Recommended Best Practices
for
TRANSPORTATION of
NON ROUTINE or SPECIAL CARGO ITEMS
TO OR FROM SITE

(This document supersedes "Best Practice Transportation of Project Related Cargo Items - Guidance")

ENDORSEMENTS

REVISION RECORD

REVISION DETAILS

Revision	Date	Circumstances Prompting Revision	Implemented By
00	TBC	New document	

DESCRIPTION OF CHANGES

Revision	Section	Change
00	New Document	Issued to replace “Best Practice Transportation of Project Related Cargo Items – Guidance Note”

CONTENTS

1 INTRODUCTION

Requirements often exist for non-routine cargo items, often associated with project development activities, to be shipped to or from various sites, both on- and offshore.

In the context of this document “non-routine cargo” includes any items which, for whatever reason, are not transported in standard cargo carrying units.

Such items are often of high value, both intrinsically and in consideration of the consequences of any project delay which might result from physical damage or delay in shipment.

By their nature, many of these items may have unusual physical features and / or transportation requirements which may result in particular arrangements having to be made for their safe transportation in a timeous manner.

This document has been prepared to summarise the best practice which experience has shown should be observed in the transportation and handling of such items.

2 SCOPE OF THIS DOCUMENT

This document relates principally to cargo items transported to or from offshore facilities on supply vessels sourced through the normal logistics support arrangements. Such items will normally be lifted by, and where relevant set in place, using appliances installed on the facility and operated by its personnel.

The maximum weight of such items is unlikely to exceed 50 tonnes, though the actual weight of items delivered to a particular facility will be determined by the safe working load of the lifting appliances installed on it.

Similar principles will apply to project cargoes transported and lifted by specialist contractors but project-specific procedures and risk assessments will normally be developed for such operations.

Whilst primarily relating to transportation to or from offshore facilities the recommendations in this document may also be relevant to projects involving items being transported to and installed at onshore sites. However, in these circumstances lifting appliances and other material handling equipment may be operated by third parties. It is the responsibility of the site occupier to ensure that all such equipment is fit for the purposes for which it is used, that the appropriate procedures have been prepared and are being complied with and that all personnel involved have appropriate competencies and experience.

3 TYPICAL EXAMPLES OF NON-ROUTINE CARGO ITEMS

Some typical examples of non-routine or special cargo items loaded onto offshore supply vessels are illustrated below.

Figure 3 – 1 Reservoir development project component

Figure 3 – 2 Umbilical transportation reel

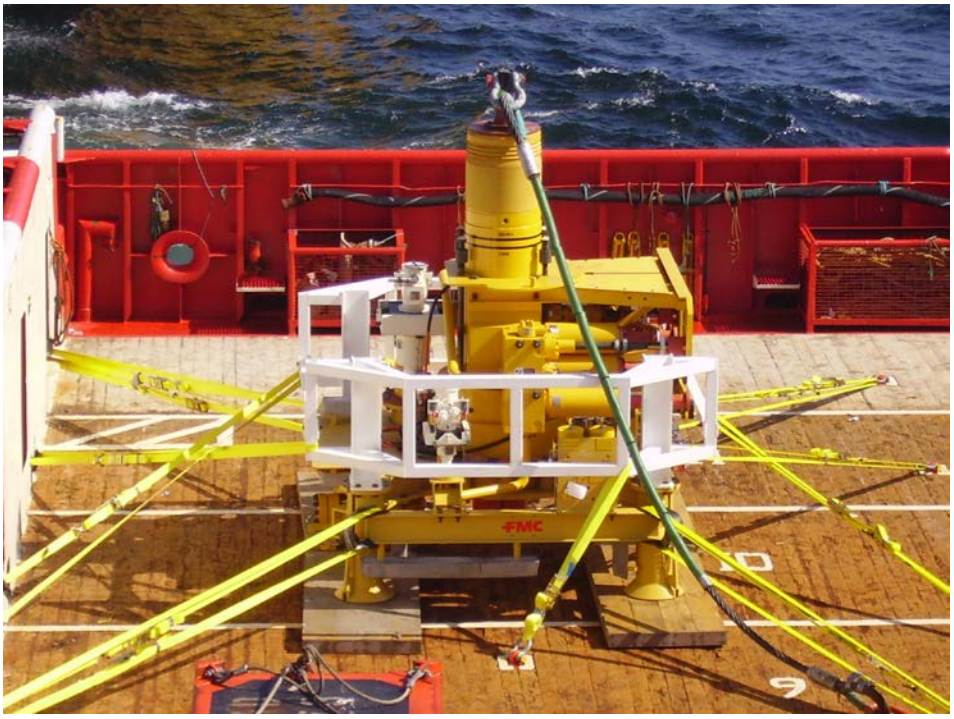

Figure 3 – 3 "Christmas Tree" just prior to off-load
(Note support arrangements to distribute footprint loading on vessel deck)

Figure 3 – 4 Accommodation modules

Figure 3 – 5 Fabricated support frames for new platform facilities

Other examples of non-routine or special cargoes are illustrated in Appendix 8.C of the primary reference.

