Report of the Commission of Inquiry into the Collision of Vessels near Lamma Island on 1 October 2012

The Honourable Mr Justice Michael Lunn, JA
Mr Benjamin Tang, GBS, JP

April 2013

Report of the Commission of Inquiry into the Collision of Vessels near Lamma Island on 1 October 2012

The Honourable Mr Justice Michael Lunn, JA

Mr Benjamin Tang, GBS, JP

April 2013

www.coi-lamma.gov.hk

INDEX

*****

*****

LIST OF APPENDICES

LIST OF WITNESSES[1]

	Name	Organisation, position and related location	Date of giving evidence
1.	Mr Yim Kit Ming	Electronics Engineer, Marine Department	12/12/2012
2.	Mr Ma Chi Tak	Electronics Engineer, Marine Department	12/12/2012 13/12/2012
3.	Mr Yau Wing Hang	Police Constable (PC) 5012, Hong Kong Police Force	13/12/2012
4.	Mr Harm Jelle Boorsma	Electrical Engineer, HITT (HK) Ltd.	13/12/2012
5.	Captain Nigel R Pryke	Expert witness of the Commission of Inquiry; Master Mariner and Elder Brother of Trinity House	13/12/2012 14/12/2012 7/2/2013 8/2/2013 5/3/2013 6/3/2013
6.	Mr Lin Ka Wang	Lamma IV passenger - Main deck, 3rd row from the stern (port side)	14/12/2012
7.	Madam Chan Kin Yan	Lamma IV passenger - Open Upper deck, bench 4 (starboard side); daughter of witness 17	14/12/2012
8.	Mr Wong Tai Wah	Lamma IV passenger - Upper deck, 6th row from bow (port side)	14/12/2012
9.	Mr Lau Kam Bor	Lamma IV passenger - Upper deck, seat 33 (port side)	17/12/2012
10.	Madam Lo Lai Ngan	Lamma IV passenger - Upper deck, seat 32 (port side); wife of witness 9	17/12/2012

[1] Unless otherwise specified, the evidence of the witnesses has been received through witness statements and orally.

	Name	Organisation, position and related location	Date of giving evidence
11.	Mr Lee Ming Sun	Lamma IV passenger - Upper deck, seat 3 (port side)	17/12/2012
12.	Mr Lui Chi Kin	Lamma IV passenger - Open Upper deck, near lifebuoys at the stern	17/12/2012
13.	Mr Chan Kam Ho	Lamma IV passenger - Open Upper deck, bench 1 (port side); son of witness 14	18/12/2012
14.	Madam Cheng Yin Bun	Lamma IV passenger - Open Upper deck, bench 1 (port side)	18/12/2012
15.	Madam Lam Muk Lin	Lamma IV passenger - Open Upper deck, near lifebuoys at the stern	18/12/2012
16.	Mr Chiu Ping Chuen	Lamma IV passenger - Open Upper deck, near lifebuoys at the stern	18/12/2012
17.	Mr Chan Wing Hang	Lamma IV passenger - Open Upper deck, bench 4 (starboard side)	18/12/2012
18.	Mr Chan Lap Kei	Lamma IV passenger - Open Upper deck, bench 4 (starboard side); son of witness 17	18/12/2012
19.	Mr Kwok Yin Tang	Lamma IV passenger - Main deck, last row at the stern (starboard side)	19/12/2012
20.	Madam Wong Yee Yi	Lamma IV passenger - Main deck, last row at the stern (starboard side); wife of witness 19	19/12/2012
21.	Mr Lai Ho Yin	Lamma IV passenger - the wheelhouse; an organiser of the event	19/12/2012
22.	Madam Lau Hau Yin	Lamma IV passenger - Upper deck, seat 44 (starboard side)	19/12/2012
23.	Madam Kong Yuen Kan	Sea Smooth passenger - Main deck, seat 120 (port side)	19/12/2012

	Name	Organisation, position and related location	Date of giving evidence
24.	Mr Niu Gang	Sea Smooth passenger - Main deck, seat 13 (port side)	19/12/2012 20/12/2012
25.	Mr Chung Kin Hing	Sea Smooth passenger - Upper deck, seat 53 (middle column)	20/12/2012
26.	Madam Catherine Tating Marsden	Sea Smooth passenger - Open Upper deck, seat 163 (middle column); wife of witness 27	20/12/2012
27.	Mr Stephen Paul Marsden	Sea Smooth passenger - Main deck, seat 74 (port side)	20/12/2012
28.	Madam Tammy Fung Wai Shan	Sea Smooth passenger - Main deck, seat 10 (starboard side); wife of witness 29	20/12/2012
29.	Mr Yip Man Fai	Sea Smooth passenger - Main deck, seat 9 (starboard side)	20/12/2012
30.	Mr Leanders Piers John Rebanks	Sea Smooth passenger - Main deck, seat 4 (middle column)	20/12/2012
31.	Mr Wan Ho Yin	Sea Smooth passenger - Upper deck, seat 20 (port side)	20/12/2012
32.	Madam Wong Wing See	Sea Smooth passenger - Main deck, seat 105 (starboard side)	20/12/2012
33.	Madam Chau Yi Ki	Sea Smooth passenger - Main deck, seat 146 or 157 (middle column)	21/12/2012
34.	Mr Chui Wai Lok	Lamma II passenger - Open Upper deck	21/12/2012
35.	Mr Ho Man Kei	Lamma II passenger - Open Upper deck, middle bench	21/12/2012
36.	Mr Chan Wing Hang	Lamma II passenger – Open Upper deck, at the stern	21/12/2012
37.	Mr Law Kwok Cheong	Lamma II passenger – Open Upper deck, middle bench	21/12/2012

	Name	Organisation, position and related location	Date of giving evidence
38.	Mr Leung Kwok Wai	Lamma II passenger - Upper deck; an organiser of the event	21/12/2012 7/1/2013
39.	Mr Cheng Muk Hee	Lamma II coxswain	7/1/2013
40.	Mr Wu Shiu Lun	Passenger on white pleasure craft, rescued witness 21	7/1/2013
41.	Mr Ivan Shuen Chi Keung	Senior Marine Officer, Marine Department	7/1/2013
42.	Mr Wong Wah Yau	Lamma II engineer	8/1/2013
43.	Mr Lee Ah Ngau	Lamma II sailor	8/1/2013
44.	Mr Fok Wing Kei	Assistant Employee Wellness Officer, Hongkong Electric Company	8/1/2013
45.	Mr Gleeson Lam Yui Cheung	Employee Relations Manager, Hongkong Electric Company	8/1/2013
46.	Mr Chan Wai Ho	Divisional Officer, Hong Kong Fire Services Department (Fire Services Department)	8/1/2013
47.	Mr Tam Kam Lun	Fireman 12994, Fire Services Department	8/1/2013
48.	Mr Kwong Chi Keung	Senior Fireman 11946, Fire Services Department	8/1/2013
49.	Mr Yuen Ka Wai	Senior Fireman 11314, Fire Services Department	9/1/2013
50.	Mr Lam Yim Lung	Fireman 13489, Fire Services Department	9/1/2013
51.	Mr Chan Man Fai	Senior Station Officer, Fire Services Department	9/1/2013
52.	Mr Liu Wai Ming	Senior Fireman 7462, Fire Services Department	9/1/2013

	Name	Organisation, position and related location	Date of giving evidence
53.	Mr Chan Ting Fai	Fireman 13666, Fire Services Department	9/1/2013
54.	Mr Leung Kin Kie	Fireman 12230, Fire Services Department	9/1/2013
55.	Mr Yuen Kin Pun	Senior Station Officer, Fire Services Department	9/1/2013
56.	Mr Ng Wah Sum	Senior Station Officer, Fire Services Department	9/1/2013
57.	Mr Yung Man Tai	Fireman 12378, Fire Services Department	9/1/2013
58.	Police Diver 1	Hong Kong Police Force	10/1/2013
59.	Police Diver 2	Hong Kong Police Force	10/1/2013
60.	Police Diver 3	Hong Kong Police Force	10/1/2013
61.	Mr Chan Tak Fun	PC 5696, Hong Kong Police Force	10/1/2013
62.	Mr Ng Kin Keung	Senior PC 13697, Hong Kong Police Force	10/1/2013
63.	Mr Lai Chun Tung	PC 6589, Hong Kong Police Force	10/1/2013
64.	Mr Yau Wai Keung	Deputy Chief Fire Officer, Fire Services Department	10/1/2013
65.	Mr Wong Tsz Kiu	Fireman 13492, Fire Services Department	10/1/2013
66.	Mr Chow Chi Kay	Fireman 12014, Fire Services Department	10/1/2013
67.	Mr Lam Chi Kin	Fireman 12057, Fire Services Department	10/1/2013
68.	Mr Lo Chi Ho	Fireman 14627, Fire Services Department	11/1/2013

	Name	Organisation, position and related location	Date of giving evidence
69.	Mr Ko Wing Ki	Fireman 12870, Fire Services Department	11/1/2013
70.	Mr Li Kin Pong	Senior Marine Officer, Marine Department	11/1/2013
71.	Mr Francis Cheng Cho Ying	General Manager of the Generation Division, Hongkong Electric Company	14/1/2013 15/1/2013
72.	A	Sea Smooth passenger - Upper deck, at the stern, seat 168 (port side)	15/1/2013
73.	Mr Terence Fung Wai Kin	Senior Superintendant of Police (Operations), Hong Kong Police Force	16/1/2013
74.	Mr Wong Chi Kin	Retired Principal Surveyor of Ships, General Manager of the Local Vessels Safety Branch, Marine Department	16/1/2013 17/1/2013
75.	Mr Leung Kwong Chow	Senior Ship Inspector, Marine Department	17/1/2013
76.	Mr Fung Wai Man	Senior Ship Inspector, Marine Department	17/1/2013
77.	Mr Choi Chi Chuen	Senior Surveyor of Ships, Marine Department	18/1/2013
78.	Mr Barry Liu Chiu Fai	Senior Surveyor of Ships, Marine Department	18/1/2013
79.	Mr Louk Hon Ying	Ship Inspector, Marine Department	18/1/2013
80.	Mr Ken Lo Ngok Yang	Director of Cheoy Lee Shipyards	18/1/2013 21/1/2013
81.	Mr John Lim	Director of Naval-Consult Pte Ltd (Evidence received orally only)	21/1/2013
82.	Mr Philip Yu Kick Chuen	Senior Ship Inspector, Marine Department	22/1/2013

	Name	Organisation, position and related location	Date of giving evidence
83.	Mr Ho Kai Tak	Retired Senior Ship Inspector, Marine Department	22/1/2013 23/1/2013
84.	Mr Leung Wai Hok	Senior Surveyor of Ships, Marine Department	23/1/2013
85.	Mr Mak Yat Wai	Retired Senior Ship Inspector, Marine Department	23/1/2013
86.	Mr Chau To Yui	Ship Inspector, Marine Department	23/1/2013 24/1/2013
87.	Mr Tam Yun Sing	Shipping Safety Officer, Marine Department	24/1/2013 4/3/2013
88.	Dr Cheng Yuk Ki	Forensic Scientist, Government Laboratory	24/1/2013 25/1/2013 6/2/2013
89.	Dr Neville Anthony Armstrong	Expert witness of the Commission of Inquiry; Fellow of the Royal Institution of Naval Architects and Fellow of the Institution of Engineers of Australia	28/1/2013 29/1/2013 30/1/2013 31/1/2013 1/2/2013 6/3/2013 7/3/2013 8/3/2013
90.	Mr Tang Ying Kit	Lamma IV passenger – Open Upper deck, at the stern	1/2/2013
91.	Mr Tang Wan On	Marine Officer, Hongkong Electric Company	4/2/2013 5/2/2013 6/2/2013

	Name	Organisation, position and related location	Date of giving evidence
92.	Mr Ng Siu Yuen	General Manager, Hong Kong and Kowloon Ferry Holdings Limited; Director and General Manager of Islands Ferry Company Limited	6/2/2013 7/2/2013 8/2/2013 18/2/2013
93.	Mr Wong Kam Ching	Senior Ship Inspector, Marine Department	18/2/2013 5/3/2013
94.	Mr Lau Wing Tat	Ship Inspector, Marine Department	18/2/2013 5/3/2013
95.	Mr Chow Chi Wai	Lamma IV coxswain	18/2/2013 19/2/2013 20/2/2013
96.	Mr Hui Sum Wai	Assistant Technician, Cheoy Lee Shipyards (Evidence received orally only)	20/2/2013
97.	Mr Leung Pui Sang	Lamma IV engineer	21/2/2013 22/2/2013
98.	Mr Leung Tai Yau	Lamma IV sailor	21/2/2013 22/2/2013
99.	Mr Lai Sai Ming	Sea Smooth coxswain	22/2/2013 25/2/2013 27/2/2013 28/2/2013
100.	Mr Wong Tai Yau	Sea Smooth sailor	25/2/2013 26/2/2013
101.	Mr Lo Pui Kay	Sea Smooth engineer	26/2/2013
102.	Mr Wong Yung Shing	Sea Smooth sailor	26/2/2013 27/2/2013

	Name	Organisation, position and related location	Date of giving evidence
103.	Mr Cheung Fook Chor	Retried ship draughtsman, Cheoy Lee Shipyards (Evidence received orally only)	27/2/2013
104.	Mr Wong Wing Chuen	Senior Surveyor of Ships, Marine Department	28/2/2013 1/3/2013 4/3/2013
105.	Mr Chung Siu Man	Assistant Director, Marine Department	4/3/2013
106.	Mr Kwok Hing Yin	Ship designer, former employee of Cheoy Lee Shipyards (Evidence received orally only)	4/3/2013
107.	Mr Leung Wing Fai	Principal Surveyor of Ships, General Manager of the Local Vessels Safety Branch, Marine Department	4/3/2013
108.	Mr Yuen Chin Wai	Ship Inspector, Marine Department	4/3/2013
109.	Professor Ho Siu Lau	Expert witness of the Commission of Inquiry; Chair Professor of the Department of Electrical Engineering of the Hong Kong Polytechnic University	7/3/2013
110.	Mr Lee Kwok Keung	Chairman, Hong Kong & Kowloon Trades Union Council	8/3/2013
111.	Mr James David Evans	Flight Operation Manager, Government Flying Service (Evidence received by witness statement read out by counsel for the Commission only)	8/3/2013

	Name	Organisation, position and related location	Date of giving evidence
112.	Mr Zhang Yu	Chief Surveyor and Senior Engineer of the China Classification Society, Guangzhou Branch (Evidence received by witness statement read out by counsel for the Commission only)	8/3/2013
113.	Mr Cheng Yeung Ming	Principal Surveyor of Ships and Chief, Marine Accident Investigation & Shipping Security Policy, Marine Department (Evidence received by witness statement read out by counsel for the Commission only)	8/3/2013

