



1

New Generation PCC / PCTC

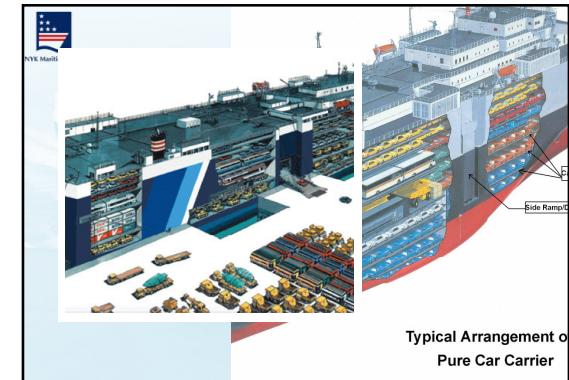
NYK Maritim College NYK GROUP

8500 RTs 200 mts 36 mts

UECC(Hybrid fuel vessels planned for delivery in 2021)

NYKSM SHIPMANAGEMENT PTE LTD

3



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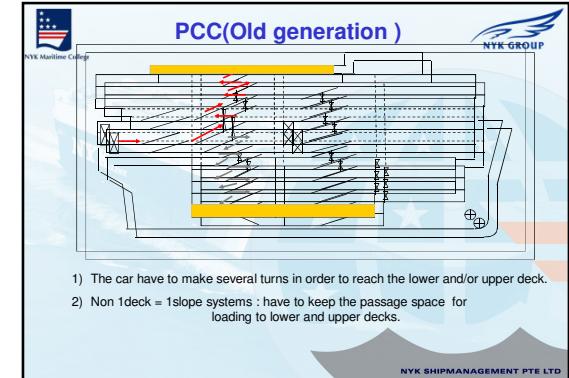
NYKSM PCC Fleet (Dry Cargo A)

NYK NYK GROUP

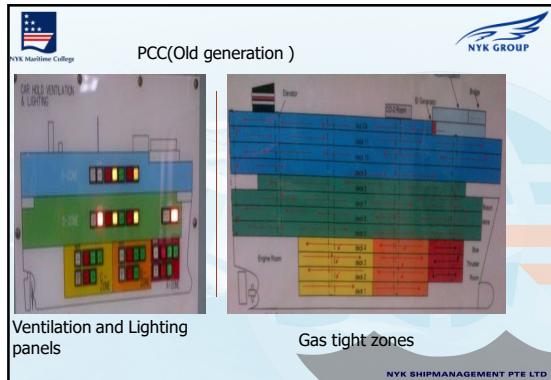
Aegean Leader	Altair Leader	Andromeda Leader
Antares Leader	Aquarius Leader	Atlas Leader
Auriga Leader	Artemis Leader	Aries Leader (7,000RT)
Cassiopeia Leader		
Castor Leader	Cetus Leader	Deneb Leader
Dorado Leader	Helios Leader	
Hercules Leader	Hestia Leader	Iris Leader
Jingu	Kaijin	Lyra Leader
Mercury Leader	Monoceros Leader	New Nada
Orion Leader	Phoenix Leader	Pleiades Leader
Poseidon Leader	Procyon Leader	Rhea Leader
Rigel Leader	Sara Leader	Virgo Leader
Venus Leader	Zeus Leader	

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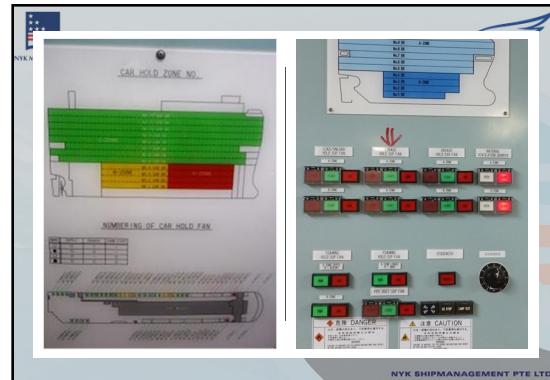
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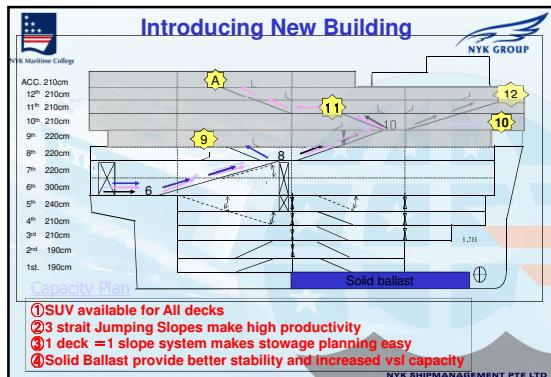
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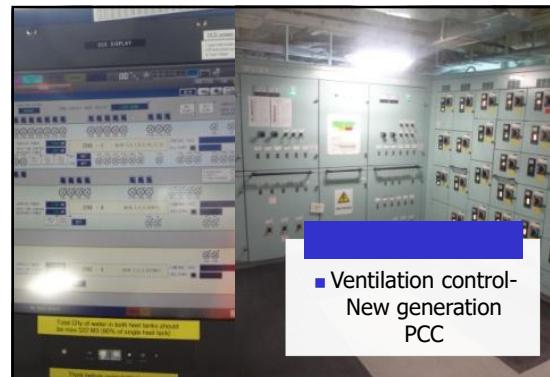
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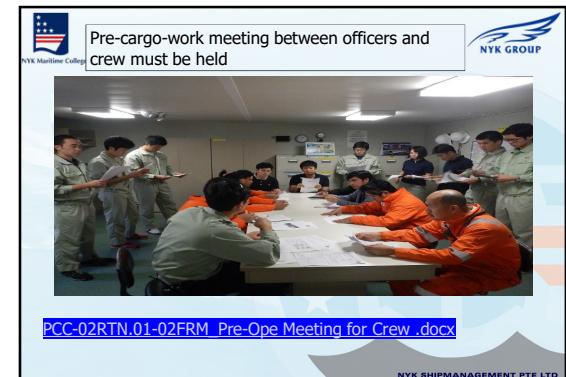
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12

Cargo Operations

A) Before starting Cargo Operations

1. Pre-operation meeting (every port)

The stevedore supervisor, NYK Agent or Port Captain, and the Master or Chief officer of the vessel should attend a pre-loading meeting.

Matters to be discussed:

- a) Number of cars to be loaded/discharged.
- b) Loading/discharging schedule, driving route and stowage plan.
- c) Schedule of outer ramp Operations.



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Cargo operations

d) Panel rise / down operation.

e) Maximum driving speed during the loading operation (should be limited to 20 km/hour (12 mph) in the cargo hold).

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■ Do's and Don'ts

17

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1. Pre-operation meeting (every port) contd...

- PCC-02RTN.02-02FRM Pre-O Mtg with Steve.docx
- Sample No Injury Report.docx

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NYK Maritime College

NYK GROUP

Cargo operations

f) Slow speed driving areas:

- Upper and lower end of outer ramp/inner slope way
- Knuckle parts of inner slope way
- Narrow spaces in lower decks which need a sharp turn

Drivers

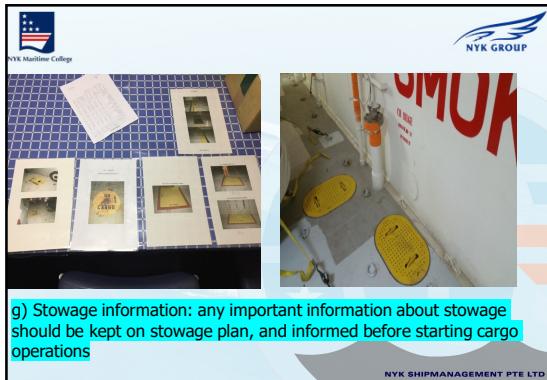
SPEED 12 Mhr or 20 km/hr

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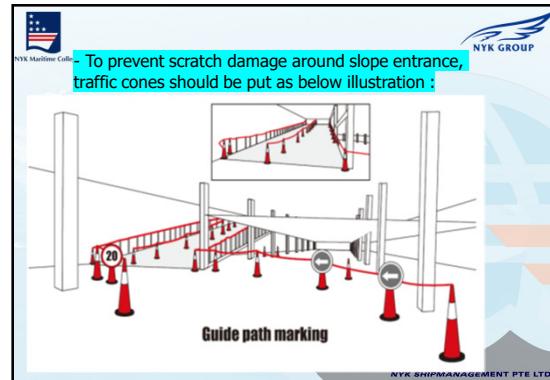
16

NYK SHIPMANAGEMENT PTE LTD

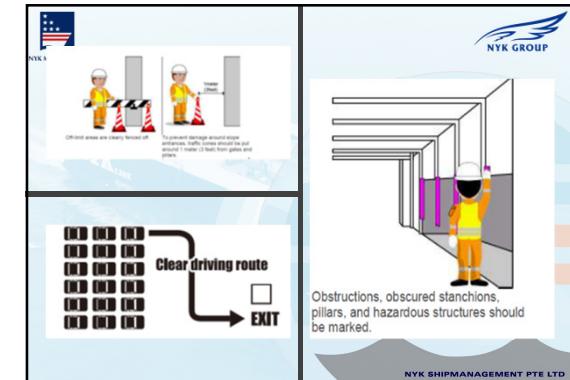
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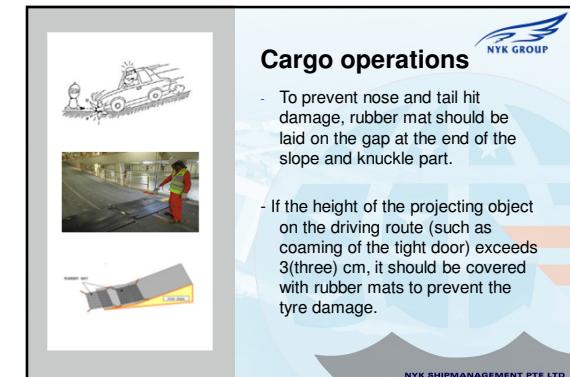
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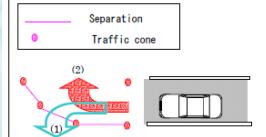
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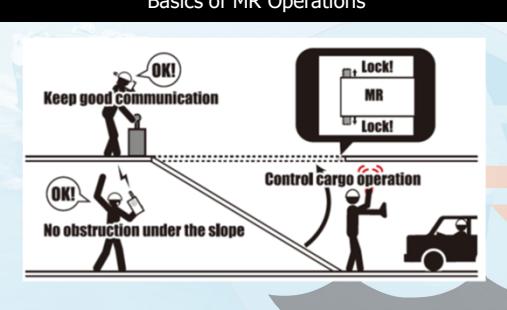
Cargo operations

B) DURING and UPON COMPLETION CARGO OPERATION

- Check point of supervising:
- Duty officer and crew member should supervise the stevedores to ensure that **GENERAL INSTRUCTIONS FOR LOADING VEHICLES FOR STEVEDORE** are followed.
- The way to control proper driving route and speed.
- When the traffic flow changes its direction from (1) to (2), the traffic cones and tape also should be changed and positioned


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Basics of MR Operations



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Cargo operations

- Distance between cars:
- The side distance between two vehicles or from the nearest ship's structure should be 10cm (4 inches)
- The distance between rear bumpers or from the nearest ship's structure should be 30 cm (12 inches) as walkway for lashing/unlashing.



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Cargo operations

3. Movable inner slope shifting operation:

- Duty officer and crew are requested to connect movable inner slope to proper deck according to cargo operation sequence.
- However, before the commencement of above operations, you should always give a pre-notice to the Stevedore Superintendent who will stop the cargo work: you can operate only after closing the traffic completely.
- Set safety rope, traffic signals, etc. at the entrance of the disconnected deck to prevent injury and/or accident.

Check Surroundings Before Operation!

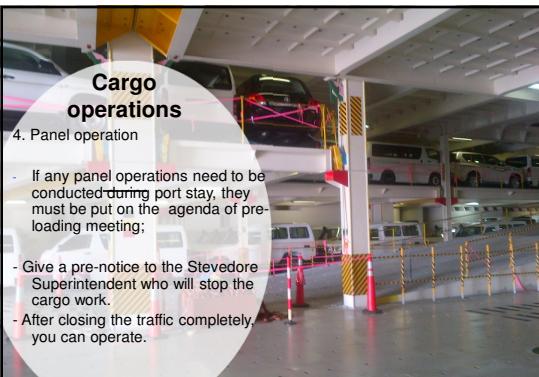
(Sample)

26

Cargo operations

4. Panel operation

- If any panel operations need to be conducted during port stay, they must be put on the agenda of pre-loading meeting;
- Give a pre-notice to the Stevedore Superintendent who will stop the cargo work.
- After closing the traffic completely, you can operate.

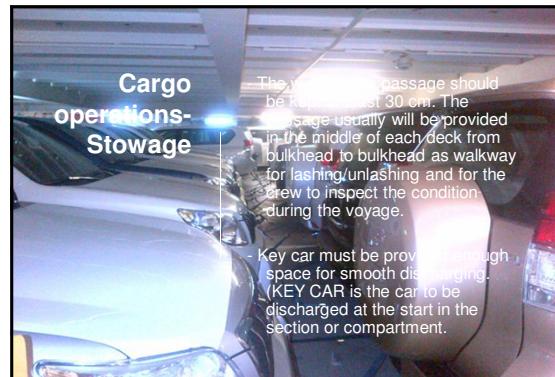


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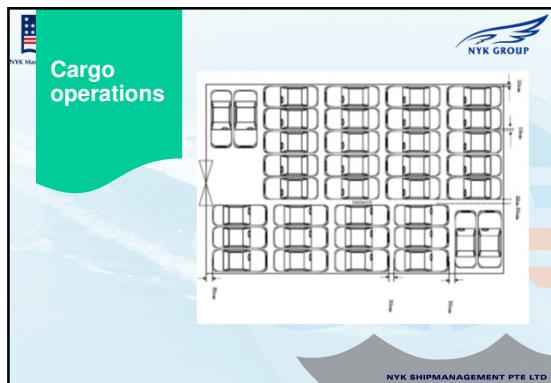
Cargo operations-Stowage

The width of the passage should be kept at least 30 cm. The usage usually will be provided in the middle of each deck from bulkhead to bulkhead as walkway for lashing/unlashing and for the crew to inspect the condition during the voyage.

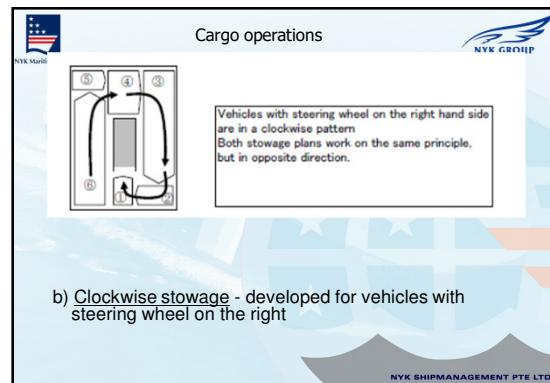
Key car must be provided enough space for smooth discharging. (KEY CAR is the car to be discharged at the start in the section or compartment.)



