UNCTAD/ECWA SEMINAR ON PORT OPERATIONS

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Container Handling in Ports - Operational Aspects

by

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CONTAINER HANDLING IN PORTS - OPERATIONAL ASPECTS

1. Knowledge of contents of contracts

1.1 As quickly as the sales department of a port operating company is successful in gaining a new container-customer to the port, the operation department is asked to despatch the new service. Service contracts between shipping lines and port companies differ from case to case and the operation department should be well aware of the operational aspects of those contracts. Thus a close contact between sales and operational department is very important during the contract negotiations. Shipping lines, for example, ask the Terminal Operator for a guaranteed throughput per ship's working hour in port. This can only be given after the operation department has studied the ship's lay out, the possibilities of loading/discharging the containers, the throughput per call and the availability of berth, storage area, labour and equipment.

1.2 An extract of the service contract between shipping line and terminal operator should be given to the operation department. The 'list of services' should include short explanations of service details agreed.

For example : Line - Agent - Ships
Berth guarantee - sailing dates.
Receiving/delivery details.
Restowages of containers.
Lashing of deck containers.
Waiting times.
Shift differentials.
Service of feederships, if any.
Stuffing/stripping of containers.
Interchange.
Internal movements.
Reefer containers.
Maintenance and repair.

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2. Operational meeting prior to first call of container vessel of a new line

2.1 All parties concerned with the despatch of a new container line should meet to discuss the operational aspects well in advance of the first call. It is very important that it should not be the 'big shots' who meet again, but those persons who will be involved in the actual operation. The group should consist it :

Line's local agent.
Line's ship planner.
Line's inland despatcher.
Line's warehouse superintendent.
Terminal operations manager.
Terminal/Marine manager.
Marine superintendents.
Container yard and CFS manager.
Yard and CFS superintendents.
Documentation and administration manager.

If tally companies and stevedores are involved, they should be present too.
The Terminal Operators' sales department should supervize the meeting.
To touch all aspects which may arise when operating the container vessel, it may be helpful to follow the flow of information which is necessary for the ship, for import and export containers.

3. The vessel

3.1 It must be known whether the vessels are :

First generation (about 800 TEU)
Second generation (about 1600 TEU)
Third generation (about 3000 TEU)

or semi-container vessels which carry a combination of containers and break-bulk cargo.
Even ro/ro ships which carry containers on deck and ro/ro cargo under deck are more and more in services of oversea trades.
The length, width, draught and register tons must be known as well as the cargo gear the ship is equipped with. Full container vessels normally carry no gear of their own and the port must provide portainers for loading operation.
How are the hatch covers constructed - are they double, triple-pontoons or single pull McGregor types ?
A triple pontoon type vessel will disturb the container operation by deck cargo. The cellular system and the numbering of slots must be known as third generation container ships carry up to 130 containers in one bay. The lashing system of deck containers.

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4. Prior arrival of the vessel

4.1 The line should supply the terminal with a long term schedule, a so-called sailing card.
One week prior to arrival, the coastal schedule will give the terminal the opportunity to include the vessel into the work planning of the week. The estimated throughput should be included, split by import and export. 48 hours prior to arrival, an ETA is the final information to confirm the ship's arrival.

4.2 According to local regulations or the contract, the line's representative or the agent will order gangs to operate the vessel. In large terminals, even the operator places gangs as a throughput by hour is guaranteed.

4.3 The import stowage plan, which covers the total import cargo and ship's conditions, should be given to the terminal as soon as possible. The container data should include:

Alfa Prefix, Number, Operator.
Port of discharge/Port of loading.
Remarks of Imdg, Reefer, Oversize and the gross weight.
Size of the container will be identified by the bay-system.
Dangerous cargo import manifests, reefer manifests and special container lists must be part of the import stowage plan.

4.4 The export stowage plan, made out by the line's ship planner, should be given to the terminal one shift before the start of operation. All local export boxes are included in this plan. If export boxes in the terminal are not stored in random access, the line' ship planner should keep in mind the storage build up when stowing the container into the plan. Dangerous goods containers as well as reefers and special containers must be marked in the stowage plan.

