



GUIDANCE NOTES ON

RECOMMENDED SPECIFICATIONS OF JUNCTION BOX AND CABLE TRAY FOR OFFSHORE APPLICATION

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Foreword

These Guidance Notes provide ABS recommendations for the design and construction of cable trays and junction boxes. These Guidance Notes are applicable to fixed and floating offshore structures as well as drilling units.

These Guidance Notes provide recommendations and best practices for standard specifications of certain electrical and instrumentation components thus improving cost efficiency (i.e., design man-hours, operation and maintenance costs), and increasing predictability of operation without compromising quality and safety in offshore structures and units. The recommendations in these Guidance Notes are based on industrial experiences, project experience, shipyard practices, manufacturer's data sheets, national regulations, international standards, and ABS Rules.

These Guidance Notes become effective on the first day of the month of publication.

Users are advised to check periodically on the ABS website www.eagle.org to verify that this version of these Guidance Notes is the most current.

We welcome your feedback. Comments or suggestions can be sent electronically by email to rsd@eagle.org.

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SECTION 1 General

1 Background

These Guidance Notes have been developed to provide shipyards, designers, owners and operators with practical guidance on the design and construction of specific electrical and instrumentation (E&I) components used in offshore structures and units that are not covered by Class Rules. The main purpose of these Guidance Notes is to provide recommendations and promote standardization for the material, design and manufacturers' requirements.

Basic requirements for some aspects of the E&I components (e.g., cable tray and junction box) can be found in the *ABS Rules for Building and Classing Mobile Offshore Drilling Units (MODU Rules)*, as well as the *ABS Guide for Classification of Drilling Systems (CDS Guide)*. However, it is recommended in these Guidance Notes that some requirements additionally be based on international standards, such as IEC, IEEE, NEC, API, and NEMA.

3 Scope and Application

These Guidance Notes are applicable to fixed and floating offshore structures as well as drilling units (without any geographical limitations) including topside installations. These Guidance Notes are not applicable to E&I components already covered by Class Rules. The recommendations in these Guidance Notes do not override any Rules or statutory requirements that may exist.

The design standard for junction boxes and cable trays in the offshore projects is based on applicable industry standards, regulations, and classification requirements. An effort is made to compare the safety standards considering OSHA, NEC, NEMA, NFPA, API and IEC Standards.

5 Instrument Junction Box

Junction boxes are an integral part of every electrical, control and instrumentation installation. For control and instrumentation, it is an enclosure used for interconnection between field devices (i.e., instruments) in the process/production areas and control/monitoring equipment typically located in the control room. The junction box is typically used for terminating multiple field devices of common systems in a general area. Instrument junction boxes should be designed to suit the environmental conditions of the intended locations. It should have certification to demonstrate proper ingress protection (IP) and hazardous area protection.

The specifications for instrument junction boxes covered in these Guidance Notes address the following items:

- Materials
- Degree of protection
- Type of terminal
- Cable entry direction and devices
- Earthing
- Temperature class and gas group
- Breather/drain plug
- Enclosure size

- Labels
- Terminal block back plate
- Doors
- Ambient temperature

Instrument junction boxes are required for many systems and can be in a variety of work locations (e.g., in wet or dry conditions and safe or hazardous areas) onboard offshore structures and units. Generally, instrument junction boxes should be maintained at safe and efficient conditions. Because typically many junction boxes are required on offshore structures and units, it is recommended that the requirements and specifications be standardized.

7 Metal Cable Tray

Cable trays are a part of a planned cable management system to support, route, protect, and provide a pathway for cable systems. All offshore structures and units require numerous electrical cables with cable tray systems for installations. Although cable trays are available in various shapes, straight type cable trays are the most common and are discussed in these Guidance Notes.

Most offshore structures and unit use the ladder type cable trays (i.e., the cables are supported by a traverse bar, similar to the rungs of a ladder, at regular intervals) due to their desirable characteristics, such as:

- They permit the maximum free flow of air across the cables, thus dissipating heat.
- They consume less space and require less labor for installation compared to other types
- The rungs provide a strong anchor position
- The rail flanges provide protection to the cables
- Faulty cables can easily be located/identified and replaced/repared

Perforated trays (i.e., punch type cable trays with holes) are another type of cable tray support system. It is usually used for small bundles of cables for short distances and generally is used for cable branching.

The standard specification of straight type metal cable trays in these Guidance Notes are addressing the following items:

- Materials
- Dimensions
- Classification
- Testing
- Finishing material

9 Abbreviations

API	American Petroleum Institute
AS/NZ	Australian/New Zealand Standard
ASTM	American Society of Testing and Materials
ATEX	ATmosphères EXplosibles
BS	British Standards
CDS	Classification of Drilling Standards
E&I	Electrical and Instrumentation
EN	European Standards