LIST OF THE DECEASED 罹難者名單

No. 編號	English Name 英文姓名	Chinese Name 中文姓名	Sex (M/F) 性別 (男/女)
1.	Au Hiu Lam	區曉霖	F
2.	Belshaw Nicholas Chi Ho	比索志豪	M*
3.	Chan Hau Luen	陳巧鑾	F
4.	Chan Man Ying	陳敏盈	F
5.	Chan Wing Ki	陳榮基	M
6.	Cheng Sin Kam	鄭先鑫	M
7.	Cheng Yin Lan	鄭燕蘭	F
8.	Cheung Chung Hin	張頌軒	M*
9.	Cheung Yuet Mei	張月媚	F
10.	Chiu Siu King	趙少琼	F
11.	Chui Lin Ho	徐蓮好	F
12.	Fu Yuk Ling Jennifer	傅玉靈	F
13.	Ho Wong Pui Lan	何黃佩蘭	F
14.	Hui Ka Wai Edwin	許嘉偉	M
15.	Ie Hwie Wendy	N/A	F
16.	Koo Man Cheung	古文昌	M
17.	Kwok Laura	郭亮瑩	F*
18.	Kwok Matthew	郭文曦	M*
19.	Lai Chui Yuk	黎翠玉	F

No. 編號	English Name 英文姓名	Chinese Name 中文姓名	Sex (M/F) 性別 (男/女)
20.	Lam Ka Man	林嘉敏	M
21.	Lam Kai Yuk	林基玉	F
22.	Lam Wai Yi Nicole	林蔚懿	F*
23.	Lam Yat	林日	M
24.	Lau Ching Naam Jeannie	劉靜嵐	F*
25.	Lau Man Lai	劉文麗	F
26.	Leung Chung Choi	梁頌彩	F
27.	Leung Ka Kit	梁家杰	M
28.	Li Shui Lan	李瑞蘭	F
29.	Li Wing Mui	李詠梅	F
30.	Ng Choi Ha Daisy	伍彩霞	F
31.	So Kwai Woon	蘇貴媛	F
32.	Se-to Ying Miran	司徒英	F
33.	Tsui Chi Wai	徐志偉	M
34.	Tsui Hoi Ying	徐凱盈	F*
35.	Wong Lai Chun	黃麗珍	F
36.	Wong Wai Ngor	王惠娥	F
37.	Wu Po Tim	鄔寶甜	F
38.	Wu Yuk Fun	胡毓芬	F
39.	Yan Tsz Ki	甄子祈	F*

* Ten years old or below 十歲或以下

LIST OF ABBREVIATIONS

A	
AIS	Automatic Identification System
B	
BHP	Brake Horse Power
Blue Book	Instructions for the Survey of Launches and Ferry Vessels (1989)
C	
Code of Practice	Code of Practice – Safety Standards for Classes I, II and III Vessels (December 2006 Edition)
COG	Course over ground
COLREGS	The International Regulations for Preventing Collisions at Sea 1972
G	
GMT	Metacentric height
GRP	Glass Reinforced Plastic
I	
IMO	International Maritime Organisation
ISM Code	International Safety Management Code
M	
MAISSPB	Marine Accident Investigation and Shipping Security Policy Branch
R	
RPM	Revolutions per minute
S	
SOG	Speed over ground
V	
VHF	Very High Frequency
VTC	Vessel Traffic Centre
VTS	Vessel Traffic Service
1995 Instructions	Instructions for the Survey of Class I and Class II Launches and Ferry Vessels (1995)

THE REPORT

The Report is written in English, with a Chinese translation.

I. PRELIMINARY MATTERS

INTRODUCTION

1. At 20:20:17 on 1 October 2012 the bow of the port hull of the Sea Smooth collided with the port aft quarter of the Lamma IV in the waters west of the Shek Kok Tsui light beacon off the north-west coast of Lamma Island. The visibility was good, the Hong Kong Observatory reporting visibility of 10 km in the general vicinity. There was an incoming tide, with a set to the north. At 20:00 the wind was 9 kilometres per hour from the east and at 21:00 14 kilometres from the north-east.

THE SEA SMOOTH

2. The Sea Smooth is a twin screw, twin-hulled catamaran with two passenger decks, constructed in glass reinforced plastic ('GRP'), with a length overall of 28.02 metres and a tonnage of gross 274 tonnes. She is owned by Islands Ferry Company Limited, a wholly-owned subsidiary of Hong Kong and Kowloon Ferry Holdings Limited, and was licensed as a Class I, Category "A" Ferry Vessel to carry 389 persons, having been licensed first by the Marine Department in 2002. As required by the Marine Department, she was equipped with radar and a Very High Frequency ('VHF') radio. Also, she had Automatic Identification System ('AIS') equipment.

THE LAMMA IV

3. The Lamma IV is a twin screw passenger launch with two passenger decks constructed in aluminium and GRP, with a length overall of 27.21 metres and a tonnage of gross 184 tonnes. She is owned by The Hongkong Electric Company Limited ('Hongkong

Electric Company') and was licensed as a Class I, Category "A" Launch to carry 232 persons, having been licensed first by the Marine Department in 1996. Although not required by her licence, she was equipped with radar, but not a VHF radio. Both vessels were built in Hong Kong by Cheoy Lee Shipyards Limited ('Cheoy Lee Shipyards').

4. The Sea Smooth was on a scheduled voyage from Central Pier, which it departed at about 20:00 hours, to Yung Shue Wan on Lamma Island. She had a crew of four and was carrying 95 passengers. The Lamma IV had a crew of three and was carrying 124 passengers, of whom 32 were children, on a voyage from the Lamma Power Station pier to Victoria Harbour to view the firework display celebrating National Day. The passengers were made up of the Hongkong Electric Company employees, their families and friends.

5. The Marine Department radar plot provides an excellent overview of almost all of the journeys of both vessels that night. The track of the Sea Smooth is in red and that of the Lamma IV in blue. (**Appendix 1; page A1**)

THE EFFECT OF THE COLLISION ON THE LAMMA IV

6. The bow of the Sea Smooth penetrated the Main deck cabin of the Lamma IV to her centreline crushing some of the passengers seating on the aft port side of that cabin. Many of those on board the vessel were thrown to the floor or into seats or other solid objects in front of the seated or standing positions they occupied. The Lamma IV was holed beneath her waterline in both her Engine room and Tank room by the bow of the port hull of the Sea Smooth. Parts of the Sea Smooth broke off inside the Lamma IV, including the keelson and stembar of the port hull. Many passengers were thrown from their

seats. Water ingress into the Engine room and Tank room of the Lamma IV was rapid and, since there was no watertight door to an 'Access Opening' in the bulkhead between the Tank room and the Steering Gear compartment, the Steering Gear compartment also flooded rapidly. The fact that 8.25 tonnes of raised lead ballast had been added to the Lamma IV after her construction and located in both the Tank room and the Steering Gear compartment compounded the difficulties of the Lamma IV, which sank rapidly by her stern until she came to rest on the seabed with her bow at an acute angle to the sea. As the angle to the horizontal at which the Lamma IV sank increased, passenger seating in the Upper deck cabin became detached from the fibreglass/foam sandwich deck dislodging passengers and causing them and the seats to be thrown towards the aft end of the Upper deck cabin. Some of the passengers were trapped as a result, although some were able to free themselves and eventually escaped. No seats were dislodged on the Main deck, which was constructed in aluminium.

7. The alarm was raised by the coxswain of the Lamma IV, who reported the collision in a '999' telephone call at 20:22:04. Then, he made contact by radio with the coxswain of the Lamma II, a sister ship of the Lamma IV, also bound from the Lamma Power Station pier to Victoria Harbour with passengers comprising the Hongkong Electric Company employees, their families and friends. The Lamma II was travelling only several minutes behind the Lamma IV in that journey and was about 1,000 metres astern at the time that the alarm was raised with her by the Lamma IV.

8. Many others also made reports of the collision by '999' telephone calls, the first of which was made at 20:21:03. That call was made by Mr Lai Ho Yin, an employee of the Wellness

Programme of the Hongkong Electric Company and an organiser of the recreational event that day. Having witnessed the collision from the wheelhouse of the Lamma IV he had made his way through the Upper deck cabin to the Open Upper deck from where he made the '999' call.

9. The transom of the Lamma IV came to rest on the seabed in about 12-13 metres of water within two minutes of the collision occurring, at which time her bow above the water was at an angle of about 70° to the horizontal. Some of the passengers on the Open Upper deck of the Lamma IV slid into the sea as the angle at which the vessel sank increased. Others were sucked into the sea by the rising waters. Since there were no lifejackets available on the Open Upper deck, although there were many lifebuoys at the stern rail, those passengers who sought lifejackets made their way into the Upper deck cabin where lifejackets were located in pouches beneath each of the seats. However, many of those passengers became trapped as the rapidly rising waters swept over the Open Upper deck and into the cabin itself.

10. As the Lamma IV sank, the main lighting on the vessel failed, albeit for a time it was replaced by emergency lighting. Batteries for both systems were located in the Engine room. So, quickly the vessel was plunged into darkness. In the circumstances of panic in darkness, together with an increasing angle of incline of the vessel, passengers had difficulty not only in extracting the lifejackets from the pouches in which they were contained beneath their seats but also in donning the lifejackets. In the result, many of those who drowned were found not to be wearing lifejackets. Tragically, no fewer than 39 passengers, including eight children, on board the Lamma IV died, almost all from drowning. One well-built young adult male passenger, whose body

was found in the aft part of the Main deck, died of massive traumatic injuries to his body, no doubt caused in the collision itself.

THE EFFECT OF THE COLLISION ON THE SEA SMOOTH

11. The collision caused many of those on board the Sea Smooth to be thrown to the floor or into seats or other solid objects in front of the seats they occupied. The Sea Smooth sustained damage to her port hull, so that the forward watertight compartment was almost totally lost. The watertight bulkhead to the second compartment was damaged and water flooded into those two compartments on the port side. There was some water ingress through one of two manhole covers on the port side forward in the cabin of the Main deck and the vessel tilted a little bit forward and to port. Following the collision, the two vessels separated, although the Sea Smooth remained in the immediate vicinity of the scene of the collision for several minutes. Then, she made her way to Yung Shue Wan Ferry Pier where her passengers disembarked. No attempt was made by those on board the Sea Smooth to go to the aid of the Lamma IV or her passengers, for example by throwing lifebuoys or lifelines into the sea or directing her searchlight onto the sinking vessel or the waters nearby.

RESCUE EFFORTS

12. On her arrival at the vicinity of the Lamma IV, the Lamma II stopped her engines and rescued survivors from the sea by throwing them lifebuoys and lowering a ladder to enable them to be brought up on to the vessel. Assisting in the initial rescue operation was a white powerboat that happened to be in the vicinity. The first Emergency Service vessels to arrive on the scene were a Marine Police vessel which arrived at 20:39 followed by a Fire Services vessel shortly

thereafter. By that stage, much of the Lamma IV was underwater with the bow jutting out above the water at an acute angle. Fireman 12994 Tam Kam Lun, from Fireboat 4, boarded a police vessel from which he effected the first rescue of a passenger on the Lamma IV, a woman clinging to a railing next to the door on the starboard side of the Main deck. He noticed that the green starboard light of the Lamma IV was still lit and the radar equipment on top of the bridge was still revolving. Having heard cries for help and seen passengers hammering on the windows on the starboard side of the Upper deck of the Lamma IV, firemen broke a window there and gained entry to the Upper deck from where they were able to help more than a dozen passengers to escape.

13. Other firemen and policemen were able to rescue survivors from both the water and the vessel, together with recovering the bodies of the deceased. Helicopters of the Government Flying Service joined in the rescue efforts conducting surveillance of the scene and providing illumination for other rescuers.

PENETRATION DIVES

14. The first of many penetration dives into the hull of the Lamma IV was commenced by Fire Services divers at 22:45. Although such dives were conducted throughout the night and well into the following day no persons were rescued alive by them from or near the Lamma IV. By contrast, the bodies of more than 20 deceased persons were recovered from within the hull. Officers from the Police joined the diving operation at 01:30 and conducted seven dives, during which the bodies of three deceased were recovered from within the hull and three from the waters outside the hull.

THE APPOINTMENT OF THE COMMISSION OF INQUIRY

15. The Commission of Inquiry[1] was appointed by order of the Chief Executive in Council on 22 October 2012, pursuant to section 2 of the Commissions of Inquiry Ordinance, Cap. 86 ('the Ordinance'). The Terms of Reference of the Commission are stipulated to be:

> "Inquire into the facts and circumstances leading to and surrounding the collision of the two vessels that took place near Lamma Island, Hong Kong on 1 October 2012: -
>
> (a) ascertain the causes of the incident and make appropriate findings thereof;
>
> (b) consider and evaluate the general conditions of maritime safety concerning passenger vessels in Hong Kong and the adequacy or otherwise of the present system of control; and
>
> (c) make recommendations on measures, if any, required for the prevention of the recurrence of similar incidents in future."

16. Pursuant to section 3 of the Ordinance, the Chief Executive in Council directed that:

> "(c) the determination of any criminal or civil liability of any person shall be outside the terms of reference of the Commission."

[1] The Commission is comprised of the Honourable Mr Justice Michael Victor Lunn, Justice of Appeal of the Court of Appeal of the High Court, as Chairman and Commissioner, and Mr Benjamin Tang Kwok Bun, GBS, JP as the other Commissioner.

PROCEEDINGS BEFORE THE COMMISSION

I. THE APPOINTMENT OF SOLICITORS, COUNSEL AND EXPERT WITNESSES

Solicitors and counsel

17. On 6 November 2012 Messrs Lo & Lo were engaged as solicitors to the Commission. Pursuant to section 6(4) of the Ordinance, on 13 November 2012 Mr Paul Shieh, S.C., Mr Roger Beresford and Mr Mike Lui were appointed as counsel for the Commission.

Expert witnesses

18. Pursuant to the power granted to the Commission of Inquiry, the Commission appointed expert witnesses to prepare written reports, in respect of which it has received their oral testimony.

(a) Captain Nigel R Pryke: Master Mariner

19. On 19 November 2012, Captain Nigel R Pryke, Master Mariner and Elder Brother of Trinity House, was appointed to assist the Commission in respect of all three aspects of the Commission's Terms of Reference. However, at the Commission's direction, first he prepared a report and testified orally in respect of his opinions as to the navigation of the Lamma IV and the Sea Smooth based primarily on the available forensic evidence. Subsequently, he testified after the crews of the two vessels had themselves testified as to the circumstances leading up to the collision. In doing so, he gave his opinions as to the culpability for the collision of those involved on each of the vessels. Then, he gave evidence as to the conditions of maritime safety concerning passenger vessels and gave his opinions as

to the adequacy of the system of control and made related recommendations.

(b) Dr Neville Anthony Armstrong: Naval Architect

20. On 4 December 2012 Dr Neville Anthony Armstrong, a Fellow of the Royal Institution of Naval Architects and a Fellow of the Institution of Engineers of Australia, was appointed to assist the Commission in respect of all three aspects of the Commission's Terms of Reference. First, he provided reports and gave testimony in respect of the damage to the respective vessels having regard, in particular, to all aspects of the construction of the Lamma IV and the adequacy of the equipment it carried in the context of the circumstances in which it sank. Then, subsequently he provided a report and gave testimony in respect of the conditions of maritime safety concerning passenger vessels and gave opinions as to the adequacy of the system of control and made related recommendations.

