ARTICLE

555

MARINAS, BOATYARDS, AND DOCKING FACILITIES

Introduction to Article 555—Marinas, Boatyards, and Docking Facilities

This article covers the installation of wiring and equipment for fixed or floating piers, wharfs, docking facilities, marinas, and boatyards. Fluctuating water levels and the hazard of electric shock drowning (ESD) require special rules to protect the users of these facilities from the hazards that arise from the use of electricity. Many of these rules are outside of the scope of this material, however, some of the topics we cover include the following:

- Scope
- Electrical Datum Plane Distances
- Electric Shock Hazard Sign
- Equipment Grounding Conductor

Article 555 consists of three parts:

- Part I. General
- Part II. Marinas, Boatyards, and Docking Facilities
- Part III. Floating Buildings (not covered)

Part II. Marinas, Boatyards, and Docking Facilities

555.35 Ground-Fault Protection (GFPE and GFCI)

Ground-fault protection for docking facilities must be provided in accordance with the following:

(A) GFPE Protection, Feeders. Feeder conductors installed on docking facilities must be provided with GFPEs set to open at trip currents not exceeding 100 mA.

Coordination with the feeder GFPE overcurrent protective device is permitted.

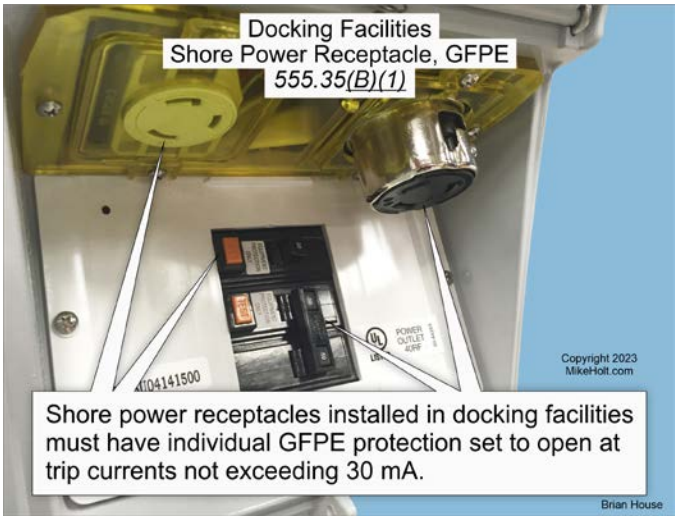
Ex: Transformer secondary conductors of a separately derived system that do not exceed 10 ft, and are installed in a raceway, are permitted to be installed without ground-fault protection. This exception also applies to the supply terminals of the equipment supplied by the transformer secondary conductors.

(B) GFPE and GFCI.

(1) Shore Power Receptacles, GFPE Protection. Shore power receptacles installed in accordance with 555.33(A) must have individual GFPE protection set to open at trip currents not exceeding 30 mA. ▸Figure 555–20

Author's Comment:

- In accordance with the research study by the American Boat and Yacht Council Foundation, Inc., 30 mA represents an acceptable threshold level for GFPE protection to prevent most electrical shock drowning incidents while remaining practical enough to minimize nuisance tripping.
- If shore power receptacles are replaced, they are required to have GFPE protection [406.4(D)(8)].



▸Figure 555–20

(2) Outlets Other than Shore Power, GFCI Protection. GFCI protection is required for docking facility outlets rated 60A and less, single-phase, and 100A and less, three-phase for electrical systems not exceeding 150V to ground.

Ex to (B): Circuits not requiring grounding, not exceeding the low-voltage contact limit, and supplied by listed transformers or power supplies complying with 680.23(A)(2) can be installed without GFCI protection.

(C) Boat Hoist. Boat hoist outlets on docking facilities must be GFCI protected where the circuit voltage does not exceed 240V. ▸Figure 555–21

▸Figure 555–21

(D) Leakage Current Measurement Device. Where more than three receptacles supply shore power to boats, a leakage current measurement device for use in marina applications must be available and be used to determine leakage current from each boat that will utilize shore power.

Note 1: Leakage current measurements will provide the capability to determine when an individual boat has defective wiring or other problems contributing to hazardous voltage and current. The use of this test device will allow the facility operator to identify a boat that is creating an electrical hazard. In some cases, a single boat could cause an upstream GFPE device protecting a feeder to trip even though multiple boats are supplied from the same feeder. The use of this test device will help the facility operator prevent a particular boat from contributing to hazardous voltage and current in the marina area.

Note 2: An annual test of each boat with the leakage current measurement device is a prudent step toward determining if a boat has defective wiring that could be contributing hazardous voltage and current. Where the leakage current measurement device reveals that a boat is contributing hazardous voltage and current, repairs should be made to the boat before it is permitted to utilize shore power.

Ex: Where the shore power equipment includes a leakage indicator and leakage alarm, a separate leakage test device is not required.