4.5 Pre-planning in the terminal

The marine superintendent in charge of the vessel's operation receives export and import stowage plans from the line's ship planner and makes out a working sequence for the ship. This means which bay has to start the discharge operation and how to proceed. It must be kept in mind that lashing of deck containers takes some time. If there is a chance, the operation of the ship should end up with under deck cargo, thus saving port stay time.

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An overall plan which covers all boxes to be handled import and export wise, will allow the marine superintendent and the supervisor operation to recognize bottlenecks in the operational phases and to act in time. The container yard superintendent must be informed about the amount of import boxes to prepare and reserve sufficient storage area. LCL boxes might be stored separately or ordered direct to the warehouse if this is located inside the terminal. Copies of the import and export bay plan must be prepared for the container gang foreman as these plans are used as a sequence list according to the ship's profile.
It might be necessary to hand over one set of stowage plans to the customs to fulfil local requirements.

5. Ship's operation

5.1 If the total operation of the vessel has been well planned in advance, accurately, and all export cargo is in the terminal, the ship's operation is purely a steady check of the progress of the gang's work and reacting to alterations which might be necessary if unforeseen facts show up.

5.2 The container gang

In a port discharging/loading containers in a chassis/van carrier operation, a container gang will include the following labour:

1 portainer with two drivers.
4 terminal trucks with chassis.
2 van carriers.
1 deck foreman.
1 yard foreman.
1 checker/tally.
1 lash foreman.
4 lashers.

The marine supervisor is controlling the whole ship side operation.

5.3 When discharging, a tally at the ship's side should note down in a 'container discharge and status report' for each box :

Alfa Prefix and container number.
Imdg label.
Seal number.
Damages at all sides.
Remarks.

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The field foreman once again notes Alfa Prefix and container number in a 'field report' and adds the field positions to which the containers are stored. As the container numbers are written twice, a cross check against the import stowage plan will be done by the marine supervisor's documentation staff.

5.4 During the loading of containers, the tally checks the boxes into the 'container load and status report' which is cross checked against the loading stowage plan.
Copies of the loading and discharge status reports should be given to the line's ship planner and maintenance and repair department.
A final loading list and a discharge list show every box handled in the export or import direction and will be used for stock reporting, charging the line and customs.

5.5 Containers stowed on deck of the vessel must be secured by lashing rods and bottlescrews or wires and twistlocks. This work must be paid special attention and the lashing foreman and his gang should be skilled personnel.

5.6 The mode of transportation of containers between ship's side and field and vice versa differs from terminal to terminal. It might be done by van carriers in a pure van carrier system, by chassis in a mixed van carrier/chassis operation or transtainer/chassis operation, by flat bed trailer in a trailer/forklift operation.
A pure forklift operation will only be successful if the storage area of the container is next to the ship's side.
The choice of the transport system depends on annual throughput, available storage area, information flow to the terminal, capital to be invested and availability of skilled personnel.
Multipurpose terminals may start with a trailer/forklift system while large terminals use transtainers or even full chassis systems.

6. Delivery of import containers

6.1 Import containers may be delivered by chassis or rail. The shipping line releases the box to the consignee or his forwarder, who orders the online transport.

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6.2 On chassis delivery, the trucker clears import papers at the receiving desk of the terminal and receives a prepared interchange paper. At the chassis exchange area, the import container will be placed onto the chassis and at the gate the box is checked out of the terminal by completion and signing of the interchange.

6.3 On rail transport, all delivery orders will be collected to a rail sequence list. After working gangs place containers onto railcars even these boxes are checked by interchange and thus delivered to the railway company for on carriage. Interchanges are handed over to the shipping line. A list of all containers delivered is made out daily by line.

7. Receiving of export containers

7.1 Each export container arriving at the terminal should be known by: operator, Alfa Prefix and container number, size/type, ship, port of destination, gross weight, Imdg class or reefer temperature, over measurement.

7.2 At the gate or at the rail, the boxes are checked into a receiving interchange whish is handed to the yard documentation and the shipping line.
According to the export stack system of the terminal, the boxes are stored random access or by ship, port of destination and weight groups into blocked stacks.

7.3 Transportation between receiving/delivery areas and storage once again differs according to local terminal lay outs. It should be kept in mind to reduce the terminal transportation distances to a minimum by central exchange areas for rail and road.