(c) Professor Ho Siu Lau: Electrical Engineer

21. On 2 March 2013 Professor Ho Siu Lau, the Chair Professor of the Department of Electrical Engineering of the Hong Kong Polytechnic University was appointed by the Commission to prepare a report and give oral testimony of the electrical system on board the Lamma IV, in particular in relation to the operation of the navigation lights.

Other expert evidence

(d) Dr Cheng Yuk Ki: Forensic Scientist

22. The Commission received the reports and testimony of Dr Cheng Yuk Ki, a forensic scientist in the Government Laboratory,

who first examined the respective vessels at the request of the Hong Kong Police Force on 3 October 2012 and did so on numerous subsequent occasions. He gave his opinions as to the circumstances of the collision, having regard in particular to the damage sustained on each of the vessels. At the request of the Commission, he provided a report and gave testimony having performed further tests on the bulbs of the side lights and masthead light of the Lamma IV to assist the Commission in determining whether or not they were lit at the time of the collision.

(e) Dr Peter Cheng Jui Shan, M.B.E.: Naval Architect

23. At the invitation of Mr Johnny Mok, S.C., on behalf of the Marine Department, the Commission received reports from Dr Peter Cheng Jui Shan in which he expressed his opinions as an expert naval architect in respect of the cause of the sinking of the Lamma IV, various Damage Stability reports prepared for the vessel and related matters.

II. THE COMMISSION'S PROCEDURE

24. Pursuant to section 4(1)(m) of the Ordinance, at a preliminary hearing held on 5 December, 2012 the Commission determined the procedure to be followed at the Inquiry. (**Appendix 2; pages A2-5**)

III. PARTICIPATION AND REPRESENTATION OF PARTIES IN THE PROCEEDINGS

25. Pursuant to section 6(1) and (2) of the Ordinance, following upon applications made on their behalf, the Commission has

determined that various stipulated parties may participate and be legally represented in the proceedings on the basis that their conduct is the subject of the inquiry or that they are in any way implicated or concerned in the subject matter of the inquiry. The persons in respect of whom such determinations have been made are:

Determinations made on 5 December 2012

(i) Hongkong Electric Company Limited and the crew of the Lamma IV, namely Mr Chow Chi Wai (the coxswain), Mr Leung Pui Sang (the engineer) and Mr Leung Tai Yau (sailor). Throughout the proceedings they had been represented by Mr Clive Grossman, S.C., leading Mr James McGowan, on the instructions of Messrs Reed Smith Richards Butler.

(ii) Islands Ferry Company Limited, Hong Kong and Kowloon Ferry Holdings Limited and the crew of the Sea Smooth, namely Mr Lai Sai Ming (the coxswain), Mr Lo Pui Kay (the engineer), Mr Wong Yung Shing and Mr Wong Tai Yau (both sailors). For most of the proceedings they were all represented by Mr Charles Sussex, S.C., leading Mr Richard Zimmern, on the instructions of Messrs Holman Fenwick & Willan. However, on 25 February 2013, during the evidence-in-chief of Mr Lai Sai Ming, counsel and their solicitors withdrew from acting for the crew. Mr Sussex informed the Commission that course was taken in light of a recently discovered conflict in instructions. Having been given an adjournment to consider their positions, the engineer and two deckhands informed the

Commission that they were prepared to proceed without representation. Their evidence was received whilst that of Mr Lai Sai Ming was adjourned, so that he could receive legal advice. On 27 February 2013, Mr Lai Sai Ming informed the Commission that he had received legal advice and was prepared to resume his testimony without legal representation. He did so that day.

Determination made on 11 January 2013

(iii) Cheoy Lee Shipyards Limited. At various times in the proceedings it was represented by Mr Felix Pao on the instructions of Messrs Wilkinson & Grist.

Determination made on 23 January 2013

(iv) China Classification Society. At various times in the proceedings it was represented by Mr Dominic Yeung on the instructions of Messrs DLA Piper Hong Kong.

26. Pursuant to section 6(3) of the Ordinance, upon an application made on their behalf, on 5 December 2012 the Commission determined that the Marine Department, the Hong Kong Police Force and the Hong Kong Fire Services Department ('Fire Services Department') were entitled to be legally represented at the Inquiry. Throughout the proceedings they had been represented by Mr Johnny Mok, S.C., leading Ms Eva Sit and Ms Frances Lok on the instructions of the Department of Justice.

IV. AMBIT OF THE MATERIAL RECEIVED BY THE COMMISSION

27. By orders dated 2 November 2012 the Commission required the Commissioner of Police, the Director of Fire Services and the Director of Marine to produce to the Commission within seven days and on a continuing basis a range of material, in particular including witness statements and records of interview taken in the course of their various enquiries arising out of the collision of the Lamma IV and the Sea Smooth. In consequence, as a result of their compliance with those orders, a huge amount of material has been made available to counsel for the Commission, from which material relevant to the Commission in the discharge of its duties has been received by the Commission in its hearings.

28. Almost all witnesses who have testified orally have been referred to prior witness statements addressing the subject of their testimony. Most of those witness statements were taken by Emergency Services to whom the orders described earlier were directed. However, in addition other witnesses, including the involved parties, have referred to witness statements prepared by solicitors on their behalf. Generally, in their oral testimony, given under oath or affirmation, such witnesses acknowledged the prior statement, amended or qualified in such way as they wished to do, as being true to the best of their knowledge and belief. Similarly, witnesses whose evidence has been received as that of an expert have produced reports to the Commission which they have addressed in their oral testimony. A list of witnesses is at pages ix-xviii.

29. Throughout the proceedings the Commission has posted on its website on a daily basis a transcript of each day's proceedings. In addition, material of particular importance has been posted from time to time in the 'Key documents' box on the website.

V. CLOSING SUBMISSIONS

30. Following the culmination of the period in which the Commission received material, namely 8 March 2013, the Commission received written and oral closing submissions on 11 and 12 March 2013 from counsel for the Commission and counsel for all the involved parties. In letters dated 9 March 2013, faxed to the Secretariat of the Commission, all the crew of the Sea Smooth stated that they did not wish to address the Commission or be present at the closing submissions.

II. THE CAUSES OF THE INCIDENT

31. In addressing the direction of the Chief Executive in Council that the Commission ascertain the causes of the incident, the Commission has considered and made appropriate findings not only as to the cause of the collision but also in respect of all the circumstances relevant to the speed with which the vessel sank together with all the matters relevant to such great loss of life among the passengers on the Lamma IV.

THE LAW

(i) THE STANDARD OF PROOF

32. The standard of proof required by the Commission in making its findings is the balance of probability. That standard was described in the judgment of Lord Nicholls for the majority in the House of Lords *In re H. and Others (Minors) (Sexual Abuse: Standard of Proof)* [1996] AC 563 at 586D-F:

> "The balance of probability standard means that a court is satisfied an event occurred if the court considers that, on the evidence, the occurrence of the event was more likely than not. When assessing the probabilities the court will have in mind as a factor, to whatever extent is appropriate in the particular case, that the more serious the allegation the less likely it is the event occurred and, hence, the stronger should be the evidence before the court concludes that the allegation is established on the balance of probability. Fraud is usually less likely than negligence. Deliberate physical injury is usually less likely than accidental physical injury. A step-father is usually less likely to have repeatedly raped and had non-consensual oral sex with his under age stepdaughter than on some occasion to have lost his temper and slapped her. Built into the preponderance of probability standard is a generous degree of flexibility in respect of the seriousness of the allegation."

33. That *dicta* was cited with approval in the judgment of Ribeiro PJ in *Nina Kung v Wong Din Shin* (2005) 8 HKCFAR 387 at 440G-441C, paragraph 182, as it had been some years earlier in the judgment of Sir Anthony Mason NPJ in the *HKSAR v Lee Ming Tee & Securities and Futures Commission* (2003) 6 HKCFAR 336 at paragraph 71.

(ii) THE COLLISION REGULATIONS

34. The International Regulations for Preventing Collisions at Sea 1972 ('COLREGS') are applicable in Hong Kong by virtue of section 27 of the Merchant Shipping (Local Vessels) Ordinance, Cap. 548. Section 2 of the Ordinance provides that the 'collision regulations', to which section 27 makes reference, means the Merchant Shipping (Safety) (Signals of Distress and Prevention of Collisions) Regulations, Cap. 369N, which are set out in the Schedule of those Regulations. (**Appendix 3; pages A6-17**. Excerpts from the COLREGS)

THE AVAILABLE ELECTRONIC DATA

35. The Marine Department operates a Vessel Traffic Service ('VTS') system, which is comprised of a number of components, including a radar system and an AIS. All of that information is sent to and collated at the Marine Department's Vessel Traffic Centre ('VTC') at the Macau Ferry Terminal.

RADAR

36. The radar system is supported by 13 radar stations located at different radar sites and is used to detect and monitor marine targets within and in the vicinity of Hong Kong waters. Each radar scanner

completes a revolution in three seconds transmitting pulses of radio frequency electromagnetic waves which are reflected from the target back to the radar equipment, which information is sent to the VTC where it is displayed as radar echoes on a display system. Information as to the time taken between the transmission and the reception of the signal is used to calculate the range and bearing of the marine target from the radar site and its position. A unique tracking number is assigned to each marine target and displayed on the system together with its position in terms of latitude and longitude, course over ground ('COG') and speed over ground ('SOG').

37. The passage of the Sea Smooth on 1 October 2012 from the Central Pier to Green Island was captured on the radar site at the VTC and her subsequent passage through the Sulphur Channel and beyond Green Island, together with the passage of the Lamma IV from the Hongkong Electric Company pier to the place of collision, was captured on radar sites located at Kau Yi Chau and Shek Kwu Chau.

AIS

38. The Marine Department's AIS comprises six AIS base stations which receive AIS signals which are broadcast from transponders on vessels in and in the vicinity of Hong Kong waters. The information transmitted in the AIS signals from those transponders contains the ship's name, its unique alphanumeric Maritime Mobile Service Identity ('MMSI') and its other vessels specific characteristics, together with information of its position in respect of latitude and longitude, COG and SOG.

39. The Sea Smooth was equipped with Samyung AIS equipment which transmitted data, including its latitude and longitude, SOG and

COG in the course of its voyage towards Yung Shue Wan. That data was captured and recorded by the VTC.

40. The radar and AIS data are recorded and stored in the hard disk of the Marine Department's computer.

DISCREPANCIES BETWEEN THE DATA DERIVED FROM RADAR RECORDED BY THE MARINE POLICE AND THE MARINE DEPARTMENT

41. The same raw radar data is supplied to both the Marine Department and the Marine Police. However, given their different requirements, the former dealing with cooperative marine targets and the latter maintaining surveillance on evasive uncooperative targets, such as fast moving small vessels used by those involved in illegal operations, separate and different data processors are used by the Marine Department and the Marine Police. The software used by the Marine Department filters out unwanted reflections, whereas that used by the Marine Police displays more reflections so that small vessels may be tracked. As a result, there is a small difference in the data generated for the two separate users in respect of time, position, COG and SOG. Mr Harm Jelle Boorsma, an electrical engineer and computer programmer, installed and maintained the Marine Police's and the Marine Department's software on behalf of his employer HITT (HK) Ltd. He said that each system had a specified average position accuracy of 10 metres, 2° in respect of course and one knot in respect of speed. The average was taken over a period of a few minutes.

DISCREPANCIES BETWEEN THE DATA DERIVED FROM RADAR AND AIS IN RESPECT OF THE SEA SMOOTH

42. Of the relative accuracy of radar in contrast to AIS, Mr Boorsma said that whilst AIS can be quite reliable, on occasions it is very unreliable. The accuracy of AIS information depended on the accuracy of the Global Positioning System ('GPS') equipment on board the vessel itself and was subject to the vagaries of reception of satellite generated data affected by atmospheric conditions.

43. Captain Pryke said that, in addressing the issue of the navigation of the Lamma IV and the Sea Smooth in their respective journeys leading to their collision on 1 October 2012, it was for reasons similar to those expressed by Mr Boorsma that he had chosen to plot the movements of the two vessels from data obtained from radar rather than AIS. He drew plots from both the data available from the Marine Police as well as the Marine Department. Although he noted that there were small differences in the resulting plots, he said that the differences were irrelevant to his concluding opinions.

44. The Marine Police and the VTC each produced video recordings taken from the radar images of the data captured and recorded in their respective computers of the positions, courses and speeds of vessels obtained in the voyages of the Sea Smooth and the Lamma IV. Those videos depicted the movements of the two vessels and other vessels that were underway at the time, together with radar images of vessels at anchor in North Lamma Anchorage and the North West Lamma Anchorage. Those anchorages are depicted in those respective geographical locations on the chart HK 1501, Lamma Channels, published by the Hydrographic Office of the Marine Department. Also, the Marine Department and the Marine Police

produced tables of the data obtained at three second intervals from their respective interpretations of radar in respect of the relevant vessels. In addition, the Marine Department provided data relevant to the Sea Smooth, but not the Lamma IV, derived from AIS.

THE EVIDENCE OF THE CREWS OF THE LAMMA IV AND THE SEA SMOOTH

45. As required by summonses issued by the Commission dated 25 January 2013, the crew members of the Lamma IV and the Sea Smooth, three and four members respectively, gave evidence in the proceedings.

THE CREW OF THE LAMMA IV

46. On 1 October 2012, Mr Chow Chi Wai was the coxswain of the Lamma IV, whilst Mr Leung Pui Sang and Mr Leung Tai Yau were the engineer and sailor respectively. Coincidentally, all three of them joined the Hongkong Electric Company in 1982, Mr Chow and Mr Leung Tai Yau as deckhands and Mr Leung Pui Sang as a technician. However, in 1992 Mr Leung Pui Sang transferred within the Hongkong Electric Company to the Marine Section and became a deckhand himself.

Coxswain: Mr Chow Chi Wai

47. Mr Chow began his life at sea in 1974 as a seaman on cargo ships of Worldwide Shipping Company. Having joined the Hongkong Electric Company in 1982 as a deckhand, he was appointed a coxswain in 1992. In 1988, he had obtained a Certificate of Competency as a master, licensing him to be in charge of vessels of up to 300 tonnes. That certificate was still valid at the time of the

collision. Having been coxswain of vessels licensed to carry up to 100 passengers, in 1996 he was assigned as a coxswain of vessels carrying more than 100 passengers. The majority of his duties required him to act as a coxswain of either the Lamma IV or the Lamma II in passages in which the vessels carried employees and contractors to the Lamma Power Station from Ap Lei Chau, Central or Tsim Sha Tsui.

Engineer: Mr Leung Pui Sang

48. For his part, Mr Leung Pui Sang obtained a Certificate of Competency as a marine engineer, for vessels with an engine power greater than 150 Brake Horse Power ('BHP'), in 1994 and a Certificate of Competency as a coxswain, for power vessels of less than 60 tonnes, in 1997. Both certificates were still valid at the time of the collision.

Deckhand: Mr Leung Tai Yau

49. Having become an employee of the Hongkong Electric Company in 1982 as a deckhand, Mr Leung Tai Yau subsequently obtained a Certificate of Competency as an engineer for power vessels up to 150 BHP. Also, he held a Certificate of Competency for a pleasure vessel. Both certificates were valid at the time of the collision.