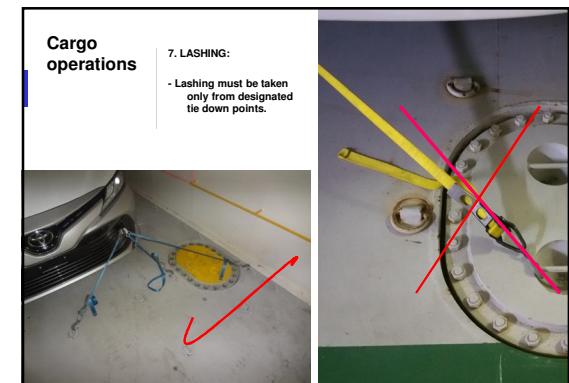
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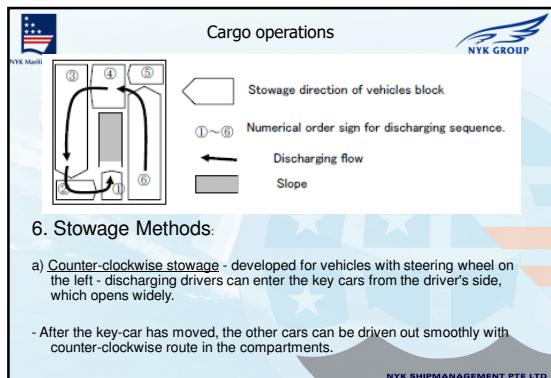
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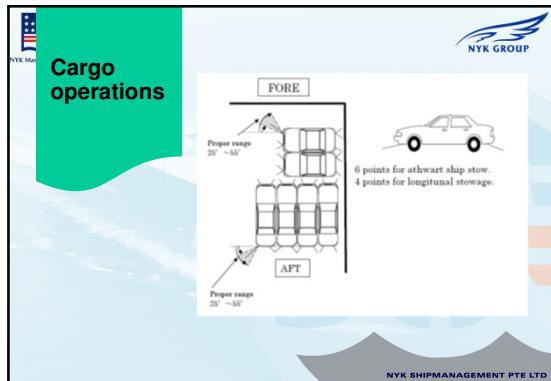
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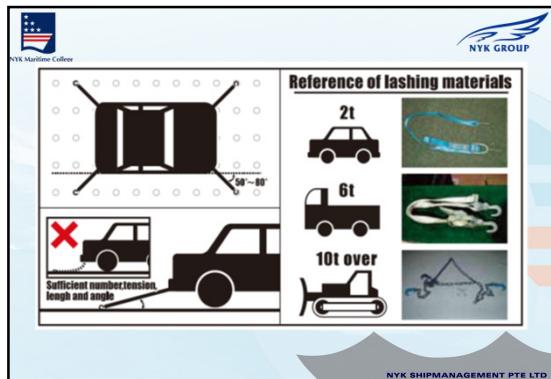
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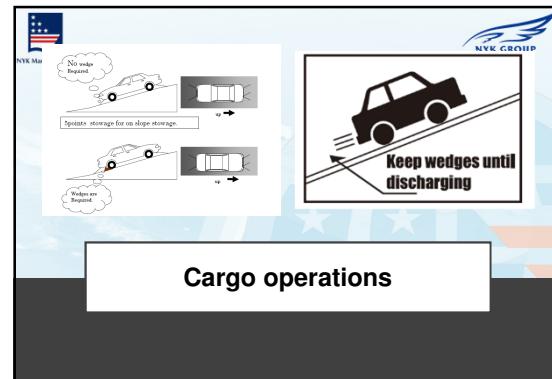
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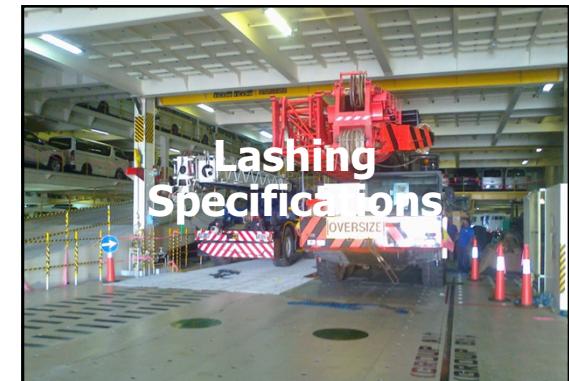
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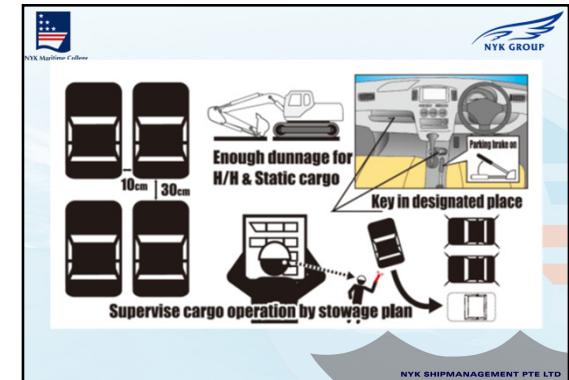
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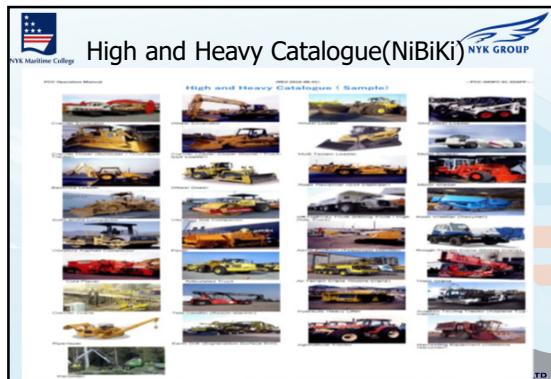
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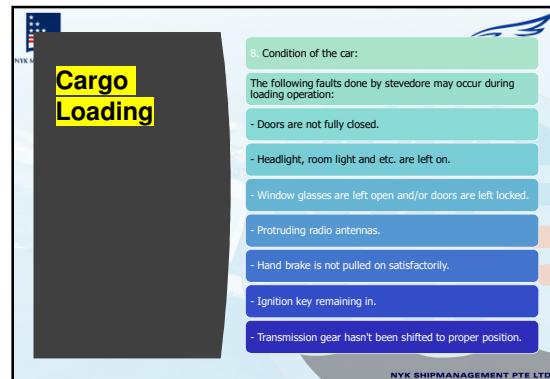
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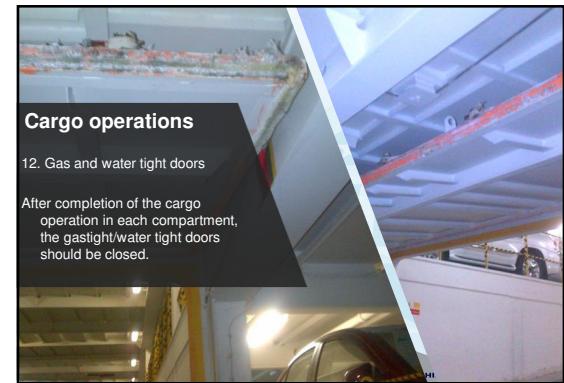


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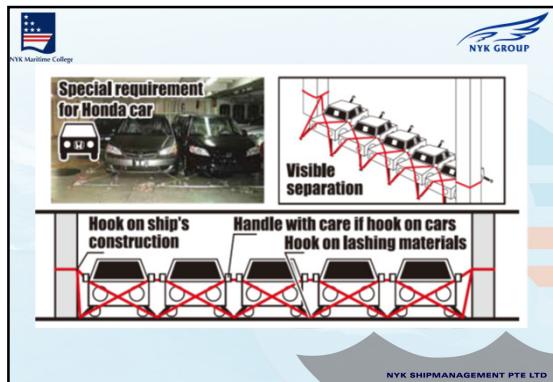


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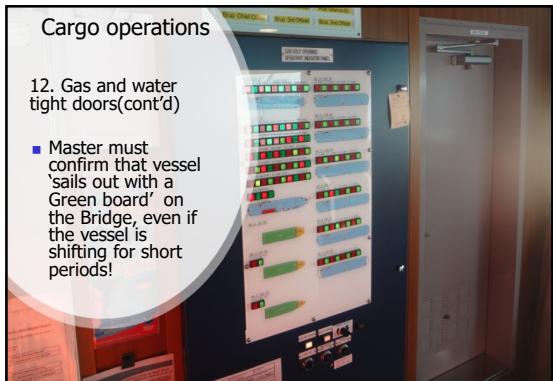
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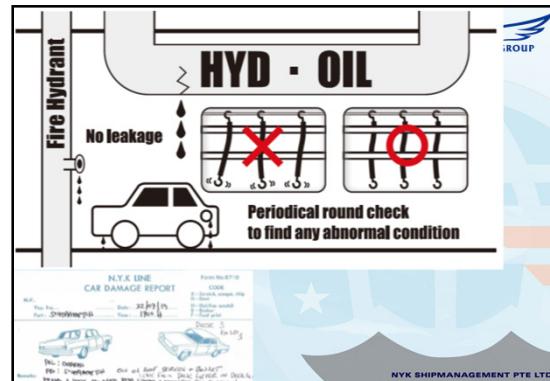
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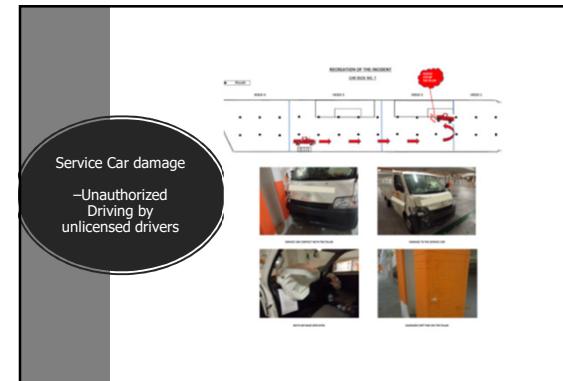
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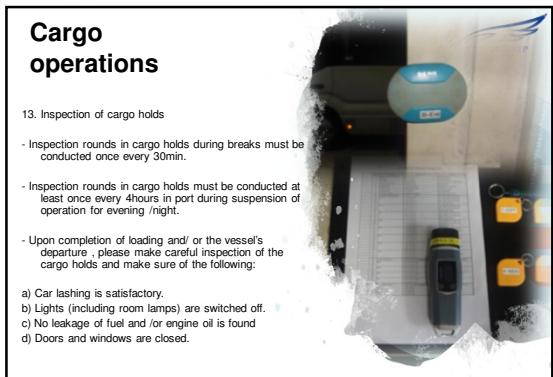
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The poster features a white service car on the left and a driver in a high-visibility vest on the right. The title 'SERVICE CAR' and 'SAFE DRIVING RULES' is at the top. Below it is a numbered list of five rules. At the bottom, it says 'TIPS TO AVOID ACCIDENTS'.

NYK SHIPMANAGEMENT PTE. LTD.  

SERVICE CAR

SAFE DRIVING RULES

1 INFORM:
Confirm Chief Officer / Duty Officer is being informed.

2 SEAT BELTS:
Please confirm seat belt is fastened.

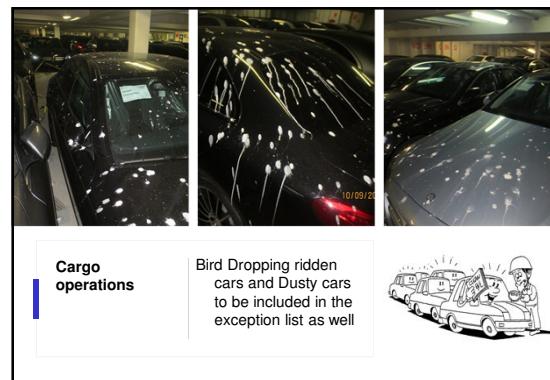
3 LIGHTS:
Confirm head lights are turned ON.

4 PROPER PPE:
Confirm Helmet is worn.

5 SPEED:
Please ensure to keep Speed limit less than 20 KM/hr.

TIPS TO AVOID ACCIDENTS

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- Whenever car damage has occurred, the "NYK Line Car Damage Report" must be issued immediately with all descriptions of damage such as VIN No, C/No., type of damage and damage part.
- The report must be signed by stevedore supervisor without delay. Otherwise they often refuse to sign the report at all.
- It is important that the name of the person signing the report is repeated in capital letters.
- After completing cargo work in each port the damage report must be sent to agent and other offices as instructed, using "Chief Officer's Report of Cargo Damage by Stevedore" form.



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Cargo operations

- 15. Mate's Receipt (M/R) and Exception List:
 - - Whenever any remarks are noted in the above documents, the contents of the remarks should be reported to NYK immediately.
 - - It is not necessary to make remarks on the M/R when the damage to the used car is considered to be usual damage, such as scratches, rust, stains, etc.
 - - Used cars which need towing, used cars with oil leaks, etc. should be placed on an exception list.

4.2. Bunker List
Bunker list shall be put at the port of loading as far as possible before a specific condition of cargo is started.
Ex: When you are storing such as coal and propane,
Temporary to store the cargo
Cargo connecting to the cargo
Not all the cargo is stored, it is recommended to put the following remarks.
From now on and the damage, as well as any other right damage the cargo will be



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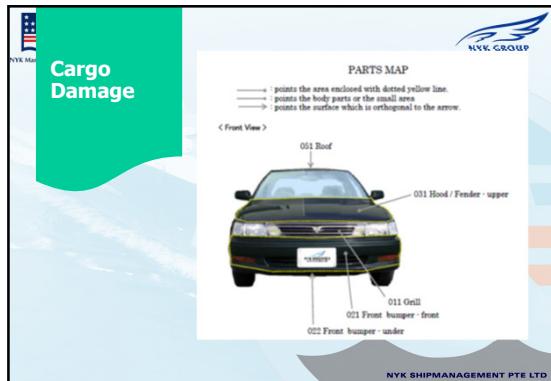
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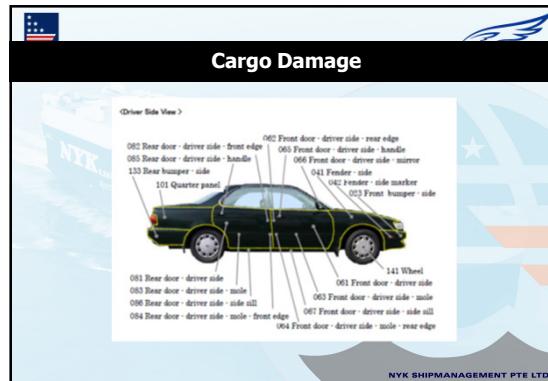
70

 <p>NYK</p>		<h2>Cargo Damage </h2> <p>SAMPLE TYPES OF CARGO DAMAGE: BROKEN</p> <p>DENT, BEND</p> <p>CHIP, SCRAPE, GOUGE</p> <p>SCRATCH, SCUFF</p> <p>RUST, STAIN</p> <p>PARTS MISSING,</p> <p>FILFERAGE</p> <p>CUT, CRACK</p> <p>OTMD (Other than marine damage) CA (Commercial Acceptable damage)</p> <p>TOTAL LOSS MANAGEMENT PTE LTD</p>
		

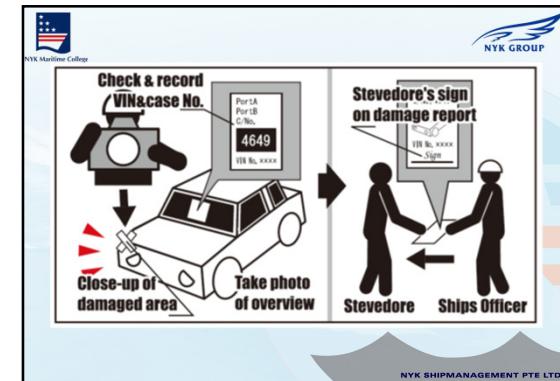
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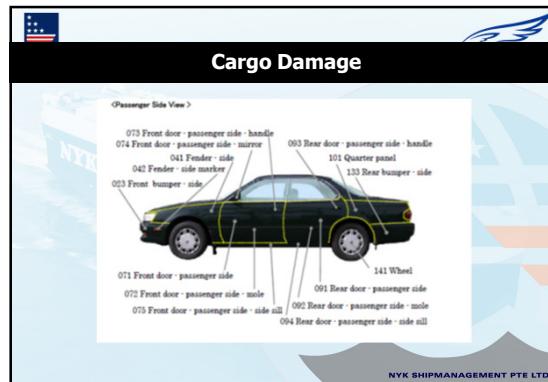
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N.Y.K LINE CAR DAMAGE REPORT
Form No.8710

Ship name: NYK LEO Date: 07.06.2013
Voy No.: 0785
Port (DEPT): MELAKA
Time: 07:30
Remarks: (DRY) VEHICLE TOWING LOADING BY 5 TON TRAILER

CODE	E - Scratches, chip F - Dent H - Scratch, scratch I - Dent, dent J - Foot print
From Agent	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No
Car Model	Car 1: TOYOTA HARRIER VIN: JZG33M1A94000103 Car 2: TOYOTA HARRIER VIN: JZG33M1A94000102
Police Off. Name	Officer Name: NT/BS/041 REV LWR Signature: [Signature]

Damage report

Vessel to use Form 8710 as well as Damage report form sent through PQI 121

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TRAFFIC CONTROL SIGNS

- The signs should be displayed in conspicuous places to enable to the drivers to see them easily, or in places where particular attention is required
- The sign should be placed on the traffic cones which are already provided to all PCC's.
- The signs on the cones are most effective for the drivers, but they may be displayed at proper place of the hold structure.



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TRAFFIC CONTROL SIGNS

Sign Type	Purpose	Location
STOP	To indicate un-intended driving route. Especially following area.	Center ramp are laid (opened) but not connected with the car deck. Inner movable slope isn't connected the car deck. In front of the inner slope, which is connected, to low car deck when high roofed cars are operated.
ARROW	To indicate intended driving route.	
20 Km/h	20km/h or 12M/h It makes it remind to drivers the speed limit in the car deck. This sign should better to be set on the straight portion on the car deck.	
SLOW	For prevention damage by over-speed. This sign should be put following area, which has high potential of damage.	1. The gap at end of inner slope or outer ramp. 2. Turning area. 3. Narrow driving area due to hold construction or other cargo. 4. The area driving speed have to be reduced less than 20km/h for safety pass.

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Requirement - 1 Stand pole requirements

1.0 m

0.5 m

Requirement - 2

Keep 3.0 m or more

Marked Locations

Label the storage place near each inner slope
Close storage areas as much as possible

Do not secure poles on mobile decks

Do not secure poles on mobile decks

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Damage prevention materials

NYK Maritime College

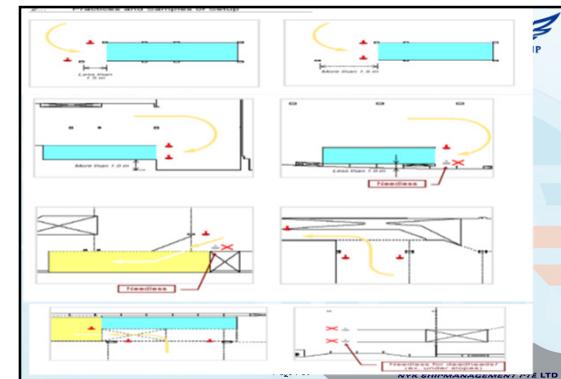
Traffic cone (pcs)= TOTAL CAPACITY(RT)/ 30
Cone Weight (pcs)=TOTAL CAPACITY(RT)/150

Please use them effectively!!

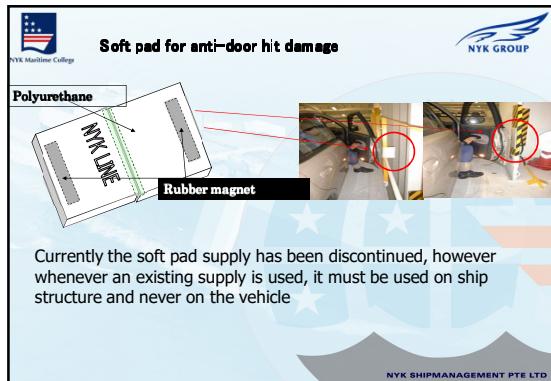
1 Meter (Steel)

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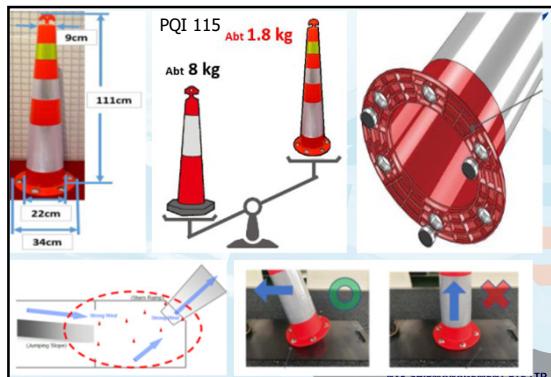
84



85



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PCC Cargo Operations Training

NMC 32

Presented By

MTD

**NYKSM SHIPMANAGEMENT
SINGAPORE**

Rev 4.0 01/10/2018
NYK SHIPMANAGEMENT PTE LTD




1

Cargo Operations

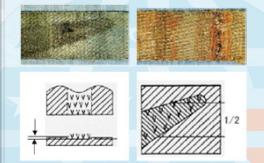
- metallic part is remarkably transformed
- the knurling is remarkably worn
- the parts which contact to belt is remarkably rusted.



