

Heavy Transport, Lifting & Shipping Seminar/Masterclass

This extensive three day Course is focused on Construction Managers, Warrantee Surveyors, Operators, Project Engineers, Sales Engineers, Freight Forwarders, QHSE Engineers, Project Managers, Cargo Superintendents and anyone who is involved in daily movements and lifting operations of heavy loads



Check the Seminar Schedule on the website: www.heavyliftspecialist.com



Since 2008 more then 2300 persons attended my Seminars/Masterclasses, dealing with „Heavy Transport , Lifting, Shipping & Offshore“.

As the pioneer in presenting „Heavy Transport & Lifting“ Seminars, now new Chapters have been added, such as "Heavy Lift Shipping" and „Offshore Lifting & Installation Techniques“.

„In Company“ as well as Public Seminars can be offered. Ask for more details and possible adaptations to suit your needs.

„LEARN HOW TO HANDLE HEAVY LIFTS SAFELY“

STOP COSTLY ACCIDENTS AND IMPROVE YOUR PERFORMANCE

13 Chapters will be presented:

- ✓ General Knowledge on transport & lifting equipment
- ✓ Mass, Forces, Centre of Gravity
- ✓ Heavy Transport with Hydraulic Platform trailers, SPMT's, correct trailer selection for a particular load
- ✓ Lifting loads with one, two or more cranes
- ✓ Maintenance & Inspection of equipment
- ✓ Skidding & Jacking Techniques
- ✓ Set-up of a Project Planning
- ✓ Preparation of a Cost Estimate and conclude a deal
- ✓ Load-outs of Extreme Heavy Loads onto barges
- ✓ Heavy Lift Shipping
- ✓ Safety & Risk analysis
- ✓ Accidents & How to avoid them + a BONUS:
- ✓ „The Do's & Don'ts in Lifting“



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Organized by:
KRABBENDAM ADVIES SERVICE, The Netherlands
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1. General Knowledge and Introduction (15 pages)

- Different Lifting- & Transport types.....	1.2
- Transport Means.....	1.3
- Cranes.....	1.4
- Largest Mobile Cranes available.....	1.5
- Mammoet Platform Twin Ring Containerized PTC-200 DS SSL.....	1.6
- Various cap. Charts and applications of PTC-DS-140 and DS-200.....	1.7
- Trailers.....	1.8
- Various Heavy Transport / Trailers types.....	1.9
- Platform trailers.....	1.10
- Different Crane Types.....	1.11
- Offshore installation vessels available.....	1.12
- Terms & Abbreviations.....	1.13
- Some definitions:.....	1.14
o Min. Break load, Safe Working Load, Working Load Limit, Test load, Mass and weight, lifting capacity, max. allowable ground load, safety factors, etc.	

2. Forces, Mass and Center of Gravity (33 pages)

- Difference between mass (kg) and force (N).....	2.2
- Newtons three laws of motion.....	2.3
- First Law of Newton (Law of Inertia).....	2.4
- Second and Third Law of Newton (Force Changes Motion).....	2.5
- Forces acting on a body.....	2.6
- Some formulas to calculate forces.....	2.7
- Calculation of Centrifugal Forces.....	2.8
- Standard triangles.....	2.9
- Something about forces.....	2.10
- Videos illustrating "No control of forces".....	2.11-12
- Composing of forces.....	2.13
- Head-Tail Method (Summary of composing of forces).....	2.14
- Summary (composing of Forces).....	2.15
- Principle of moment (moment equation).....	2.16
- Principle of Center of Gravity.....	2.17
- Calculating Outrigger Loads of a crane.....	2.18
- Wind force (video shots on accidents due to wind force).....	2.19
- Wind Force (Scale of Beaufort) + Video Milwaukee Accident.....	2.20
- Wind force.....	2.21
- Water force.....	2.22
- Accelerations and decelerations.....	2.23
- Friction forces (when sliding).....	2.24
- Forces on vessels.....	2.25
- Important sling angles.....	2.26
- Calculation of weights.....	2.27
- Estimating of Weight of different loads.....	2.28
- Ratio between mass and volume of different loads.....	2.29
- Essential information for Transport & Lifting Projects.....	2.30