8. Stuffing and stripping of containers with LCL cargo

8.1 Small shipments of cargo which are less than container load are collected in the terminal's warehouse. Prior to ship's arrival, the shipping line's tally measures the export shipments and orders a stuffing gang to pack the cargo into containers. These boxes are called LCL containers. After stuffing, the containers are sealed and included in the export stack of the ship.

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The tally will make out a container packing list which shows all shipments packed into the box. The packing list is even called a container manifest. In case of import LCL boxes the procedure acts vice versa.

9. Data system

9.1 The amount of data required in a container terminal and the quick despatch of ships and boxes may lead to the need of EDP systems. Multi-purpose terminals, however, should start with manual stack control and movement reports.

10. Empty containers

These boxes should be stacked blockwise by type/size in a forklift system and only be allowed inside the terminal in a limited number.

11. Maintenance and repair

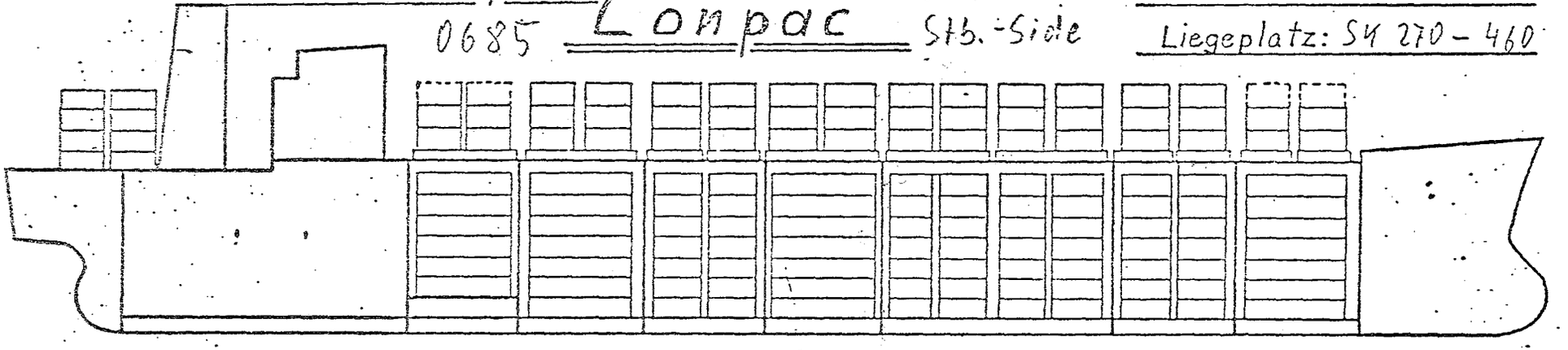
Maintenance and repair of containers should be left to the shipping lines in separate areas which do not interfere with the port operation.

The shown aspects of container handling in port allow only an overall view of modes of systems. Local handling procedures must be worked out carefully and the terminal staff trained in them prior to introduction of container services.

35	33		31	29	27	25	23	21	19	17	15	13	11	09	07	05	03	01
34		ON DECK BAYS 40 ft.	30		26		22		18		14		10		06		02	

Cordillera Express 6.4.79 Brücken: SK 2+3

0685 Compac Stb.-Side Liegeplatz: SK 270 – 460



BELOW DECK BAYS	30	26	23	21	18	15	13	11	09	07	05	02

	35	33	31	29	27	25	23	21	19	17	15	13	11	09	07	05	03	01	Total
	34		30		26		22		18		14		10		06		02		
40' DECK	\								12										
20'	X				12	6									14	20	3	3	
13½'	X				28				36						18	16			
Sum					46				48						68		6		168
40' DECK			6		14				12										
20'															20	20			
13½'	X		35		20				38						12	18			
			41		34				50						70				195

VESSEL Cordillera Expr. SAILING NO 0685

BAY30

30 10 86	30 08 86	30 06 86	30 04 86	30 02 86	30 00 86	30 01 86	30 03 86	30 05 86	30 07 86	30 09 86	86
				BRH X HOU INCU 208 6407 F 8	BRH X HOU INCU 209 1384 F 8	BRH X HOU INCU 209 6447 F 8					
30 10 84	30 08 84	30 06 84	30 04 84	30 02 84	30 00 84	30 01 84	30 03 84	30 05 84	30 07 84	30 09 84	84
				BRH X HOU INCU 209 0351 F 8	BRH X HOU INCU 209 1281 F 8	BRH X HOU HLCU 427 4243 F 9					
30 10 82	30 08 82	30 06 82	30 04 82	30 02 82	30 00 82	30 01 82	30 03 82	30 05 82	30 07 82	30 09 82	82