3

Cargo Operations

- The thickness of the belt is reduced less than 5/6 of the original 1/6
- The scratch due to tire slip is extended more than 1/2 of the belt width





5

Cargo Operations

A) Before arrival first loading Port

I. Lashing materials and Consumables supply

1. Lashing condition check: the lashing materials should be checked according standard, removing the un-useable materials.
 - The "DOWEL" is out of order: not able to be engaged sufficiently. (Required dowel holding force is about 30N)

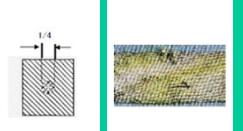
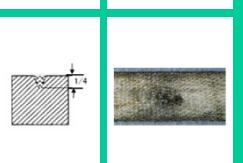




2

Cargo Operations

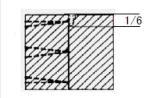
- The belt is cut at center part more than 1/4 of belt width.
- The belt is cut at side more than 1/4 of belt width


4

Cargo Operations

- The belt is cut around sewing part more than 1/6 of the width






6



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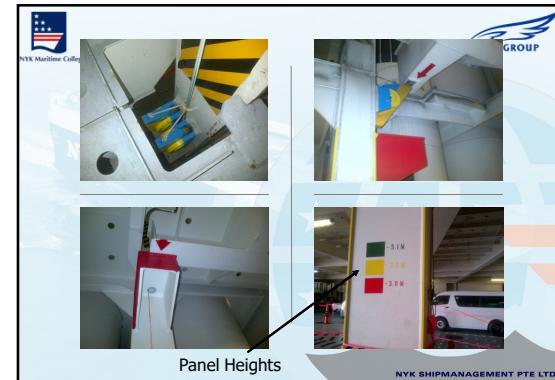
Cargo Operations

3. Preparation for loading

- AA. Prevention of soot damage
 - Soot may affect the paint surface of vehicles on yard, therefore, soot blowing should be done before entering every port and decks washed before entering port
- BB. Foreign object
 - Check and remove foreign objects (such as empty bottles, cans) that are often placed on the beams in the ceilings of the decks.
- CC. Make sure that all hold ventilation systems are in good order.

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Cargo Operations

2. Lashing inventory:

- Report to NYK the condition and the number of lashing materials and consumable required, about one week prior to arrival at first loading port.
- Lashing materials specifications in accordance to "LASHING CATALOGUE", using the established form for reporting.

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Cargo Operations

4. Panel operations

- Liftable panels should be set in accordance to NYK instructions.
- The unused liftable deck support should be folded.
- Stanchions, safety ropes and safety signs are placed at the gaps between the panels.

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A slide titled "Panel Operations-Precautions" featuring several photographs and diagrams related to panel handling. The top left shows a yellow panel being lowered from a ship's hatch. The top right is a logo for "NYK GROUP". Below these are two rows of images: the first row shows a yellow panel being lowered, a yellow panel being secured with a strap, and a yellow panel being lowered again; the second row shows a yellow panel being lowered, a yellow panel being secured with a strap, and a yellow panel being lowered again. To the right of these images are three diagrams labeled N1, N2, and N3, showing various panel configurations and inspection points.

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When you carry out visual check of them, you should pay attention that no abnormal signs are found such as following practice.

Fig.5

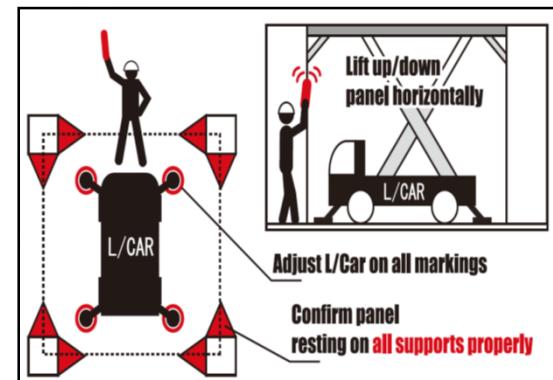
<Crack>

<Deformation>

In case you encounter any serious situation, do not carry out recovery without any communication with owners, ship managers, operator and storage planner in charge in order to prevent further incident.

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18

 Case Study: Damage to Maserati Cars during panel ops 

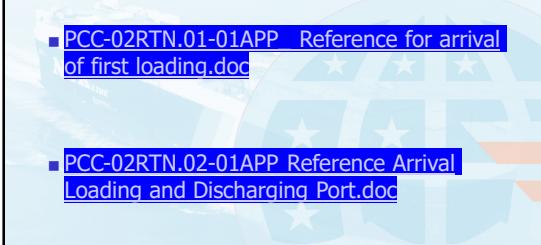


Car bonnet damage after contact with deck lifter

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 Checklists from PCC Operation manual 



- [PCC-02RTN.01-01APP Reference for arrival of first loading.doc](#)
- [PCC-02RTN.02-01APP Reference Arrival Loading and Discharging Port.doc](#)

NYK SHIPMANAGEMENT PTE LTD

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Cargo Operations



5. Materials for damage prevention: traffic cones, separation tapes, rubber mat, etc, to be sufficient and properly distributed in cargo hold.
6. Plywood to be in sufficient quantity for the protection of wharf surface (used under the outer ramps)
7. Oil absorbent to be available near the outer ramps for any oil spill on decks.

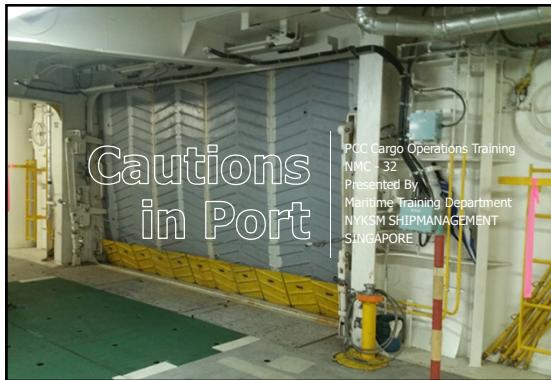
<http://www.absorbentbarrier.com/oilspillpads.htm>

20



THANK YOU

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1

Cautions in Port

2. Heaving line

- Heaving line should be thrown toward the pier with special attention to prevent hit damage of cars in the vicinity during the docking operation.(do not throw heaving line to jetty at private berths!)

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Cautions in Port

A) General Cautions

1. Soot damage

- Special attention should be paid to cars in the vicinity of wind direction to prevent soot damage at the time of try-engine.
- During stay in the berth, chief officer or duty officer or duty crew confirm frequently that no soot is exhausted from funnel.
- The boiler should be operated continuously.

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2

Cautions in Port

3. Contact to bitts or car stopper

- Care should be taken of the flare of the hull overhanging the berth, so the ship's hull may come in contact with shore facility (Car Stopper, Bitts etc.)
- The vessel must always be kept parallel to the berth. Otherwise, the stern corner may touch the berth and cause damage.

4

Cautions in Port

4. Rat guards

- Rat guards which are moving on mooring lines, have a potential to hit the vehicles in the yard during a strong wind. Make one more small hole on their upper brim to tie the fitting rope on their point to prevent breaking of small ring on the rope end.
- If you cannot fit the rat guards to the mooring line completely at the ship's mooring hole, fit them to the line near the bit.
- During strong wind condition, install rat guards near the bitts so as to prevent them from falling off and cause damage to the cars.

6

Extract from RNF088

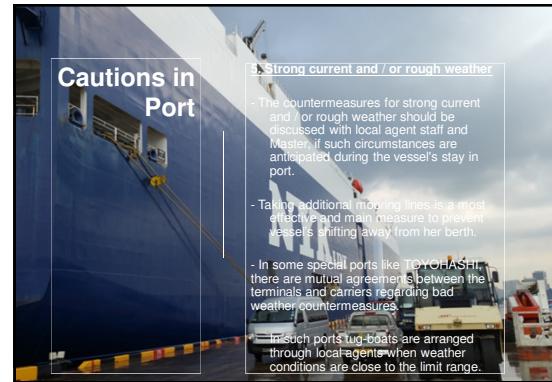
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1. Keep all rat-guards in good condition including lanyards and connecting parts.

2) Set rat-guards correctly and carry out periodical check if all of them are set in good order.

3) Take care of rat-guard when you heave/slack mooring lines during berthing.

7



9

<p>Fig.23 Standard arrangement of mooring lines</p>	Head Line A 30 ton	Per Lines
	Stem Line F 10 ton	
	Breast Line B,E 15 ton when using storm bkt., 20 ton	
	Spring Line C,D,NONE	
	Spring Line E 15 ton (or 20 ton)	
	Stem Line F 10 ton (or 20 ton)	
	Total 120ton	

Simple calculation:
Find correspondent wind velocity and mooring force in case of the arrangement as shown in Fig.23.

Head Line A	10 ton (= 30 ton)
Breast Line B	15 ton (= 20 ton)
Spring Line C	NL
Spring Line D	15 ton (= 20 ton)
Breast Line E	15 ton (= 20 ton)
Stem Line F	10 ton (= 20 ton)

**Extract from Guide to maneuvering of PCC (in Stars program)
(Usual arrangement on PCC is 4+2<no breast line>, thus assume around 80t holding power of ropes, To estimate quantum of wind force using tool from Nibiki)**

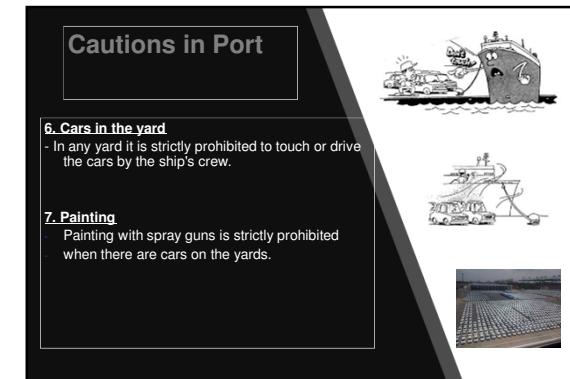
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12

NYK Maritime College  **Cautions in Port**

8. Ballasting work

- During Ballasting /Deballasting work, special attention to avoid the spill ballast water from hawsse pipes, air pipes or scuppers.
- Unnecessary valves should be completely shut before starting the ballast work.
- Even light wind can carry the seawater spray from shipside to the yard and the vehicles may be subject to damage (those vehicles must be washed down immediately with fresh water).

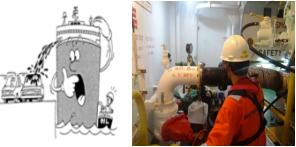


13

Cautions in Port

9. Bunkering

- During the bunkering, safety measures to be applied by using the check lists, in order to prevent overflow of fuel from the sounding pipe or air pipe.
- Also keep these pipes away from any heat source.
- Particular attention is required to air purge operation at last stage of bunkering.



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Cautions in Port
B General Instructions for the Crew



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Injury possibility to any person walking on the wharf due to water overflow

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14



16



DON'T's

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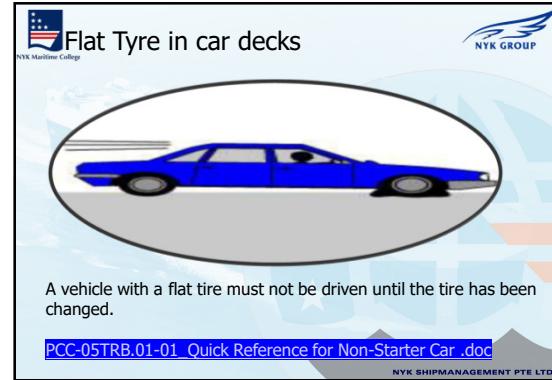
18

Cautions in Port

3. Precautions against fire

- Crew should be familiar and fully know the locations of portable fire extinguishers, fire hydrants, fire hoses and all other fire-fighting equipment, in case of emergency.

19



21

Cautions in Port

C) Outer Ramps Operation

1. Familiarization with outer ramp

- Outer ramp is a very important facility for the RORO cargo operations on a PCC. Therefore, for the officers and crew of a PCC, it is essential to have sufficient knowledge to operate.
- Outer ramps should be set within the shortest possible time to save stand by costs of the gangs waiting to start cargo work.

23

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may be

Do not allow drivers to carry out refuelling in the same gastight compartment where jumpstarting is being carried out.

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4. Familiarization with Damage Prevention

- Crew must be familiar with contents of Flip Flap Instructions

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PCC Equipment competency standards

PCC Operation Manual / PCC-02RTN-04 Cargo Equipment Operation

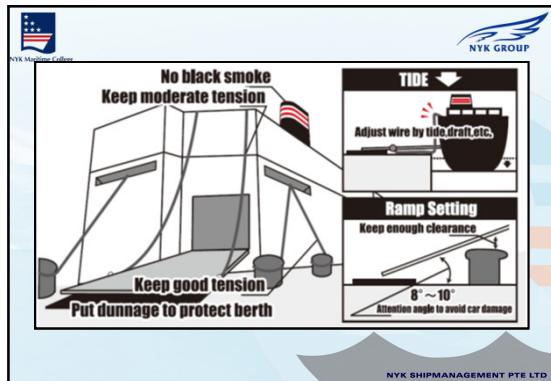
Version: 2018.08.01
Approved By: Head of G-SMSC

4. Procedure
Designated operator (*The Operator must have more than 6 months experience in Deck dept, or Officer's license.)

Equipment	Supervisor	Main Operator*	Back-up Operator*	Remark
Outer Ramp	C/O or Bosun	Bosun or Responsible Officer	As assigned by the C/O	Post operational instruction at control stand.
Inner Ramp	C/O or D/O/B	Bosun or D/O/B	As assigned by the C/O	Post operational instruction at control stand.
Deck Lifter	C/O or D/O/B	Bosun or D/O/B	As assigned by the C/O	Post work instruction for parcelling
Gaslight Box	C/O or D/O/B	Bosun or D/O/B	As assigned by the C/O	
Forklift	-	Bosun	As assigned by the Master (NYKSM)	Special training is required for Main and Back-up Operator.
Service Car	-	Bosun	As assigned by the C/O	Post work instruction and ready near the forklift.
				Driving license of crew country is required

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Case Study-Damage to yard cars by plywood

Action to be taken

- 1) when setting/securing outer ramp, at least one crew shall stay on berth side.
- 2) During operation, crew shall take care of ramp and its circumstances around the ramp. If there is cargo near by ramp, special caution shall be needed.
- 3) For countermeasure against such incident, installation of rope to connect some pieces of plywood may work.

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Cautions in Port

Determine proper berthing position

- Monitor clearance between Ramp and Bitt
- Take action before/after adjusting Ramp angle

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Cautions in Port

2. Protection for wharf surface and ramps

- When setting outer ramps, plywood must be put under the ramps to prevent damage to the wharf surface and /or ramps.
- Duty officer and crew engaging in ramp setting should keep stevedores away from above operation area.

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3. Adjusting height of the outer ramp

NYK GROUP

The ramp connection height is to be checked after the ship has berthed. If the connection height is lower than the wharf height, the ramp height must be adjusted so that the difference is less than 20 cm. The top of the ramp must be level with the wharf surface. Otherwise, the ramp will be damaged.

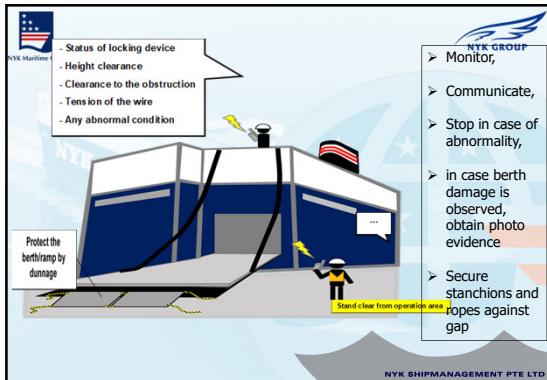
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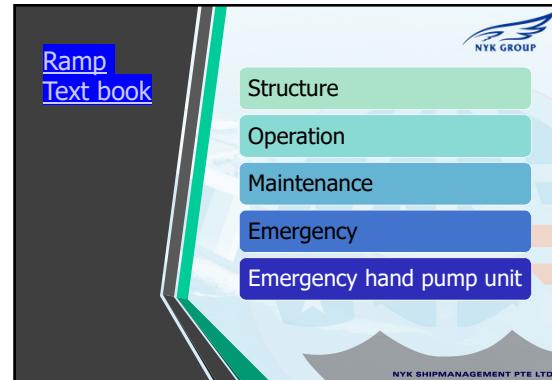
Proper Berthing Position method

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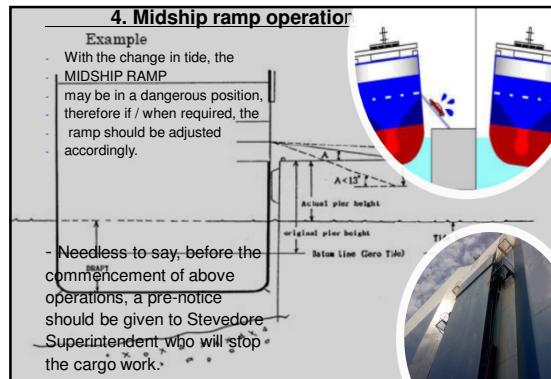
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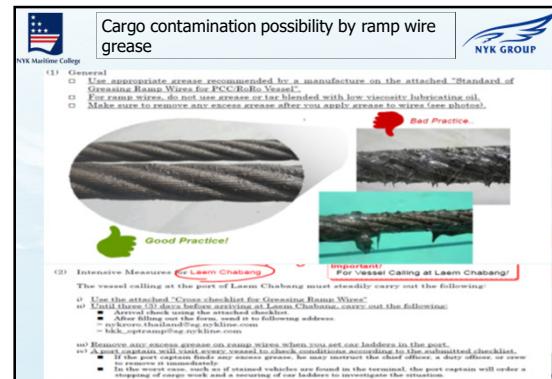
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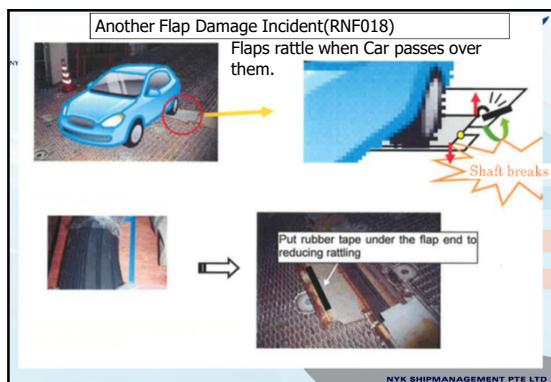
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Checklists/Reference tables in PCC Operation Manual(Cont'd)

- [PCC-02RTN.05-02APP Standard Stowage.doc](#)
- [PCC-02RTN.05-03APP Head Clearance .doc](#)
- [PCC-02RTN.05-04APP Number of Minimum Lashing .pdf](#)
- [PCC-02RTN.07-01APP Reference for after cargo operation .doc](#)

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Who / When can operate Forklift?