3. Heavy Transport with Hydraulic Platform trailer (50 pages)

- Difference between platform trailers and standard flatbed trailers.....	3.2
- USA Dolly compared to Platform trailer.....	3.3
- Principle of a hydraulic platform trailer.....	3.4-3.7
- Capacity / Specification of Conventional platform trailers.....	3.8
- Platform Trailer selection for 466 Tons load.....	3.9
- Platform Trailer selection for 810 Tons load.....	3.10
- Capacity / Specification of Self Propelled Modular Transporter (SPMT).....	3.11
- Example of 1050 Tons reactor on SPMT's.....	3.12
- Platform Trailer selection for 495 Tons load.....	3.13
- Stability of Trailers (Hydraulic Stability).....	3.14
- Stability of Trailers (Tipping Lines).....	3.15-3.17
- Stability: 3- and 4- point suspension system, pro's- and con's.....	3.18
- A load placed on a flat bed trailer.....	3.19
- Stability of a SPMT 3-point versus 4-point suspension.....	3.20
- Symmetrical and A-symmetrical Stability of SPMT's (double wide).....	3.21
- Alternative 3-Point stability system of Platform trailers (SPMT's or Conventional).....	3.22
- Critical Stability of a single SPMT used in dolly configuration with turntables.....	3.23
- Tipped Transport Combination.....	3.24-3.25
- Stability of a Conventional Hydraulic Platform Trailer.....	3.26
- Axle loads (A-Symmetrical suspension).....	3.27
- Calculation of axle loads.....	3.28
- Calculating the average ground pressure (Load spreading mats).....	3.29-3.30
- Realistic ground pressure profile.....	3.31
- Load on ground surface or steel deck.....	3.32
- Goldhofer Faktor 5 Girder trailer configuration video.....	3.33
- Steering principle of platform trailers Conventional and SPMT's.....	3.34
- Principle of Steering (SPMT's).....	3.35
- Video: Different steering modes of SPMT's.....	3.36
- Heavy Duty tractor versus required pulling force.....	3.37
- Video: 230 tons Generator roll-on and roll off example.....	3.38
- Calculating the required needed pulling force in Tons.....	3.39
- Estimation of the pulling force of a HD Tractor.....	3.40
- Choice of Trailer configuration for 520 tons load.....	3.41-3.42
- Video: Transport of 420 tons column by barge and SPMT,s.....	3.43
- Job site preparation.....	3.44
- Selecting the right trailer configuration for the load (illustrated with Video footage).....	3.45
- How many tractor units are needed for a particular load?.....	3.46
- Choice of Trailer configuration for a 16 m diameter Sphere 260 Ton.....	3.47
- The Transport Plan.....	3.48
- Recommendations.....	3.49