1 October 2012

50. On 1 October 2012, Mr Chow travelled together with his engineer and deckhand on board Lamma II from Ap Lei Chau to Lamma Power Station, where they boarded the Lamma IV about noon to begin that day's duty, namely to convey the Hongkong Electric

Company employees, their relatives and friends on an organised excursion. Mr Chow said that before sailing the vessel he checked its equipment, testing its whistle by sounding it. He heard that it was working, as was the other equipment. Mr Leung Pui Sang said that he had heard the whistle being sounded at that time. Then, Mr Chow and his crew brought about 180 such passengers on the Lamma IV from Tsim Sha Tsui and Central, via Ap Lei Chau, to the Hongkong Electric Company Power Station, where they berthed at about 15:00.

51. In the evening, for the voyage to Victoria Harbour to view the National Day firework display, the total number of passengers was split between the Lamma II and the Lamma IV on the basis of the place of eventual disembarkation. The Lamma IV was to disembark passengers in Central and the Lamma II at Ap Lei Chau.

Marine Department Notice No. 131/2012

52. Mr Chow said that he was aware of the Marine Department Notice published in advance of the firework display held in Victoria Harbour on 1 October 2012. About a week prior to 1 October 2012, copies of the notice had been placed not only in the crew room on the pier at the Hongkong Electric Company Power Station but also in the wheelhouses of both the Lamma II and the Lamma IV. He noted the obligatory section dealing with exclusion zones and the opening times of landing facilities. He regarded the rest of the notice as of an advisory nature only. (**Appendix 4; page A18**. Excerpt from Annex to Marine Department Notice No. 131 of 2012)

53. For his part, Mr Leung Pui Sang said that he was not aware of that Marine Department Notice. There was no system of bringing such notices to his attention. No one had told him that the Marine

Department had advised owners, operators and coxswains of vessels attending the firework display in Victoria Harbour that children should be required to don lifejackets at all times. Similarly, Mr Leung Tai Yau said that he was unaware of that Marine Department Notice. No one had told him of their advice for that event in respect of lifejackets with regard to children.

Preparations for the voyage of the Lamma IV to Victoria Harbour: navigation lights and radar

54. As noted earlier, on first boarding the Lamma IV that day Mr Chow had checked that all its equipment was working properly, including its whistle. Before he set sail that evening he had switched on the radar and the vessels navigation lights, namely the white masthead light, green and red sidelights and the white stern light, by switching on the master switch. As a matter of routine, the individual switches were left in the 'On' position on the electrical panel. Each of the individual switches had an indicator light above it which was illuminated, if the switch was set to 'On', when the respective navigation light was operating. He checked that they were all operating. Failure of a particular navigation light caused the respective light on the panel to fail and sounded an audio alarm. Then, he turned off the lighting in the Upper deck cabin and Open deck area, but left the lights on in the Main deck. That was his usual practice when navigating at night, so as to reduce interference by lights with his night vision.

55. Mr Leung Pui Sang said that while he was in the crew room on the pier at around 6:00 p.m. he had seen the coxswain board the Lamma IV and turn on the navigation lights. In particular, he said that he had seen the green navigation light lit. The Lamma IV was at

Berth 1 in the Hongkong Electric Company Typhoon Shelter, so that the crew room was near the bow of the Lamma IV as she was alongside the pier on her starboard side. For his part, Mr Leung Tai Yau said that he had seen the green and red sidelights and the white masthead light lit as he had taken a walk after dinner that evening and before they set sail from the crew room along the pier. He had walked beyond the then unoccupied Berth 2 from which position he could see the Lamma IV from the bow perspective, starboard side at Berth 1.

Radar

56. Mr Chow said that the radar equipment was operating and was set to a range of one nautical mile. Although the original radar equipment had been replaced in 2009, with more advanced equipment that included a chart plotter, Mr Chow said that he did not know how to use that feature of the new equipment and did not do so. Information in respect of the speed, position and depth of the waters beneath the Lamma IV was displayed on the radar equipment.

57. In cross-examination by counsel for the Commission, both Mr Chow and Mr Leung Pui Sang said that they had never seen the training manual designed by Mr Tang Wan On, the Hongkong Electric Company Marine Officer, that amongst other things, addressed the use of radar.

58. Mr Chow said that when new radar equipment was installed on the Lamma IV in 2009 the manual supplied to him was in English, which he was unable to read properly. When he raised that difficulty with Mr Tang, the latter made no response. Mr Chow said that he had asked Mr Tang Wan On if he could learn how to operate it, in particular the increased number of buttons on the equipment. He had

in mind a course of some kind, perhaps a Vocational Training Council course. However, Mr Tang Wan On did not respond.

20:15

59. At 20:15 Mr Chow manoeuvred the Lamma IV out of the typhoon shelter at the Hongkong Electric Company Power Station and set sail for Victoria Harbour, doing so at about 1,000 Revolutions Per Minute ('RPM'), which he increased to 1,200 RPM as he exited the breakwater. He was alone in the wheelhouse. He saw the radar echo of the Lamma II and the light beacon off Shek Kok Tsui displayed on the radar screen. There were no moving targets displayed on the screen. Mr Chow said that he steered a course intending to pass 1 to 1½ cables[2] off Shek Kok Tsui beacon. As usual, there was light from vessels anchored in the North West Lamma Anchorage. Mr Chow said that Mr Lai Ho Yin had spoken to him from outside the door to the wheelhouse, telling him that he had come to retrieve gifts for the lucky draw which he planned to hold. They had no conversation.

60. Mr Chow said that after the vessel had been sailing for about three minutes, Mr Leung Pui Sang entered the wheelhouse. Mr Chow said that at that time he noted from the radar that the speed of the Lamma IV was 12 knots. From that information he concluded that the vessel had sailed six cables from the Hongkong Electric Company Typhoon Shelter. Since visibility was good, Mr Chow said that he was navigating by line of sight.

61. For his part, Mr Leung Pui Sang said that as Mr Chow manoeuvred the Lamma IV from the pier in the Hongkong Electric Company Typhoon Shelter he had observed from the aft end of the

[2] One cable is a tenth of a nautical mile or 608 feet.

Open Upper deck. Then, he had entered the Engine room through the door that led down from the Main deck on its starboard side. Having observed that the engines were running at 1,200 RPM he made his way via the Main deck and up the staircase to the Upper deck to the wheelhouse. There, he encountered Mr Lai Ho Yin leaving the wheelhouse through the door to the Upper deck cabin. Standing on the starboard side of the conning chair in front of which was the console, Mr Leung Pui Sang observed the engine instrumentation. He noticed from the glow emitted from its screen that the radar, which was on his right side in the position he occupied, was operating.

62. Then, he passed behind the coxswain's conning chair and, having checked from the switchboard that the navigation lights were working, he took up a position on the port side of the wheelhouse, so as to act as a look-out. No sooner had he done so, at least within the matter of a few seconds, he saw a fast moving vessel moving at more than 20 knots sailing towards the Lamma IV.

63. Mr Leung Tai Yau said that, after he had dealt with the mooring lines as Lamma IV left its berth in the Hongkong Electric Typhoon Shelter, he made his way through the Main and Upper deck cabins and the Open Upper deck counting passengers, after which he entered the wheelhouse and made an entry in the log of the Lamma IV that she was carrying 124 passengers. Then, he passed through those places again to ensure that all was well with the passengers before returning once more to the wheelhouse. As he did so, he noticed Mr Lai Ho Yin standing outside the wheelhouse. On his entry to the wheelhouse he stood behind the conning chair on which Mr Chow was seated. Mr Chow told him that a vessel was coming directly at the Lamma IV. So, having looked through the forward window on the

port side of bridge he saw a flashing yellow light, green and red sidelights and a masthead light of a vessel at a distance of about 300 metres coming at them at an angle of about 10° to 20° on the port side. As a result, he confirmed to Mr Chow that a ship was coming at them from their port side. He did not hear the sound of a ship's whistle or see the beam of a searchlight. He did not feel that the Lamma IV was slowing down. The vessels collided within 10 to 20 seconds of his first sighting of the other vessel.

64. Notwithstanding his description of events in his police statement, made at 05:15 on 2 October 2012, that he had alerted Mr Chow first to the presence of the oncoming vessel, Mr Leung Tai Yau said that it was Mr Chow who told him first. For his part, he had not noticed the presence of Mr Leung Pui Sang in the wheelhouse or heard him shout out.

65. For his part, Mr Chow said that the first time he saw the flashing yellow light of a high-speed craft, which in the event turned out to be the Sea Smooth, was when it appeared to be adjacent to the Shek Kok Tsui beacon. He judged it to be at a distance of three cables from the Lamma IV. He said that he saw not only the masthead light but also both sidelights, namely starboard and port. In consequence, he concluded that it was heading straight towards the Lamma IV.

Whistle: hard starboard

66. In those circumstances, in compliance with the COLREGS, he sounded one short blast on the whistle, indicating that the Lamma IV was turning to starboard and steered the vessel hard to starboard using the steering joystick. He pressed a button on the console in front of him to sound the whistle. He said that he heard the blast on the

whistle himself. Within two seconds the Lamma IV began to turn to starboard. About that time he heard Mr Leung Tai Yau shout out that a vessel was approaching the Lamma IV at speed on their port side. It was only then that he realised that he too had entered the wheelhouse.

67. For his part, Mr Leung Pui Sang said that having taken up his position on the port side of the wheelhouse he had seen a vessel coming towards the Lamma IV 30° off her bow at a speed he estimated to be more than 20 knots, at a distance of two to three boat lengths or about 100 metres. With his back to the coxswain, as he followed the progress of the vessel towards them, he shouted out: "A ship is coming at us!" He said that he was not aware of the presence of Mr Leung Tai Yau in the wheelhouse and had not heard him or Mr Chow shouting out a warning about the oncoming vessel. At no time during the short period leading up to the collision had he heard the sound of a whistle or seen the beam of a searchlight projecting forward from the searchlight located on the roof of the wheelhouse of the Lamma IV. In a matter of seconds the other vessel collided with the port aft quarter of the Lamma IV.

68. Mr Lai Ho Yin said that, having been the last person to board the Lamma IV before it left its berth at the Hongkong Electric Company Typhoon Shelter, he made his way to the wheelhouse, intending to borrow an amplifier for use in a quiz he intended to hold amongst the passengers. He reached the wheelhouse about one minute after the vessel had set sail and remained there until the collision occurred about five minutes later. On arrival in the wheelhouse, he told the coxswain that there was "plenty of time", but received no response. He meant that observation to be understood in relation to the time needed to reach Victoria Harbour in order to watch

the fireworks display. Then, he went to the port side of the wheelhouse, where he engaged in casual conversation with one of the crew he knew as 'Ah Sang', who stood to his left. Then, he saw a vessel at a distance of about 100 metres ahead of the Lamma IV on the port side coming towards them. Some 10 to 20 seconds later the coxswain steered the vessel to starboard. He thought that he used the wheel to do so. He said that he heard the increased sound of engines. He estimated that the vessels collided about 30 seconds after he first sighted the other vessel. He did not shout out anything about his observation of the oncoming vessel nor did he recollect hearing anyone else doing so.

69. Mr Chow responded to the question, of why it was that he had not seen the vessel any earlier, by explaining (18 February 2013; Day 34, page 106):

> "Because there was only me on the bow of the vessel, and the Sea Smooth was - the track of Sea Smooth was not shown on the radar screen yet. And also, the light from the North-west Anchorage was blinding my sight."

Light signal

70. Mr Chow said that the Lamma IV began turning quickly to starboard, so that after a few seconds he saw the light of the beacon off Shek Kok Tsui through the port side window of the wheelhouse. However, he was also able to see the green sidelight of the Sea Smooth, which he judged to mean that she had altered course to port. As a result, he flashed the searchlight switch to indicate that the Lamma IV was turning to starboard. That was the light signal equivalent of the one short blast on the whistle, indicating the vessel was turning to starboard. He did so by pulling up a button on the console in front of him and then returning it to its original position to

extinguish the light. The searchlight was mounted on the exterior of the wheelhouse roof. However, he did not have time or available hands to manoeuvre the toggle which protruded downwards from the wheelhouse roof and which permitted a change to be made in the direction in which the searchlight beam was cast. Moreover, he did not pay attention to whether or not a beam of light emanated from the searchlight.

71. In answer to questions by Mr Sussex, he accepted that in his police interview in the early afternoon of 2 October 2012 when asked whether or not he had given any warning to the approaching vessel, other than the sound signal, he had said in terms "No, I didn't apply a flashlight". His explanation was that he had forgotten, saying that at the time he was hospitalised.

Engine speed

72. By now he had become very nervous. He said that, although he did not have a clear recollection of his subsequent actions, he believed that he had increased the engine speed to between 1,300 and 1,400 RPM. He did so in order to increase the rate of turn to starboard. Then, realising that the collision was inevitable, he said that he had stopped the Lamma IV's engines. He did so to reduce the force of the impending impact.

73. Although some passengers on the Lamma IV said that they had not noticed any change in the sound of the engines of the Lamma IV before the collision, others said that they had noticed an increase in the sound of the engines. Mr Tang Ying Kit testified that he was standing together with his girlfriend, whose life sadly was lost in the tragedy, at the starboard side at the stern of the Open Upper deck of

the Lamma IV. He was looking astern. After the vessel had been sailing for about five minutes and had reached a steady speed, the engine noise had become louder and the white wake became denser, which he judged to be the result of engine acceleration. Two or three seconds later he heard a further increase in the engine noise and observed a denser wake as a result of yet further acceleration. However, he said that he did not sense any change in direction of the vessel. Then, four or five seconds later the collision occurred.

74. Madam Lam Muk Lin testified that she was standing at the stern of the Open Upper deck of the Lamma IV next to the lifebuoys. Her husband and son were sitting on the lifebuoys. Suddenly, the Lamma IV accelerated and the noise of her engines increased. She grabbed onto the stern railing to maintain her balance. She said that she did not feel that the vessel was turning. Her husband suggested that the vessel was accelerating in order to get to the firework display in time. Then, the collision occurred.

Collision

75. Mr Chow said that the port bow of the Sea Smooth struck the port aft quarter of the Lamma IV with a loud bang causing the Lamma IV to rock. He estimated that about one minute had passed from the time when he had first sighted the yellow flashing light of the Sea Smooth to the moment of collision. At the latter point in time the heading of the Lamma IV was about 50° to 60°.

Reports of the collision

76. Mr Chow said that he sent the engineer and the sailor to check the damage to the Lamma IV and made a report of the collision to the police by a '999' telephone call on his own mobile telephone.

Mr Chow identified his voice on the audio recording of that conversation. That phone call began at 20:22:04. In response to enquiries made of him in the '999' telephone call, as to whether or not there were injured passengers, he rushed through the Upper deck cabin onto the Open deck and saw that passengers were injured and lying on the floor, which information he reported to the police. Then, he used the Motorola Maxtrack trunk radio to call the coxswain of the Lamma II to report the collision and to seek help.