4 DICTIONARY

4.1 ACRONYMS AND ABBREVIATIONS

Acronym	Meaning	Further Information
CCU	Cargo Carrying Unit	
CoS	Chamber of Shipping	
CSS	Cargo Stowage and Securing	IMO Code
DNV	Det Norske Veritas	Now DNV-GL
GOMO	Guidelines for Offshore Marine Operations	
GOMO (UK)	Guidelines for Offshore Marine Operations United Kingdom Continental Shelf Supplement	
IMCA	International Marine Contractors' Association	
IMO	International Maritime Organisation	
ISO	International Standards Organisation	
MBL	Minimum Breaking Load	
MSF	Marine Safety Forum	
MWS	Marine Warranty Surveyor	
NEP&I Ass'n	North of England P&I Association	
NI	Nautical Institute	
NSL	North Sea Lifting	
NUI	Normally Unattended Installation	
P&I	Protection and Indemnity	
O&GUK	Oil & Gas UK	Formerly UKOOA
OSV	Offshore Support / Supply Vessel	
SWL	Safe Working Load	
UKCS	United Kingdom Continental Shelf	
UKP&I	UK Protection and Indemnity (Club)	
UKOOA	UK Offshore Operators' Association	Replaced by O&GUK

4.2 DEFINITIONS

Term	Meaning
Current Standards	In the context of this document these are the current standards for the design, construction, and where relevant, the testing of cargo carrying units and their appurtances, including any lifting equipment. Current standards for the design, construction, and where relevant testing, of CCU's for use in the North Sea are contained within European Standard EN 12079 which has been adopted as a British Standard. The requirements included in the DNV 2.7-1 code are generally similar to the European Standard. The former CCU standard BS7072 has been withdrawn as a "build" standard, and is to be used solely for the inspection and / or repair of units built to that standard which remain in use.
Cargo Carrying Unit	Any unit intended for the carriage of goods or materials to or from offshore facilities. Typically these will include containers (open or closed), baskets and tanks manufactured in compliance with the current standards applicable to the units concerned.
Duty Holder	Corporate entity responsible for the preparation of and compliance with the Safety Case relating to an Offshore Installation
Ex Works	Any goods, including cargo items, delivered into care of shipper at point of manufacture
Rule of Thumb	Guidance in sound operational practice based on practical experience as distinct from that based on theoretical calculation or engineering analysis.
Seafastening	Arrangements for securing any cargo item on the deck of a vessel in preparation for a seagoing voyage. "Internal seafastening" relates to the securing of any loose items within the cargo item itself.
Site Occupier	Entity responsible for ensuring that all activities undertaken at an on-shore work-site are managed in a safe manner and in accordance with all relevant legislation and good industrial practice.
Ship Loose	Cargo items transported on the deck of an OSV which are not packed in a container.

5 PROCUREMENT STRATEGY

It is strongly recommended that within the contracting and operator's organisations the logistics and operational safety support teams are involved at certain stages in the procurement process, as follows:-

5.1 TENDERING

Prior to any invitation to tender or bid for the supply of the equipment being issued the project engineer or relevant buyer is to contact the two support teams referred to above to ascertain their particular requirements, if any, to ensure that the item(s) can be safely handled and / or transported throughout the entire journey from point of delivery to final installation on- or offshore.

Information which is of particular interest will include, but is not limited to:-

1. Proposals for transportation modes throughout the journey from the point of receipt to final delivery / installation

2. Proposals for materials handling at each intermodal interface throughout the journey.

3. Proposals for transportation route(s) throughout the journey

Particular requirements identified at this time will be recorded as actions for the project team to include in the outline tender document.

It is also recommended that the tender document includes a specific section relating to transportation and materials handling requirements..

Particulars of a nominated address with suitable facilities for receiving the item(s) on delivery is also be included.

5.2 PURCHASING

Compliance with the specific sections in the tender document relating to transportation and materials handling is to be verified by the relevant support teams before placing any order.

A hold point will exist immediately prior to order confirmation to ensure that the actions identified in the tendering stage have been adequately addressed.

5.3 DELIVERY

On delivery, a check will be made of all relevant documentation, including certification, to ensure that it is valid and correct.

To facilitate such checks it is advisable that, where available, documents are submitted for review as they become available.

6 MARINE WARRANTY / INDEPENDENT VERIFICATION

In some instances lifting, materials handling or transportation arrangements may require to be reviewed, approved, and dependent on requirements actual operations witnessed, by representatives of the operator's nominated marine warranty surveyor or other independent verification authority.

Any such requirement must be identified by the project team at an early stage, and the relevant specialist in-house personnel advised accordingly.

7 INFORMATION REQUIRED BY LOGISTICS TEAM(S)

As noted in the introduction this document relates principally to the outward transportation and, where relevant, installation of items at offshore sites
.
Inward transportation from such sites is also included.

Information in this section relates to such activities and summarises the information required by the relevant support teams to facilitate safe and timeous operations.

It is to be noted that this summary is of a general nature and particular requirements will depend on the specific circumstances of each project.

7.1 DATE OF INTENDED SHIPMENT

The specialist support team(s) are to be included at an early stage in project, when the general nature of the item(s) involved and schedule are being developed.

The support teams are to be advised when the final delivery date has been confirmed, such information being forwarded at least two weeks prior to the actual date.

7.2 PROJECT SCHEDULE

As above, the specialist support team(s) are to be included from the early planning phase when the project schedule is being developed.

Thereafter, they are to be kept advised of any changes to in the key project dates .

In the context of this document such information will include, but not limited to, the following:-

1. Date(s) when lifting and / or materials handling arrangements may be inspected.

2. Date(s) when preparations for transportation may be inspected.

In some instances these dates may constitute "hold points" in the project programme.

7.3 PHYSICAL DESCRIPTION OF THE CARGO TO BE SHIPPED

A full description of the cargo to be shipped is to be included.

This description is to include, but is not limited to, the following:-

1. All significant dimensions.
2. Drawings and / or pictures of the pieces
3. Weights and centre of gravity
4. Details of suitable sea fastening points
5. Details of hard points which may be suitable for bracing the item(s) into a container.

8 CARRIAGE OF SPECIAL CARGOES IN CONTAINERS

8.1 PROCEDURES FOR USE OF STANDARD OFFSHORE CONTAINERS

Whilst this document relates principally to cargo items which cannot be safely packed in standard offshore transportation containers where this is possible it is to be considered as the preferred means of shipment.

The relevant logistics support team(s) will provide appropriate advice and arrange for containers suitable for the purpose intended to be made available as required.

All their normal procedures are to be complied with at all times.

8.2 CONTAINER PACKING REQUIREMENTS

.
Items are to be properly secured in the container and shippers should consult the primary reference for further guidance regarding this matter.