4. Lifting of loads with two or more cranes (72 pages)

- Differences in Lifting of Loads.....	4.2
- Crane Capacity rating (Load moment).....	4.3
- Quick Reference capacity Chart for Hydraulic cranes.....	4.4
- Different Boom (crane) types.....	4.5
- Setting up of a Lift plan (work drawing: side-view, top-view, back-view).....	4.6
- Set-up of a lift plan for the erection of a 320 tons reactor.....	4.7-4.8
- Excel Program "Boom clearance".....	4.9
- Set-up of a Lift plan for erection of a reactor.....	4.10
- Video: Lifting of a 320 Tons reactor.....	4.11
- The Moment equation and the application in the field.....	4.12
- The load in each crane depends on the location of CoG and angle with horizo.....	4.13
- Location of CoG in relation to the lift points (various examples).....	4.14
- The 10 Golden rules for Lifting a Load.....	4.15
- Mobile Crane Hand signals.....	4.16
- Tail crane and distribution of load between tail crane and main lift crane.....	4.17-4.20
- Excel program for calculating Tail load and main lift crane load.....	4.21
- Lifting of a Load with two or more cranes (position of cranes).....	4.22-4.23
- The lifting of two large refinery columns with 3 cranes.....	4.24-4.27
- The inclinometer (Continue lifting a two refinery columns with 3 cranes).....	4.28-4.30
- Video: Lifting 520 tons column.....	4.31
- Sling Plan and forces in lifting slings.....	4.32-4.33
- Top angle never more then 120o.....	4.34
- Standard triangles.....	4.35
- The Cog is always suspended straight under the hook.....	4.36
- Calculation of the force in each sling (equal and unequal lengths).....	4.37-4.38
- Use the graphical method in defining sling forces.....	4.39
- Calculate sling forces S1 and S2 at Different elevations of the lift points.....	4.40-4.41
- Calculate the sling length with an a-symmetrical location of CoG.....	4.42
- Define the force in each sling.....	4.43
- Calculate the forces in the spreader beam.....	4.44
- Calculate the forces in slings and spreader beam.....	4.45
- The Stability criteria of a crane.....	4.46
- Stability of a load to be lifted.....	4.47-4.48
- The Stability Range.....	4.49
- The Stability Moment of the load to be lifted.....	4.50-4.51
- The Stability of the Load to be Lifted.....	4.52-4.53
- The Stability of the load with 3 lift points below the CoG.....	4.54
- The Stability of the load to be lifted.....	4.55
- Lifting a 650 tons reactor with two cranes of 250 Tons and 400 tons Cap.....	4.56-4.58
- Use of lifting- and spreader beams.....	4.59
- Lift beam (800 Tons) and Spreader (1000 Tons).....	4.60
- Use of lifting- and spreader.....	4.61-4.63
- Use of various Lifting beams.....	4.64
- Loading directions of lifting points.....	4.65
- Details of steel load spreading mat.....	4.66
- Work factors (Safety Factors).....	4.67
- Sling capacities in various applications.....	4.68
- Grommet capacities in various applications.....	4.69
- Applying slings to a load.....	4.70
- Calculate the loads in these two examples.....	4.71

5. Maintenance and inspection (11 pages)

- Inspection criteria for Mobile Cranes.....	5.2
- Maintain, Inspect, Check and Test.....	5.3
- Inspection criteria for Lifting Equipment.....	5.4
- Excessive wear on Crane sheaves.....	5.5
- Maintenance recommendations for transport equipment.....	5.6
- Work factors (Safety Factors).....	5.7
- Utilization factors for steel slings.....	5.8
- Utilization factors for fiber slings.....	5.9
- Identification of CE Marks.....	5.10

6. Skidding, Jacking & Moving Techniques (24 pages)

- Various Skidding & Moving techniques.....	6.2
- Skidding Techniques.....	6.3
- Stainless Steel on PTFE Blocks.....	6.4
- Enerpac Skidding solutions.....	6.5
- Hydra-Slide skidding systems.....	6.6
- ALE Skid shoe system SKS-1000 (1000 T Cap.).....	6.7
- Skid system for extreme heavy loads.....	6.8
- Load-out of 9,500 tons Utility Module on Skids.....	6.9
- Skidding of 830 tons container crane.....	6.10
- Skidding float pads of 200 tons each.....	6.11
- Using Strand jacks as lifting devices.....	6.12
- Working principle of Strand jacks.....	6.13
- ALE's Super Crane SK-190/SK-350 using strand jacks.....	6.14-6.17
- Jacking and skidding Methods.....	6.18
- Jacking towers and hydraulic gantries.....	6.19
- ALE's Mega Jacking systems (up to 40,000 tons) + Mammoet Push-Up System.....	6.20-6.21
- Airbags, Water skates, Air Pallets.....	6.22-6.23

7. Set up of a Project planning (8 pages)

- Making a Project planning.....	7.2
- What is a "Bar Chart" Planning schedule.....	7.3
- Example: Lifting a 320 Tons reactor.....	7.4
- Example: Lifting an traffic gantry over a Highway.....	7.5
- Critical path in a Planning Schedule.....	7.6
- Another example.....	7.7



PROGRAM for Three Day Seminar: "Heavy Lifting, Transport & Shipping"

8. Preparation of a cost estimate (9 pages)

- Why a Cost estimate8.2
- Essential to cost estimates8.3
- Make a Lift plan and Transport plan and find out what is needed8.4
- On basis of a plans make a Planning Schedule8.5
- Prepare cost estimate on basis of Planning Schedule8.6
- Example of Cost estimate8.7
- Recommendations8.8