77. For his part, Mr Lai Ho Yin said that he was not thrown to the ground as a result of the collision. He held onto the ledge in front of him on the port side of the wheelhouse. Then, he left the wheelhouse and made his way through the Upper deck cabin to the Open Upper deck. At the latter location he saw an injured male passenger, lying on the deck, being attended by a female. At the stern of the Open Upper deck he made a '999' telephone call on his own mobile telephone, informing the Emergency Services of the fact of the collision. That telephone call was recorded, as were all such other calls to the Emergency Services, and began at 20:21:03. Then, he took lifebuoys that were stowed at the stern of the Open Upper deck and distributed them, before he found himself in the sea holding onto three lifebuoys. He was rescued in due course by a power boat.

The Lamma IV begins to sink

78. Having heard the engineer shouting that the Engine room was being flooded, Mr Chow ordered that lifejackets be distributed to passengers and gave them instructions to don lifejackets. However, quickly the Lamma IV began to tilt by the stern. He estimated that within 30 seconds of the collision the generator failed, followed by a failure of the batteries, so that all the lights were extinguished.

79. After a period of what he estimated to be another 30 seconds, as the angle of the Lamma IV was about 45°-50° to the sea, Mr Chow said that he saw the first seats become detached from their attachments to the Upper deck and slide down the deck, as did passengers, into the water that was now flooding into the Upper deck cabin of the vessel. Then, within seconds the Lamma IV reached an almost vertical angle to the sea and, no longer able to hold onto the wheelhouse door, he fell into the water in the Upper deck cabin. He was able to break his fall by holding on to the railing by the stairway but sustained a painful injury to his right arm. Also, he thought he had broken some ribs. Having lost his own mobile telephone he borrowed one from a passenger and made another '999' telephone call to the police, after which he reassured passengers that help was on the way.

80. Mr Chow said that the water level within the Upper deck cabin began to stabilise at about the fourth window from the bow. At about 20:40 he was aware of the arrival of the first rescue vessel from the Fire Services Department and heard windows being smashed in the Main deck. After a fireman broke a window on the port side of the cabin of the Upper deck, water flooded into the cabin. He advised passengers to wait until the water level outside and inside stabilised and then to swim out. Passengers did that on both sides of the vessel. For his part, Mr Chow said that he was the last person to leave the wheelhouse through a window that a fireman had broken on the port side of the main console in the wheelhouse. He said that he remained on the vessel, on the roof of the wheelhouse, until he was satisfied that there were no more persons to be rescued from the sea around the sunk vessel.

81. Following his rescue Mr Chow was taken to Queen Mary Hospital where his injured arm was treated, as was a broken rib. He was discharged from the hospital on 6 October 2012.

82. For his part, Mr Leung Pui Sang said that the force of the collision had thrown him to the deck of the wheelhouse. Having regained his footing, he ran down to the Engine room, in which he discovered rising water ingress up to his ankles. He judged the vessel to be sinking. As he made his way along the corridor on the outside of the starboard side of the Main deck he saw the vessel with which the Lamma IV had collided, stationary two to three boat lengths away. Although he waved his arms and shouted for help, those efforts elicited no response.

83. From the staircase between the Main and Upper deck cabins he yelled out to the coxswain that the vessel was sinking, asking him to make a call for help and to tell passengers to don lifejackets. He assisted passengers to retrieve lifejackets from under their seats. Three motionless passengers seated on the port aft quarter of the Main deck did not respond in any way to his entreaties to run away. Fallen debris blocked his attempt to reach them. Then, the generator failed, and after a short while in darkness the emergency lighting provided some lighting. At his urging, many passengers jumped into the sea through the side doors to the Main cabin, holding lifejackets as they did so.

84. Mr Leung Pui Sang said that he made his way through fallen debris to a mother and daughter, who remained seated on the starboard side of the Main cabin holding on to each other and not moving. Having reached them and taken the girl into his arms he hurdled his way back over their seats towards the bow of the Main cabin with the

mother following them. However, at that stage water ingress was such that the vessel tilted to 45°, sinking to the stern. As he became immersed in the incoming water he lost hold of the girl and sight of her mother. Having become trapped in the flooded Main cabin he was able to escape only when rescuers from outside smashed a window and he and others made good their escape into the sea. Then, he helped a girl, who was holding a lifejacket, to reach the safety of a life raft.

85. For his part, Mr Leung Tai Yau said that following the collision he had run through the Upper deck cabin to the Open area in which journey he saw that many passengers had fallen down and were injured. He saw the other vessel which hit the Lamma IV was stationery nearby. Having reached the Main deck cabin he saw debris on the port side of the cabin and injured passengers. As he made his way up the stairs to the Upper deck the lights failed. He saw that the coxswain was outside the wheelhouse yelling at passengers to don lifejackets as the vessel tilted towards the stern and water entered the Upper cabin. As he helped a father put lifejackets on his daughter and son, aged about seven to eight and five years respectively, chairs began to fall, trapping his right leg. Having opened the second window on the port side aft of the Upper deck cabin he helped the father and his children escape into the sea. He pushed another young girl, aged four or five years old, who was not wearing a lifejacket out of the window through which he also escaped. All of them made their way to a life raft.

Lifejackets on board the Lamma IV

86. Mr Chow said that there were adult lifejackets under each of the seats on the Main and Upper deck cabins, but not in the Open area

of the Upper deck. He said that there were more lifejackets on board than the maximum number of persons permitted by the licence to be on board, namely 232. Those adult lifejackets that were not stowed under seats were kept in lockers in the Crew quarters in the Under deck, whilst one lifejacket was kept in a locker in the wheelhouse. He accepted that there was no sign on the Open Upper deck or elsewhere as to where those other lifejackets were kept.

Child lifejackets

87. By contrast, he said there were no lifejackets for children on board the Lamma IV and never had been. In particular, he said that he had been part of the crew that participated in the annual survey of the vessel on 8 May 2012 and no child lifejackets had been shown to the Marine Department Inspector nor had he asked to see any such lifejackets. In any event, there were none to show them. He said that Mr Tang Wan On attended that survey and made up the fourth crew member.

Minimum crew for safe manning

88. Mr Chow said that when the Marine Department changed the stipulation as to the minimum permitted safe manning level, from two crewmen to four crewmen, in 2008 he had raised with Mr Tang Wan On the insufficiency of the usual three uniformed crew members. He said that he had accepted the practice then implemented of regarding one of the company employees travelling on the vessel as being the fourth crew member. For his part, he was responsible only for implementing the company's plan, "whatever the company arranged, I would accept."

Sighting of the Sea Smooth on radar

89. In cross-examination by Mr Sussex, when it was suggested to him that he had not seen the Sea Smooth about one minute before the collision, rather it had been a matter of seconds, Mr Chow asserted for the first time that he had observed the Sea Smooth on the radar equipment of the Lamma IV when she was one nautical mile away. However, he went on to say (19 February 2013; Day 35, page 77):

> "After looking at the radar, I stopped looking at the radar and then I spotted it by sight."

He went on to explain (page 78):

> "What I said just now was that I haven't taken action when I spotted it on the radar. I took action after I saw it with my own eyes."

90. Mr Chow answered in the affirmative the question from the Chairman as to whether or not he had monitored its progress on the radar screen after he had observed it first at one nautical mile range, and went on to say (page 79):

> "I looked at it every now and then, because the radar was at my side."

91. He said that he had seen the target moving across the one mile ring on the radar screen, coming closer and closer to his own vessel. He took avoiding action only when he saw the vessel visually at three cables distance.

92. In cross-examination by Mr Sussex, Mr Chow accepted that in his various out-of-court written statements, including the witness statement dated 6 February 2013 accepted as part of evidence-in-chief at the hearing, he had not made any mention of seeing the Sea Smooth on radar. He explained that omission on the basis that he had probably forgotten to do so. Furthermore, he accepted that in the

Notes of Interview conducted of him by the Marine Department he had said (Notes of Interview, page 89-6):

> "(I) had checked the radar (picture) when my vessel left the typhoon shelter, but shortly afterwards I reversed the vessel by visual contact. Therefore, (I) did not notice the radar picture. *Up to the moment of collision, I did not check the radar picture.*" [Italics added.]

93. Mr Chow denied that he had invented his evidence of seeing the radar echo of the Sea Smooth on the radar screen of the Lamma IV. Similarly, he denied that the first time that he had seen the Sea Smooth was when she was within a few boat lengths of the Lamma IV. Whilst Mr Chow accepted that there was no significant change of course to starboard recorded in the VTC tracking records of the course of the Lamma IV in the period of either 30 or 60 seconds prior to 20:20:17, namely the time of collision, he denied that he had not altered course to starboard until a few seconds before the collision occurred.

94. In answer to questions from Mr Sussex, Mr Chow accepted that in the record of interview recorded from him by the police in the early afternoon of 2 October 2012, whilst he was at Queen Mary Hospital, in the description he gave of the lights he saw displayed by the Sea Smooth as she approached the Lamma IV he had said only that he saw a green light displayed. However, he explained that he had said to the police that he had sighted the Sea Smooth "dead ahead" from the Lamma IV. He agreed that the first time he mentioned specifically having seen both sidelights of the Sea Smooth as she approached the Lamma IV was in the Notes of Interview conducted of him by an officer of the Marine Department on 7 November 2012.

95. In answer to questions from counsel for the Commission, Mr Chow explained that he had not seen the Sea Smooth visually, when he identified it at one nautical mile on the radar screen, because of what he described as the "blinding" glow coming from vessels at anchor in the North West Lamma Anchorage. He accepted that those circumstances were all the more reason to monitor the radar screen. However, he claimed that to do so involved his turning his neck to the starboard side of the wheelhouse and said that doing so constantly would have rendered him tired. He agreed that it would have been helpful to have had another member of the crew in the wheelhouse to assist him with look-out.

Failure of the navigation lights on the Lamma IV

96. In answer to questions from Mr Sussex, Mr Chow accepted that there had been a pattern of regular failure of light bulbs in the navigation lights of the Lamma IV, namely masthead, side lights and stern light. He said that such failures used to happen about twice a week. The failure of a particular navigation light bulb was marked by the bulb used to indicate its use being extinguished and by an audio signal being sounded. If a bulb did fail, he would turn off the 'On' switch for that particular bulb. He did not make use of the facility to mute the audio alarm.

97. The problem stemmed directly from power surges in electricity generated from the on-board generator, which problem was circumvented by turning the dial not to 'Transformer' but to 'Auxiliary batteries'. As a result, it became the usual practice to switch the power source for the navigation lights to the setting for batteries, rather than for the generator. In answer to questions from counsel for the Commission he said that solution to that problem had

been discovered about five years previously, so that it no longer occurred.

98. Mr Chow said that when he had turned on the navigation lights on the evening of 1 October 2012 he did so by deploying the master switch dial to the position marked '2', which was for Auxiliary batteries. He had done that after sunset, at "6:00 ish". The master switch dial remained in that position when the vessel sank. He said that no audio alarm for the navigation light panel sounded or indicator bulb was extinguished on the journey from the Hongkong Electric Company Typhoon Shelter pier until the collision with the Sea Smooth.

Loudhailer

99. In answer to questions from counsel for the Commission, Mr Chow said that he had not used the loudhailer system, available to him on the console in front of his steering position in the wheelhouse, to communicate with passengers and crew on board the Lamma IV after the collision because he did not have time in which to do so. Instead, he had shouted out instructions.

THE CREW OF THE SEA SMOOTH

100. On its various voyages from the time that they came on duty at 07:30 on 1 October 2012, the coxswain of the Sea Smooth was Mr Lai Sai Ming, the engineer Mr Lo Pui Kay and the two deckhands Mr Wong Tai Yau and Mr Wong Yung Shing. Whilst Mr Wong Yung Shing had joined Hong Kong and Kowloon Ferry Limited in March 2009 the other three crew members had joined the company in 2008. Each of them had spent decades at sea in one capacity or another.

Coxswain: Mr Lai Sai Ming

101. Mr Lai Sai Ming, the coxswain of the Sea Smooth, testified that he was born into a family of fishermen and as a child and young man sailed on fishing boats. In 1981, he became a sailor on board ferries operated by Hong Kong and Yaumatei Ferry Company Limited. In 1994 and 1997, respectively he was promoted to first officer and captain. In July 2008, he joined Hong Kong and Kowloon Ferry Limited. Since June 2012, he has been employed as one of the captains of the Sea Smooth.

Engineer: Mr Lo Pui Kay

102. Mr Lo Pui Kay, the engineer of the Sea Smooth, had worked as a sailor on the family shrimp boat for 30 years. He had been educated only to Primary II level. He held a master's licence granted to him in 1980, endorsed in 1994 so that then he was permitted to be in charge of vessels up to 60 tonnes. In 1993, he had obtained a licence in respect of engines up to 150 BHP, which was endorsed without limit the following year. Having joined Hong Kong and Kowloon Ferry Limited as a sailor in 2008, in about 2011 he had been promoted to serve as an engineer and began to serve in that capacity on the Sea Smooth in June 2012.

Deckhands: Messrs Wong Tai Yau and Wong Yung Shing

103. Mr Wong Tai Yau was one of the deckhands on the Sea Smooth. He came from a fishing family and was educated to Primary III level only. He held a master's ticket for Class III vessels up to 15 metres in length. He had no training in the use of radar equipment. He was deployed as a relief sailor on various vessels. The last time he worked on the Sea Smooth was about a month prior to the collision.

104. Mr Wong Yung Shing, the other of the deckhands on the Sea Smooth, also came from a fishing family and was educated to Primary II only. He has spent decades working on the family fishing boat, but in 2009 became a shore-based sailor for Hong Kong and Kowloon Ferry Limited. In 2010, he was assigned to work at sea on vessels. From June 2012, he had been assigned to work on the Sea Smooth.

30 September 2012

105. On the morning of 30 September 2012 Mr Lai handed over control of the Sea Smooth to another captain and went off duty for 24 hours. During that day he slept from about 08:00 to 12:30 and then again during the night from about 23:00 to 06:20. He said that he had enjoyed a relaxing day off.

1 October 2012

106. Mr Lai said that he reported for duty on board the Sea Smooth at Central Pier at about 07:30 on 1 October 2012. There he was joined by his crew, namely Mr Lo Pui Kay, the engineer, and two sailors, Mr Wong Tai Yau and Mr Wong Yung Shing. A check of the equipment, including the radar, steering and AIS, revealed that it was all working well.

107. Having completed bunkering, Mr Lai began the first of the day's scheduled voyages, a round trip from Central to Peng Chau at 08:40. Thereafter, the vessel made seven round trip voyages from Central to Yung Shue Wan on Lamma Island. Having navigated from Central Pier to Yung Shue Wan hundreds of times, he said that he navigated by sight and did so from the conning chair located on the centre line in the wheelhouse. Although the radar equipment was on and functioning, he glanced at it only occasionally on such passages.

20:00

108. At about 20:00 Mr Lai manoeuvred the Sea Smooth away from Central Pier on its fateful journey towards Yung Shue Wan. Earlier, he had turned on the vessel's navigation lights, including its yellow flashing light, and they remained on. He said that the radar was set at 0.75 nautical miles and he judged visibility to be about six miles or more on a fine evening. He judged that setting of the radar to be safe, notwithstanding that his vessel would travel at speeds of 23 to 24 knots once outside Victoria Harbour.

