

API Specification

17E

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Specification for Subsea Production
Control Umbilicals

Appendix A

Purchasing Guidelines

API Monogram[®] Required Yes No

Appendix A—Information to be Provided within a Purchaser/functional Specification

A.1 Introduction

This Appendix provides guidelines for information to be provided within a Purchaser/ Functional Specification for an umbilical system, which references this API Specification as the detailed standard for the design, manufacture and test of the umbilical to be incorporated in the umbilical system. These guidelines, set out below, are not intended to be mandatory, but are intended as a convenient reference such that the umbilical Manufacturer is provided with sufficient information to ensure the umbilical is correctly designed for its intended functionality.

NOTE Functional requirements not specifically required by the Purchaser/User which may affect the design, materials, manufacturing, testing, installation deployment and operation of the umbilical/umbilical system shall be specified by the Manufacturer in the Manufacturer's written specification.

The Purchaser/User shall specify project specific design requirements and considerations within a Purchaser/ Functional Specification, which shall be based on the following:

A.2 Information to be Provided

A.2.1 Scope Of Development

The Manufacturer should be aware of the scope of the development for which the umbilical system is intended and where it is incorporated as part of the development. This should be provided by means of narrative description and schematic arrangement drawings.

Additionally, the Manufacturer should also be aware of the proposed installation sequence and method by which the umbilical system will be installed.

A.2.2 Scope of Supply

The scope of supply in respect of the umbilical system should be clearly defined, including but not limited to the following:

- a) Number off and lengths, including spare lengths, of each umbilical design.
- b) Type of terminations/ancillary equipment required, including repair joint kits, buoyancy attachments, etc.

A.2.3 Applicable Codes, Standards and Regulations

Other applicable Codes, Standards and Regulations that will apply to the design, manufacture and test of the umbilical/umbilical system or could have an influence should be clearly defined. This should cover National, International and Purchaser/User Specifications. Additionally, any Purchaser/User requirement amendments to this API Specification should be clearly stated.

A.2.4 Operating Environment

The relevant operating environment applicable to the design, installation and operation of the umbilical and the umbilical system should be clearly defined. This should address the following:

- Location: Geographical data for the installation location.
- Water Depth: Design water depth, variations over pipe location and tidal variations.
- Seawater Data: Minimum and maximum temperatures.
- Air Temperature: Minimum and maximum during storage, installation and operation. (Storage/operation including localized areas where extreme temperatures are to be experienced, e.g. FPS turret with the umbilical adjacent to high temperature flowlines).
- Survival Conditions: Conditions which the umbilical may experience as a result of non-planned activities, (extended period for the umbilical suspended from the installation vessel as a result of a breakdown within the installation spread, loss of FPS mooring chain resulting in a modified vessel offset, etc.), which should be catered for within the umbilical system.
- Sea-bed Conditions: Description, friction coefficients, seabed scour, sand waves and variations along umbilical route.
- Marine Growth: Maximum values and variations along length.
- Ice: Maximum ice accumulation, or drifting icebergs and ice floes.
- Current Data: As a function of water depth, direction and return period, and including the known effects of local current phenomena.
- Wind Data: Direction, speeds, frequencies.
- Wave Data: Significant and maximum waves, associated periods, wave spectra as a function of direction and return period.

Further environmental data will be required to carry out installation and service analysis.

A.2.5 Specific Purchaser Requirements

The following requirements specific to the Purchaser/User field development requirements should be clearly defined.

A.2.5.1 Design Life

The intended design life and not the required Manufacturer's mechanical warranty (guarantee), shall be stated.

A.2.5.2 Umbilical Length

The required umbilical length for each umbilical system including manufacturing tolerance shall be stated.

NOTE Installation considerations normally dictate the negative length tolerance shall be zero and the positive length tolerance + 1%.

A.2.5.3 Functional Requirements

The number, type, size duty and duty rating of each component design should be stated.

A.2.5.4 Umbilical Characteristics

Where umbilical characteristics are important to overall system performance, these should be clearly defined.

NOTE For static umbilicals, this is normally limited to maximum working load, maximum weight, minimum bend radius if these are likely to impact on the shipment and/or installation equipment.

For dynamic umbilicals, this should address the following:

- a) Diameter to weight ratio expressed as mm.kg.m^{-1} (in.lb.ft^{-1}).
- b) Buoyancy attachment (no off, location, upthrust).
- c) Points applicable to any static length of the umbilical if appropriate.
- d) Loads and minimum bend radii at key interfaces (generally resulting from mathematical modeling of the installed configuration in connection with sea currents and vessel motions).

A.2.5.5 Component Characteristics

Where component characteristics are important to overall system performance, these shall be clearly defined.

NOTE For hoses, this is normally limited to volumetric expansion and resistance to external hydrostatic pressure as defined by measured collapse pressure. For electric cables/cable elements, this is normally limited to attenuation, characteristic impedance, capacitance, inductance and cross-talk where the umbilical incorporates separate power and signal cores.

A.2.5.6 Service Fluids

The purchaser should specify the control fluid, injected fluids for continual and occasional chemical treatments (dosages, exposure times, concentrations and frequency) and possible produced fluids (composition of individual phases). In the specification of the internal fluid composition the following should be defined:

- a) Liquids, including water, oil composition and alcohols.
- b) Injected chemical products including alcohols, and inhibitors for corrosion, hydrate, paraffin, scale and wax.
- c) Corrosive agents, including bacteria, chlorides, organic acids and sulphur bearing compounds.
- d) Aromatic components.
- e) Gases, including oxygen, hydrogen, methane and nitrogen.
- f) All parameters which define service conditions, including partial pressure of H_2S and CO_2 , pH of aqueous phase, TAN (as per ASTM D664 or D974) and water content (produced water, seawater and free water).

A.2.6 One-off Functional Requirements

Functional requirements which have to be met only once, but which are necessary for the installation or operation of the umbilical/umbilical system should be stated.

A.2.7 Interfaces

Interface areas between the umbilical and mating arrangements should be clearly defined. The connector requirements for both end terminations in the umbilical should be specified. This should include, connector type, welding specification, seal type and sizes.

Interface details including but not limited to the following shall be specified:

- a) Purchaser supplied pull-in and connection tools, terminations and mating test connectors etc.
- b) Geometric, dimensional and imposed loading data.
- c) Purchaser supplied installation aids and equipment.

A.2.8 Installation Requirements

The purchaser should specify performance requirements for installation services to be provided, considering the following as a minimum:

- a) For installation by the purchaser, the purchaser should specify any requirements on load restrictions, clamping/tensioner loads, overboarding chute requirements, installation tolerances and any other facility limitations.
- b) For installation by the manufacturer, the purchaser should specify any requirements for season, environment, vessel limitations, installation tolerances, restrictions due to conflicting activities, and installation scope (including trenching, burial, testing, inspection, surveying and documentation).

The purchaser should specify any requirements for recoverability and reusability of the umbilical within its service life.