Only trained and evaluated operators

- Every Bosun on board a PCC/PCTC must be trained by an approved shore based organization
- Bosun in turn shall train other crew members on board in forklift operation under the supervision of the master

Key control

The Chief Officer / Bosun shall take custody of the forklift key

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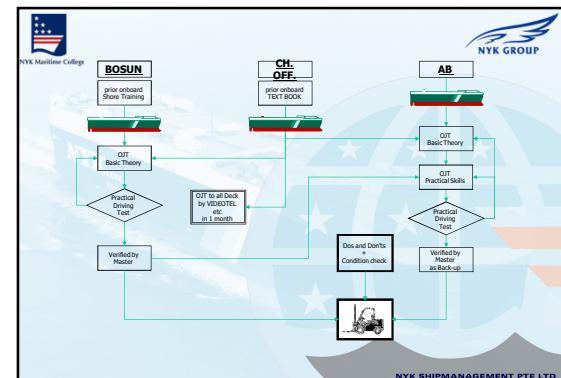
Checklists/Reference tables in PCC Operation Manual

- [PCC-02RTN.03-01APP Reference General Caution while in Port.doc](#)
- [PCC-02RTN.04-01 APP Reference of Cargo Eq Operation.doc](#)
- [PCC-02RTN.05-01 APP Reference During Loading .doc](#)
- [PCC-02RTN.06-01APP During Discharging .doc](#)

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Required Trainings

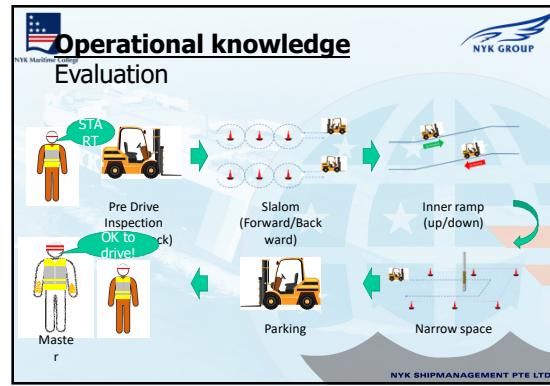


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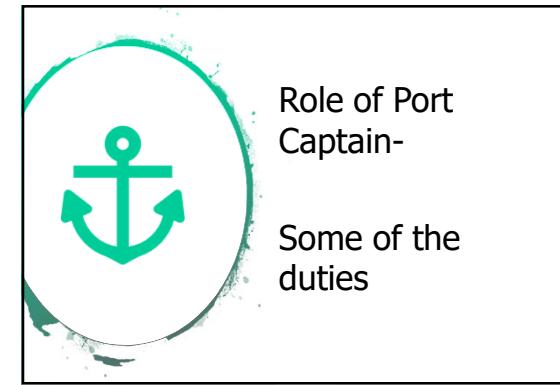
- a Forklift Operation – Power Point Presentation
- b Forklift Operation – VideoTel Presentation
- c Forklift Operation – Theoretical and Quiz
- d Forklift Operation – Driving and Practical Operation

Forklift training booklet

43



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What should you learn?



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Theoretical knowledge

- Differences from automobile
- Steering and maneuvering
- Visibility
- Vehicle capacity and stability
- Vehicle inspection and maintenance

Operational knowledge

- Pre driving inspection
- Start-up procedure
- Travelling
- Loading and Unloading Operation
- Driving in Reverse
- Driving on Indines
- Parking

Handling skills

- Onboard Training Program
- Evaluation

44

FORKLIFT SAFE DRIVE

- Keep it slow
It's not a race!
- Do not travel or turn with a raised load,
the forklift could tip over.
- Face your load uphill.
- Going downhill?
Travel in reverse.
- Be careful of rear end swing.
Avoid rear endings, pinching movement.

FORKLIFT CHECKS WEEKLY

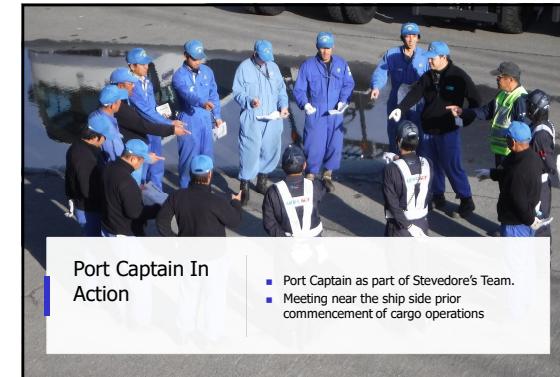
- Check the tire of the lift and lift system.
- Check for damage and cracks in handle bars.
- Check the load capacity plate is readable and not damaged.
- Check that the load capacity plate is readable and not damaged.
- Check for damage and cracks in handle bars.
- Check the load capacity plate is readable and not damaged.

FORKLIFT SAFETY RULES

- Always wear a seatbelt while operating a forklift.
- Know the load limits of the forklift before operating.
- Keep your hands, arms and legs inside the lift truck.
- Sound horn at blind corners and at intersections.
- Don't load the vehicle beyond its capacity.
- Do not let anybody ride on the forks.
- Keep the forklift in well maintained condition.
- Always wear required Personal Protective Equipment.

TIPS TO AVOID ACCIDENTS

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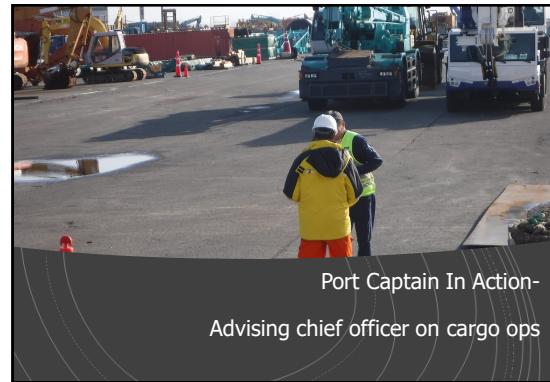
48



Port Captain In Action

Close monitoring of cargo operations

49



Port Captain In Action-
Advising chief officer on cargo ops

51



Port Captain In Action

■ Coordinating ship-stevedore matters

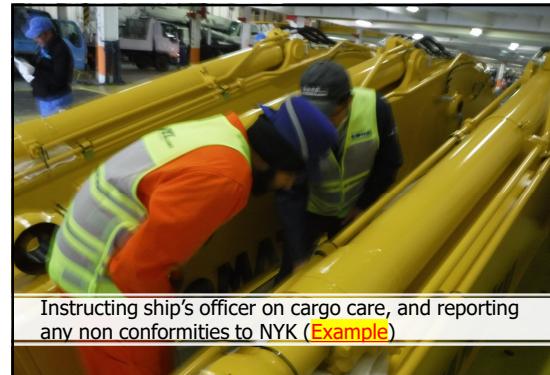
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Assisting vessel(at times) during difficult cargo loading

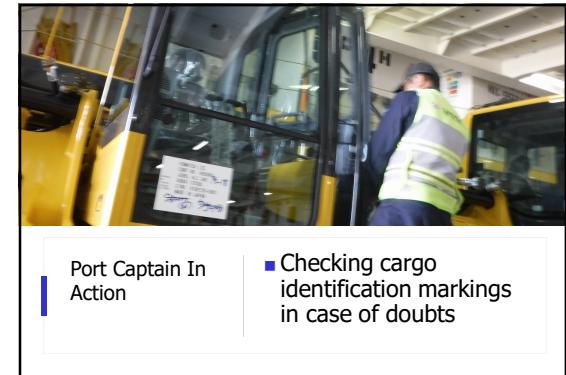
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50



Instructing ship's officer on cargo care, and reporting
any non conformities to NYK ([Example](#))

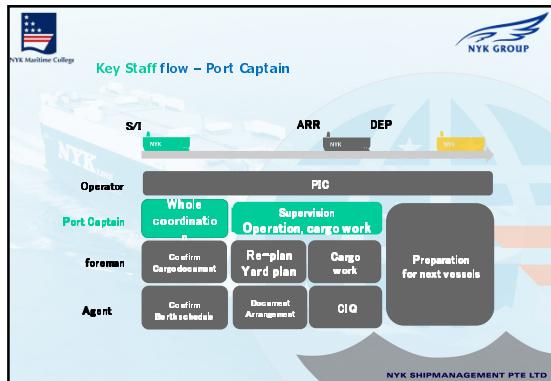
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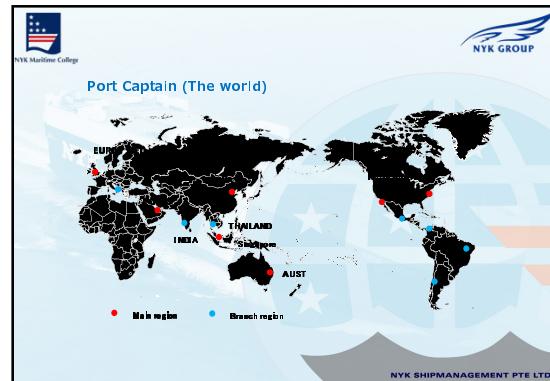
Port Captain In Action

■ Checking cargo
identification markings
in case of doubts

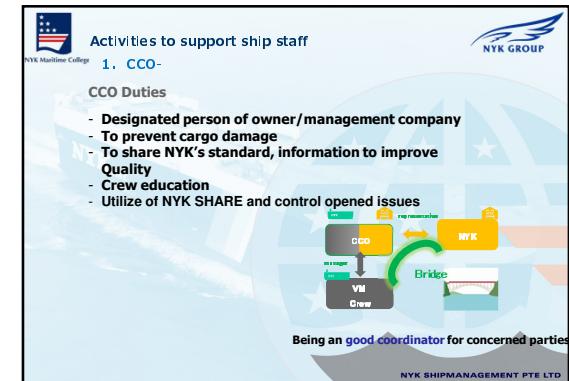
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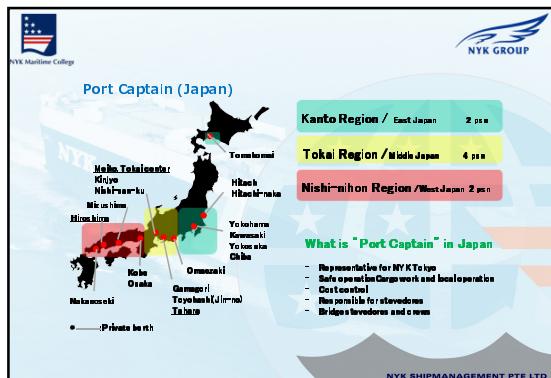
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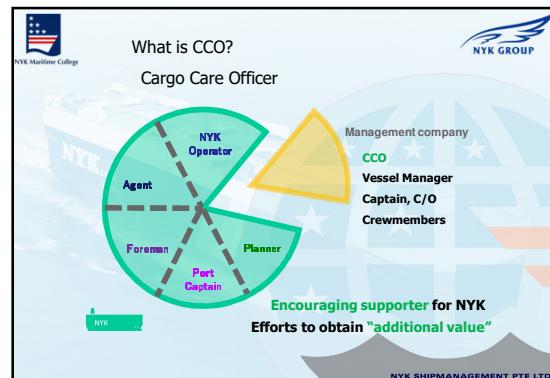
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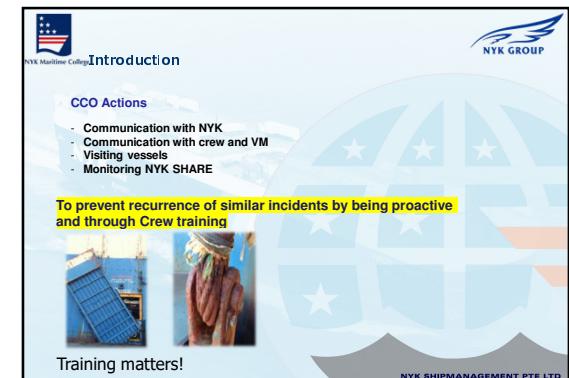
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PCC Cargo Operations Training

NMC 32

Presented By

MTD

NYKSM SHIPMANAGEMENT
SINGAPORE

Rev 3.0 01/12/2010
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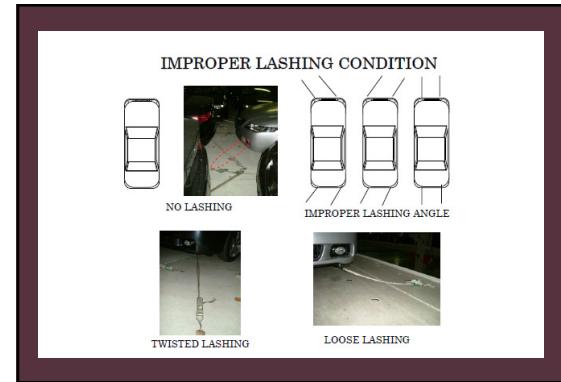
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Hold Inspection during Laden Voyage

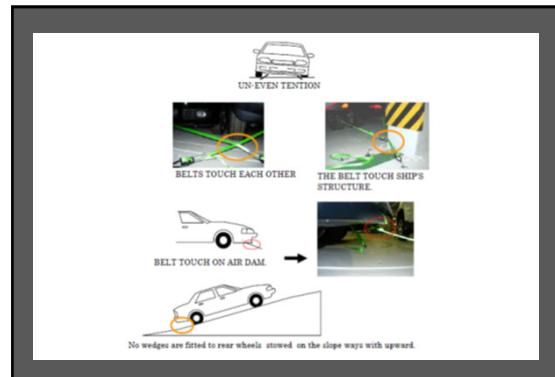
A) Lashing Check

- Timing of lashing check
 - lashing of the loaded cars must be checked after sailing every loading port, and corrected if not properly done – refer to "IMPROPER LASHING CONDITION."
 - especially after sailing from last loading port, all lashing must be confirmed properly done.

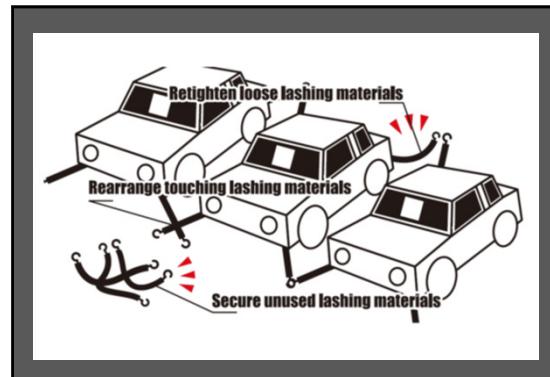
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Hold Inspection during Laden Voyage

2. Cargo securing manual: to be confirmed the proper balance between cargo weight and strength of the lashing materials with reference to CARGO SECURING MANUAL

Say that a cargo unit of 18 tonnes mass is to be secured using only shackles, web lashings, chains and turnbuckles – all MSLs of 50% breaking strength (BS). The unit will require 18 tonnef MSL on each side, namely, 36 tonnef total MSL (72 tonnef BS for these items), representing a total lashing breaking strength to cargo mass ratio of $72/18 = 4$.

Courtesy to Cargo Adhesive Committee www.uscg.mil

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Table 2. Determination of MSL from breaking strength, including safe-end multiples		
Material	MSL	ASL Multiples
Shackles, rings, turnbuckles, combination of mild steel	50% of breaking strength	4.00
Plane tape	50% of breaking strength	6.00
Wire tape (single use)	80% of breaking strength	1.00
Wire lashing	50% of breaking strength (ass. 70%)	4.00
Wire tape (reusable)	50% of breaking strength	6.00
Overhead single use	70% of breaking strength	1.00
Chains	50% of breaking strength	4.00

7

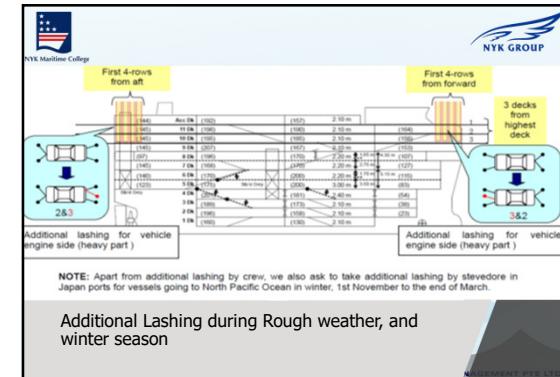
Hold Inspection during Laden Voyage

3. Confirmation hand brake and the position of transmission

4. Report of improper lashing: report location (where the units were stowed) and the loading port.

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CASE STUDY : Near Miss

Countermeasure?

Lashing materials wrongly secured.

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CASE STUDY : Poorly stowed lashing materials

Stow position → Break-out

Lashing materials (Endless strops) on handrail

Strops tangled up with the bumper and damaged on its bumper

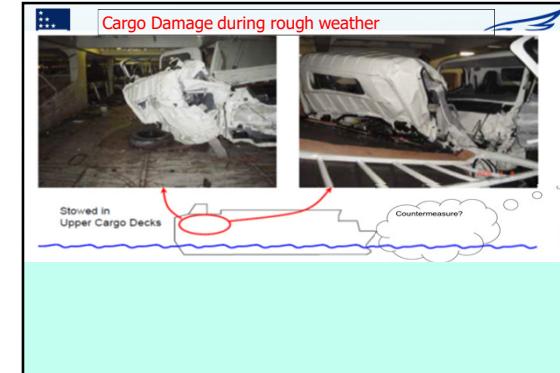
Fig.1 Image of damage situation

Fig.2 Image of damage situation

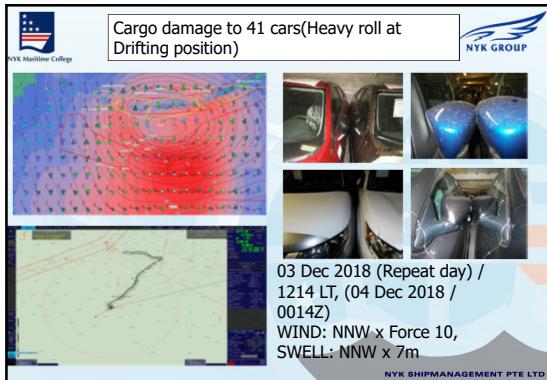
Countermeasure?

