



Marine Safety Center Technical Note

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16703/NVIC 2-89

MTN: 05-95

Subj: ACCEPTABLE APPLICATIONS OF WIRE ON COAST GUARD CERTIFICATED
VESSELS

Ref: (a) Title 46 Code of Federal Regulations (CFR) 111.60-11
(b) Title 46 CFR 183.05
(c) Navigation and Vessel Inspection Circular (NVIC) 2-89, Guide for Electrical
Installations on Merchant Vessels and Mobile Offshore Drilling Units
(d) IEEE Standard 45, IEEE Recommended Practice for Electric Installations on
Shipboard
(e) ANSI/NFPA 70, National Electrical Code

1. PURPOSE: Identify the acceptable applications for wire on Coast Guard certificated vessels.
2. DESCRIPTION: The acceptable use of wire instead of cable in vessel's electrical distribution systems is an area of regular misunderstanding. Unfortunately NVIC 2-89 confuses the cable vs. wire issue by stating wire in conduit may be accepted if certain conditions are met. To date use of wire has only been accepted for the three applications noted below.
3. DISCUSSION: In short, wire must not be used for a vessel's electrical distribution system, except in the following limited applications:
 - a. Small passenger vessel (46 CFR Subchapter T) electrical system's less than 50 volts.
 - b. Wiring inside an enclosure (e.g. motor controllers, electrical panels, instrument enclosures, etc...). This does not include wire inside of conduit. Conduit is not an enclosure.
 - c. Wiring in conduit on the deck of a barge. Cable is a factory assembly of two or more conductors having an overall covering or jacket. Wire is one or more conductors without an overall covering. Both the Code of Federal Regulations and IEEE Standard 45 require power distribution and control circuits to be made using cable. The additional protection offered by the jacket makes cable much better suited for the marine, shipboard environment. The conductors' insulation is better protected during installation and in service.

4. ACTION: The wire used aboard certificated vessels must meet the requirements of 46 CFR 111.60-11. Wire used on small passenger vessels must meet 46 CFR 183.05-45. Wire in conduit aboard barges must meet the following:

- a. The requirements of 46 CFR 111.60-11.
- b. The National Electrical Code (NEC) requirements for sizes and fill, bends and bending methods, couplings and connectors, and support methods and locations.
- c. The installation must be suitable for a marine environment (corrosion, moisture, watertight bulkhead penetrations and flexing must be addressed).



T. H. WALSH

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