9. Load-outs of extreme Heavy Lifts (Part 1) (51 pages)

- Various Ro-Ro operations9.2
- Necessary information for Ro-Ro operation9.3
- Something about Tide Tables and Tides9.4-9.5
- Make use of the tidal conditions9.6
- Roll-on to free floating barge (Tidal)9.7-9.11
- Roll-on to free floating barge (Non Tidal)9.12-9.15
- Roll-on via steel plates (Non Tidal)9.16-9.20
- Roll-on to barge fixed aground9.21-9.23
- Beach landing, barge fixed aground9.24-9.27
- Examples of a beach landing9.28-9.30
- Positioning of SPMT's under the load9.31
- Technical data of SPMT's (Scheuerle)9.32
- Technical data of Goldhofer SPMT's9.33
- Roll-off with a 2400 Tons HRSG Module9.34
- Ro-Ro ramps or steel plates9.35
- Configure right Transport Combination for 1865 Tons Module9.36
- Configure right Transport Combination for 12,800 Tons Topside9.37-9.38
- Video: Load-out 12,800 Tons Topside: Transport beams-Sea fastening combined9.39
- Load-out of 12,800 Tons Module9.40-9.41
- Load-out of Special Structures9.42-9.43
- Transport & Load-out of a large Module (2350-4800 Ton)9.44
- Site Moves of Heavy Loads9.45
- Load diagrams of Platform trailers9.46
- Moving various Heavy Loads9.47-9.50
- Recommendations9.51

10. Safety and Risk Analysis (46 pages)

- Video: BP Safety video10.2
- History of Jumbo's Safety Policy10.3
- Part of Jumbo's QHSE Policy Statement10.3
- Slips and Falls cause the majority of injuries on board ship10.5
- What is right and what is wrong in these pictures10.6
- Excessive Noise can Damage your hearing10.7
- Accidents still happen10.8
- Safety improvement Program10.9
- What is Safety: Culture, Planning, Procedures10.10
- Safety Awareness Culture Ladder10.11
- Safety Awareness Culture Ladder Explanation10.12
- The Iceberg Theory10.13
- How do we Record & Analyze?10.14
- Some Definitions10.15-16
- What are our goals?10.17
- Safety Culture and Awareness10.18
- How?10.19
- Use Proper PPE=Personal Protective Equipment10.20
- Reduce 20% of causes and you reduce 80% of all accidents10.21
- Keep Welding and Cutting equipment in Good Condition10.22-23
- Use proper PPE = Personal Protective Equipments10.24-25
- PPE and good accessible lifting points10.26
- Accident & Incident Reporting and Analysis10.27
- Video: Stay Focused10.28
- Use a Risk Matrix10.30
- Risk Matrix. Frequency x Consequence = Risk10.31
- The theory of the Swiss Cheese10.32
- Guide line Job Hazard Analysis10.33
- Job Hazard analysis(JHA)10.34
- Safety Awareness Posters10.35
- Is it all OK?10.36
- Identification of Hazards10.37-38
- Why, When and How a "Toolbox Meeting"10.39
- Last Minute Risk Analysis (LMRA)10.40
- Co-operation with Client is essential10.41
- Examples of well secured Transport saddles10.42
- Examples of badly secured Transport saddles +Video10.43-44
- Conclusion: Things To Remember10.45