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Hold Inspection during Laden Voyage

B) Cargo separation

1. General
Cargo separation should be rechecked during the laden voyage.
- Color labels (6 colors with written discharging port should be placed on the front glass of the cars which are stowed along the borderlines for each discharging port to find the car to be unlashed more easily.

2. Report of discrepancy
If any discrepancy is found in the number of vehicles stowed in a compartment, (between stowage plan and actual stowage), should be reported to NYK to prevent short-haul or over-carry cargo trouble.

3. Correction of discrepancy
In case of wrong separation, the tapes can be rearranged after confirmation and double-check

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Hold Inspection during Laden Voyage

C) Car condition check

1. Proper condition
 - condition of the loaded cars in the hold must be checked together with lashing check, and correct properly as follows, if applicable:
 - All light should be turned off.
 - All doors and windows are closed.
 - Radio antenna is retracted.
 - Doors are unlocked.
 - Hand brake is fully engaged.
 - The key is out of the ignition.

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Hold Inspection during Laden Voyage

2. Used cars: inspection must be conducted at least once every 2 hours during first 12hours immediately after departure from loading port.

3. Oil leakage

- Leakage and oil spills on deck should be cleaned away as soon as possible.
- To prevent further stain damage, oil absorbent should be placed on the lashing holes near the area.
- Collect and keep small quantity of the oil as a sample for inquiry from shipper or consignee or maker.

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Hold Inspection during Laden Voyage

Hold Inspection during Laden Voyage

17

Hold Inspection during Laden Voyage

4. Report of residues:
if any residues such as rust and scale are sighted on car roofs or side, must report to NYK the vin no.,C/no. stowage location, any other info;

- DO NOT remove the residues, nor to touch the surfaces affected.

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Hold Inspection during Laden Voyage

D) Cargo hold condition

1. Check points: rounds in cargo holds must be conducted at least in once every 4 hours to confirm the following points:

- Gas tight door, water tight door, passage door and other access hatch covers must be closed.
- Any leakage of sea water from side port for outer ramps.
- Service cars, lift cars and gear boxes to be properly lashed/secured.
- Any leakage of oil or grease from the pipes and valves.
- Any leakage of ballast water from the pipes and valves.
- Any un-usual smell and / or noise.

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Hold Inspection during Laden Voyage

D) Cargo hold condition

2. F.O. Tanks surface temperature

Take and record once a day, temperatures of F.O. in heating tanks, double bottom tanks and tank numbers with remote control thermometer or with thermometer on F.O. transfer pump inlet.

With remote control thermometer, if available, take temperatures of pre-heating tanks.

With infrared thermometer supplied by NYK, take and record at least once a day temperature on tank top of heating tanks.

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E) Fire Prevention

1. Fire Patrol: during the voyage, inspect the cargo holds, engine room and living quarters at regular intervals.
2. Gastight and passage doors must be kept closed.
3. Locations of portable fire extinguishers, fire detecting system to be maintained in good condition at all times.
4. Ventilation at sea:
Dampers of cargo fan should be kept closed to prevent rust damage to cars due to moisture or sea-water spray;

If any leakage of gasoline and inflammable gas in the hold, use ventilation fans as necessary.

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Hold Inspection during Laden Voyage

F) High – Risk Car

1. General

- Marking the location of "high risk car" is very useful for prevention of damage during discharging operation.
- "High risk car"... A car which has high probability of being damaged if stevedores won't paid extra caution for discharging,
- Caution labels (Stickers) are placed on a front glass of each high risk car at the loading port, by stevedore / checkers.

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Hold Inspection during Laden Voyage

- However, if other high risk car is identified during the hold inspection, a caution label can be placed by duty Officer.
- All information about stowage and damage prevention must be mentioned in the stowage plan and discussed with stevedores during the pre-discharging meeting.
- For USA, EUROPE or the west coast of South America trades, please enter them in the "BLOCK (Flow) Stowage plan"

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Hold Inspection during Laden Voyage

2. Critical point, Caution labels and Caution sign

- The car stowed at small distance from ship's structure should be considered high risk car (30cm to 35cm)

POSTER: Prevent DENT damage (D), **Caution label (D)** on the front glass.

On above stowage flow pattern, shaded areas indicate the area of potential door hit damage.

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Hold Inspection during Laden Voyage

Prevent damage scratch by turning in small areas

- The cars in the colored area are very difficult or impossible to enter the slope with one turn.

Caution label (T) on the front glass

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Hold Inspection during Laden Voyage

- To prevent scratching with outside rear corner, don't turn round sharply when starting.

Example: a small area where is stowed a car with long rear, such as a pick-up truck

Caution label (R) on the front glass

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Hold Inspection during Laden Voyage

Prevent scratch damage by walk (S): be careful not to cause scratch damage when you walk close to car in a small width area / passage way

Caution label (S) on the front glass

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Hold Inspection during Laden Voyage

Prevent scratch damage at break out of the stow in area where ship's structure or other objects are less than 150cm from the front of the car

Caution sign (B) on the front glass

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Fig.1 Discharge case
Fig.2 The rule of collision due to error of discharging order
Fig.3 1st car labels

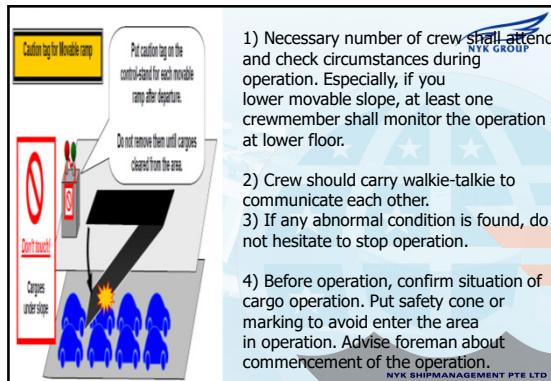
Key car label set is composed by five paper labels showing '1st car', '2nd car', '3rd car', '4th car' and '5th car'. 'Key car' means first car to be discharged.

Caution! Do not stick them on window by paste or adhesive tape. The each label is designed to only put on the window of the car.

Use of Key Car labels

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Lashing material Fell Down from Handrail and Damaged Car in Port

Action to be taken

Use of slope handrails as Lashing hangers is prohibited.

If the number of lashing gears is excessive, secure them properly

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CASE STUDY -Stevedore drove the car over an unconnected slopeway

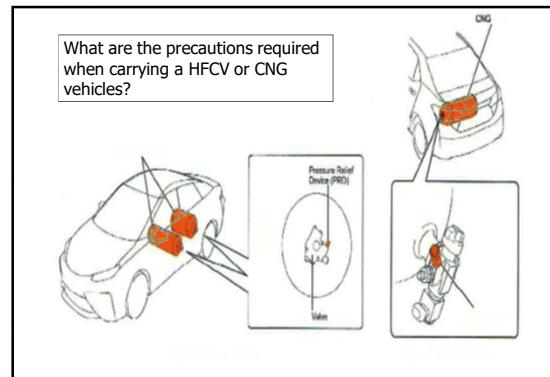
33

CASE STUDY(similar to previous slide)

Vehicle Fell Down from Unconnected Slope Way

To enhance marking and visual effects to drivers, please use not only safety cones but also separation tape to indicate the safe way.

34



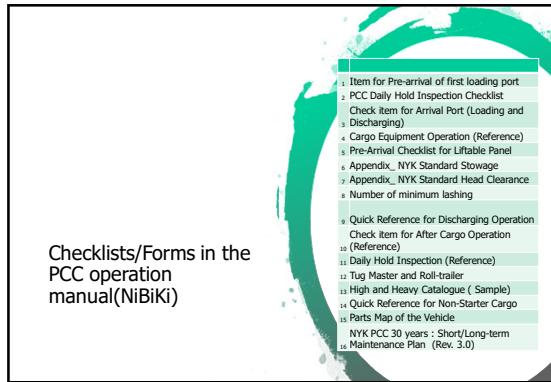
35

Checklist/Reference in PCC operation manual

[PCC-02RTN.08-01APP_Daily Operation .doc](#)

[PCC-02RTN.08-02CHK_Daily hold checklist.docx](#)

36



37



38

Case Studies

PCC Cargo Operations Training

NMC – 32

Presented By

MTD

**NYKSM SHIPMANAGEMENT
SINGAPORE**

NYK SHIPMANAGEMENT PTE LTD

1

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In the figure below, solid line shows the limitation of course keeping by the maximum under angle 30° in this case when 7000RT vessel is maneuvered so as to counter the leeward pressure flow.

Fig 32: Maneuvering limit curve at under angle 30 deg.

Fig 34: Rudder angle necessary to hold on course.

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The response of the vessel to leeward pressure flow may be different from those listed above if only one of the following conditions are met:
 1. Calm weather – wind 10 knots or less, calm sea.
 2. Water depth greater than twice the vessel's draft.
 3. High hull speed or clean propeller.

River Plate-PCC grounding

Aground

MarineTraffic

Full Load Condition

Port	Speed (knot)	Yaw (deg)	Turn (deg)	Course (deg)	Time (min)
Port	10	0	0	0	10
Starboard	10	0	0	0	10
Port	10	0	0	0	10
Starboard	10	0	0	0	10
Port	10	0	0	0	10
Starboard	10	0	0	0	10

Distance in nautical miles

Wind Speed: 10 kn, Wind Direction: 000, Current Speed: 0 kn, Current Direction: 000

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Grounding—Strong Wind

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Heavy berth impact at high speed

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Harbour maneuvering challenges

True Started pull on higher power. The ship was unable to turn around with tug and astern engine. Due to the high current, ship then tripped due to over load.

Shore Gantry Equipment

CHANNEL

CASE 1

CASE 2

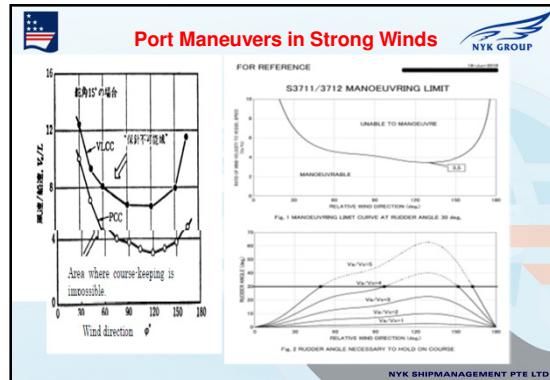
CASE 3

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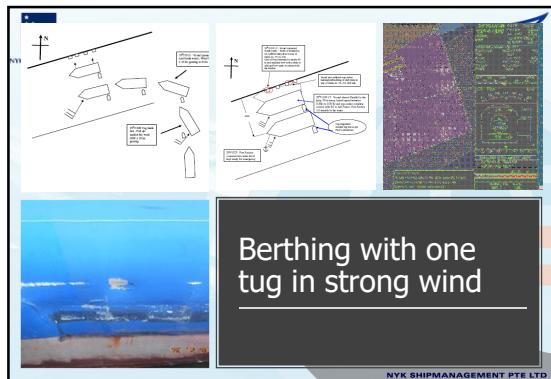
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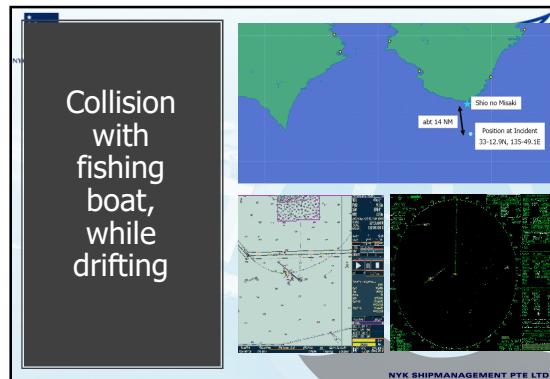
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"Special Berth".which needs additional measurement

a) Private Berth	b) Additional Berth
Meiko	Kawasaki
Tokai	Honmoku
Tahara,	Nakanoseki
Hiroshima	Singapore
	Leam Chabang -- Thailand

2 Action to be taken for each machinery
Please take following actions and keep monitoring funnel smoke condition in the port.

Machinery *	Item	Special Berth	Ordinary Berth
Main Engine*2	Fuel from entering to leaving	HFO	Prohibited
	Air blow after finishing fuel	Unlimited	Unlimited
	Air running before departure		
Diesel Generator*2	Fuel from entering to leaving	GO / DO with Econofree-A*	HFO
	Combustion control		
Aux Boiler	Soot blow (boiler furnace and EGE)		Keep firing
	Burning of garbage & waste oil		Carry out before entering port
Incinerator	Burning of garbage & waste oil		Prohibited
Funnel	Funnel mesh filter	Set '4'	
	Funnel mesh filter for funnel smoke		Keep watching 15

*1 Maintenance of each machinery should be properly carried out in accordance with PMS
*2 Minimize load changing and Start/Stop.
*3 Econofree-A will be used only in port, not when sailing at open ocean.
*4 Funnel Filter must be fitted at all berth. (This regulation was changed from old PGI)
*5 NYK recommends installing of funnel monitoring system (CCD Camera & Monitor in ECR)

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Counter Measure (1)

For black smoke and soot damage

Before entering port

- Soot blowing before entering port
- Wash down the soot before entering port

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Counter Measure (3)

For black smoke and soot damage

Before leaving port

- Check wind direction before trying M/E

Maintenance at sea

- Carry out regular/periodically overhaul

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M/E Screen

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Counter Measure (2)

For black smoke and soot damage

During port-stay:

- Air blow after Finished with engines-Prohibited
- No use of incinerator in port
- Pay special attention for smoke condition
- For DG, GO/D.O Additives (Econofree A)
- Continuously fire running Boiler

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Counter Measure (4)

For black smoke and soot damage

(Hardware)

- M/E Screen
- Filter Mesh
- Monitoring Camera

16

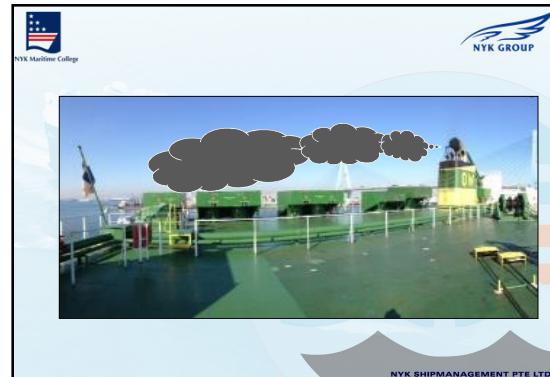
Mesh Filter (for D/G, Boiler)

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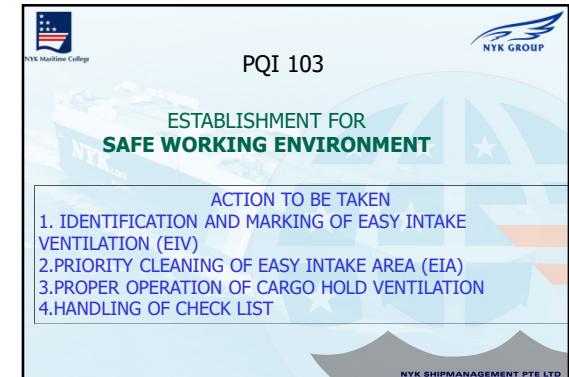
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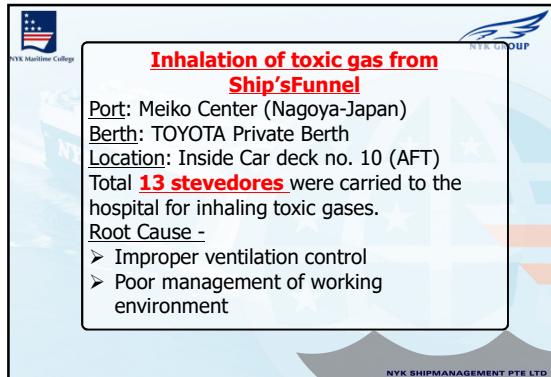
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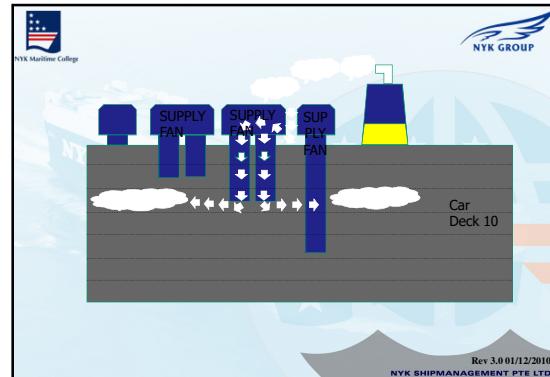
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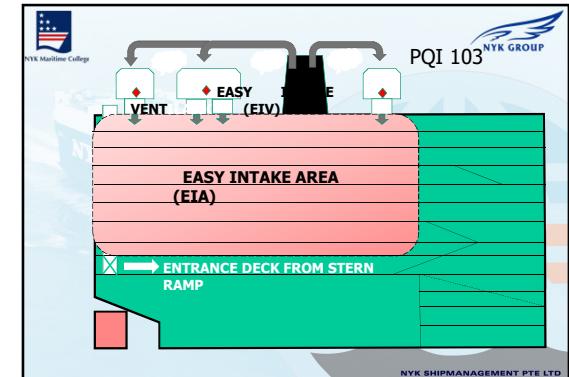
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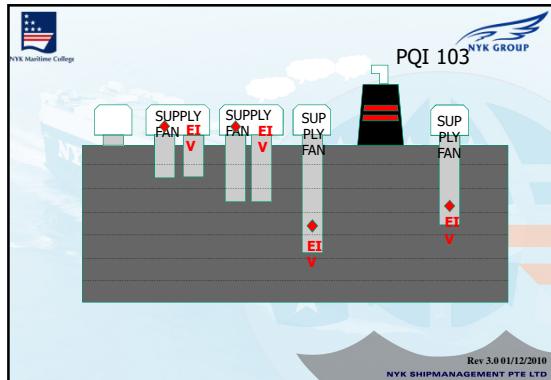
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EIA

POI103, Fleet Circular

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Fire Prevention

NYK Maritime College

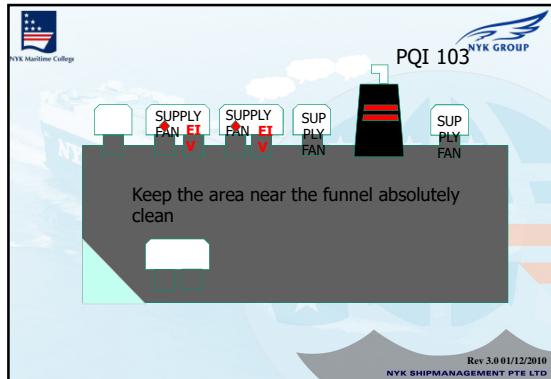
Image source: <http://scuttlein.com/car-carrier-caughts-fire-at-port-of-incheon/>

When fire breaks out in the cargo hold, what action will you take?