109. Mr Lai said that three or four minutes into the voyage he was joined in the wheelhouse by the engineer and the two sailors. The former sat on a chair at a table and the two sailors on an adjoining settee at the aft of the wheelhouse. The wheelhouse was dark, illuminated only by the lighting from the radar, engine gauges and compass, which he had dimmed as much as possible.

110. For their part, the three crew members confirmed that they had joined the coxswain in the wheelhouse of the Sea Smooth during her journey west in Victoria Harbour from Central Pier. Mr Lo Pui Kay said that he sat on a stool/chair next to a table, which itself was next to the settee situated at the aft wall of the wheelhouse. The conning chair, on which Mr Lai sat, was on the centre line of the vessel, and the chair on which he sat was aft and to the starboard side of the conning chair. There, he made entries in the log of the Sea Smooth. However, he also walked over and stood on the port side of the conning chair, from which position he observed the engine instrumentation on the console display in front of that chair, after which he returned to his stool/chair and table. From that position, he had no view outside the wheelhouse. The two deckhands occupied the

settee, Mr Wong Tai Yau sitting on the port side. For his part, Mr Lai Sai Ming said that the engineer had stood on the starboard side of the conning chair, which he occupied, when he viewed the instrumentation displayed on the console.

111. Mr Lai said that he steered the Sea Smooth to the Eastern Cardinal Buoy in Victoria Harbour, within the maximum speed of 15 knots. At that point, as was permitted, he increased the speed to about 21-23 knots and steered through the Sulphur Channel and south of Green Island. In so doing, he altered course or reduced speed on a number of occasions to accommodate small vessels making their way into the harbour. Mr Lai Sai Ming said that from the Sulphur Channel he could see Lamma Island and judged the visibility to be good.

112. For their part, the three crew members confirmed that Mr Lai had altered course for vessels that were bound for Victoria Harbour and the firework display.

113. Then, having crossed the Western Fairway of the Lamma Channel at right angles and having reached waters north of the North Lamma Anchorage, Mr Lai said that he altered course to port and passed through that anchorage. In doing so, he adjusted his course to avoid the four or five vessels at anchor. Nevertheless, he kept his general heading at 180°, although he did not look at his compass or radar very often.

114. Having passed through the anchorage, he said that there were no other ships or small boats ahead of the Sea Smooth. Apart from the very bright light at the entrance to the Lamma Power Station Typhoon Shelter, the usual shore lights and those of the Power Station itself, he saw no other lights or vessels. Visibility remained fine and he was able to see the bright white flashing light of the beacon off

Shek Kok Tsui from about the place on the chart on which the "North Lamma Anchorage" is marked in Chinese characters (**Appendix 5; page A19**). It was his intention to pass about 300 metres off the beacon, as he usually did, before altering course gradually to port to head for Yung Shue Wan. That was his usual route, as it was for all ferries sailing from Central to Yung Shue Wan.

Look-out

115. Significantly, it was the undisputed effect of the evidence of the entire crew that the chair immediately to the port side of the conning chair, which provided a commanding view, similar to that of the coxswain seated in the conning chair, remained unoccupied throughout the journey. Mr Lo Pui Kay said that he felt more comfortable sitting on the stool next to the table, rather than sitting in the chair next to the conning chair. He agreed that sitting in the chair imposed some level of duty in respect of look-out. He said that, after the vessel had passed Green Island to starboard as it was travelling west, he got up and had another look at the engine instruments on the console. However, after having done so he returned to resume his seat on the stool. He said that he had paid "not much attention" to the navigation of the vessel. Having been on duty for over 12 hours, he was "a little bit tired".

116. Mr Wong Tai Yau said that, notwithstanding that he was seated on the settee, he had kept a look-out, scanning from side to side during the journey. For his part, Mr Wong Yung Shing, who was seated on the settee said that his look-out consisted of looking "occasionally" side to side.

117. It was the effect of the evidence of the three crew members that there were no instructions or directions from the company as to how any one of them was to play the role of look-out, thereby assisting the coxswain in the navigation of the vessel. Mr Wong Yung Shing said that the coxswain had given no directions to any of them to act as a look-out. Moreover, he said that he had never heard him giving any such direction on any other voyage. He said that he had not occupied the chair next to the conning chair, lest the engineer wished to do so whilst monitoring the engine instruments.

118. For his part, Mr Lai Sai Ming confirmed that he had not ordered any of the crew to act as look-out on that voyage to Yung Shue Wan. After some prevarication, he agreed that he had the power to order any one of the crew to keep a look-out and in fact did do so on occasions, but only in bad weather. However, since the visibility was good he had chosen not to give such an order. He agreed that the chair next to the conning chair was a particularly good place from which to keep a look-out, but confirmed that no one had occupied that chair during that voyage.

The crew leave the wheelhouse

119. Mr Lai said that when the light beacon off Shek Kok Tsui was at about an angle of 10 o'clock, to the Sea Smooth's course of 12 o'clock, his three crew members left the wheelhouse to attend to their duties in anticipation of their arrival at Yung Shue Wan. He did not remember at what distance the beacon lay from the Sea Smooth at that time.

120. For their part, all three crew members said that they had begun to leave the wheelhouse after they had sighted the light beacon off

Shek Kok Tsui forward off the port bow of the Sea Smooth. Mr Lo Pui Kay said that at that stage the beacon was 10° to 20° off the port bow at a distance of four to five boat lengths.

121. Mr Lai Sai Ming agreed that well before the Sea Smooth was abeam the beacon off Shek Kok Tsui he started to alter its course to port gradually. He accepted from the plot drafted on the chart by Captain Pryke that he had begun that turn at least by 20:19:32. He said that in due course he intended to steer towards O Tsai Pai, another beacon located in the sea. Once abeam O Tsai Pai, as was his usual practice, he intended reducing the speed of the Sea Smooth. He accepted that at that time the Lamma IV was well within the 0.75 nautical mile range to which he had set the radar on the Sea Smooth. He agreed that a glance at the radar screen would have revealed the presence of the echo created by the Lamma IV as it came towards the Sea Smooth. Indeed, he accepted that for over a minute before the collision the Lamma IV would have been visible on his radar screen.

Collision

122. Mr Lai Sai Ming said that suddenly, a black shadow, about 2-3 boat lengths ahead of the Sea Smooth, loomed out of the very bright light shining from the entrance to the Lamma Power Station Typhoon Shelter. He agreed that it was very close indeed. He saw that it did not display any navigation lights. He judged it to be a small boat. Subsequently in his testimony, he said that when the vessels collided he had recognised it to be the Lamma IV, which was a vessel to which he had been seconded to act as coxswain earlier that year. Immediately, he put the engines of the Sea Smooth full astern and her rudders hard to starboard. As a result, the Sea Smooth's speed reduced rapidly and the vessel started altering course to starboard.

However, at that moment the bow of the port side hull of the Sea Smooth collided with the port side of the other vessel close to her stern. He judged the angle of the collision to be about 45° to the port side bow of the Sea Smooth. Although the impact of the collision was hard, he was able to remain in his seat.

The light at the entrance to the Hongkong Electric Company Power Station Typhoon Shelter

123. Mr Lai Sai Ming said that the intensity of the light from the entrance to the Hongkong Electric Company Typhoon Shelter at the Power Station was something of which he was aware as an impediment to his ability to sight a vessel at night approaching from a distance, so that he had to pay very great attention to detect a vessel. However, he accepted that he had not paid frequent attention to the radar screen. He explained that as being a "momentary" or "occasional" slip of attention. It was a "lapse of attention".

Whistle and light signals

124. Mr Lai Sai Ming said that he had not heard any whistle from the other vessel or seen or heard any other warning prior to the collision, although he accepted that both doors to the wheelhouse on the Sea Smooth were closed. Notwithstanding the fact that the wheelhouse was so enclosed, Mr Lai Sai Ming said that it was "impossible" for him not to have heard the sound of the whistle on the Lamma IV, if it had been sounded, as they approached each other. Similarly, he said that he did not see any searchlight being flashed from the Lamma IV. For his part, he did not give any sound signal on the Sea Smooth, not having had time in which to do so.

125. Mr Lai Sai Ming said that he was very shocked. Nevertheless, he opened the port side door to the wheelhouse of the Sea Smooth and saw the other vessel about two boat lengths off the port quarter of the Sea Smooth slowly drifting away. The other vessel was very similar in size to the Sea Smooth and had two decks, the Upper deck being in darkness whereas the cabin of the Lower deck was lit. Although he shouted an enquiry to the other vessel, as to whether or not those on board were all right, he received no response. On opening the door to the Upper deck cabin of the Sea Smooth, Mr Lai was told by some of the passengers that some had been injured. He ordered his crew to ascertain the circumstances of the other passengers.

126. For their part, the three crew members said that they had left the wheelhouse together and, having made their way into the Upper cabin, made their way down the stairs to the Main cabin. Then, as they reached or were reaching the Main deck, the vessel slowed down, after which they heard a loud crash. Mr Lo Pui Kay said that he had reached the gangway exit on the starboard side of the Main deck when the collision occurred. He fell to the ground. Mr Wong Tai Yau said that he had reached the penultimate step on the stairs when he too fell to the ground as a result of the collision.

127. For his part, Mr Wong Yung Shing said that he was standing in the vicinity forward of the gangway on the port side of the Main deck. He felt that the vessel was slowing gradually. Then, there was a crash and he was knocked down to the deck by the collision. He said that the door to the bow from the Main cabin burst open. As he regained his standing position he noticed through the doorway a ship in contact with Sea Smooth, sliding down its port side. He said that there were dim lights at its stern. He said that he followed some

passengers out through the door onto the bow area. However, he had returned to the cabin when he had heard shouts instructing people to don lifejackets.

128. None of the members of the crew heard the sound of a ship's whistle, although they too accepted that they were inside, first the wheelhouse and then the cabins, none of which had windows open to the elements.

129. Mr Lo Pui Kay and Mr Wong Tai Yau patrolled the cabins to ascertain whether any passengers had sustained any injuries. Then, they returned to the wheelhouse to communicate with the coxswain. Mr Lo Pui Kay said that in answer to his question as to what happened, the coxswain had said "We hit a vessel". Since the coxswain was on the radio to the Marine Department, he gave no further explanation then or indeed at any stage subsequently. Mr Lo Pui Kay said that he heard an audio alarm sound. The alarm indicated that two of the watertight compartments on the port side of the hull, namely compartments 1 and 2 were flooding. Mr Lo Pui Kay said that, on the instructions of Mr Lai Sai Ming, he went to the Lower deck to check water ingress.

130. For his part, Mr Lai Sai Ming said that he had heard the audio alarm alerting the wheelhouse to water ingress into the watertight compartments in the hull. Although he said that there was a row of lights on the console in the wheelhouse indicated water ingress into each of the watertight compartments of the two hulls of Sea Smooth, he said that he did not pay attention or notice whether or not the lights were illuminated or how many of them were so illuminated. He was not sure how many such watertight compartments were in Sea Smooth's hull.

131. Mr Lo Pui Kay said that there was no water ingress in the Engine room, but nevertheless he turned on the fire pump to act as another bilge pump. Then, he returned to the Main deck, where he conducted an inspection of watertight compartments in the port hull by opening up the respective manhole covers. He discovered that there was some water in compartment 3 and ongoing water ingress into compartments 1 and 2. However, having opened the manhole covers he did not lock them back into position. Next, he told passengers to don lifejackets, after which he returned to the wheelhouse to report to the coxswain. Then, water came into the cabin through one of those manhole covers on the port side forward.

132. Having returned to the wheelhouse, Mr Lo Pui Kay said that once again the coxswain was communicating with people outside the vessel, this time using a telephone to speak to company representatives. He said that he told Mr Lai that the port hull was damaged and that there was water ingress. For his part, Mr Lai Sai Ming said that he did not remember the engineer reporting that matter, although he remembered that someone had told him that water was coming in and there was a "big hole there". As a result, he ordered the passengers to don lifejackets.

133. Mr Lo Pui Kay said that by this stage, a large number of passengers were demanding that the vessel be sailed to the nearby pier at Yung Shue Wan. One male passenger entered the wheelhouse to demand just that. For his part, Mr Lo Pui Kay said that he had gone out onto the wing bridge and noticed that the vessel was close to rocks of the beacon off Shek Kok Tsui. He urged the coxswain to sail away. In the result, the coxswain sailed the vessel to Yung Shue Wan, where the passengers disembarked.

134. Although Mr Lo Pui Kay said that he had gone to the stern of the Sea Smooth earlier, as he patrolled the decks after the collision, in order to check whether or not any passengers had fallen overboard and although he went on to the wing bridge at the time when he sighted the nearby rocks at no stage did he see any sign of the other vessel involved in a collision or any of its passengers. It did not occur to him to seek to find out what had happened to the other vessel. He merely waited for the coxswain to give instructions. Whilst he acknowledged that there was a searchlight mounted on the exterior roof of the wheelhouse of the Sea Smooth, he did not remember seeing the beam of light being displayed after the collision.

The Sea Smooth sails on to Yung Shue Wan

135. Mr Lai Sai Ming said that an atmosphere of panic and fear reigned amongst the passengers, some of whom expressed concerns that the Sea Smooth might sink and made demands that the vessel sailed to Yung Shue Wan Ferry Pier immediately. He said that although he was concerned about the safety of the other vessel involved in the collision, having regard to his own vessel and its passengers he determined to proceed to Yung Shue Wan Ferry Pier. He said that he had not heard the engineer warning him about the proximity of rocks or a reef on the port side of the Sea Smooth. That issue had nothing to do with his decision to sail to Yung Shue Wan Ferry Pier.

136. Having returned to the wheelhouse, Mr Lai said that he called the Marine Department on Sea Smooth's VHF radio and on his mobile telephone, informing them that there had been a collision near Lamma Island and that his vessel was damaged with water ingress and, given that he was in a dangerous situation, he was proceeding with his

passengers to Yung Shue Wan Ferry Pier. Also, he contacted Hong Kong and Kowloon Ferry Company by Sea Smooth's single side band radio and gave them the same information. Then, he steered Sea Smooth to Yung Shue Wan Ferry Pier where his passengers disembarked.

137. Mr Lai Sai Ming explained the fact that he had shouted enquiries and given directions to those on board the Sea Smooth after the collision on the basis that, although he had looked for the microphone for the public address system, it had become dislodged in the course of the collision. Shouting was all he could do. Photographs taken of the wheelhouse of the Sea Smooth shortly after the collision confirm that to be the case.

138. After Mr Lai Sai Ming had sighted the Lamma IV from the port bridge wing shortly after the collision, at which point it was two boat lengths to his aft port quarter, it was their evidence that none of the crew of the Sea Smooth sighted the Lamma IV again. It was the tenor of their evidence that they were preoccupied with the predicament of their own vessel and the safety of their own passengers. Mr Lai Sai Ming said that he had not even looked on his radar screen to see if he could locate the other vessel involved in the collision. They made no attempt to throw lifebuoys into the sea or manoeuvre the vessel so that its searchlight could be brought to play on the surrounding waters. Rather, following the collision, after having drifted for a while whilst its engines were neutral, Mr Lai Sai Ming steered the Sea Smooth directly to the Yung Shue Wan Ferry Pier.