40 FOOT HATCH COVERS

30 08 14	30 06 14	30 04 14	30 02 14	OH=100 cm	30 01 14	30 03 14	OH=55 cm	OH=55 cm	14
	BRH X NOL INCU 208 0688 F 14			BRH X HOU HLCU 465 6544 L 37 FLAT OW=40 cm e.s.			BRH X HOU HLCU 464 1550 F 18	BRH X HOU HLCU 464 1159 F 18	
30 08 12	30 06 12	30 04 12	OH=55 cm	30 00 12	OH=55 cm	30 03 12	OT 30 05 12	OT 30 07 12	12
BRH X NOL INCU 209 6339 F 12	BRH X NOL HLCU 430 8831 F 22		BRH X HOU HLCU 440 738 F 18	BRH X HOU HLCU 423 5702 F 8	BRH X HOU HLCU 461 3619 F 18		BRH X HOU HLCU 474 1332 F 24	BRH X HOU HLCU 440 9879 F 23	
30 08 10	30 06 10	30 04 10	OT 30 02 10	30 00 10	OT 30 01 10	30 03 10	ISO 30 05 10	30 07 10	10
BRH X NOL INCU 208 0970 F 17	BRH X NOL INCU 208 1473 F 12		BRH X HOU HLCU 442 3603 F 8	BRH X HOU HLCU 423 9387 F 8	BRH X HOU HLCU 429 1174 F 8		BRH X HOU HLCU 427 0659 F 14	BRH X HOU INCU 209 6703 F 25	
30 08 08	30 06 08	30 04 08	30 02 08	30 00 08	30 01 08	30 03 08	30 05 08	30 07 08	08
BRH X NOL HLCU 430 7028 F 18	BRH X NOL INCU 209 0264 F 17		BRH X HOU INCU 209 4233 F 8	BRH X HOU HLCU 425 7879 F 8	BRH X HOU INCU 208 7168 F 8		BRH X HOU INCU 208 3028 F 18	BRH X HOU HLCU 455 0568 F 7 9/6	
30 08 06	30 06 06	30 04 06	30 02 06	30 00 06	30 01 06	30 03 06	30 05 06	30 07 06	06
	BRH X NOL HLCU 425 3153 F 20	BRH X NOL UFCU 960 1607 F 16 9/6	BRH X HOU INCU 208 2818 F 25	BRH X HOU INCU 209 6600 F 10	BRH X HOU HLCU 474 4136 F 27 ISO		BRH X HOU INCU 208 4929 F 18		
	30 06 04	30 04 04	30 02 04	30 00 04	30 01 04	30 03 04	30 05 04		04
			BRH X HOU INCU 209 4465 F 25	BRH X HOU INCU 209 [illegible] 25 F 24	BRH X HOU INCU 209 3546 F 24				
		30 04 02	30 02 02	30 00 02	30 01 02	30 03 02			02