RNF-096

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Date: 17th June 2018
Ref. No.: RNF-096
Issued By: WARPOC, GARPOC
For: All Crew

Re: Fire broke out from brand-new car

Reference: Manual for Cr Carrier, Hold inspection during ballast voyage, 1. Fire Prevention

Reports: K-Line Car Carrier on Fire in South China Sea

Updated: Search continues for two missing from Japanese car carrier Sincerity Ace, three feared dead

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Fire Prevention

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Do you know;

- How to control (Open/Close) the Ventilation
- How to operate the CO2 fixed fire extinguisher and cargo hold zone
- How to connect seawater line to CO2 line
- How to control fire & gas tight door

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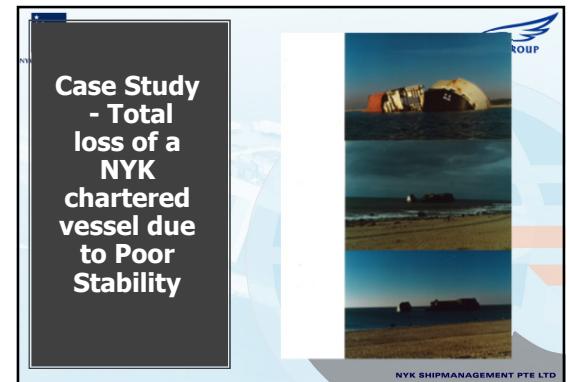
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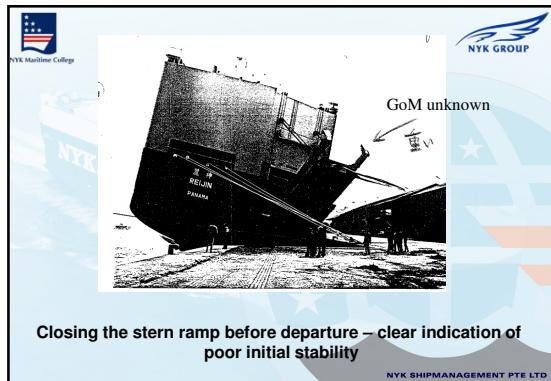
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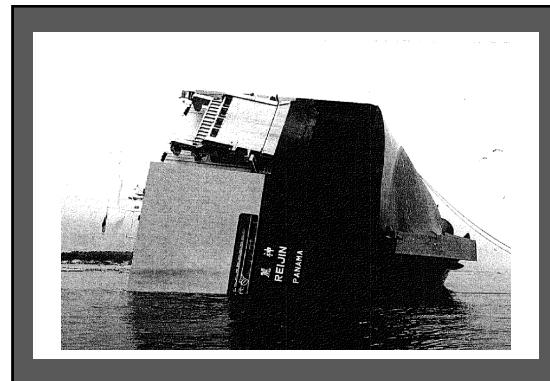
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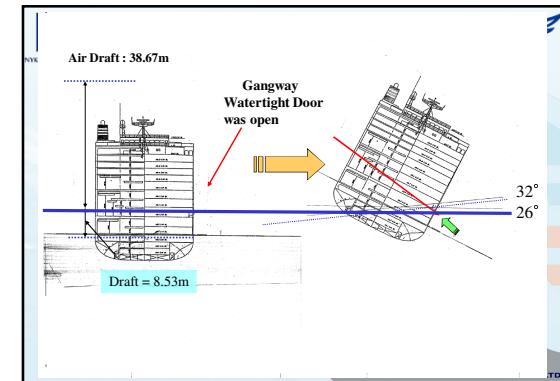
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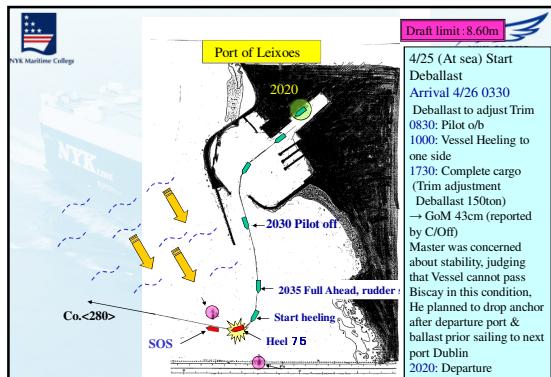
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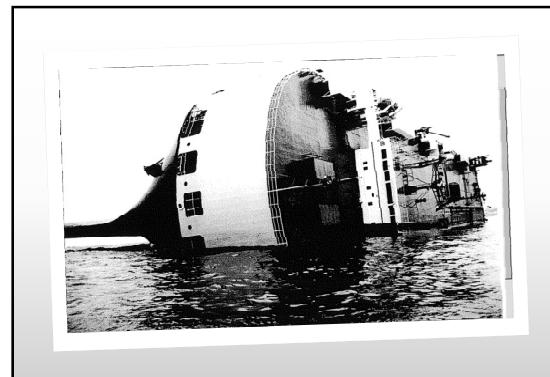
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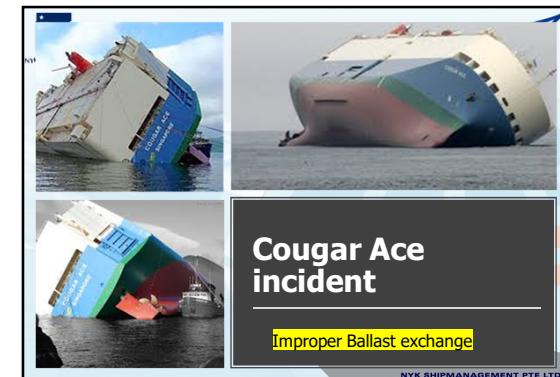
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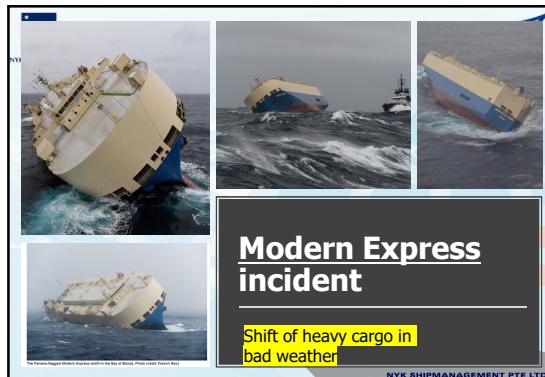
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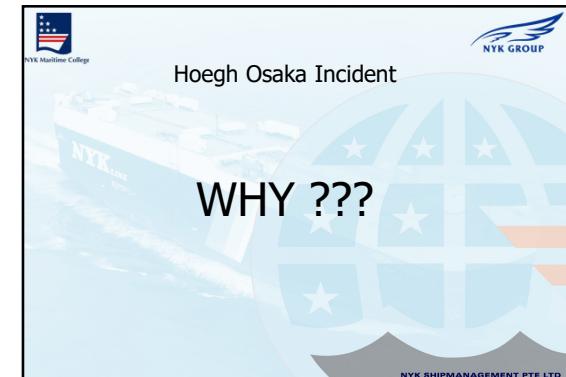
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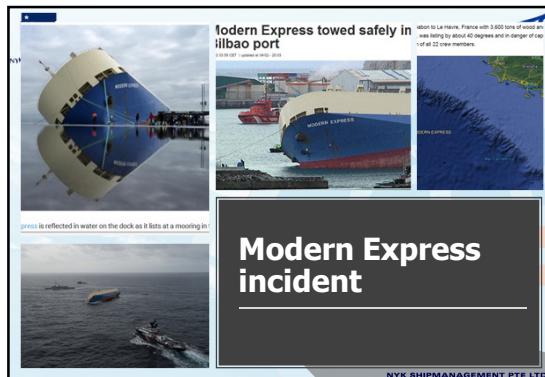
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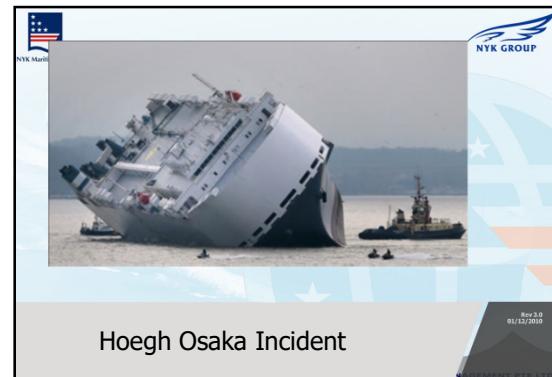
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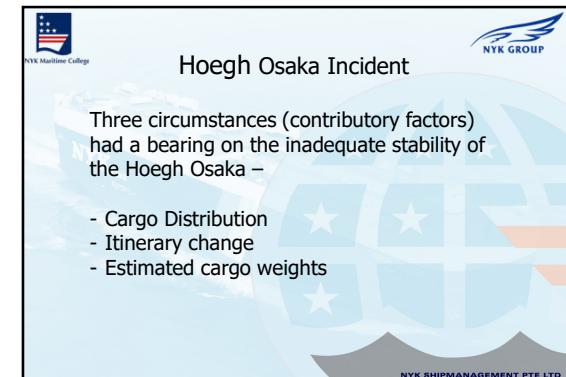
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Hoegh Osaka Incident

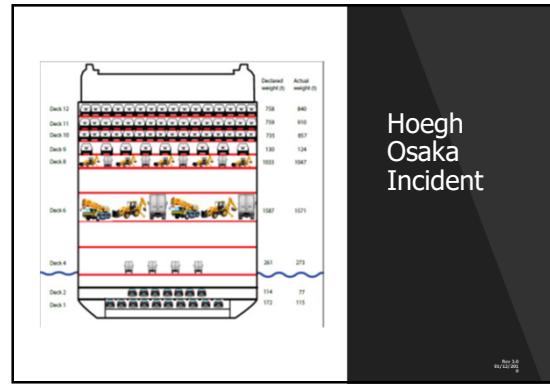
Itinerary change

Southampton was originally to be Hoegh Osaka's final north-west European port. The ship was to load cargo in Hamburg and Bremerhaven before proceeding to Southampton. The port captain had already compiled pre-stowage cargo plans for these ports assuming this itinerary. When the itinerary changed, the pre-stowage plans were not altered. The cargo loaded in Southampton was loaded in the same location as it would have been, had Southampton been the final loading port, not the first.

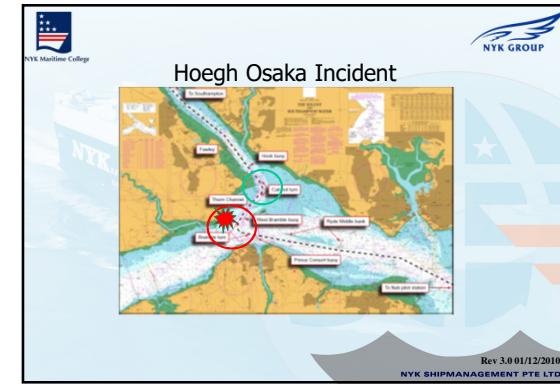
ORIGINAL PORT ROTATION	ACTUAL PORT ROTATION
1. Hamburg	1. Southampton
2. Bremerhaven	2. Hamburg
3. Southampton	3. Bremerhaven

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Hoegh Osaka Incident

Itinerary change

Bremerhaven was the principal port in Europe for loading high and heavy cargo. 3172t of cargo was to be loaded on decks 1, 2, 3, 4, 6 and 8. In addition to loading cargo in Hamburg, 1950t of bunker fuel oil had been ordered. When the ship was loading in Southampton, space was left on the lower decks to load cargo in Germany and the upper decks were filled. This resulted in the ship leaving Southampton with a VCG that was too high.

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Estimated cargo weights

The final cargo tally provided to the ship prior to departure was an estimation of the weight of cargo on board. SOLAS Chapter VI requires the master to be provided with an accurate weight by the shipper. Decks 10, 11 and 12, had a higher weight of cargo than expected. Conversely, decks 1 and 2 had a lower weight of cargo than anticipated.

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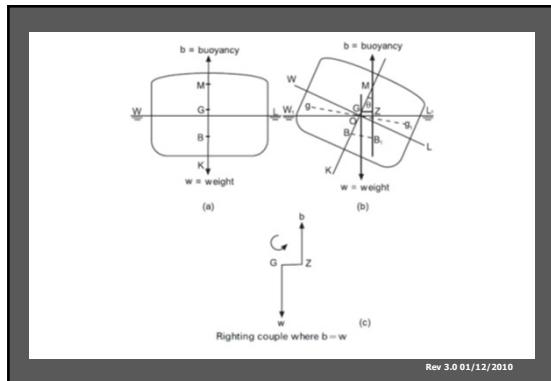
Hoegh Osaka Incident

There could be two main reasons (immediate cause) for the vessel heeling but righting at **Calshot turn (10 kts)** while heeling at the **Bramble turn(12 Kts.)** but not righting the same way -

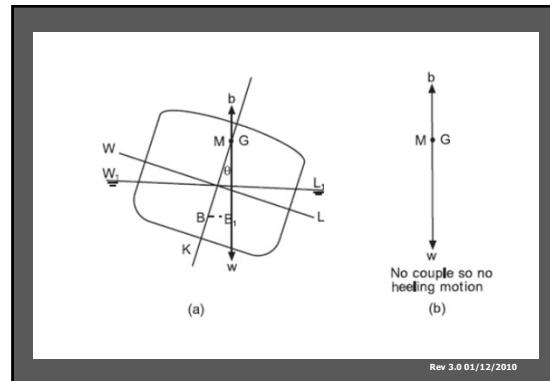
- Speed of the vessel
- Angle of turn / Helm

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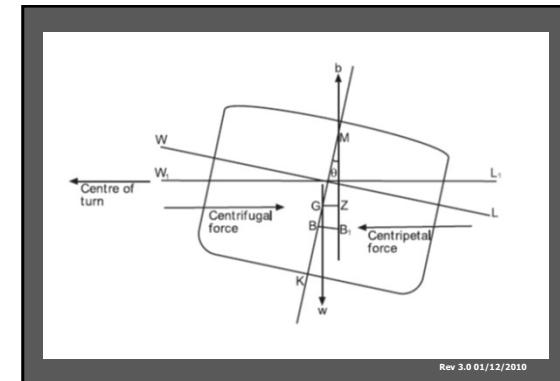
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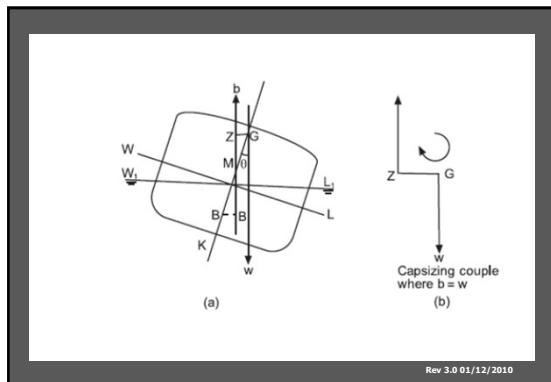
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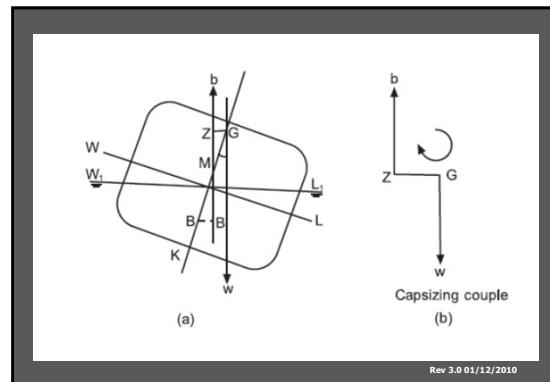
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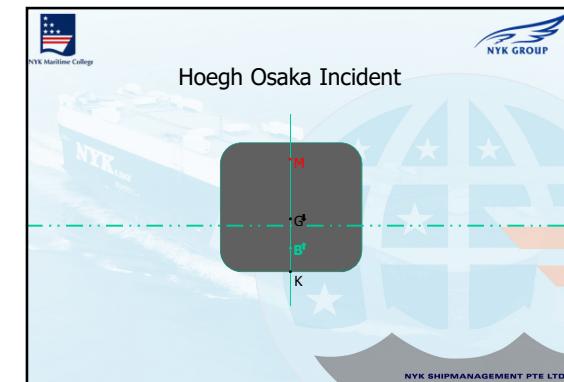
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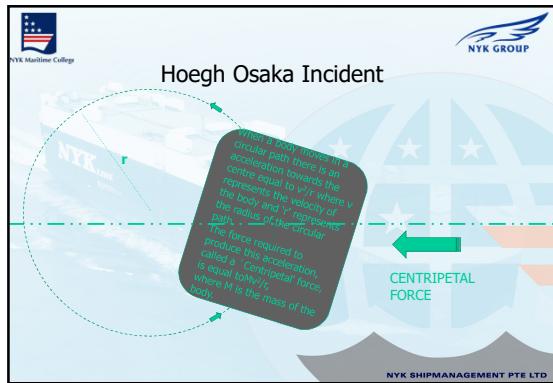
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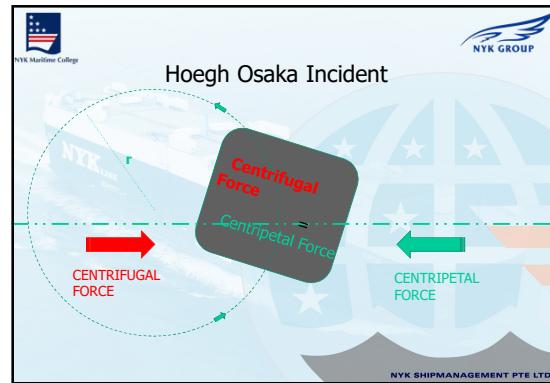
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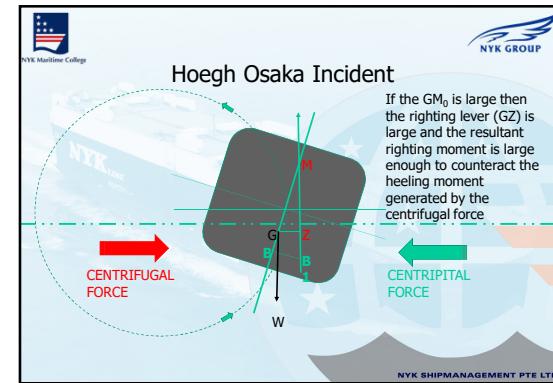
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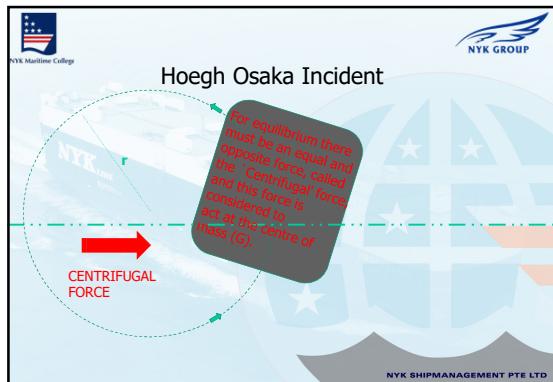
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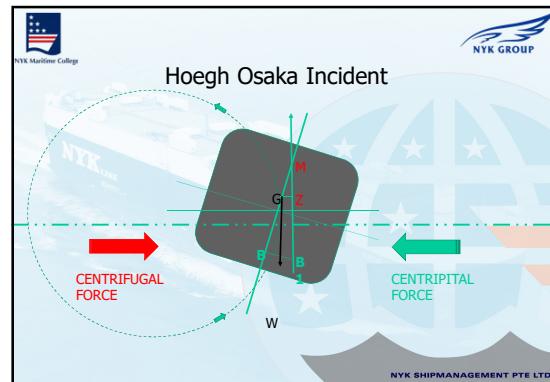
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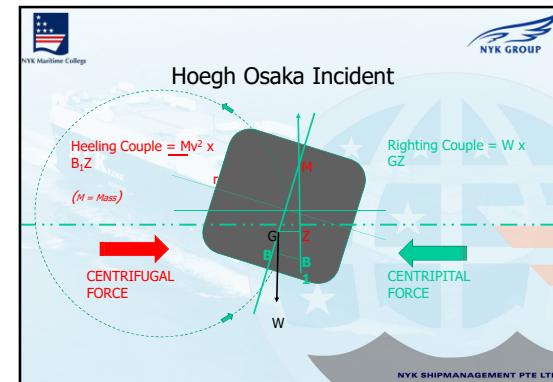
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66