11. Heavy Lift Shipping (52 pages)

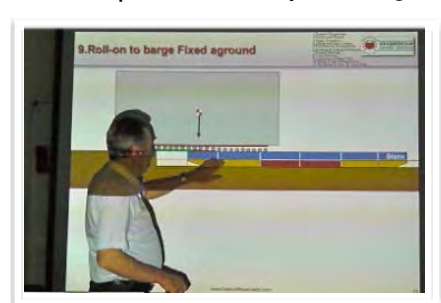
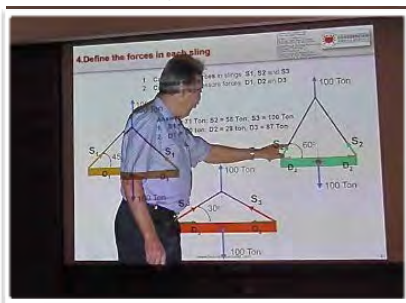
- Various Types of Heavy Lift Ships: Lo-Lo11.2
- Various Types of Heavy Lift Ships: Flo-Flo11.3
- Various Types of Heavy Lift Ships: Ro-Ro11.4
- Major Heavy Lift Ships, Crane Types: Lift-on / Lift-Off11.5
- Difference between Pedestal crane and Mast crane11.6
- Heavy Lift Mast Cranes: 900 tons on J-Type Jumbo11.7
- Cargo Types: Petrochemical, Offshore, Floating Equipment11.8
- Cargo Types: Pressure vessels, Modules, Gasturbines11.9
- How to lift a Heavy Load with a floating vessel11.10
- How to rig a Trafo to a Lifting Beam11.11
- Lifting 3 Bullet tanks over PS on board11.12
- How to prepare a Loading/Unloading Operation (Lo-Lo)11.13-14
- Check Stability of the Load11.15
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- Stability of Heavy Lift Ships - Definitions11.19-22
- Calculation of Metacenter of a ship11.23
- Calculation of GM Value11.24
- The location of B and M at increasing angle of heel11.25
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- Arm of Stability - Uprighting Moment11.27
- Stability Range of a Heavy Lift Ship11.28
- Stability Requirements of IMO11.29
- How can the Stability of a Ship be influenced11.30
- Change of CoG of Ship due to cargo loading11.31
- Stability Example11.32
- CoG of load when freely suspended in crane11.33
- Use of Ballast water11.34
- Sea fastening of Cargo on Heavy Lift Ships11.35
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- Check list for Lashing & Securing11.37
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- Examples of Sea fastenings (Jumbo+SAL)(Lashing wires)11.40
- Lashing examples SAL: 1100 Tons Ship loader11.41
- Calculation of Sea fastening Forces11.42
- How to calculate the required number of lashings?11.43
- Division of Forces over stoppers due to location of CoG11.44
- Examples of Sea fastenings (Jumbo)(Lashing wires + Stoppers)11.45
- How to lash a Heavy Pressure vessel (Lashing wires + Stoppers)11.46
- Examples of Sea fastenings Calculations11.47-49
- Lashing & Securing Methods11.50
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12. Accidents and how to avoid them? (53 pages)

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- The Accident12.3
- Accident Analysis12.4-12.6
- Conclusion Accident12.7-12.9
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- Some Transport accidents12.11
- Rules on Trailer Stability needed or not??12.12-12.13
- Video: Tipping of Transport Combination12.14
- Some transport accidents12.17-12.15
- Video: Trailer tipping over12.16
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- Transport Accident Analysis12.18
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- Load-out of 1000 Tons module went wrong12.25-12.28
- The Salvage12.29
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- A similar case, but worse!12.34
- Load-out of Living quarters and tipped over12.35-12.38
- Mechanical Failure of support girders12.39-12.43
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- Roll-off with reactor from barge (weak bottom)12.49-12.50
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- Lots of Success in your further career12.53

13. BONUS CHAPTER: The Do's & Dont's in Lifting (30 Slides)

NOTE: This lecture schedule and items presented are subject to changes





All Participants will Receive a Certificate with a rating depending on their score during the evaluation test at the end of the Course

WHO SHOULD ATTEND:

- Freight Forwarders
- Crane & Transport Contractors
- Module Fabrication Yards
- EPC Contractors
- Power Plant Builders
- Shipyards
- Marine Warrantee Surveyors
- Oil Companies
- Plant Construction
- Cargo Superintendents
- Operators
- Offshore Installation Contractor
- SURF Contractors
- FPSO Builders
- Civil Industry
- Petrochemical Industry/Refineries
- Rigging & Transport Supervisors
- Lift Directors, Banks men

Some Testimonials:

- Facilitator is a highly experienced engineer and excellent on the subject matter. An excellent program, if targeted at participants with suitable background
- It was a great experience. Clearly brought about how even in our own homes, we do things wrongly without accessing the risk. It has given me different perspective to working on project/heavy lift cargo. The Presenter indeed is a specialist with a very broad and wide knowledge in the Industry
- Just right in time. You may consider to present this Seminar in 3 days
- As engineer the part about lifting stability was most interesting after all a great Seminar!!
- I love to learn, this learning in two days was great, lot of information, well delivered in a very limited time. Feel confident in practical application, Thank you!!

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