all metallic components on the roof (HVAC, pipes, etc.) are bonded to the lightning protection system.

2. Surge Protective Devices (SPDs)

- Install SPDs at all service entrances, distribution panels, and critical equipment locations.
- Select SPDs with appropriate surge current ratings and voltage protection levels for the specific application.
- Verify that SPDs are installed correctly, with short lead lengths and proper grounding.
- Check SPD status indicators regularly to ensure they are functioning correctly.
- Coordinate SPDs to provide layered protection throughout the electrical system.
- Protect incoming power, data, and communication lines with appropriate SPDs.

3. Grounding Systems

- Establish a low-impedance grounding system that complies with applicable electrical codes (e.g., NEC Article 250).
- Verify that all grounding connections are tight, clean, and free from corrosion.
- Inspect ground rods, grounding conductors, and bonding jumpers for integrity.
- Ensure that all electrical systems and equipment are properly grounded and bonded.
- Test the grounding system resistance periodically to ensure it is within acceptable limits.

4. Building Structure

- Inspect roofs, walls, and foundations for any openings or cracks that may allow lightning or surge currents to enter the building.
- Seal any gaps or openings with appropriate materials to maintain the integrity of the building envelope.

During Lightning Storms/Power Surges

1. Personnel Safety

- Advise personnel to stay indoors and away from windows, doors, and metal objects during lightning storms.
- Prohibit the use of corded telephones and electronic devices during lightning activity.

2. Equipment Protection

- Disconnect sensitive electronic equipment from power outlets and data lines if possible.
- Monitor electrical systems for any signs of surge activity or equipment malfunction.

3. System Monitoring

- Use building management systems (BMS) to monitor power quality and detect surge events.
- Check surge protection devices for proper operation after a surge event.

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