Hoegh Osaka Incident

Therefore it becomes very important for the vessel's staff to monitor both the –

- Speed of the vessel
- Angle of turn.....

....In view of the less than the required GM and GZ.....

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Hoegh Osaka Incident

Stability Assessment

the chief officer advised the master that *Hoegh Osaka*'s GM for departure was 1.46m and met the requirements of the loading and stability information manual

While *Hoegh Osaka* left its berth with positive stability ($GM>0$), its estimated condition did not comply with IMO stability requirements.

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Hoegh Osaka Incident

Stability Assessment

The angle at which the shell plating damage in the vicinity of the starboard gangway void was submerged was estimated at 30° , although at what heel angle this damage occurred is unknown. However, at some stage beyond 30° heel, flood water (estimated 2700 MT) would have entered the ship.

As the ship heeled further to starboard, the available righting moment would have increased as the hull side became immersed.

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Hoegh Osaka Incident

Stability Assessment

The results from the analysis conducted following this accident show that *Hoegh Osaka* heeled heavily to starboard while rounding West Bramble buoy as a result of having inadequate stability. The *Hoegh Osaka* would have lost stability once it had heeled to an angle of around 12° at 2109:11, causing it to roll rapidly to a large angle (possibly as high as 60°) before settling at around 40° .

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Hoegh Osaka Incident

Stability Assessment

Using a GM of 0.7m, it was possible to model *Hoegh Osaka*'s behavior as it turned in the vicinity of Bramble Bank. The righting moment that was available to resist the heeling moment of *Hoegh Osaka* when turning to port in the vicinity of Bramble Bank was insufficient compared to righting moment to resist the heeling moment at the Calshot starboard turn.

Hoegh Osaka had inadequate residual stability to survive the Bramble Bank turn at 12kt, but had sufficient residual stability to survive the Calshot turn at 10kt. This was because the heeling moment when turning is proportional to the square of the speed (44% greater heeling moment).

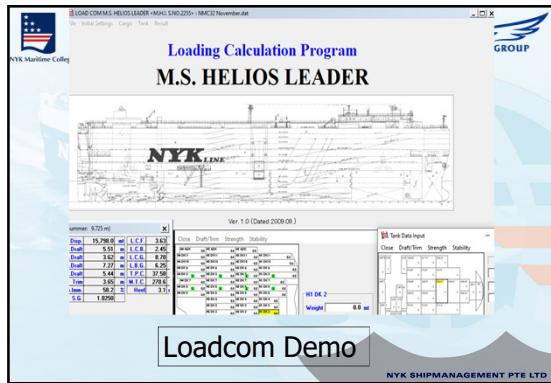
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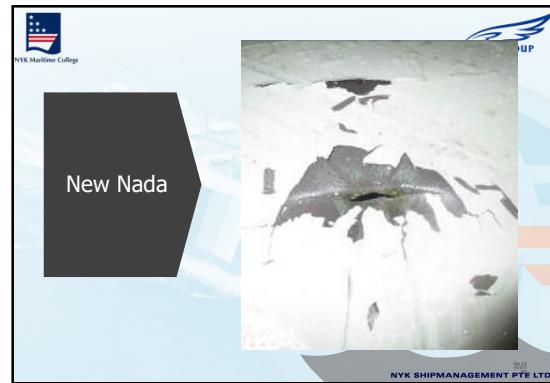
Hoegh Osaka Incident

- All PCC/PCTC Master's to ensure
- that Ballast and other tanks soundings are taken when ballast operations take place so that exact quantities and percentage filling are known at all times.
- Ensure cargo data is properly entered into the Loadicator along with all other weights and all stability (Fluid GM) requirements are full complied with and vessel is not 'tender'.
- Do not come under any "perceived commercial pressure". Ensure vessel is well secured and stable in every respect for the entire voyage before agreeing to sail out.'

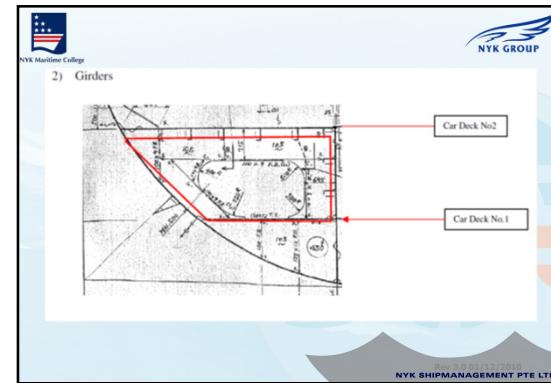
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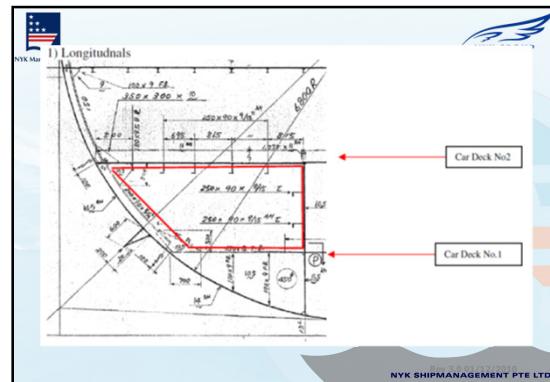
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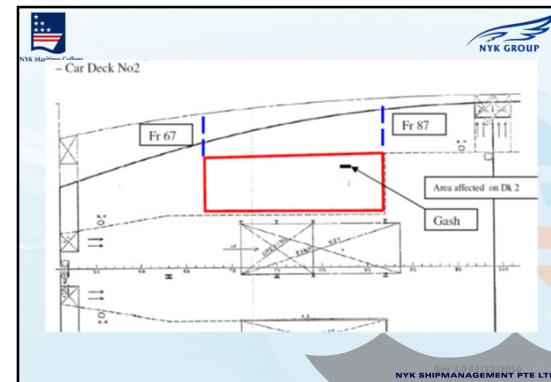
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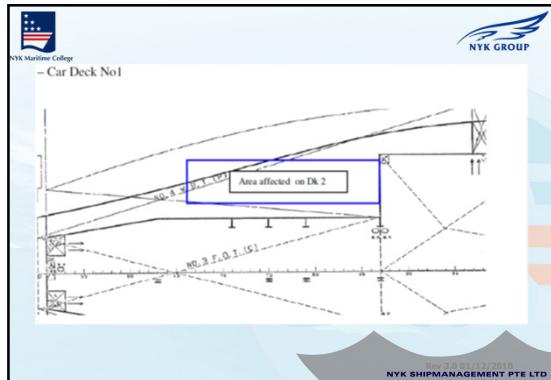
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Ballast Overflow

Fleet Circular, Good practice from vessel

Air vent pipe and Air vent head bonnet were damaged by incoming water pressure. As a result, more than one hundred cargoes were covered with sea water.

83



80

NYK Marline College

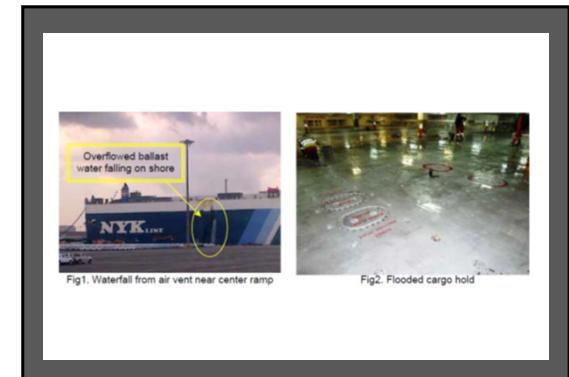
NYK GROUP

IMPORTANT:

Ballasting : Debollasting jobs shall be discussed between applicable Head of departments during the daily Job order meeting
As far as practicable, when time permits, ballasting of tanks shall be done by gravity instead of pumps. Especially, topping up of bottom tank shall be done by gravity.

NO PRESSURE TESTING OF ANY BALLAST TANKS. TO BE DONE ON OUR VESSELS UNLESS SPECIFICALLY REQUESTED DURING DRY DOCKING OR REPAIR PERIOD FOR SURVEY REQUIREMENTS.

82



84

The slide contains four photographs illustrating cargo contamination. The top left shows a close-up of a cylindrical metal pipe. The top right shows a valve handle partially open. The bottom left is a whiteboard with handwritten notes and a diagram of a ship's hull cross-section, with annotations pointing to specific areas. The bottom right shows a large green drum labeled 'No SWELL' with a red hose attached.

85

87

89

86

The slide contains two photographs illustrating the Chief Officer's position during the incident. The left photograph shows the Chief Officer working on a ship's deck structure, with a large building and a parking lot visible in the background. The right photograph shows the Chief Officer working on a ship's deck structure, with a body of water and a clear sky in the background. Both images are taken from a high vantage point, likely from another part of the ship.

88

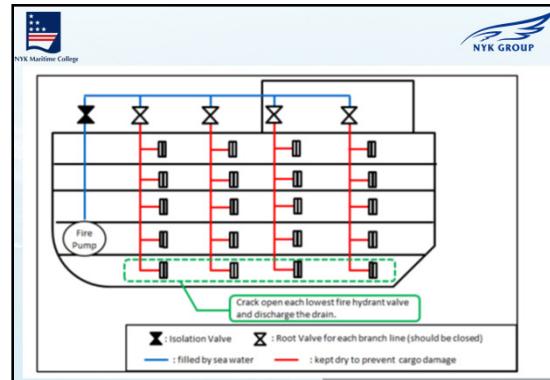
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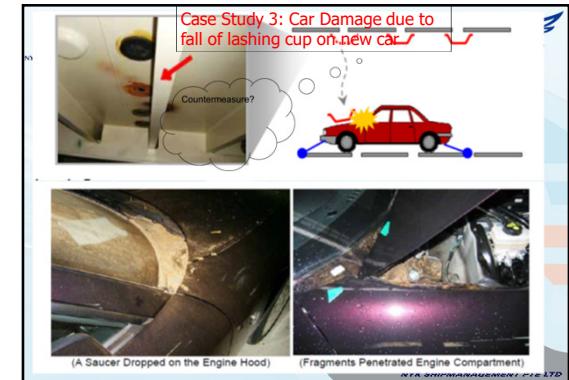
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PCC Cargo Operations Training
NMC – 32
Case Studies
Presented By
MTD
NYKSM SHIPMANAGEMENT SINGAPORE

1



3



5

CASE STUDY 1: Damage due to missing hydrant caps

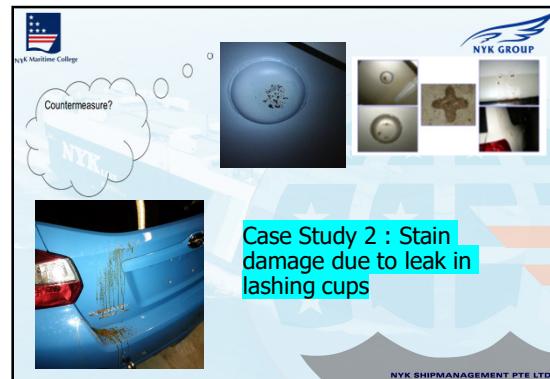
Countermeasure?

One hydrant was left open

Fire Hydrant Lines

NYK SHIPMANAGEMENT PTE LTD

2



4

Case Study 4

Case 1 Leakage from Crack on Under Cover for Lashing Holes

- Some of under cover were corroded due to rain water that accumulated in the covers for a long time.
- The dropping rusty water contaminated cars.

Case 2 Leakage from Crack on Sea Water Pipe Line

- Seawater pipe lines covered with insulation are running the ceiling of cargo hold.
- Seawater was leaked from pin hole little by little through the insulation.

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6



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CASE STUDY 6:
Handling the released lashing materials.

A car ran over lashing material on the discharging route.

Countermeasure?

NYK GROUP

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CASE STUDY 7:
Lack of recheck on unlashing ops.

A car started with one lashing material still fasten. Then hit against next car

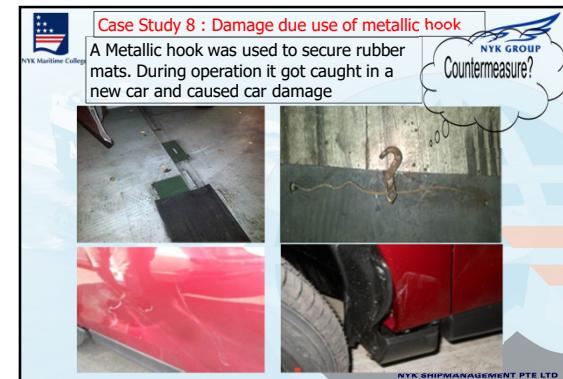
One clasper was not unashed

Countermeasure?

