



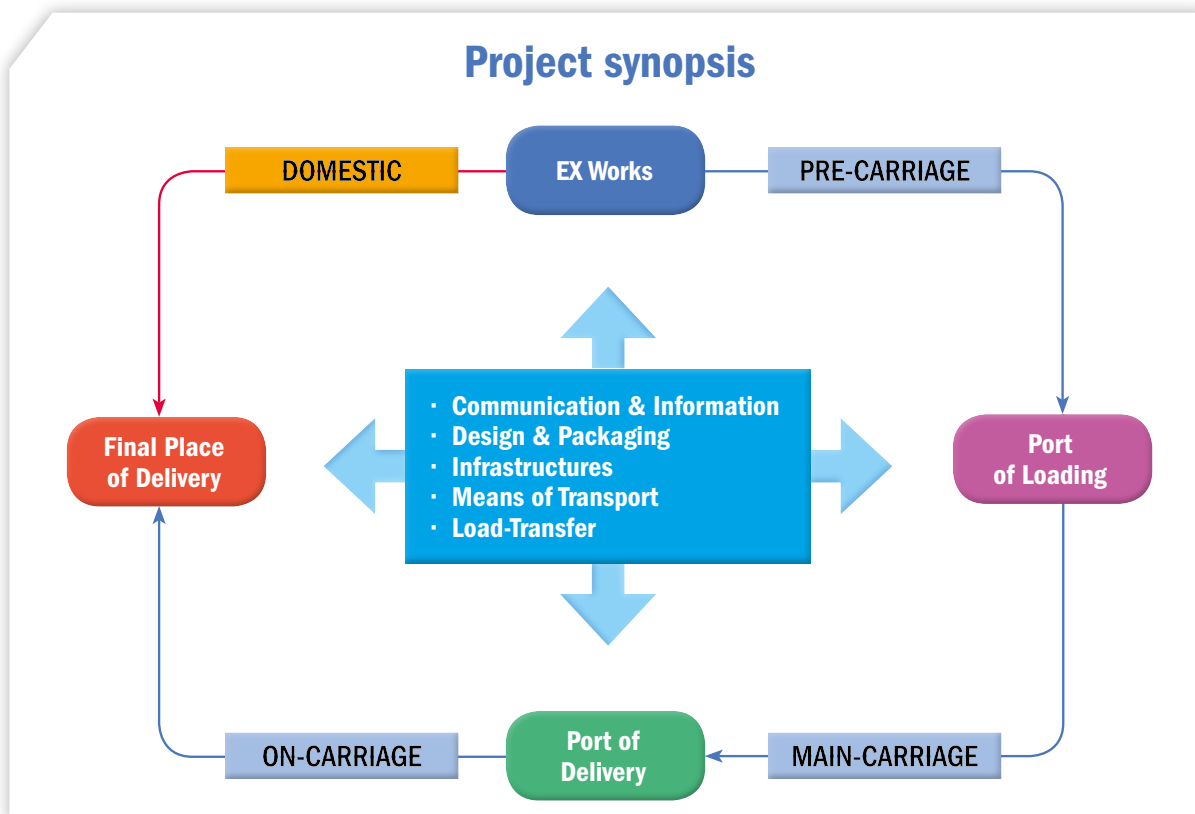
# Project cargo

## Pre-Planning for Heavy Lift Transport

No Heavy Lift transportation goes entirely according to plan! Deviations are normal as it is about a project and not a process. Proper **technical pre-planning** however reduces those anomalies, reducing improvisation and ultimately resulting in lower risk – and costs!

In order to prevent risks from developing into catastrophes a five-point **Transportation and Logistics Engineering Plan** should be formulated.

The diagram below features the theoretical framework which supports on-going attention to critical details leading to success.



## 1 Communication & Information

- › Transport project team should be set up and persons in charge (pic) of each involved party shall be identified and contact details
- › Responsibilities and authorisations should be defined and agreed
- › Critical issues (sea fastening, roll on / off operations, lifting arrangements, towing arrangements, etc.) should be determined, listed and rigorously planned
- › Measures regarding the monitoring of corrosion protection and shock or humidity indication systems should be shared with all involved parties

## 2 Design & Packaging

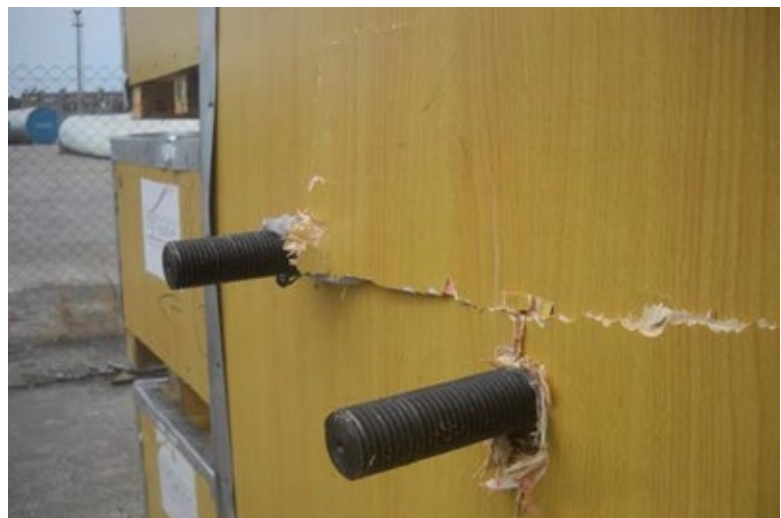
### › During the design phase attention shall be paid to following items:

- Load distribution requirements during transport should determine unit's footing design
- Positioning of the centre of gravity
- Well marked points of sufficient strength for :
  - support for storage stacking and beams or jacking operations
  - Lifting with an advice whether a spreader beam or any other specific lifting arrangement is required or not
  - Securing (and quantity) with an advice regarding the maximum load and securing angles

### › The need for shock / humidity indicators and their user's manuals.

### › Packaging comprises the following critical issues:

- Sensitive components to be protected as per their special requirements (switchboards, pipes of inert gas systems, gauges etc.)
- Packaging material should allow for good access to lifting or securing points
- Corrosive protections effective for at least 6 months in excess of the scheduled arrival



### 3 Infrastructural Circumstances

› **Road survey(s) should be carried out with special focus on:**

- Transport permits
- Nature of road surface (max. load per axle, traction)
- Inclinations / slope
- Limitation in height and width
- Condition of bridges to be passed
- Necessity and possibility of bypass constructions

› **Police escort or guard cars could be an insurance warranty.**

› **Provisional and safe storage places (max. ground load, traffic, etc.) shall be shortlisted all along the road in case of unexpected stop / incident.**



### 4 Means of Transport

› **Ships:**

- Preferably a qualified Heavy Lift carrier should be chosen
- Ship's particulars (decks' strength, ballast capacity, etc) to be reviewed towards stowage plan
- Comprehensive sketch and calculation for stowing and lashing
- Commercial history of vessel (including PSC, Class) should be reviewed.

› **Barges towed or pushed (Flat Top Barges, pontoons):**

- Secure suitable size and capacity of barge (stability)
- Ramp design and ballast operation for RoRo should be thoroughly planned (dedicated "ballast supervisor")



- Barge's tank top strength and respective load distribution measures for the selected method of stowage (e.g. blocks and beams)
- Comprehensive sketch and calculation for stowing and lashing
- IMO regulation relating to ocean towing should be strictly complied with (Res A 765 - planning, manning, bollard pull, preparation, weather forecast / reports, tug, equipment, contingency plan, etc)
- A towage approval certificate (TAC) shall be issued by a marine warranty surveyor (\*).

› **Road trailer:**

- Trailer to be suitable for size and weight of cargo regarding height, radius and for the maximum axle-load limitations
- Amount of prime-movers / power packs & driven axles to be sufficient regarding inclinations and road surfaces.
- Sketch and calculation regarding load distribution, axle loads and securing of cargo

› **Rail Car:**

- Sketch and calculation regarding load distribution and securing of cargo
- Check with local service provider (LSP) acceptable shocks (vertical, longitudinal)

› **Aircraft:**

- Sketch and calculation regarding load distribution and securing of cargo
- Make sure that cargo unit(s) is / are suitable for the expectable accelerations during an airfreight carriage.



## 5 Means of Load-Transfer

- › In all cases the lifting arrangement (soft-slings, grommets, wires, spreaders, traverses, etc.) must meet the requirements of the cargo such as position and strength of lifting points, gross weight, position of centre of gravity etc.
- › **Ship's cranes and cargo gears (LoLo operations): secure...**
  - Sufficient Safe Working Load capacity; overload operations should be rejected systematically\*\*
  - Enough ballast capacity / ship's stability for load transfer
  - Prove that local circumstances allow for the out-reach limits of the ship's cranes (e.g. large fixed fenders at the pier, rail tracks, bollards)
  - In special cases tidal influences have to be taken into account regarding the lifting height
  - Ports where swell occurs shall be avoided if possible; otherwise sufficient time for load transfer operations has to be scheduled
  - Especially in river ports the ships traffic has to be monitored during cargo operations
- › **For floating cranes all topics of ship's cranes apply too. In addition, sufficient space for safe manoeuvring of the floating crane shall be ensured**
- › **Fixed port cranes, port cranes on rails, fixed gantry cranes container gantry bridges:**
  - Assure sufficient Safe Working Load Capacity and proper monitoring of outreach



**› Mobile cranes and crawler cranes:**

- Only crawler cranes are allowed to drive with the load on the hook.
- Allowed positioning of the mobile crane's supports to be clarified with port authorities (on the quay's edge or with well clearance => required outreach!)
- Clarify maximum permissible ground load and ensure a proper load distribution / bedding

**› Ro-Ro Operations:**

- The ramp construction (Barge) and SWL (e.g. car carrier) has to provide sufficient load capacity
- Ballast operations to be pre-planned in respect of
  - tidal influences
  - ramp construction and angle
  - vessel's / barge's draft
- Actual tidal circumstances can be monitored during Ro-Ro operations
- Redundant systems for Ro-Ro operations have to be established

**› Hydraulic gantry systems for foundation setting: ensure...**

- Preferably lift & lock systems or strand jacks that provide a mechanical safety-lock should be employed
- Sufficient ground load capacity for rail track
- Careful alignment of rail track
- That the verticality of the hydraulic masts is monitored during the whole operation

**› Jack & Slide operations: ensure...**

- That jacking points are known by the respective service providers
- Sufficient ground load capacity for rail track
- Careful alignment of rail track
- The skidding system should be designed in a way that does not allow for a deviation from the track, e.g. by rails.



## Reminder!

- › **Make your insurer part of the Transport project team**
- › **Pre-planning supports loss prevention**
- › **Marine & transport risk consultants are prepared:**
  - For shortlist process and technical review
  - To attend meetings as necessary
  - To support the project manager in decision-making
  - To manage warranty surveys
  - To attend on site
  - To monitor and optimize prevention budget

This note available in pdf format is the new publication of a catalogue dedicated to the heavy lifts project.

You can also find in that collection:

- › **The “Appointing dedicated experts” Risk focus**
- › **The “Operating cargo gear over limit” Risk focus**
- › **The “Stability of hydraulic modular trailers and SPMT’s” Best practices**