THE OPINION OF CAPTAIN PRYKE AS TO THE CAUSE OF THE COLLISION

INITIAL OPINION: FORENSIC EVIDENCE

139. As noted earlier, at the direction of the Commission Captain Pryke addressed first of all the issue of the navigation of the Lamma IV and the Sea Smooth in the context of the available forensic evidence, in particular having regard to compliance with the COLREGS, but prior to the receipt of any account of events from the coxswain of the Sea Smooth or any witness statements supplied by the respective solicitors of the crew of the two vessels in advance of their subsequent oral testimony. He did so in written reports dated 4 and 8 December 2012, in respect of which he testified on 13 and 14 December 2012.

140. Subsequently, Captain Pryke was recalled on 7 and 8 February 2013 to permit questioning by Mr Sussex on behalf of the Sea Smooth involved parties, he having been allowed to reserve his questioning pending his receipt of assistance by an expert. On his recall the Commission received a 'Note' from Captain Pryke, which primarily addressed matters raised earlier by Captain Pryke with which Captain Browne, engaged on behalf of the Sea Smooth involved parties, had taken issue in a report dated 29 January 2013 which, together with his oral testimony, the Commission was invited to receive by Mr Sussex. Following the receipt of the testimony of the crews of the two vessels, Mr Sussex was permitted to withdraw his application that the Commission receive Captain Browne's report and oral testimony.

141. Captain Pryke testified that he had used the radar data from both the Marine Department and the Marine Police to plot the courses of the two vessels as they approached one another in what resulted in

their collision. Although that data provided positions of latitude and longitude at three second intervals, he chose to plot the course based on positions stipulated at about one minute and then, as they came closer to one another, at 30 second intervals. He did so in particular in order to accommodate the inaccuracies inherent of taking a plot based on such a short period as three seconds. (**Appendix 5; page A19.** Radar plot prepared by Captain Pryke)

142. As noted earlier, the Marine Department radar plot provides an overview of almost all of the journeys of both vessels that night. (**Appendix 1**)

143. Captain Pryke said that he calculated that the distance between the Sea Smooth and the Lamma IV and the bearing of one from the other was:

20:17	1.92 nautical miles - the Lamma IV 4° from the port bow of the Sea Smooth; the Lamma IV was just completing her manoeuvre out of the typhoon shelter;
20:18	1.375 nautical miles - the Lamma IV 4° from the port bow of Sea Smooth (steady); Sea Smooth 6° from the starboard bow of the Lamma IV;
20:19	8 cables (0.8 nautical miles) - the Lamma IV 5° from the port bow of Sea Smooth and Sea Smooth 6° from the port bow of the Lamma IV;
20:20	1.9 cables (0.19 nautical miles); and
20:20:17	collision.

144. Captain Pryke said that the digital radar records did not show any deceleration before the collision of either Sea Smooth or the Lamma IV.

20:16:00: sighting of each vessel from the other

145. In his opinion, from 20:16:00 both vessels could have seen each other very clearly on radar and visually. He said that the lights exhibited by vessels at anchor in the North Lamma Anchorage, which would have appeared behind the lights of the Sea Smooth between 20:18 and 20:20 might well have caused a slight delay in the sighting of the Sea Smooth from the Lamma IV. Nevertheless, he said that given its fast approach and the flashing yellow light at his masthead the approach of the Sea Smooth ought to have been very clear to the Lamma IV. He noted that their closing speed was about 36 knots, with the Sea Smooth travelling at about 24.5 knots and the Lamma IV at about 11.5 knots. At that speed, they were closing at 1/10 of a nautical mile every 10 seconds.

20:18:00: risk of collision

146. For purposes of determining the manoeuvre each vessel was required to perform as they approached each other, it was his opinion that the two vessels were clearly in a head-on and not crossing situation. Accordingly, Rule 14 of the COLREGS applied.

147. Captain Pryke said that at 20:18 the coxswain of the Sea Smooth should have assessed the risk of collision as having arisen, given that the Lamma IV had remained for one minute on a steady bearing of 4° from the bow of the Sea Smooth. Between 20:17 and 20:18 the Sea Smooth made a course of 180° (8 February 2013; Day 33, page 18, line 14). Having manoeuvred out of the Hongkong Electric Company Typhoon Shelter, at 20:18 the Lamma IV was steering a course at 350°. Having re-plotted the matter during his testimony, Captain Pryke said that between 20:19:01 and 20:19:32 the

Lamma IV made a course of 358° and that between 20:19:32 and 20:20:01 she made a course of 000°. In those circumstances, it was Captain Pryke's opinion that, if both vessels remained on those courses, no collision would have occurred, albeit that the vessels would have passed each other on reciprocal courses at a distance of under one cable, which was an "unacceptable close quarters situation".

148. However, in Captain Pryke's opinion the collision was caused by an alteration of course to port by the Sea Smooth at 20:19:30. That manoeuvre by the Sea Smooth to port, rather than the required manoeuvre to starboard, was in flagrant contravention of Rule 14(a).

149. He noted that between 20:19:00 and 20:20:17, the time of the collision, the Sea Smooth had altered course 16° to port, whereas in the same time period the Lamma IV had altered her course 13° to starboard.

150. When recalled to give further testimony in the first week of March 2013 Captain Pryke did so having read the transcript of the evidence of the crews of both the Sea Smooth and the Lamma IV.

Look-out

151. In the context of the evidence of the two crews, Captain Pryke said of the look-out of the Sea Smooth (5 March 2013; Day 45, page 59):

> "... the evidence of Coxswain Lai underlines even more that there was no bridge organisation on the Sea Smooth, and the matter of the look-out was, well, appalling."

152. Of the look-out on the Lamma IV, Captain Pryke said of the fact that he had not expressed the opinion that there had been a failure

of look-out on the Lamma IV in his first report dated 4 December 2012, that (5 March 2013; Day 45, page 56):

> "... the reason that I didn't at that time was that he did apparently see Sea Smooth at about three cables, and he did have a problem with all the anchored ships in the Lamma Anchorage."

He went on to say:

> "I think his look-out was clearly better than Coxswain Lai, but nevertheless it did, of course, leave something to be desired."

153. Of Coxswain Chow's evidence, that he had first sighted the Sea Smooth on radar at one nautical mile distance, but had not observed the vessel further until he sighted it visually at three cables distance from the Lamma IV, Captain Pryke went on to say (page 60):

> "Well, obviously it is not good. But there is also the case, in fairness to him, that if he saw it a mile off, that was before Sea Smooth altered course to port, Sea Smooth altered course to port around about half a mile off, as I recall. That was the point of no return, frankly. Whereas if you look at an echo at a mile and you see which way the track is running, which you can see from the afterglow on the screen, had he seen it at a mile, with an afterglow that was running down past the centre of his radar screen, in other words looking not to be on a collision course, he may have put that in the back of his mind for later reference. Whereas *the alteration of course at half a mile off to port really was the fatal manoeuvre in this whole thing."* [Italics added.]

154. Nevertheless, Captain Pryke went on to agree that if Coxswain Chow had been watching his radar screen he would have noticed the change of course of the Sea Smooth to port at half a nautical mile.

The Lamma IV's alteration of course to starboard

155. Captain Pryke said that having regard to the report of Dr Armstrong, made only after Captain Pryke had made his first two reports and given oral evidence in December 2012, in which he expressed the opinion that the two vessels had collided at an angle of

about 40°, Captain Pryke said that he was satisfied that the Lamma IV (page 55):

> "… did actually manage to alter (course) quite considerably before the collision."

156. However, he said that the alteration of course "hard to starboard", which he accepted to be the appropriate collision avoidance action for the Lamma IV, was not taken until about 20:20:10, in other words seconds before the collision. In particular, he said that it was his opinion (6 March 2013; Day 46, page 39):

> "… I don't think he did it at three cables."

Alteration of course by the Sea Smooth

157. Of such alteration of course that there was by the Sea Smooth immediately before the collision, Captain Pryke said (5 March 2013; Day 45, page 54):

> "… but I think the action taken was just so late that it wasn't an action. It wasn't a practical collision-avoidance option; it was just a last-minute panic."

COLREGS

158. Having regard to the COLREGS it was his opinion that:

The Sea Smooth

did not:

(a) keep a proper look-out (Rule 5);

(b) proceed at a safe speed (Rule 6);

(c) make proper use of radar (Rule 7(b));

(d) take action to avoid collision (Rule 8);

(e) alter course to starboard (Rule 14); and

(f) make any warning signals (Rules 34 and 36).

The Lamma IV

did not:

(a) take positive action in an ample time (Rule 8);

(b) alter her course sufficiently to starboard (Rule 14); and

(c) use warning signals in compliance with Rule 34 (d) and Rule 36.

159. Of the relative culpability of the two coxswains, it was Captain Pryke's opinion that Coxswain Lai on the Sea Smooth was primarily responsible for the collision, having regard to the fact that he had made a significant alteration of course to port at 20:19:29, which change of course was in flagrant breach of Rule 14 (a), which required him to alter course to starboard, given that the two vessels were meeting on reciprocal or nearly reciprocal courses, so as to avoid risk of collision.

A CONSIDERATION OF THE EVIDENCE

I. WERE THE NAVIGATION LIGHTS OF THE LAMMA IV LIT AT THE TIME OF THE COLLISION?

160. In addition to the evidence of all three crew members of the Lamma IV that the navigation lights of the Lamma IV had been turned

on whilst the vessel was berthed alongside at the Hongkong Electric Company Typhoon Shelter, the coxswain of the Lamma II testified that he had seen the navigation lights of the Lamma IV lit as she manoeuvred away from her berth and exited the typhoon shelter. He said that he had seen it displaying navigation lights, in particular its red and green sidelights. His vessel was also berthed alongside next to the Lamma IV and he had followed it out of the typhoon shelter.

161. Mr John Rebanks, a passenger seated in the middle of the first row on the Main deck of the Sea Smooth, testified that he witnessed the approach of the vessel with which Sea Smooth collided. From his perspective it was approaching him head-on, slightly to the right. He said that he has seen lights coming from the Upper cabin of the other vessel, above which was a white light on top of the mast. It was the bright light which caught his attention because he realised that the collision was about to occur. At first, he had thought it was a light on a navigation mark, but then realised it was a white light on top of the mast of a ferry. He did not see either a green or red light displayed on the other vessel. He said that after it had been approaching for about 10 seconds it turned to its right, he judged that it was to avoid a collision. However, immediately the collision occurred. (**Appendices 6-7; pages A20-21**. Upper deck and Main deck plans of the Sea Smooth)

162. Mr Tam Kam Lun, Fireman 12994, testified that he had arrived at the immediate vicinity of the Lamma IV as she was sinking at about 20:41 on Fireboat 4. He noticed that the bow of the Lamma IV was pointing upwards out of the water and saw a starboard green navigation light that was still lit and noted that the radar scanner on top of the bridge was still turning. During the course of rescuing

passengers trapped inside the Lamma IV, Mr Tam said that he had tied off the mooring line of a police vessel to the wooden structure which housed the starboard navigation light. That evidence was not challenged at all in questions put on behalf of the crew of the Sea Smooth.

Forensic evidence

(i) Dr Cheng Yuk Ki

163. Dr Cheng Yuk Ki is a forensic scientist employed since 1997 as a chemist by the Forensic Science Division of the Hong Kong Government Laboratory. He was awarded the degrees of Bachelor of Science (Chemistry) and Doctor of Philosophy by the University of Hong Kong. He examined and inspected the Lamma IV on a number of occasions, first on 3 October 2012 when she was beached at Nga Kau Wan and thereafter at the Government Dockyard. In an examination he conducted on 15 October 2012, he found that the housing of the green starboard light, the red port light and the masthead light were intact but contained traces of water. The light bulb in the red port light was broken and the bulb in the green starboard light snapped in the middle, as was the bulb in the masthead light.

164. On 19 October 2012, those bulbs were delivered to him in the Government Laboratory for his inspection. On an initial inspection, he found white/black powder deposited on the inside of the glass bulbs and the contact wires. In consequence, he said it was his opinion that it was highly likely that the filaments of the light bulbs were illuminated when the glass bulbs were cracked, probably due to water ingress in the housing of the navigation lights which caused the

bulbs to crack due to the rapid cooling of the hot glass bulbs in contact with seawater. Dr Cheng explained that contact with air, in particular oxygen in the air, of hot tungsten filament caused immediate oxidisation of the tungsten.

165. At the request of the Commission, Dr Cheng performed further tests to confirm the presence of tungsten oxide inside the three respective bulbs and was recalled subsequently to testify in respect of those results. He said that he had detected tungsten and oxygen in the powder attached to the filament coils of all three bulbs. The powder was black or dark purple in the cases of the bulbs housed in the starboard and port sidelights. Also, in the case of the bulb in the starboard light he found white powder attached to the tail of the filament. Those findings further strengthened his opinion that the bulbs were highly likely to have been lit at the time that the bulbs were cracked when they came into contact with seawater.

166. In the case of the bulbs in the port sidelights and the masthead light he found white powder attached to the long metal supports of the light bulbs which was analysed to contain magnesium, sodium chloride and oxygen. Electrolysis of seawater causes the deposit of magnesium hydroxide on the cathode, namely the negative electrode. In his opinion, a direct current of electricity was still flowing between the metal supports of the bulb when it came into contact with seawater.

(ii) Professor Ho Siu Lau

167. Professor Ho's assistance was sought in respect of the narrow issue of the interrelationship between two electrical panels located on the aft wall of the port side of the wheelhouse of the Lamma IV and the details of how they were to be operated. That assistance was necessary because neither the owner of the vessel, Hongkong Electric

Company, nor the shipbuilder, Cheoy Lee Shipyards, was able to provide the Commission with any material whatsoever as to those matters. For example, a manual that explained the positions in which switches or dials were on or off.

168. The two electrical panels were labelled respectively: 'NAVIGATION LT D/ST BOARD' and '24V DC MAIN SW BOARD'. The former being positioned above the latter.

169. Beneath a row of seven white indicator lights, each marked with a specific navigation light, were seven matching switches. The four switches for the indicator lights marked masthead, port, starboard and stern were all in the 'On' position. In that position the indicator light would be illuminated if the respective navigation light was lit. Similarly, the respective circuit breakers beneath those four switches were all in the 'On' position, so that an electric current that reached a functioning bulb would cause it to be illuminated.

170. Many of the circuit breakers on the '24V DC Main SW Board', including that for the navigation lights had been tripped. In Professor Ho's opinion that indicated a large current has caused them to trip. Tripping of the circuit breaker for the navigation lights would have cut off the supply of electricity to those bulbs.

171. Without further examination of similar equipment, Professor Ho was unable to establish in which position of the 'alarm mute' switch the audio alarm sounded in the event of a navigation light bulb failure. Similarly, because of the presence of rust, he was unable to express an opinion as to how dim the indicator lamp bulbs could be reduced in brightness by application of the 'Dimmer' dial. He noted that copper oxide was to be found on the connections to the

button for use of the whistle, located in the console in the wheelhouse. He pointed out that it was to be found also on other connections of other pieces of equipment in the console. He did not know if those deposits came to be there before or after the collision. He was unable to say whether the whistle would have functioned before the collision.

