Electric Shock Drowning (ESD) Prevention

Keeping Up-To-Date with Marina Design Standards

NEC Ground Fault Protection Requirements

- *Article 555.3, Ground Fault Protection:*

  "The main over current protective device which feeds the marina shall have ground fault protection not exceeding 100mA. Ground fault protection of each individual branch or feeder circuit shall be permitted as a suitable alternative."

Main panel-level protection

- Satisfies NEC 555.3
- Protects against ESD
- Relatively simple installation
- When tripped, creates significant inconvenience, better for small marinas


Fuse. GFI Monitor
The ground fault monitor in this panel is set at 100mA per the NEC. "The main overcurrent protective device that feeds the marina shall have ground fault protection not exceeding 100mA. Ground fault protection of each individual branch or feeder circuit shall be permitted as a suitable alternative."
SIDEWALK LIGHTS

What does a main panel-level protection system mean to a marina?

1. Fault is detected
2. The entire feeder to that panel is shunted – tripped (10-100+ slips)
3. All slips lose power
4. Angry boaters
5. Locating fault can be a difficult and long process

Branch circuit-level protection

- Satisfies NEC 555.3
- Protects against ESD
- More complex installation
- Simplified process to locate fault

What does a circuit-level protection system mean to a marina?

1. Fault is detected in a circuit
2. One circuit is shunted – tripped (typically 2-4 slips on a circuit)
3. 2-4 slips lose power
4. 2-4 temporarily angry boaters
5. Locating fault is much simpler – only 2-4 possible slips

NFPA Electrical Maintenance Requirements

- *Part 5.20.1, Maintenance of Electrical Wiring and Equip.:*

  "An inspection of all electrical wiring, ground connections, conduit, hangers, supports, connections, outlets, appliances, devices, and portable cables installed or used in a marina, boatyard, boat basin, or similar establishment shall be made at regular intervals to ensure a complete inspection at least annually.."

ESD Prevention Recommendations

- *Goal 1 – Safety and minimizing risk of injury/death*
- *Get organized and keep records*
- *Assess your system for code compliance & condition*
- *Make corrections immediately*
- *Perform regular inspections by qualified electrician*
- *Obtain a clamp on tester (ammeter) for regular shore power checks by harbormaster*
- *Absolutely NO SWIMMING in marinas*
- *Boater education and signage*


RANGE
HOLD
HIOKI 3283
CLAMP ON LEAK HITESTER