DEST.	NO OF CONT.
TOTAL	

ON DECK 33

UNDER DECK 57

TOTAL PORT

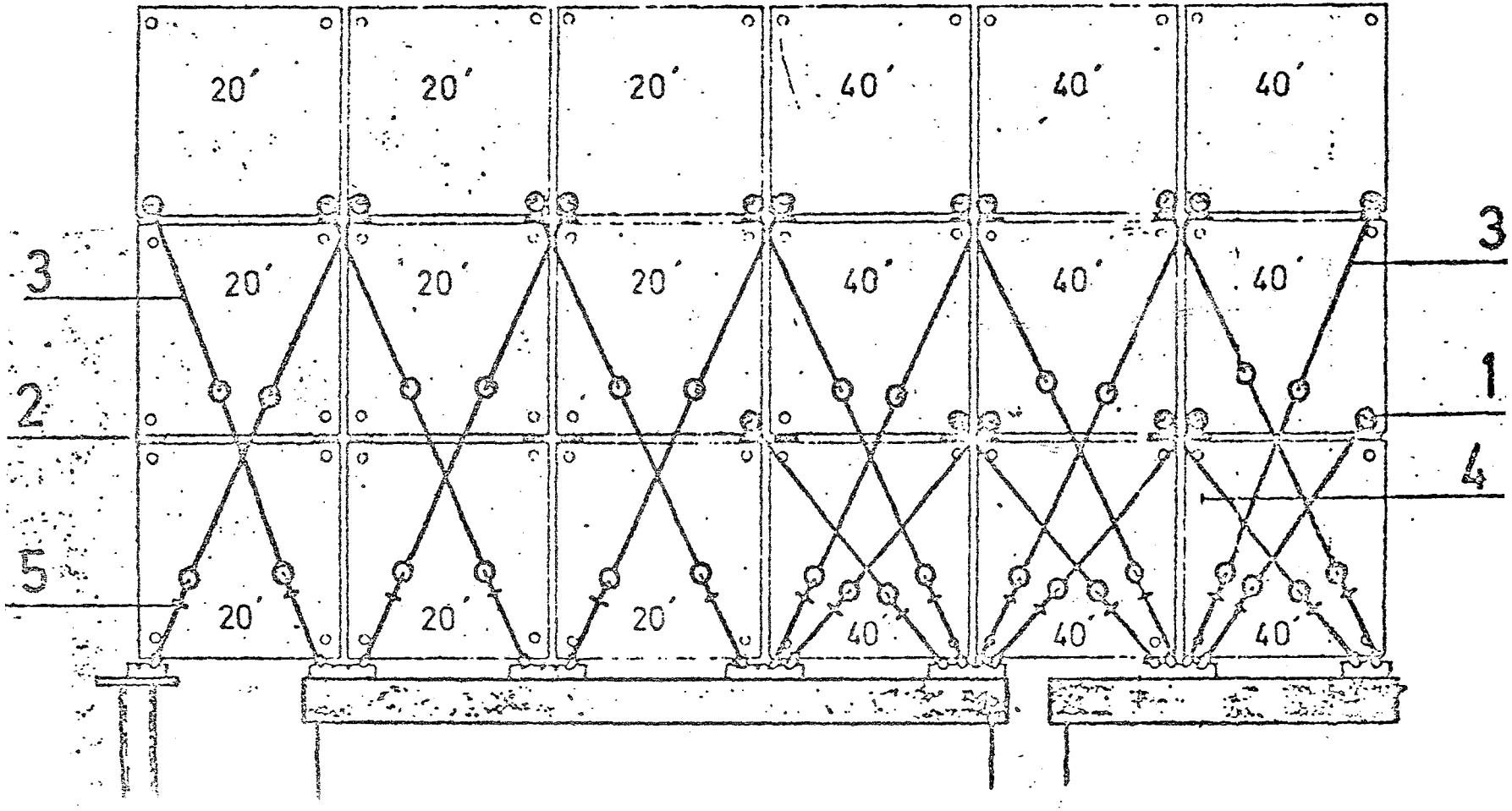
TOTAL STB

X 13.62 = MT	X 11.29 = MT	X 8.59 = MT	X 5.90 = MT	X 2.70 = MT		X 2.70 = MT	X 5.90 = MT	X 8.59 = MT	X 11.29 = MT	X 13.62 = MT