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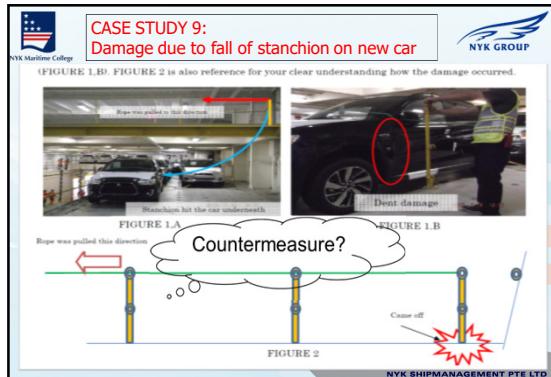
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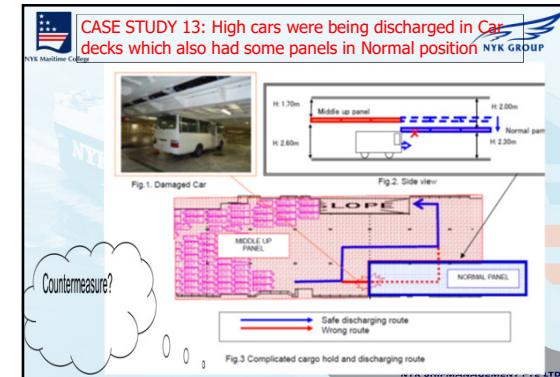
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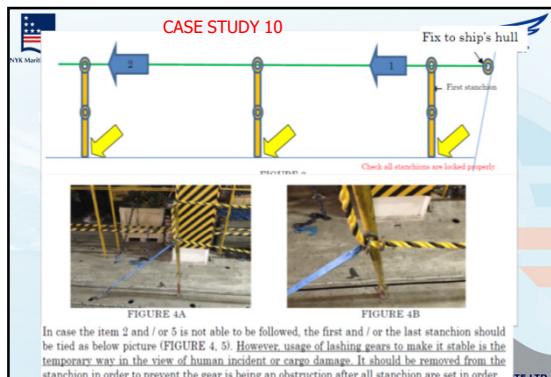
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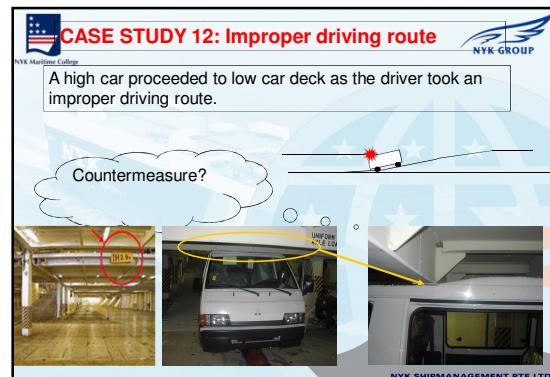
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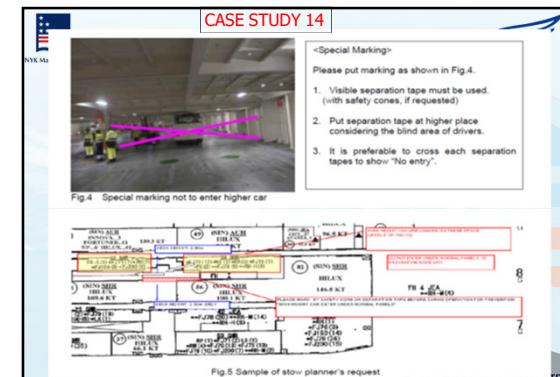
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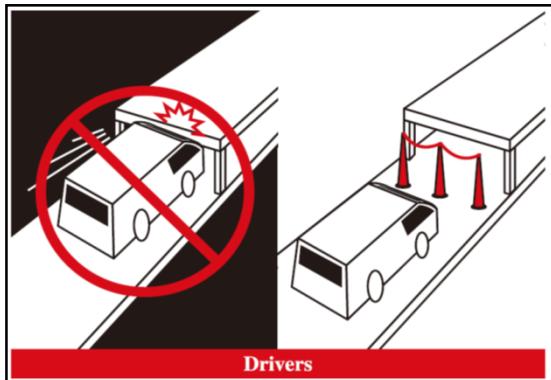
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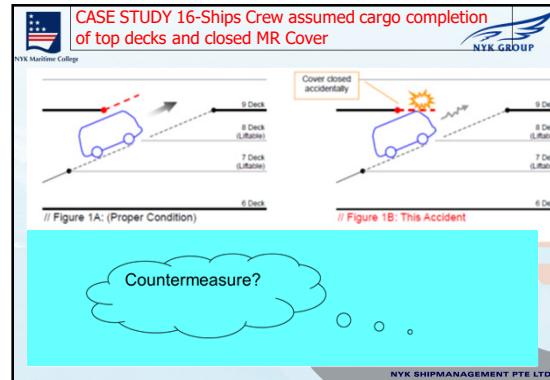
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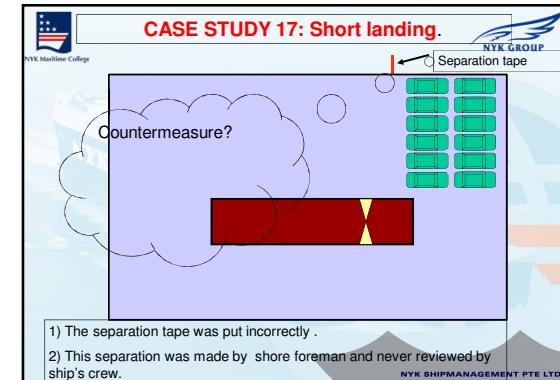
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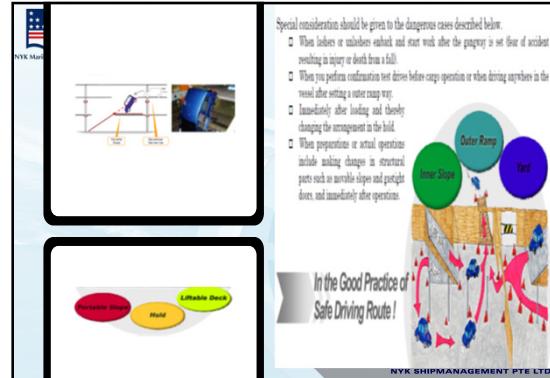
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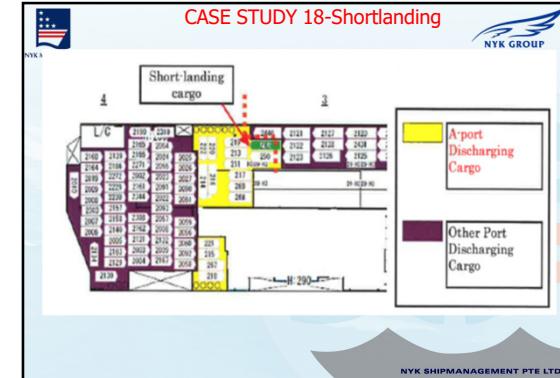
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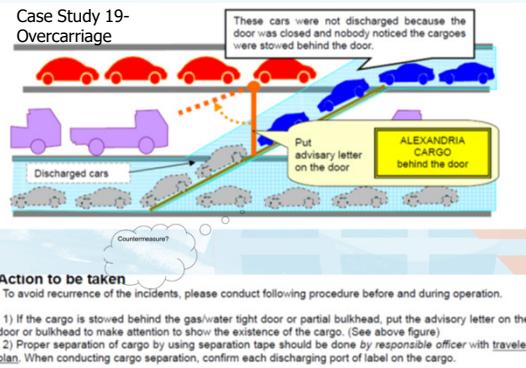
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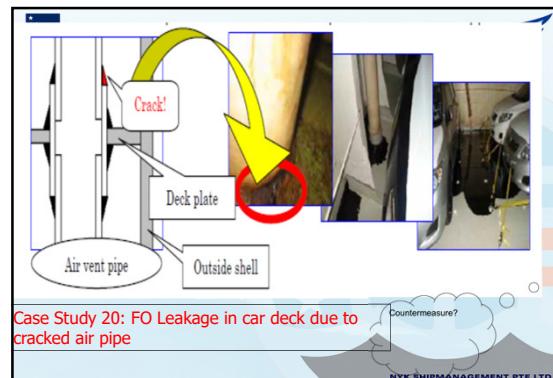
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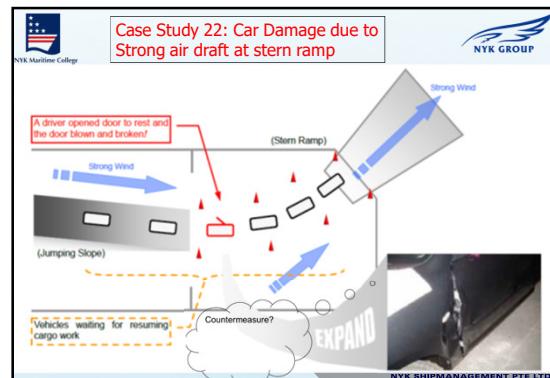
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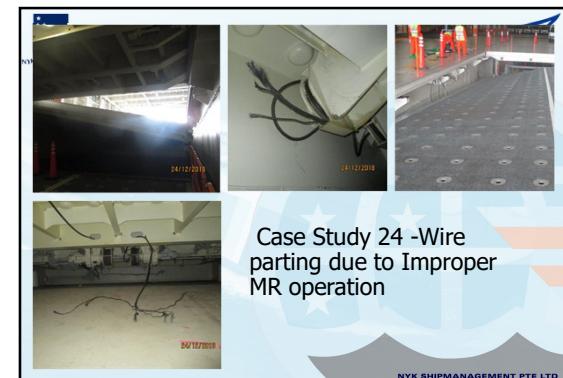
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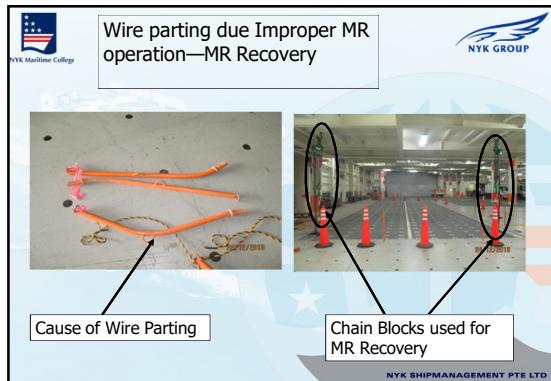
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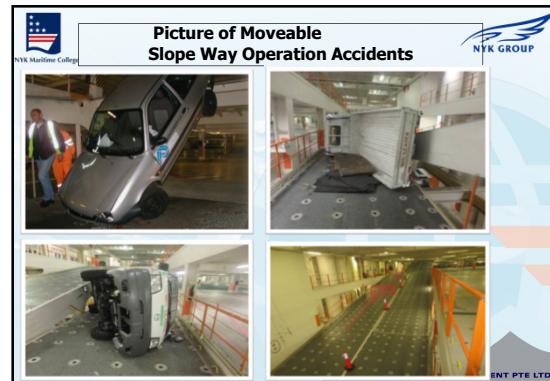
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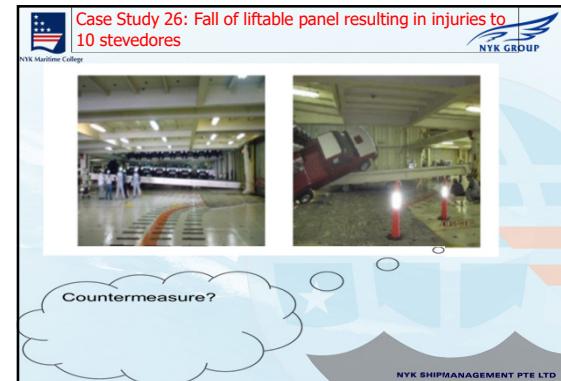
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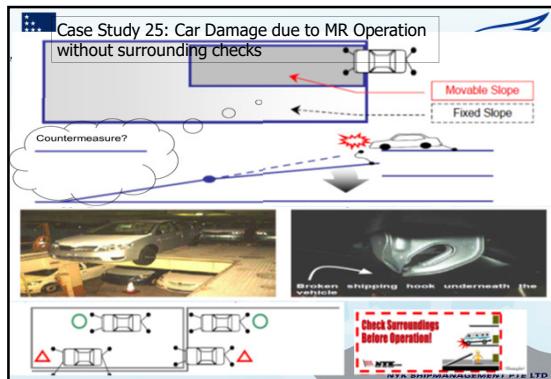
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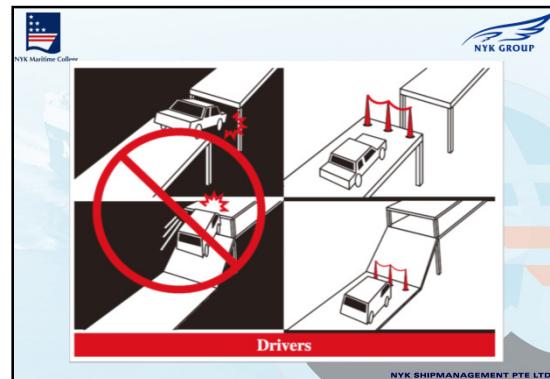
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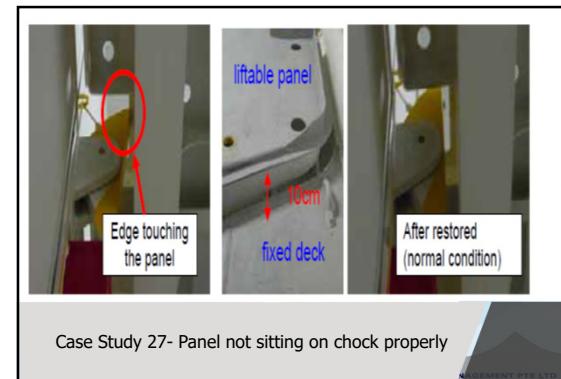
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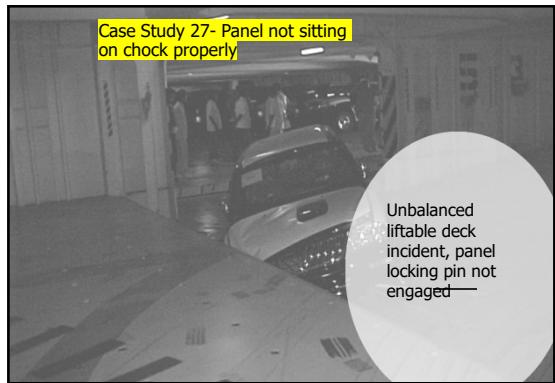
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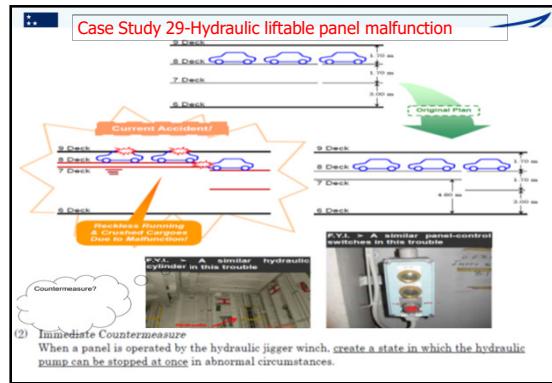
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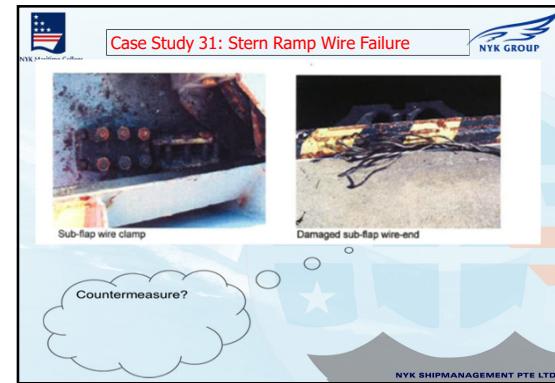
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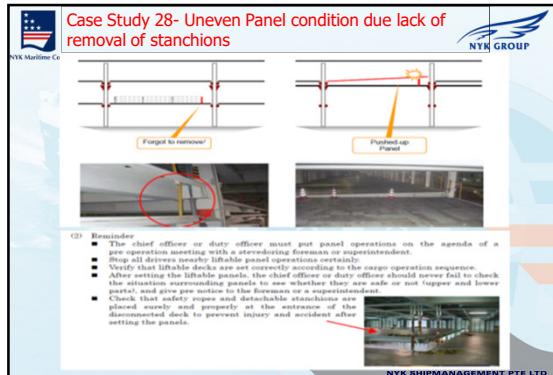
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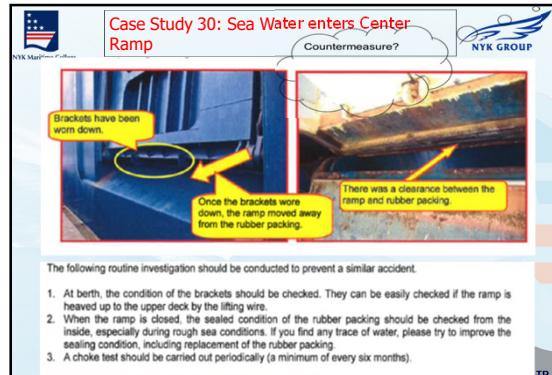
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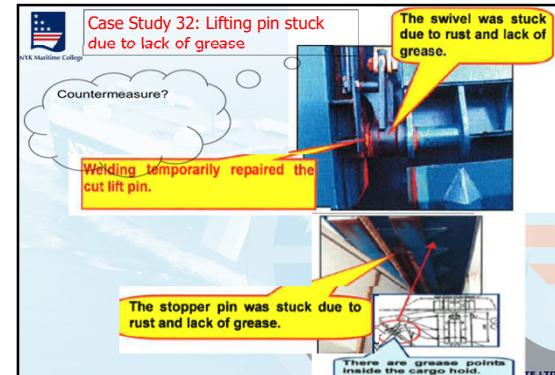
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CASE STUDY 33:
Paint flakes fell onto cars below

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She had several welding work on the boat deck and car decks during the dry dock. This accident happened on her first voyage right after the dry dock.

Countermeasure?

Fleet Circular

Fell on the bonnet
Fell on the roof

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Case Study 35: Paint Contamination of Car tyres

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What kind of action can you take for prevention of the accident?

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Countermeasure?

Case Study 37- Used vehicle –fire in 1. Battery and 2. electric distributor

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Case Study 36: Discharged water from anchor wash valve sprayed onto new cars on the wharf

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Never discharge seawater higher than the waterline to adjust a pressure!

Use the overboard valve in the engine room to adjust a pressure

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Case Study 38- Damage to Ramp Pushout Cylinder due to misoperation

NYK Maritime College NYK GROUP

ENSURE CLEATS LOCK LEVER IN 'UN LOCK' POSITION PRIOR USING PUSH CYLINDER

ENSURE PUSH CYLINDER IS IN RETRACTED POSITION PRIOR TO LOWERING LIFTING LINE TO SHOT THE CENTER RAMP IS RETRACTED

While opening center ramp & shifting it from Deck 6 to Deck 7 , Push out Cylinder got damaged as same was kept in Extended position and not retracted.

Incident Cause: Lack of familiarization. All crew were newly joined except Chief Officer.

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Case Study 39: Centre Ramp Wedge Damage

Incident Cause: Lack of familiarization of Bosun coupled with carefree lookout

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Case Study 40: Centre Ramp Wedge Damage-One of the Countermeasures

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Case Study 42- Sabotage

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Checks must be done by a lookout from inside as well as outside decks
(Gentle Reminder: Use Point and Call during cargo equipment operation)

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Case Study 41
STERN RAMP FINGER FLAP DETACHED AND FELL IN THE WATER

Finger Flap No.1 (Extreme Starboard) Starboard Side Hinge (Maximum wear of about 60~70 % of radial thickness found on the Hinge hole)

Hinge Newly Fabricated by Shipyard

Finger Flap No.1 Port Side Hinge (Maximum wear of about 60~70 % of radial thickness found on the Hinge hole)

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5S + SAFETY

- SEIRI** 整理 ⇤ **SORT**
Keep only needed items in area of work.
When in doubt sort it out
- SEITON** 整頓 ⇤ **SET IN ORDER**
Keep items organized so that they can be found quickly
- SEISO** 清掃 ⇤ **SHINE**
Keep workplace, items, material & tools clean and eliminate sources of dirt
- SEIKETSU** 清潔 ⇤ **STANDARDIZE**
Create standards so that anything unusual can be easily observed
- SHITSUKE** 締め ⇤ **SUSTAIN**
Maintaining a habit of practicing the steps of 5S for an efficient and safe workplace

5 S Activity

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Point and Call activities during cargo ops

- Use of KYT(Point and call) during Stern Ramp Operations.
- STERN RAMP POINT CALLING.doc
- MR Operation Point and Call.pdf

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Loadcom Demo

- Fill in data according to Dorado leader Voyage 38 pre-stow plan

Tank Condition

- Assume all FO/DO/LO tanks as 85%, FW+DW 200t
- Adjust Ballast in order to have achieve maximum GM (with trim upto 1m and keeping with in summer draft)
- Check stability, strength, and free surface effect of the largest tank

M.S. DORADO LEADER

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