



Electrical Grounding & Bonding in Shipyards & Military Bases Systems

Ensuring Safety, Reliability, and Code Compliance for High-Risk Environments

Proper electrical grounding and bonding are essential for shipyards, military bases, and industrial facilities to mitigate electrical shock risks, reduce interference, and ensure compliance with NEC, NFPA 70, and MIL-SPEC standards.

Without proper grounding and bonding, equipment failures, personnel hazards, and electrical fires can occur, leading to operational downtime and costly repairs.

This guide provides key grounding and bonding principles for facility managers, military contractors, and shipyard engineers to ensure safe, efficient, and regulation-compliant electrical infrastructure.

Grounding System Design & Installation

- Verify Facility Grounding Electrode System (GES) – Ensure proper use of ground rods, plates, or grids.
- Test Resistance to Ground – Measure grounding effectiveness using fall-of-potential testing (5 ohms or less for industrial/military applications).
- Ensure Grounding of All Major Equipment – Properly bond transformers, switchgear, motor control centers, and subpanels.
- Confirm Grounding of Dockside & Shipboard Power Systems – Ship-to-shore power must meet NAVSEA and NEC Article 555 requirements.
- Install Dedicated Grounding for Lightning Protection – Ensure lightning rods and surge suppression systems are bonded to the facility's grounding system.

Bonding for Electrical Safety & Interference Reduction

- Eliminate Ground Loops by Using Proper Bonding Techniques – Prevent signal interference and equipment damage.
- Ensure Effective Bonding of Metal Structures & Enclosures – Bond all metallic conduits, panels, and structures to prevent floating voltages.
- Test Continuity Between Bonded Components – Use low-resistance ohm meters to confirm bonding integrity.
- Verify Shipboard Bonding for Electrolytic Corrosion Prevention – Reduce galvanic corrosion caused by improper bonding in saltwater environments.
- Inspect Grounding & Bonding for High-Voltage Systems – Ensure proper bonding of substations, generators, and mission-critical power systems.

Grounding & Bonding Compliance Testing

- Conduct Periodic Ground Resistance Testing – Verify that resistance stays within MIL-SPEC & NEC tolerances.
- Use Infrared Thermal Scans to Identify Bonding Failures – Detect loose or corroded bonding points before failures occur.
- Verify Compliance with NEC 250 & NFPA 70 – Ensure that grounding installations meet regulatory spacing and depth requirements.
- Perform Arc Flash Risk Assessments – Confirm that grounding paths can handle fault currents safely.
- Document All Grounding & Bonding Work for Compliance Records – Keep logs of installations, inspections, and test results for audits.



Electrical Grounding & Bonding in Shipyards & Military Bases Systems

Ensuring Safety, Reliability, and Code Compliance for High-Risk Environments

Proper electrical grounding and bonding are essential for shipyards, military bases, and industrial facilities to mitigate electrical shock risks, reduce interference, and ensure compliance with NEC, NFPA 70, and MIL-SPEC standards.

Without proper grounding and bonding, equipment failures, personnel hazards, and electrical fires can occur, leading to operational downtime and costly repairs.

This guide provides key grounding and bonding principles for facility managers, military contractors, and shipyard engineers to ensure safe, efficient, and regulation-compliant electrical infrastructure.

Why Proper Grounding & Bonding is Critical

Prevents Electrical Shock & Arc Flash Incidents – Reduces safety risks for personnel.

Eliminates Electrical Noise & Equipment Interference – Ensures stable power for sensitive systems.

Meets Military & Industrial Safety Standards – Complies with NFPA, NEC, NAVSEA, and MIL-SPEC regulations.

Extends Equipment Lifespan – Reduces corrosion, overheating, and electrical stress on components.

Need Expert Grounding & Bonding Solutions?

MD Marine Electric specializes in grounding & bonding design, installation, and compliance testing for military, shipyard, and industrial facilities.

Ensure compliance. Prevent safety risks. Optimize electrical performance.

Email: MainOffice@MDMarineElectric.com

Phone: (253) 383-9983

Website: www.mdmarineelectric.com