FRONT VIEW

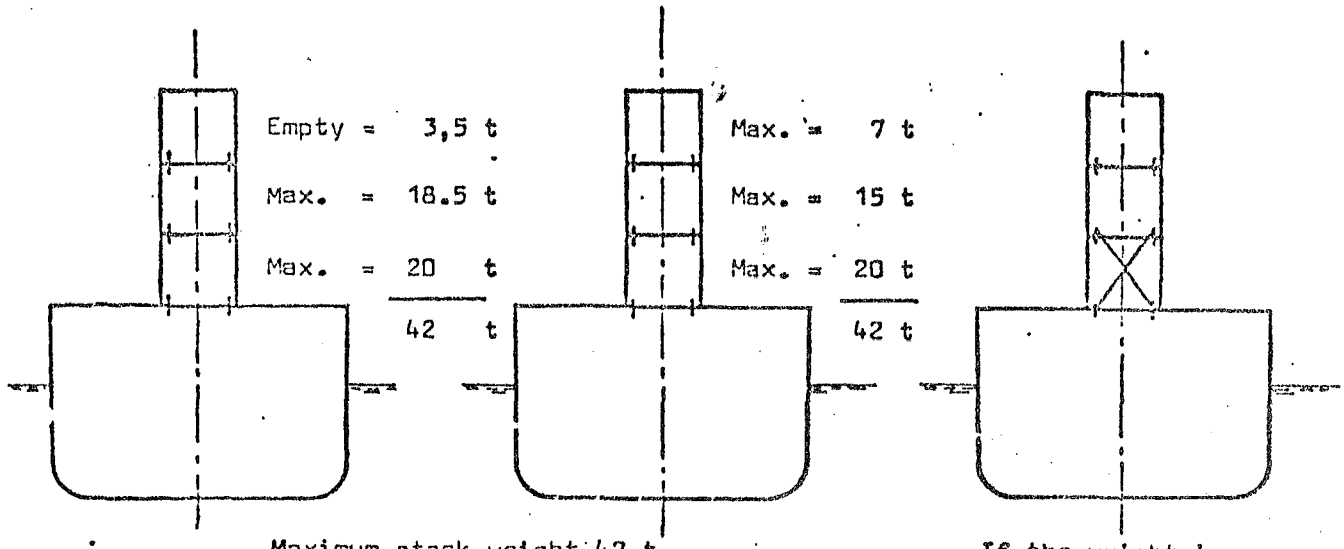
Lashing system for 20' Container in 3 tiers

Lashing system for 40' Container in 3 tiers



40' CONTAINERS

A/ The stack is inboard



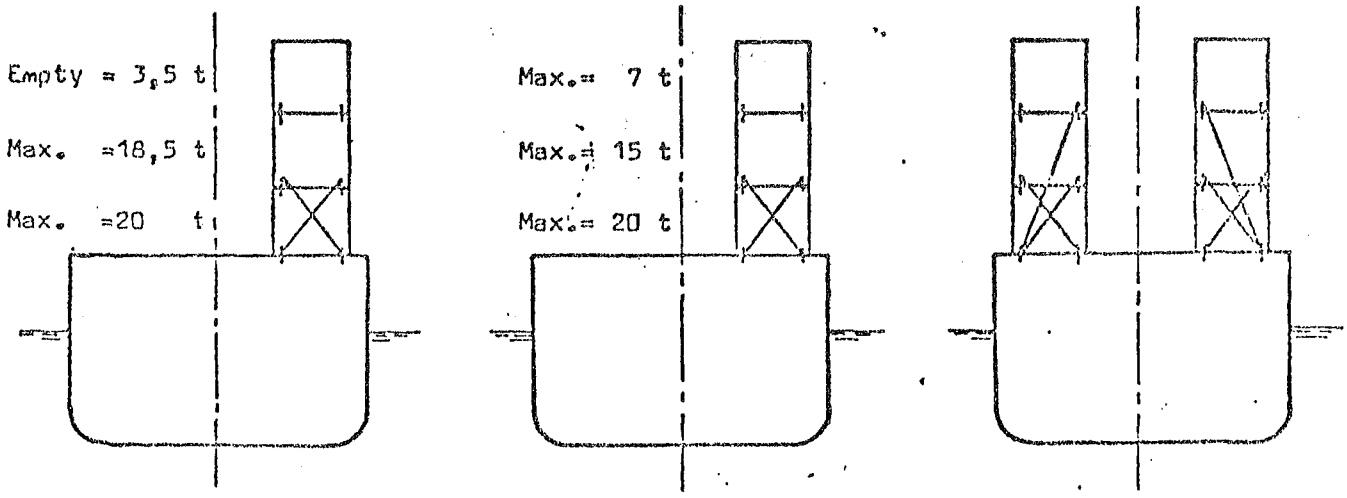
Maximum stack weight 42 t

Twistlocks only

If the weight is between 42 and 63 t

Twistlocks and rods

B/ The stack is an outermost one



Maximum stack weight 42 t

Twistlocks and rods fastened to the second layer

If the weight is between 42 and 63 t

Twistlocks and rods fastened to the second and third containers