



## **Industrial & Maritime Lightning Protection & Surge Prevention**

*Ensuring Electrical System Resilience for Shipyards, Military Bases, and Industrial Facilities*

Lightning strikes and power surges pose a severe risk to marine vessels, shipyards, military bases, and industrial plants. Without proper protection, electrical surges can damage mission-critical equipment, disrupt operations, and pose safety hazards.

This guide provides best practices for designing, installing, and maintaining lightning protection and surge suppression systems in compliance with NFPA 780, NEC Article 285, and MIL-STD-188-125 standards.

### **Lightning Protection System (LPS) Design & Installation**

- Conduct Risk Assessments for Facility & Vessel Exposure – Identify high-risk locations for lightning strikes & power surges.
- Install Air Terminals (Lightning Rods) at Proper Heights – Ensure NFPA 780-recommended spacing & conductor paths.
- Bond All Metal Structures to a Unified Grounding System – Reduce risk of side-flash arcing & floating voltages.
- Ensure Proper Grounding Electrode System (GES) Installation – Use deep-driven ground rods, plates, or grids to disperse lightning current.
- Verify Surge Protection Integration with Critical Electrical Systems – Deploy MIL-STD-rated transient voltage suppression (TVS) devices.

### **Surge Protection & Transient Voltage Suppression (TVS)**

- Install Surge Protection Devices (SPDs) on Main Electrical Panels – Protect against grid-induced voltage spikes.
- Use Class 1, 2, & 3 SPDs for Layered Defense – Implement multi-tiered surge suppression at power entry, distribution, and endpoint levels.
- Ensure Proper Bonding of Cable & Communication Lines – Prevent induced surges from nearby lightning strikes.
- Deploy Shielded & Grounded Power Cables for Sensitive Equipment – Reduce risks of electromagnetic interference (EMI).
- Regularly Test & Replace Degraded SPD Units – Ensure continued protection as MOV (metal oxide varistor) components degrade over time.

### **Grounding & Lightning Mitigation for Shipyards & Industrial Sites**

- Ensure Low-Resistance Grounding Paths (5 Ohms or Less) – Essential for military & industrial electrical infrastructure.
- Test & Maintain Lightning Protection Grounding System Annually – Conduct fall-of-potential testing for resistance verification.
- Inspect & Secure Bonding Points on All Large Metallic Structures – Reduce potential voltage differentials during strikes.
- Verify Compliance with NEC 250 & NFPA 780 Standards – Meet regulatory guidelines for lightning protection in hazardous locations.
- Integrate Uninterruptible Power Supplies (UPS) with Surge Protection – Prevent downtime caused by sudden power disruptions.



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### **Lightning Protection for Military & Government Infrastructure**

- Install EMP (Electromagnetic Pulse) Protection for Defense Facilities – Ensure MIL-STD-188-125 compliance for hardened electrical systems.
- Use Faraday Cages for Critical Communication Equipment – Shield command centers from lightning & electromagnetic interference (EMI).
- Deploy Remote Monitoring Systems for Surge Event Tracking – Use IoT-based diagnostics to detect & mitigate surge events in real-time.
- Conduct Lightning Strike Simulations & System Resilience Testing – Validate that electrical systems can withstand extreme transient voltage conditions.

### **Why Lightning Protection & Surge Prevention is Critical**

Prevents Costly Electrical Equipment Failures – Reduces damage to sensitive systems.

Ensures Safety for Personnel & Critical Infrastructure – Protects workers & operations from dangerous power surges.

Meets NFPA, NEC, & MIL-SPEC Compliance Standards – Aligns with government & industrial regulatory requirements.

Reduces Operational Downtime – Ensures mission-critical systems remain functional during storms & power surges.

### **Need Expert Lightning Protection & Surge Suppression?**

MD Marine Electric specializes in lightning protection & surge prevention for military, industrial, and maritime applications.

Ensure compliance. Safeguard your electrical infrastructure. Prevent costly system failures.

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