

Guidance Note : Umbilical Systems – Typical Manufacturer/Installer Interface Guidelines

UMF – GN05

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Umbilical Manufacturers'
Federation

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UMBILICAL SYSTEMS - MANUFACTURER/INSTALLER INTERFACE

1.0 Purpose

The purpose of this Guidance Note is to define the typical respective considerations of both the Manufacturer and Installer in respect of load out, development of the installation procedure(s) and Manufacturer support to Installer during load-out, installation and commissioning of the goods provided by Manufacturer. It also identifies what is normally considered to be the respective activities of Installer and Manufacturer but is not intended to define the rights and obligations of the parties; these would be specifically defined under the contracts applicable to the purchase and supply of the goods and their installation.

2.0 General

Manufacturer and Installer of the goods may be separate or the same independent organisation. The umbilical manufacturer normally prepares the goods and makes ready for delivery transfer to the organisation responsible for receipt of goods.

Installer shall install the goods safely, correctly and without compromising the installation parameters as defined by the manufacturer of the goods.

Transfer of the goods may be by means of lifting the goods on its installation/shipping reel onto the deck of the installation/shipping vessel. Alternatively, it may involve a spooled transfer from Manufacturer's (or others) storage facility onto or into the vessel. During installation, Installer is recommended to utilize the services of Manufacturer to undertake hook-up and testing to verify the integrity of the installed goods. Alternatively an installer may hire a monitor or post load out testing contractor.

The interface between Manufacturer and Installer is very important for the successful installation & commissioning of the goods. This document aims to identify common interface activities and to ensure these activities are noted and duly allocated to the allocated party. How information is communicated between the parties is generally the subject of project specific contractual arrangements and is **not** addressed by this Guidance Note.

3.0 Terms, Definitions, and Abbreviated Terms

3.1 Terms and Definitions

| | |
|------------------------------|---|
| ancillary equipment | An accessory to the umbilical system which does not form part of the main umbilical system. (Weak link, buoyancy collar, I/J-tube seal, etc.). May also be known as an appurtenance . |
| break-out arrangement | An arrangement installed part way along the length of an umbilical to allow functional components to break-out of the umbilical and be connected to some remote part of a subsea production system (SPS), sub-sea isolation valve, water injection well, etc. |
| Delivery location | The physical location where the responsibility for the goods |

| | |
|-------------------------|--|
| | transfers to another entity. |
| delivery term | The contractual term (which may be an Incoterm) defining the point at which title and risk of loss of the goods passes from one party to another party |
| goods | A general term describing the tangible elements of the scope of supply. (Umbilical systems, spares, jumper bundles, jumper assemblies, buoyancy modules, documentation, etc.). |
| Installer | The entity responsible for the installation of the goods. |
| loadout | The physical act of transferring the umbilical cable or umbilical system typically from the manufacturing facility or dockside onto a shipping/installation vessel involving lifting of reeled product directly onto the vessel, and/or transfer by spooling from the storage system (reel, carousel) onto the vessel storage system (reel, carousel). |
| Manufacturer | The manufacture of the goods |
| May | Indicates typical possible course of action. |
| Permit to Work | <p>A formal check is performed when all elements of a ‘safe system of work’ are in place before anyone is allowed into areas where a Permit to Work system is in operation.</p> <p>Site managers should communicate with those personnel in advance of undertaking work in hazardous areas and will include daily Toolbox Talk forums. Invariably it involves working to formal documented procedures.</p> |
| Purchaser | <p>The organisation responsible for the procurement of the goods under a contractual arrangement with Manufacturer.</p> <p>Note: under an EPIC contract arrangement Purchaser and Installer may be the same organisation.</p> |
| saddle / cradle | An arrangement, usually resembling a saddle in shape, located between the rim of an installation/shipping/storage reel and the load bearing member, (ground, vessel deck, etc.) to enable a loads to be distributed over a greater area |
| shall | Indicates typical mandatory requirement. |
| should | Indicates typical preferred course of action or is recommended as good practice. |
| spooled transfer | The process of unwinding an umbilical from its storage reel or carousel, and transferring along a prescribed route, which may involve roller paths, onto a reel or carousel |
| stand-by | The period in which the installation vessel ceases to install the |

| | |
|--|---|
| | goods with the umbilical suspended from the deployment chute, usually as a result of unplanned events or outside influences eg. Installation equipment breakdown, poor weather, ROV failure, etc. |
|--|---|

3.2 Abbreviations

| Abbreviation | Abbreviation Expanded |
|-------------------|--|
| EPIC | Engineer, Procure, Install and Commission |
| QHSS&E | Quality, Health, Safety, Security and Environment |
| Incoterms | Terms of Trade for International Contracts |
| HAZOP/HIRA | Hazard and Operability/Hazard Identification Risk Analysis |
| SPS | Subsea Production System |

4.0 Overview of Interfaces

Provided in **Appendix 1** is a summary table highlighting Manufacturer and Installer typical interfaces as further detailed in this document.