Whilst containers holding project cargo may be opened and inspected on delivery to premises operated by the contracting or operator's organisations it is the responsibility of the shipper to ensure that all such cargo is adequately packed and secured in the container.

8.2.1 Internal Seafastening of Items within Containers

Items are to be secured in containers in accordance with the recommendations included in Section 9.7 of the primary reference.

Where necessary, seafastenings may be assembled using scaffolding poles or similar components clamped to the structure of the container.

Where it is considered that welding is the preferred option for securing items within containers, or for securing the container itself on the deck of the vessel, the relevant logistics team, container owner and, where relevant the vessel owner, **must** be consulted beforehand.

Uncontrolled or unapproved welding involving containers is NOT permitted and will immediately invalidate certification relating to the construction of the unit.

9 CARRIAGE OF NON-CONTAINERISED CARGO ITEMS

The remainder of this document relates primarily to the planning, preparation and carriage from point of origin to final destination of cargo items which cannot be carried by conventional means in offshore transportation containers.

9.1 CARGO CONDITION AND / OR REQUIREMENTS DURING SHIPMENT

A full description of the condition of the cargo and / or any particular requirements during transportation is to be provided.

This description is to include, but is not limited to, the following:-

9.1.1 Lifting Arrangements

A full description of proposed lifting arrangements, including drawings, is to be included.

Lifting arrangements are to be designed, installed, and where appropriate tested, in accordance with the current standards for CCU's.

Wherever practical lifting arrangements are to be consolidated into a single master link or similar lifting point.

In assembling such consolidated arrangements due regard is to be given to the manual handling which will be involved during any lifting operations throughout the journey from point of origin to final destination.

Use of multiple terminations is not normally acceptable since this is likely to increase chance of incorrect installation on the crane hook leading to increased risk to personnel, equipment and property.

The original certificates of all lifting elements installed on the item(s) is to be available before it will be lifted off any transportation at any premises operated either by the contracting or operator's organisation.

Attention is also drawn to Section 8.4.7 of the primary reference which states:-

> "Where possible, lifting arrangements for all cargo should be consolidated into a single lift point terminating in either a master link or quadruple assembly to minimise handling requirements, multiple terminations are not normally acceptable and may require duty holder approval"

9.1.2 Seafastening Arrangements

A full description of proposed support and seafastening arrangements, including drawings, is to be included

Please refer to Sections 9.6 and 9.7 for further information relating to support and seafastening arrangements.

9.1.3 Support during Transportation

Details of any special support or foundation requirements during transportation are to be provided.

Of particular interest are any parts extending below the main structure of the cargo item(s) involved.

Particulars of any point loadings on supporting structures are to be provided.

It is to be noted that the deck load capacity of most supply vessels currently in service is approximately 5 tonnes / square metre. Where transportation involves carriage by sea on such a vessel and the actual point loadings imposed by the cargo exceeds this capacity special arrangements will be required.

Please refer to Section 9.6.3 for further guidance relating to this matter.

9.1.4 Securing of Internal Items

Particulars of any loose internal components which will require checking prior to onward transportation is to be provided..

Where internal components remain attached during transportation additional support may be required. Such items are likely to require particular attention.

9.2 CARGO ITEMS OF PARTICULAR INTEREST

In addition to the general information which is to be provided referred to in the preceding Section certain cargo items will be of particular interest to parties involved in arranging their transportation.

This Section relates particularly to transportation on and lifting to or from vessels but may also be relevant to other phases of an item's journey from point of origin to final destination.

Matters or interest will include, but will not necessarily be limited to, the following:-

9.2.1 Unusual Shape and Weight Distribution

Potential concerns relating to any cargo item(s) having an unusual shape or weight distribution will include, but are not limited to the following:-

1. Items with a high and / or offset centre of gravity are likely to be unstable and will almost certainly require additional stabilisation rigging

2. Items having an off-set centre of gravity may require the use of:-

    a. lifting beams

    b. frames

    c. asymmetric rigging arrangements.

    It is the obligation of the shipper to ensure that all relevant information is provided in a timeous manner and that, where relevant, all such equipment is available when required.

Lifting arrangements, including spreader beams, provided for the handling of any cargo item will normally remain attached to it, protection and where necessary secured to the item in readiness for use as required throughout its journey from point of origin to final destination.

Spreader beams, frames or similar lifting aids are to be secured in a suitable manner to prevent risk of injury to personnel or damage to the cargo item itself.

3. Where it is found necessary to remove and subsequently re-attach any such handling aids they are to be stowed and secured as separate cargo items.

   A full and formal assessment of potential risks associated with re-attachment is to be undertaken prior to commencement of this particular operation.

4. The transportation and lifting of any items which are in horizontal position whilst in transit but are later up-ended at their final destination requires careful review and must be subject to a thorough Risk Assessment.

   The shipper has an obligation to ensure that all relevant information is provided in a timeous manner.

9.2.2 Unusually Heavy Items

In the context of this document “unusually heavy” may be considered to include all items weighing 20 tonnes or more.

However, the actual capacity of the appliances which will be used to lift it in the course of its journey from point of origin to its final destination are also be taken into consideration. It is likely that where an item’s weight is greater than 90% of the maximum SWL of the appliance(s) which will be used to lift it at any particular stage in this journey it should be considered as being “unusually heavy” during the course of any lifting operations undertaken at that point.

The principal factors to be taken into account when considering the transportation and lifting of unusually heavy items include, but are not limited to the following:-

1. They may require stowage on a particular part of the vessel’s deck for the following reasons:-

   a. The underdeck structure may be stronger in some parts of the deck than others.
   .
   b. Locating the item at or close to the vessel’s transverse and longitudinal centres of rotation will reduce the dynamic forces when lifting from the deck.

   c. Allowing the vessel a free choice of heading whilst the item(s) are being off-loaded at the offshore location may potentially reduce environmental restrictions.

      See Section 9.6.4 for further information regarding 9.2.2 (b) and (c) above.

