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 by-pass 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.
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