5.0 Interface Meeting(s)

In advance of the development of the procedures detailed in this document, consideration should be given to interface meeting(s) typically between Manufacturer and Installer under the auspices of Purchaser. At these meetings, key aspects including but not limited to the items below should be addressed.

Such meetings should be scheduled way in advance of the activities and should not form the project critical path as it is important these are well prepared and organised in advance with adequate contingency. The interfaces can alter plans and should consider ample time periods to allow for any procurement of newly identified items or equipment as a result of these meetings.

5.1 QHSS&E

- Maintenance of quality, performance and reliability of the goods from load-out through to deployment, installation hook-up and integrity testing
- Health and safety of respective parties when working at other parties sites and/or remote locations
- HAZOP/risk assessments
- HIRA's
- Safety audit(s) of Installer installation vessel / equipment and work areas where Manufacturer's personnel may be required to visit or work;
- Personnel security in respect of travelling to and from work sites at remote / hazardous locations

- 'Permit to Work' arrangements
- Toolbox Talks
- Environmental issues associated with disposal of consumables such as test fluids, etc;
- Contingency plans
- Management of change
- Authority to stop work during load out/installation
- Applicable HSE procedures

5.2 Loadout

- Delivery location(s)/term(s);
- Product orientation
- Durations/spooling rates (m/hr);
- Craneage requirements (mobile/fixed) and associated liabilities;
- Respective responsibilities/point(s) of responsibility transfer;
- Anticipated loadout date/time;
- Loadout notification mechanism;
- Handling of all terminations and ancillary equipment;
- Loadout location (which may or may not be at or adjacent to Manufacturer's facility);
- Single or multiple mobilisations
- Applicable rules, regulations and specifications;
- Contingency planning in the event of equipment breakdown, damage to the goods, etc.
- Unplanned events including repair and emergency abandonment
- Communications: Equipment and Protocol, definitions of single points of contacts during load out and mechanism to stop processes.
- Quay draft (m)
- Requirements for barges
- Shipping agent responsibilities
- Requirements for port services
- Access to quay/onshore/manufacturing facilities
- Noise or other environmental limitations
- Planned and emergency stops
- Vessel location/orientation at quay side, vessel mooring locations
- Load out route
- Vessel and quayside readiness requirements and preparedness including relative positions of the terminations

5.3 Post Loadout Testing

- Extent and durations;
- Party(s) allocated for testing and associated activities
- Test equipment and connections adaptors
- Accessibility for connection to test equipment;
- Assistance/services to be provided by all participating parties;
- Applicable specifications;
- Contingency planning in event of equipment breakdown, test result discrepancies, etc;

- Space availability on vessel to accommodate test equipment /operatives personnel;

5.4 Installation Witnessing

- Manufacturer's, Installers, subcontractors activities, roles, records and monitoring
- Purchasers requirements
- Pre installation interface meeting with all involved parties

5.5 Integrity Monitoring/Testing

- Anticipated durations/manning levels and planned consumables;
- Personnel, Services and test equipment deployment vis-à-vis vessel and host facility;
- Space availability on vessel and/or at host facility to accommodate test equipment /operatives personnel;
- Applicable specifications/procedures/record forms

5.6 Administration Issues

- Shipping manifest/release certificates
- Delivery documentation
- Integrity monitoring/testing reports
- Identification of any procedures yet or to be developed
- Notification mechanisms for mobilisation of personnel/equipment required for load-out/Installation/Commissioning and test.
- Installation witnessing records

5.7 Typical Special Considerations

- Review of any contract requirements between Installer and Purchaser and Manufacturer and Purchaser that may impact on Manufacturer-Installer interface.
- Care, control, custody, loss or damage of Manufacturer's equipment during shipping to and from point of embarkation and storage on the installation/transportation vessel.

6.0 Typical Manufacturer Activities and Tasks

6.1 Information Relating to the Goods

To assist Installer develop the installation procedure(s), the Manufacturer typically generates the following information in relation to the goods:

6.1.1 Umbilical(s) and Ancillary Equipment

- Nominal diameter;
- Nominal weight in air;
- Nominal weight in water;
- Allowable static bend radius for post installation and storage
- Allowable bend radius for vessel handling and installation
- Allowable dynamic bend radius for operation
- Allowable bend radius versus tension
- Maximum clamping pressure on umbilical jacket
- Umbilical outer & inner jacket friction factors;
- Angular rotation versus axial tension;
- Bend stiffness;
- Nominal pressurisation level(s) for fluid conduits for load-out, shipping, and installation.
- Maximum working load
- Minimum breaking load
- Cross- sectional arrangement
- Outer sheath material and thickness
- Length marking details
- Fluid types and quantities
- Installation and handling guidelines
- Time duration during stand-by before the umbilical over boarding touchdown point (region of flexing) is changed

6.1.2 Terminations and Ancillary Equipment

- Location, size, footprint, weight and, centre of gravity (if applicable);
- Mechanical protection
- Installation and handling guidelines

6.2 Manufacturers review and comments on Installation Procedure

Installation procedures are typically de-risked thru a review cycle by the Manufacturer well in advance of the installation to check that the product capabilities are not infringed and that the installation process is well designed with low levels of risk to the product.