2. Additional support arrangements to distribute the loading on the vessel's deck may be required.

3. Shipment of items of this nature is to involve discussion between all parties, including the vessel's Master.

4. An assessment of the lifting dynamics is to be undertaken.

5. A further reduction in the environmental operating criteria may have to be considered.

Experience indicates that lifting of heavy items in significant sea states exceeding approximately 2.0 metres should not normally be attempted.

9.2.3 Unusually Long and / or Fragile Items.

The principal factors to be taken into account when considering the transportation and lifting of unusually long and / or fragile items include, but are not limited to the following:-

1. The use of special packing or protection arrangements may be required.
.
2. Items vulnerable to water damage are to be suitably protected.
.
3. The use of tag lines may be appropriate.

9.2.4 Make Up and Use of Tag Lines

Please refer to Appendix 8.D in the primary reference or Appendix 9 – C in GOMO for guidance in the make-up and use of tag lines.

9.2.5 Access & Clearances

Details of any access which might be required to the item(s) during transportation are to be provided in order that sufficient clearance to ensure that safety of personnel can be maintained.

It is to be noted that during any marine transportation personnel access to any item stowed on vessel will be entirely at the discretion of the Master.

Additional clearances around long or fragile items may also be required to minimise the risk of snagging whilst being lifted from a vessel.

9.2.6 Presence of Stored or Restrained Energy

Full details of any stored or restrained energy sources included in any cargo item(s) are to be provided.

These may include, but are not limited to, the following:-

1. Pressurised vessels

2. Live electrical sources within the item(s)

3. Components which include restrained mechanical energy, including springs, etc.

9.2.7 Liquids in Tanks

Details of any liquids contained in tanks installed in cargo item(s) are to be provided.

Of particular interest will be liquids which are:-

1. Flammable
2. Toxic
3. Potential environmental pollutant.

Any tanks containing liquids are to be fully topped up to avoid the risk of surging whilst item(s) are being lifted or transported.

Where this is not possible attention should be drawn to this fact.

9.2.8 Services Required whilst in Transit

Particulars are to be provided relating to any services to be supplied to the cargo item(s) whilst in transit.

Such services may include, but may not be limited to, the following:-

1. Electrical current
2. Compressed air.
3. Water for cooling or other purposes

Where the supply of any such services is necessary full specifications of the characteristics required are to be provided.

Details of relevant connection arrangements are to be provided.

9.2.9 Pre-Assembled and / or Pre-Commissioned Machinery Items

Owing to the potential fragile nature and high intrinsic value of items of this nature they will normally be transported and lifted using a purpose designed and constructed lifting frame or module.

If this is not the case then factors to be taken into account include, but are not limited to the following:-

1. The items are to be shipped in a crate made of heavy-duty material to reduce the risk of damage.
   .
2. The crate is to be constructed in a manner suitable for lifting.
   .
3. The crate containing the item is to be delivered with its own lifting arrangements, which is comply with the current standards.

   The original certification relating to the lifting arrangements is to be delivered with the crate.

4. The crate is to be clearly marked to indicate the nature of the goods, and any particular protection which may be required..
.
5. For transportation to an offshore location the crate is to be lifted into and secured in a suitable CCU as described in Section 9.7 of the primary reference.

9.2.10 Special Protective Arrangements

Details are to be supplied relating to any special arrangements which have been installed to minimise the risk of damage to vulnerable components whilst in transit.

Particular attention is to be given to any components which extend beyond the protection afforded by the main structure of the item(s)

9.2.11 Cargo to Normally Unattended Installations

Many installations of this type have crane weight restrictions which may mean that the use of CCU's for transportation of equipment to or from them would result in the crane's safe working load being exceeded.

In such circumstances operations are to be fully risk assessed, taking into consideration the following points:-

1. It may be safer to use fibre or suitably coated wire rope slings to lift "ship loose" items from the deck of a vessel or to return them on completion of any work.
.
2. Scaffolding bundles which cannot be transported in a half-height container due to offshore crane weight restrictions are to be pre-slung and secured using steel banding or other suitable means around them to prevent movement.

9.3 CHECK LIST FOR USE BY VENDORS

A check list which may be forwarded to vendors, etc. to assist in ensuring that the required information is provided is attached as Appendix 9 - 1 of this document

9.4 PRE-SHIPMENT PHYSICAL INSPECTION

Following review of the above information representative(s) of the relevant support team(s) may wish to inspect the cargo before shipment.

To facilitate such inspections the following is to be included:-

1. Particulars of the items' current location(s).

2. Contact details at each location.

9.5 DESCRIPTION OF OPERATIONS PRIOR TO OR FOLLOWING SHIPMENT

A summary of operations prior to or following shipment is to be included.

This is to include details relating to the following:-

1. The premises from which the item(s) are being delivered from or are to be returned to.

2. The party responsible for arranging transport.

If there is an expectation that this will be arranged by the Marine Logistics Support Team(s) this is to be clearly stated.

3. Any particular transportation restrictions.

   Out-of gauge and / or heavy loads may well require escort facilities to be arranged when transported on the public highway.

   Police permission may also be required.

9.6 STOWAGE, LOCATION AND SUPPORT OF CARGOES ON VESSELS

9.6.1 Discretion of Master (or Nominated Deputy)

As will all other cargo the carriage of non-routine or special items on any vessel is at the discretion of the Master or his (or her) nominated deputy.

The approval of this person for the loading and securing of any such item must be sought prior to loading onto the vessel.

9.6.2 Other Cargo carried simultaneously

Any other cargo carried on the deck of an offshore supply vessel simultaneously with non-routine or special items must be stowed and secured in such a manner that its presence does not introduce unacceptable risks in the course of the transportation and off-load.

Particular attention should be paid to the following:-

1. Vessel personnel must have clear and unobstructed access to undertake the following activities:-

   a. Connect lifting arrangements.

   b. Release seafastenings on arrival at the offshore facility or, if necessary, adjust same during transportation.

   It is strongly recommended that the entire deck area around each item of non-routine or special cargo and its associated seafastenings is kept totally clear of any potential obstructions.

2. The vertical lift path from the vessel's deck must be clear and unobstructed so that the item can be lifted clear of the deck, side barriers and any other cargo items without risk of snagging.

   It is recommended that a clear envelope of 2 ~ 3 metres extending vertically to the 1 metre above the height of the side barrier or any other cargo / structure in the vicinity is maintained all around any non-routine or special cargo item to ensure that the risk of snagging is minimised.

9.6.3 Support Arrangements

As noted in Section 9.1.3 the load-bearing capacity of the cargo deck on the majority of offshore supply vessels is normally approximately 5 tonnes per square metre, though on some newer tonnage this may be increased.

Where any cargo item has a footprint loading which exceeds the load capacity of the vessel's deck supplementary support arrangements are to be provided.

Such arrangements may include:-

1. Steel grillage, designed and fabricated to support the particular item(s) of cargo.
.
2. Steel plate having sufficient thickness to distribute the footprint loading and reduce it to the capacity of the underlying deck.
.
3. Timber baulks, typically railway sleepers, used to assemble suitable support arrangements and to distribute the footprint loading reducing it to that of the deck.

When installing any supplementary support arrangements certain precautions are to be observed including, but not limited to, the following:-

1. Mechanical handling aids are to be employed as appropriate.

2. Suitable arrangements for the attachment of lifting rigging are to be provided as required.

3. Timber baulks used to make up supplementary support arrangements are to be physically attached to each other.

4. Any supplementary support arrangements are to be seafastened separately from the cargo item(s) supported by them.

9.6.4 Location on Vessel Deck

Where unusually large or heavy items are involved careful consideration should be given to where they would be best located on the deck of the vessel to facilitate subsequent operations.

9.6.4.1 Location near Vessel's Centres of Buoyancy or Flotation

Whilst all items on a vessel will experience vertical accelerations due to heave as it rises and falls in a seaway those located near its centres of buoyancy or floatation (generally on centre-line and midships) will experience minimum such accelerations due to roll and pitch.

Locating items in this location may therefore offer the following advantages:-

1. The dynamic load on the facility's crane when lifting off the vessel can be minimised.

However, some other factors must also be borne in mind, as follows:-

1. The crane must be able to plumb the middle of the vessel, requiring extended out-reach of the heavy-lift block and / or the vessel to manoeuvre itself into a position in close proximity to the facility.

2. The vessel's options for taking up the best heading in relation to the prevailing environmental conditions will be minimised which may then result in other risks being introduced.

Figure 3 – 1 shows a cargo item stowed in the location described above.

9.6.4.2 Location near Stern of Vessel

Items located near the stern of the vessel will experience the maximum vertical acceleration due to pitch in addition to those due to heave and roll.

However, locating items in this location may offer some advantages, as follows:-

1. The vessel will have a much wider choice of heading in relation to the prevailing environmental conditions and will thus be able to minimise their effects on its movements, potentially increasing weather working opportunities.

2. The vessel may be able to maintain a greater distance from the facility whilst still permitting the heavy-lift block of the crane to plumb the item.

3. The vessel has more options to move clear of the facility immediately the item is lifted from its deck.

Potential disadvantages of locating cargo items in this location include:-

1. Vertical accelerations due to pitch (and roll if located at side of vessel's deck) are maximised.

Figure 3 – 3 shows a cargo item stowed in the location described above.

9.7 SEAFASTENING ARRANGEMENTS

9.7.1 General Information Regarding Securing of Cargo on OSV's

Items which cannot be "containerised" and which must be carried on vessel decks will require sea-fastening to prevent movement and / or damage during transportation.

In such instances the following information will be required:-

1. Particulars of arrangements included in the item(s) to facilitate sea-fastening, if any.

2. Proposed arrangements for sea-fastening, if any.

3. The party responsible for designing and installing the sea-fastenings.

   If there is an expectation that this will be arranged by the support teams this is to be clearly stated and the relevant cost code provided.

4. Particulars of Marine Warranty Surveyor involvement, including relevant contact details.

9.7.2 General Principles for Seafastening Arrangements

9.7.2.1 Strength, Capacity of Each Element

Each element of any securing arrangements, including the connection to the vessel's structure, is to have sufficient capacity to comply with the strength requirements as calculated by design or "rule of thumb".

When assessing the strength of any rigging items including chain, wire or synthetic strops the maximum breaking load, including a bend reduction factor, rather than the safe working load should be used.

The latter relates to lifting operations and is not relevant in these circumstances.

9.7.2.2 Attachment to the Cargo Item(s)

Wherever possible the attachments on the Cargo Items(s) to be secured are to be designed such that the seafastening arrangements are connected to it at the same height as its centre of gravity.

However, the vertical angle between the vessel's deck and any seafastening rigging is not to exceed 60°.

Where the centre of gravity of the cargo item is higher than that at which the seafastening are attached additional stabilisation arrangements may be required.

These are not be included in the calculation of the capacity of the primary seafastening arrangements.

9.7.2.3 Frictional Resistance

When assessing the adequacy of seafastening arrangements most marine warranty surveyors will discount the contribution frictional resistance between the cargo item and the vessel's deck makes in preventing the former from shifting.

This is due to the fact that the factors contributing to the coefficient of friction between the two are many and varied, rendering the actual contribution of friction might make very difficult to estimate.

Whilst, therefore, the sources mentioned to in Section 9.7.3.3 may make reference to the contribution made by frictional resistance in the prevention of items carried on the vessel decks from shifting it is suggested that when planning for the transportation of cargoes to or from offshore facilities it is prudent to adopt the approach of the marine warranty houses and consider the effect of friction between the cargo item and the underlying deck an additional safety factor for which no credit is taken in the calculations.