6.3 Load Out Procedure.

Typically, the Manufacturer develops a loadout procedure up to the point of handling where the transference of the goods takes place which normally addresses the following:

- Loadout location and any unusual features/restrictions;
- Loadout method (spooling, crane lift, or, combination of both)
- Sequence of events

- Any requirement to disconnect/reconnect end terminations due to size/weight restrictions and re-connection on the vessel
- Typical post loadout test regime
- Identify the location and sequence where the goods are transferred
- Lifting of end terminations from the quayside to a defined location(s) on the vessel
- Spooling umbilical from the storage facility (Manufacturer's or remote location) onto the vessel
- Master control party for operations start/stop communications
- Ancillary item/spares to be loaded onto the vessel should be considered
- Load out sequence
- Single or multiple load out mobilisations
- Anticipated/planned umbilical load out rate and time to transfer end terminations from Manufacturer's facility onto the vessel
- Reel size(s), weight and packing details
- Saddle / cradle fixing details
- Craneage provision (fixed and/or mobile including vessel craneage)
- Any umbilical breakout arrangement and ancillary
- Personnel cover during break periods/shift changes

6.4 Mobilisation Notification Mechanism(s)

Typically defined in the contract documents

6.4.1 Offshore Test Equipment and Personnel

Offshore test equipment and personnel are often mobilised at the time of load out, and installation

6.4.3 Offshore Testing/Commissioning and Hook-up of the Goods

Often, Engineers, equipment for onshore/offshore assembly activities, monitoring/testing of the goods during deployment, post installation hook-up and during the commissioning stages of a project are mobilised.

This typically involves:

- Detailed work instructions based on scope of work
- Inspection and test plans specific to the offshore activities
- Equipment/manpower listings
- Equipment/manpower transportation logistics
- Test and record documentation
- QHSS&E requirements
- Medical/survival training requirements;
- Personnel requirements;
- Mobilisation notices
- Communication protocol between parties involved in the testing;
- Contingency actions
- Support services.
- Emergency abandonment procedure to maintain integrity of goods

7.0 Typical Installer Responsibilities

7.1 Installation Procedure(s)

Typically developed by the Installer, taking account the installation vessel, available installation spread, site physical and environmental conditions and design constraints of the goods. The procedure(s) typically define the installation parameters not to be compromised including the maximum allowable parameters for the umbilical and its associated hardware, (e.g., J-tube pull-in load, bend radius of umbilical at J-tube entry etc.) and shall include the procedural requirements in the event of localised and/or extended damage to the goods or the requirement for emergency abandonment in the event of unforeseen events such as significant change of sea state; vessel breakdown; vessel collision etc.

Note that the development of such procedure(s) often requires several iterations.

7.2 Offshore Work Scope

Offshore test equipment and testing / monitoring personnel for use on the installation vessel / platform is typical and support may be required to provide personnel resources (e.g, manual labour), utilities (compressed air, electricity, etc) and support services / arrangements (weather protection, lighting, etc).

7.3 Vessel Berthing

Typically mutually agreed during contract phase with the purchaser and manufacturer.

8.0 Delay to Installation Vessel

Delays often occur and should be planned and managed. Consideration should be taken with respect to extended storage of scope of work and associated test equipment and resources.

APPENDIX 1 : TYPICAL INTERFACE MATRIX

| Item No | Activity | Manufacturer | Installer | Purchaser | Tester or Test Subcontractor |
|----------------|---|---------------------|------------------|------------------|-------------------------------------|
| 1 | Interface meeting(s) | Participant | Participant | Convener | Participant |
| 2 | Technical information relating to goods | Author | Review | Review | Review |
| 3 | Installation procedure | Review | Author | Review | n/a |
| 6 | Post load-out/offshore test procedures | Author | Review | Review | Author |
| 8 | Shipping manifest | Author | Review | Review | n/a |
| 9 | Offshore test equipment requirements | If applicable | Review | Review | If applicable |
| 10 | Load out procedures and layout drawings (up to point of delivery) | Author | Review | Review | n/a |
| 11 | Load out procedures and layout drawings (after point of delivery) | Review | Author | Review | n/a |