9.7.2.4 Inspection before Use.

All elements proposed for use in any seafastening arrangements are to be thoroughly inspected before use to ensure that they are not damaged and are fit for the purpose intended.

Any elements found to be damaged, particularly fibre straps or strops, is to be rejected and replaced with new equipment.

It should be noted that some rules prohibit the re-use of fibre straps or strops in seafastening arrangements.

9.7.2.5 Trial Fit-Ups

Where the proposed arrangements are complex, involving a number of elements a preliminary trial make-up to ensure that all components fit together is to be considered

9.7.2.6 Installation of Seafastenings (1)

Seafastening arrangements are always to be installed in such a manner that the cargo item(s) being secured are not damaged.

Where necessary, appropriate chafe protection is to be provided.

9.7.2.7 Installation of Seafastenings (2)

Seafastening arrangements are always to be installed in such a manner that they themselves are not damaged.

Where necessary, appropriate chafe protection and / or bend restriction arrangements are to be provided.

9.7.2.8 Access by Personnel

Securing arrangements are to be such that they can be set up, adjusted, released and, where necessary, reinstated by personnel standing on the vessel's main deck.

9.7.2.9 Arrangements for Adjustment of Seafastenings

Tensioning arrangements which must be released for adjustment are **not** to be used.

The lever-based chain load-binders used when securing cargoes on road or rail vehicles are typical examples of such equipment which are prohibited.

9.7.2.10 Nomination of Vessel

The deck strength together with the distribution and capacity of the securing arrangements on vessels which may be available to carry cargo items may vary considerably.

To assist in the design of the seafastening arrangements it is therefore advantageous if the intended vessel can be nominated and confirmed as soon as possible.

9.7.2.11 Prior Approval for Temporary Connections on Vessel

Prior to attaching any temporary connections to the vessel's structure approval from the Master, or if necessary the Owner's Marine Superintendent, is to be obtained.

9.7.2.12 Attachment of Temporary Connections to Deck Timber Retaining Girders

The deck timbers on OSV's are likely to be retained in position by inverted "T" section beams which may only be intermittently attached to the steel deck underneath.

Temporary connections attached to these girders may therefore have insufficient strength for seafastening purposes.

9.7.3 Design and Installation of Seafastening Arrangements

9.7.3.1 Cargo Securing Manual

All cargo carried on board any vessel must be stowed and secured in accordance with the ship-specific Cargo Securing Manual, which will be based on the IMO Code of Safe Practice for Cargo Stowage and Securing.

9.7.3.2 Use of Design Aids

Several design aids, often soft-ware based, have been developed to assist in developing seafastening arrangements which comply with the requirements of the vessel's Cargo Securing Manual.

DNV's "Lashcon" program is an example of one such aid.

These aids may be used to develop the details of the arrangements, which are to be installed, and where necessary tested, as indicated by the results of the design exercise.

9.7.3.3 Use of "Rules of Thumb"

As an alternative to the use of the design aids referred to above one of the "rules of thumb" which have been proven by operational experience may be used to develop the design of the seafastening arrangements.

Examples relevant to the transportation of cargo items to or from offshore facilities are summarised in the table below.

		Nautical Institute[1] UKP&I[2]	NEP&I Ass'n[3]
TOTAL CAPACITY		3 x W	3 x W
TRANSVERSE	**% of Total Capacity**	80%	70%
	Transverse Capacity	2.4 x W	2.1 x W
	Attached Symmetrically		
	% Each Side	40%	35%
	Capacity Each Side	1.2 x W	1.05 x W
LONGITUDNAL	**% of Total Capacity**	20%	30%
	Longitudinal Capacity	0.6 x W	0.9 x W
	Attached Symmetrically		
	% Each End	10%	15%
	Capacity Each End	0.3 x W	0.45 x W

where “W” is the weight of the item to be seafastened.

Table 7 - 1

Sources

(1) “Lashing and Securing of Deck Cargo”, 3rd Edition, Nautical Institute, 2002

(2) “Carefully to Carry”, UKP&I, 2006

(3) “Cargo Stowage and Securing, Guide to Good Practice”, NEP&I Association, 2007

9.7.3.4 Involvement of Marine Warranty Surveyor

Please refer to Section 9.8 below.

9.8 MARINE WARRANTY SURVEYOR INVOLVEMENT

Where the arrangements for transportation of cargo item(s) is to be subject to verification by the marine warranty surveyor the particulars of the proposed support and seafastening arrangements, including the attachments to or on the item(s), are to be forwarded to the nominated contact for review, comment and approval.

Seafastening arrangements developed using the methods described in Section 9.7.3 above will generally comply with or exceed the requirements of most marine warranty surveyors.

However, it is to be noted that whilst the method proposed by the North of England P & I Association ensures more than adequate transverse capacity in the longitudinal capacity thus derived may be marginally insufficient to comply with the requirements of some warranty houses.

The warranty surveyor may also require to attend on site as the item(s) are loaded onto and secured on board the vessel, to witness that all seafastening and support arrangements have been installed, and where relevant tested, in accordance with the approved procedures. In some instances the surveyor may also be required to accompany the item(s) on their outward voyage, to witness transportation and off-load at their final destination.

9.9 ITEMS SHIPPED INWARD

The above guidance applies to items shipped both outward and inward.

However, items being shipped inward may involve some further additional risks which will require particular consideration. These include, but are not limited to:-

1. Heavy and / or bulky items will be very difficult to land and secure on the deck of any vessel, particularly in a seaway.

2. The prediction of weight and / or centre of gravity on any items which have been on an installation for some time may be difficult, leading to lifting and / or handling problems.

3. The shape and / or geometry of an item may lead to difficulties owing to lack of stability when landing onto the vessel.

   In this context round items are more problematic than those having a flat base. Provision of additional supports or transportation frame for such items, to be installed before discharging onto a supply vessel is recommended.

In general, NO item which cannot be loaded into a standard offshore container or a purpose-built transportation frame is to be shipped inward from any offshore installation without prior consultation with the appropriate logistics and / or operational safety support teams within the contracting and operator's organisations.

10 FURTHER INFORMATION

10.1 WEATHER CONDITIONS FOR SHIPMENT / OFF-LOAD

Experience has shown that it will only be possible for many of the items to which this document relates to be shipped to and / or off-loaded at their final destination at the offshore facility in relatively benign weather conditions.

The operator's marine specialist will assess actual and forecast weather conditions and advise project personnel accordingly.

Where practical, operations which require particularly benign conditions will be given priority but it must be recognised that from time to time weather conditions may not be suitable at any time and vessels may return to port with the cargo still on board.

In such circumstances the relevant logistics team will agree with the project as to whether the cargo is to be discharged or remain on board for the next sailing.

For some particularly weather-sensitive activities projects may wish to consider making arrangements for exclusive use of a vessel to be loaded, sail and remain on location for as long as may be required whilst awaiting suitable conditions under which operations may proceed. On first sight this may seem an expensive option but this must be balanced against potential disruption to the project's own and other operations when using operator's core fleet resources shared with other users.

The relevant logistics team will be able advise upon and facilitate such arrangements if necessary.

10.2 BRIEFINGS

The logistics and operational safety teams, together with the operator's marine specialist will ensure that, within their area of responsibility, the relevant personnel are fully briefed as to any particular precautions which are to be observed when transporting project-related cargoes.

11 COMMUNICATIONS BETWEEN PARTIES INVOLVED

GOMO draws attention to the fact that offshore operations are often complex, involving many parties. It further states that failures in communications between those involved are often at the root cause of many subsequent problems.

Section 6 of that document includes a diagram summarising recommendations regarding which parties should be involved and what subjects should be discussed at the various stages of a typical voyage to and from an offshore facility.

Good communications between all parties involved leading to a clear understanding of the requirements of each are particularly important in both the planning and execution of operations involving the transportation of non-routine cargo items to or from offshore locations, activities to which this document relates.

To ensure that the various parties involved are adequately informed of the requirements or concerns of the others involved as operations progress certain personnel should normally participate in any relevant conversations. These should always include a discussion regarding project-specific aspects of the transportation or handling of the particular cargo item(s) involved.

The parties to be involved and matters to be discussed are summarised below.

11.1 IN PORT, OUTWARD OR INWARD CARGOES

Dependent on the nature of the proposed operation personnel are to be involved as follows:-

1. Quayside Supervisor
2. Vessel Master (or designated deputy)
3. Crane Driver
4. Stevedore's Charge Hand
5. Vessel Boatswain or Deck Supervisor
6. Client Representative (if present)
7. Project Engineer (if present)
8. Seafastening Contractor (if relevant)
9. Marine Warranty Surveyor (if present)

Matters to be included for discussion are to include, but are not necessarily limited to the following:-

1. Environmental restrictions (if relevant)
2. Location of Vessel

3. Any particular preparations required on Vessel or quayside

4. Operation, location of crane.

5. Particular characteristics of the Cargo Items involved, as discussed in Sections 9.1 and 9.2 of this document.

6. Seafastening and support requirements, as discussed in Section 9.6 of this document

7. If Cargo Item(s) shipped from the Offshore Facility back to port, any particular concerns relating to matters discussed in Section 9.7 of this document

NOTE

To ascertain their relevance to the intended operations all parties likely to be involved are to review Sections 9.1, 9.2, 9.6, 9.7 and 9.8 of this document prior to the discussions referred to above.

11.2 AT OFFSHORE FACILITY, OUTWARD OR INWARD CARGOES

Dependent on the nature of the proposed operation personnel should be involved as follows:-

On Facility

1. Offshore Installation Manager (or designated deputy)

2. Deck Foreman

3. Crane Driver

4. Client Representative (if present)

5. Project Engineer (if present)

6. Marine Warranty Surveyor (if present)

On Vessel

1. Vessel Master (or duty Senior Watchkeeper)

2. Vessel Boatswain or Deck Supervisor

3. Client Representative (if present)

4. Project Engineer (if present)

5. Seafastening Contractor (if present)

6. Marine Warranty Surveyor (if present)

Matters to be included for discussion are to include, but are not necessarily limited to the following:-

1. Anticipated weather during operation, based on latest forecasts received
2. Environmental restrictions, particularly if relevant to forecast(s) received
3. Location of Vessel, including any operational considerations
4. Any particular preparations required on Facility or Vessel
5. Operation of crane.
6. Details of rigging arrangements offered to Vessel for connection to those installed on the Cargo Item(s)
7. Particular characteristics of the Cargo Items involved, as discussed in Sections 9.1 and 9.2 of this document.
8. Seafastening and support requirements, as discussed in Section 9.6 of this document
9. If Cargo Item(s) shipped from the Offshore Facility back to port, any particular concerns relating to matters discussed in Section 9.7 of this document

NOTE

To ascertain their relevance to the intended operations all parties likely to be involved are to review Sections 9.1, 9.2, 9.6, 9.7 and 9.8 of this document prior to the discussions referred to above.

10. Transfer of documentation relating to the Cargo Item(s) to or from Vessel

12 PROJECT SUMMARY & CONTACT DETAILS

In addition to the project team itself contact arrangements for the specialist support teams arranging for the delivery of cargo items involved will include representatives from the contracting and / or operator's organisations listed below.

A short project summary together with details for relevant contacts are to be obtained and promulgated as required as part of the project planning process.

The pro-forma included below may be used for this purpose.

12.1 PROJECT SUMMARY

Project		
Item(s) being Transported		
Client		
Vendor or Supplier		Vendor or Supplier to complete Vendor Logistics Check List (See below)
Vendor / Supplier Agent(s)		
Logistics Service Provider(s)		
Shipped	**From**	
	To	
	Via	
Further Information		1.

12.2 VENDOR LOGISTICS CHECK LIST

VENDOR LOGISTICS CHECK LIST - Form.d

Click on the icon above to open the Vendor Logistics Check List in protected Word format, otherwise refer to Appendix 9 - 1

12.2.1 Project team

Contact Information	Particulars
Nominated Person(s)	
Representing	
Function	
Department	
Telephone, Office	
Telephone, Mobile	
Electronic Mail Address	

Contact Information	Particulars
Nominated Person(s)	
Representing	
Function	
Department	
Telephone, Office	
Telephone, Mobile	
Electronic Mail Address	

Contact Information	Particulars
Nominated Person(s)	
Representing	
Function	
Department	
Telephone, Office	
Telephone, Mobile	
Electronic Mail Address	

Contact Information	Particulars
Nominated Person(s)	
Representing	
Function	
Department	
Telephone, Office	
Telephone, Mobile	
Electronic Mail Address	

12.3 OPERATIONS SUPPORT TEAMS

12.3.1 Logistics and Quayside Operations

Contact Information	Particulars
Nominated Person(s)	
Representing	
Function	
Department	
Telephone, Office	
Telephone, Mobile	
Electronic Mail Address	

Contact Information	Particulars
Nominated Person(s)	
Representing	
Function	
Department	
Telephone, Office	
Telephone, Mobile	
Electronic Mail Address	

12.3.2 Marine Specialists

Contact Information	Particulars
Nominated Person(s)	
Representing	
Function	
Department	
Telephone, Office	
Telephone, Mobile	
Electronic Mail Address	

Contact Information	Particulars
Nominated Person(s)	
Representing	
Function	
Department	
Telephone, Office	
Telephone, Mobile	
Electronic Mail Address	

12.3.3 Procurement

Contact Information	Particulars
Nominated Person(s)	
Representing	
Function	
Department	
Telephone, Office	
Telephone, Mobile	
Electronic Mail Address	

12.3.4 Operational Safety

Contact Information	Particulars
Nominated Person(s)	
Representing	
Function	
Department	
Telephone, Office	
Telephone, Mobile	
Electronic Mail Address	

12.4 VESSELS

12.4.1 Vessel 1

Contact Information	Particulars
Function	
Name of Vessel	
Name of Master (if known)	
Telephone, KU Band	
Telephone, Marisat	
Telephone, Mobile	
VHF Channels	
UHF Channels	
Electronic Mail Address	

12.4.2 Vessel 2

Contact Information	Particulars
Function	
Name of Vessel	
Name of Master (if known)	
Telephone, KU Band	
Telephone, Marisat	
Telephone, Mobile	
VHF Channels	
UHF Channels	
Electronic Mail Address	

12.4.3 Vessel 3

Contact Information	Particulars
Function	
Name of Vessel	
Name of Master (if known)	
Telephone, KU Band	
Telephone, Marisat	
Telephone, Mobile	
VHF Channels	
UHF Channels	
Electronic Mail Address	

A version of this form is available in protected Word format

13 REFERENCES & BIBLIOGRAPHY

13.1 PRIMARY REFERENCE

TITLE	PUBLISHED BY	AVAILABLE FROM
Best Practice for the Safe Packing and Handling of Cargo to and from Offshore Installations (Issue 6, dated 2015)	O&GUK	www.marinesafetyforum.org

A copy of this document is to be included in every project library and consulted when cargo is to be shipped outward or inward.

This document includes additional information relating more specifically to the particular requirements of the various support teams who will assist in ensuring the safe and timeous delivery of the equipment to its final destination off- or on-shore.

13.2 OTHER REFERENCES

TITLE	PUBLISHED BY	AVAILABLE FROM
Guidelines for Offshore Marine Operations	UK CoS and Others	www.g-omo.info
Lashing and Securing Deck Cargoes	NI	Contact Nautical Institute
Carefully to Carry	UK P&I	www.ukpandi.com

GOMO also includes other information relating to the carriage of cargo on offshore support vessels.

13.3 BIBLIOGRAPHY

Other publications which contain information relevant to the topics considered in this document include:-

TITLE	PUBLISHED BY	AVAILABLE FROM
Guidelines for Offshore Marine Operations (United Kingdom Continental Shelf Supplement)	MSF	www.g-omo.info
Guidelines for Lifting Operations (IMCA M187)	IMCA	www.imca-int.com
The International Crane Operations & Cargo Handling Handbook	NSL	Contact North Sea Lifting

APPENDIX 9 – 1 VENDOR CHECK LIST

VENDOR LOGISTICS CHECK LIST

VENDOR LOGISTICS CHECK LIST
(NON-ROUTINE CARGO or EQUIPMENT)

All relevant information to be included

ORDER / CONTACT DETAILS	
Purchase Order Reference	
Logistics contact name / details	
EQUIPMENT PARTICULARS	
Equipment description	
GA Drawing provided	
Dimensions	
Weight	
Location of C of G	
Lifting Points (number, type, capacity)	
Transport Fastening Points (number, type, capacity)	
Pressurized and / or Energized parts present	
Fluids & / or Hazardous Substances present	
Electrical Power present or required	
Compressed Air present or required	
Cooling Water required	
PACKAGING AND LOADING ARRANGEMENTS	
Packaging design / type	
Dedicated Lifting Rigging supplied or offered	
Original Certificates for Lifting Rigging to accompany Cargo Item(s) throughout journey	
Plant type/capacity for handling throughout journey	
Handling recommendations throughout journey	
TRANSPORT & DELIVERY ARRANGEMENS	
Type / capacity of Transport required	
Notifications required for road haulage, if any	
Transport risk assessment throughout journey	
For Ex Works all known risks to be considered	
Potential changes in C of G due to loading/movement	
ONWARD SHIPMENT	
Special precautions for loading / unloading	
Special precautions for transport by sea	
DOCUMENTATION	
Lift Plan required for movement/loading	
O&GUK Cargo Handling Guidelines to be available & consulted when planning for each stage of journey	

This form is also available in protected Word format