Conclusion

172. We accept Dr Cheng's evidence as to the state of the inside of the broken bulbs that had been housed in the starboard, port and masthead lights of the Lamma IV as compelling evidence that those bulbs had been illuminated at the time of the collision. The obvious explanation suggested by Dr Cheng, that the bulbs fractured when the hot glass came into contact with seawater, was entirely consistent with his findings of tungsten oxide in all three bulbs. That oxide had been formed by contact with oxygen in the air when tungsten filament was very hot, as is the case when it provides light. The presence of magnesium hydroxide in the bulbs housed in the port and masthead navigation lights was indicative of electrolysis with seawater at a time when the current was flowing in the bulb. The evidence of Professor Ho did not in any way cast doubt on those findings.

173. In any event, we accept the evidence, wholly independent from the crew of the Lamma IV or the coxswain of the Lamma II, of Mr John Rebanks that he had seen the illuminated masthead light bulb of the Lamma IV in the seconds before the collision occurred with the Sea Smooth. He gave a compelling description of his view of the light as he came to realise that it was a masthead light on a vessel with which his vessel was about to collide. Similarly, we readily accept the graphic evidence of Fireman Tam Kam Lun that he had seen the green starboard light illuminated as he went to the rescue of a female

passenger of the Lamma IV, who was hanging on to a railing at the side of the Main deck. Again, he was a witness wholly independent from the crew of the Lamma IV or the coxswain of the Lamma II.

174. We also accept the evidence of the three crew members of the Lamma IV in respect of the navigation lights of the Lamma IV being turned on and displayed before the commencement of the voyage to Victoria Harbour. Similarly, we accept the evidence of the coxswain of the Lamma II that the appropriate navigation lights were displayed on the Lamma IV, as he saw her manoeuvre out of the Hongkong Electric Company Typhoon Shelter.

175. In the result, we are satisfied that the Lamma IV was displaying the appropriate navigation lights forward as she was approached by the Sea Smooth. Accordingly, without hesitation, we reject the evidence of Coxswain Lai that no navigation lights were displayed on the Lamma IV.

II. THE NAVIGATION OF THE SEA SMOOTH

176. We accept as entirely appropriate Captain Pryke's opinion of the organisation of a bridge look-out on the Sea Smooth as "appalling". Clearly, Mr Lai had an ample number of crew with him in the wheelhouse at an early stage of his voyage with which to post a look-out to assist him in navigating the vessel. He bears the responsibility for failing to post such a look-out. Perhaps, his failure to do so resulted from an over familiarity with the route on which he was navigating. Given that he was navigating the vessel at speeds of up to 24.5 knots, his failure to avail himself of readily available assistance was egregious.

177. Mr Lai's failure to ensure that a proper look-out was in place is to be viewed in the context of the corporate culture of Hong Kong and Kowloon Ferry Company. If there had been in place company directives communicated to both coxswains and their crew that a member of the crew was to be designated by the coxswain as a look-out on each voyage, no doubt that would have been of assistance to Mr Lai in requiring a member of the crew to act as his look-out. There was no such structure in place. For his part, Mr Lai evinced an obvious reluctance to order a member of the crew to be a look-out, other than in bad weather. It would seem that, rather than be seen to be imposing that duty on a member of the crew, perhaps tired at the end of a long day, he chose to take all responsibility on his own shoulders.

178. The reluctance of Mr Lai to impose a duty of look-out on his crew appears to have been matched in equal measure by the reluctance of the crew to take it upon themselves to assist him in look-out. The engineer placed himself in a position where he could not see outside the wheelhouse for most of the journey. We are satisfied that such look-out as the two deckhands might have maintained was desultory, at best. The obvious place from which a look-out ought to have been maintained was in the chair next to the conning chair. The fact that it was empty throughout the voyage speaks volumes.

Radar

179. We accept Captain Pryke's opinion that setting the radar screen at a 0.75 nautical mile setting, without ever changing it from time to time to afford himself a greater view of oncoming traffic, was a failure to use the available radar equipment appropriately. Given that the speed at which the Sea Smooth was travelling, particularly

after she had passed through the Sulphur Channel leaving Green Island to starboard, we are satisfied that a prudent mariner would have done as Captain Pryke suggested and changed the radar setting from time to time to afford himself the opportunity of identifying oncoming vessels at a greater distance, so that he would be alert to their impending arrival on the lower range setting of 0.75 nautical miles. We accept Captain Pryke's evidence that if Mr Lai had done that, he would have been able to detect the Lamma IV as she left the Hongkong Electric Company Typhoon Shelter.

180. In any event, on the setting of 0.75 nautical miles, which Mr Lai said was the setting on the radar of the Sea Smooth, the Lamma IV would have been detectable as a radar echo by 20:19:08, a full one minute and nine seconds before the collision. Whilst we accept the force of Captain Pryke's observation that 20:19:08 was a point in time before the Sea Smooth began her significant move to port at 20:19:30, equally we accept the significance of the fact that the manoeuvre was begun when the vessels were as much as about half a nautical mile apart. That afforded ample opportunity to detect the fact that the Sea Smooth was turning to port and not to starboard.

181. We do not accept Mr Lai's evidence that his failure to detect the Lamma IV on radar was a momentary or occasional slip of attention. We are satisfied that, for whatever reason, perhaps because of the relatively good visibility and his over familiarity with the route, he made no use or proper use at all of the radar on the Sea Smooth on that voyage.

The light at the end of the pier

182. It is to be noted that Captain Pryke calculated that at 20:19:00 the Sea Smooth was 1.2 nautical miles away from the light at the end of the pier of the Hongkong Electric Company Typhoon Shelter. Clearly, the effective use of radar on the Sea Smooth would have overcome whatever difficulties that were, and we do not think those alleged difficulties to be at all significant, in sighting a vessel visually against the background of that light. Moreover, it is significant that even at 20:19:30 and 20:20:00 the Sea Smooth was at 1.02 and 0.80 nautical miles respectively away from that light. We are satisfied that the presence of the light in no way explains, let alone excuses, Mr Lai's failure to sight the Lamma IV visually. Needless to say, it is wholly irrelevant to his failure to sight the Lamma IV on radar.

Collision risk and avoidance action

183. We accept Captain Pryke's evidence that at 20:18:00 Mr Lai ought to have determined that the risk of collision existed with the Lamma IV and that the vessels were in a head-on situation, such that Rule 14 of the COLREGS applied. His chart plot (**Appendix 5**) bears eloquent testimony to the fact that Captain Pryke is correct in expressing that opinion. The Lamma IV and the Sea Smooth were on reciprocal or nearly reciprocal courses.

184. Further, we accept Captain Pryke's opinion that as the two vessels closed on each other at a combined speed of 36 knots, at which speed the distance between them narrowed at one cable every ten seconds, Mr Lai ought to have complied with Rule 14 and turned the Sea Smooth to starboard. In fact, he did the opposite and turned the Sea Smooth to port at about 20:19:30. We accept Captain Pryke's

characterisation of the turn to port of the Sea Smooth as the "fatal manoeuvre". As he said in testimony, "doing nothing would have been better" so that, although there would have been an unacceptably close quarters passing of the vessels, the collision would not have occurred.

The Lamma IV: Sound and light signals

185. We accept Mr Lai's evidence that he did not hear a sound signal or see a light signal, in particular a short blast on the whistle and a short flash with the searchlight of the Lamma IV, in the time period leading up to the collision. For the reasons set out subsequently we are satisfied no such signals were given by Mr Chow Chi Wai on the Lamma IV.

Action

186. We are satisfied that, even if Mr Lai's evidence is accepted in respect of his action in the face of the collision, namely to put the Sea Smooth's engines full astern and her rudders hard to starboard, such action was too little and too late. We accept Captain Pryke's categorisation of that action, "it wasn't a practical collision-avoidance option; it was just a last-minute panic."

Conclusion

187. Mr Lai's failure to detect the Lamma IV at all on radar and not to detect that vessel by sight, which we have found to be displaying her proper navigation lights, until she was 2-3 boat lengths away, was a truly egregious failure of look-out. It displayed a woeful standard of seamanship. We accept Captain Pryke's opinion in respect of Mr Lai's breaches of the COLREGS, namely that he did not:

keep a proper look-out (Rule 5);

make proper use of radar (Rule 7);

proceed at a safe speed (Rule 6);

take action to avoid collision (Rule 8);

alter course to starboard (Rule 14); and

make any warnings or signals (Rules 34 and 36).

188. Finally, whilst we accept that it is not appropriate for this Commission to condescend to any detailed attribution of the proportion of culpability between the two coxswains, we are satisfied that fairness requires that we state that we accept Captain Pryke's opinion that Mr Lai was primarily responsible for the collision.

III. THE NAVIGATION OF THE LAMMA IV

Radar

189. There is no dispute that, although the Lamma IV was not required by the Marine Department to be equipped with radar, she was equipped with radar and that radar was operating on her fateful voyage on the evening of 1 October 2012. At issue is what use Mr Chow made of his radar during the voyage. He said that he had observed the radar screen at the start of his voyage with the rings set at one nautical mile, so that he was able to see not only the Lamma II but also the light beacon off Shek Kok Tsui.

190. We accept Captain Pryke's opinion that it would have been a better practice to have observed the screen at a three nautical mile ring prior to commencing the voyage, so that marine traffic could have

been observed as far away as the Sulphur Channel in the passage between Green Island and Hong Kong Island. If Mr Chow had done that in the minute before he set sail, he would have observed Sea Smooth travelling at over 20 knots in the direction into which he was going to sail.

191. There is no question but that visibility was good on the evening of 1 October 2012. No doubt, for that reason Mr Chow said that he was steering the Lamma IV by line of sight. We reject his testimony that he first observed what turned out to be Sea Smooth on radar at one nautical mile distance. Not only had he never mentioned that in any of his earlier written statements or notes of interview but also in his interview by the Marine Department he had asserted the opposite:

> "Therefore, (I) did not notice the radar picture. Up to the moment of collision, I did not check the radar picture."

192. His explanation that he had "forgotten" to include an account of his sighting the Sea Smooth on radar at one nautical mile in the full and lengthy statement dated 6 February 2013 accepted as his evidence-in-chief simply beggars belief. Needless to say, all the various enquiries of Mr Chow prior to these hearings available to the Commission as to the circumstances of the collision invited him to address the issue of when it was that he had first sighted the Sea Smooth. It was self-evident that his account was of vital importance. Similarly, we reject his assertion that he had monitored the progress of the echo of Sea Smooth on his radar screen as she moved across the one nautical mile ring towards the Lamma IV.

193. We find that Mr Chow relied only on visual navigation. Perhaps, that approach was born out of over familiarity with the route, it being one which he traversed many times. In the result, we are satisfied that he failed to make any or any proper use of the radar available to him as an aid to navigation in his journey. In consequence, he was in breach of COLREGS Rule 7(b).

Lights from the North West Lamma Anchorage

194. We are satisfied that Mr Chow has exaggerated the effect on his ability to navigate visually by the presence of anchored vessels in the North West Lamma Anchorage. To describe those lights as being "blinding" as presented to him on that journey is an absurd exaggeration. No doubt, as Captain Pryke testified they presented a degree of difficulty to a navigator as the oncoming Sea Smooth navigated through the anchorage, after which the lights in the anchorage were a background to the oncoming vessel. But, as Captain Pryke said, the Sea Smooth presented as a fast moving vessel with a flashing yellow light at her masthead. She was readily visible to Mr Chow long before any of the various versions he has given as to when he saw her first: either at three cables, or about one minute before the collision or adjacent to the light beacon off Shek Kok Tsui. In the event, we are satisfied that Mr Chow failed to keep a proper look-out, contrary to Rule 5 of the COLREGS.

195. In any event, such well-known difficulty as Mr Chow contended the lights did present to him was all the more reason that a proper watch ought to have been maintained on radar. He did not do so.

196. We readily accept Captain Pryke's opinion that in conning the vessel Mr Chow was handicapped by the absence of a crew member to perform look-out duties, in particular in respect of radar. We accept his opinion that it is extraordinary that the Lamma IV was not required by the Marine Department to be equipped with radar. She was a vessel licensed to carry 232 persons on board and regularly plied a route across the very busy Lamma Channel. Equally, it is most unsatisfactory that nobody on board the Lamma IV was officially qualified as a radar observer. In this respect, we accept that Mr Chow had a working knowledge of the use of radar for navigation. We accept his testimony that his request of Mr Tang Wan On for assistance in being trained to use the radar equipment more effectively, particularly after the installation of the new radar equipment in 2009, met with no positive response. That attitude of the Marine Officer of Hongkong Electric Company, together with the provision of a radar manual in English only, notwithstanding requests for assistance in that regard, is to be strongly deprecated in an important public utility company for whom issues of safety must be paramount.

Alteration of course to starboard

197. We accept Captain Pryke's ultimate opinion that shortly before the collision occurred the Lamma IV had been turned to starboard. However, equally we accept that the turn to starboard had occurred only very shortly before the collision, namely at about 20:20:10. The fact that the vessel had been turned to starboard is consistent with the evidence of Dr Armstrong as to the relative headings of the vessels, namely about 40°, at the time of the collision and to his evidence and that of Dr Cheng as the angle of the gash in the hull of the Lamma IV. We reject Mr Chow's evidence that he

turned the vessel hard to starboard at a much earlier time, having seen the oncoming Sea Smooth at around three cables distance. Strong support for the rejection of that evidence is to be found in the forensic evidence in respect of the course of the Lamma IV up to the moment of the collision, which indicated no deviation of course of the kind to be expected to follow an application of the rudders to "hard starboard" at a much earlier time than 20:20:10.

198. Similarly, we are prepared to accept the evidence of Mr Chow that he had accelerated the engines of the Lamma IV shortly before the collision in order to try and turn the vessel more quickly. His evidence in that respect was consistent with the evidence of two witnesses who were standing at the stern of the Lamma IV's Open Upper deck area, Mr Tang Ying Kit and Madam Lam Muk Lin. However, we are satisfied that both actions came too late. Accordingly, we are satisfied that Mr Chow was in breach of Rules 8 and 14 of the COLREGS in that respectively he failed to take positive action in ample time and to alter course sufficiently to starboard.

Sound and light signals

199. We reject Mr Chow's evidence that, after he had turned to starboard, he had sounded a short blast on the whistle of the Lamma IV followed by a short flash on the searchlight of the vessel, both signals indicating that the Lamma IV was turning to starboard. Given that the whistle was required to have an audibility range of one nautical mile, it beggars belief that, if it had been sounded, it was not heard by a single person on either vessel. In that respect, we accept the evidence of Mr Lai that if the whistle had been sounded on the Lamma IV in the circumstances described by Mr Chow it was "impossible" that he had not heard it. Similarly, nobody on either

vessel saw the light signal Mr Chow said that he gave on the searchlight of the Lamma IV. We are satisfied that Mr Chow was embellishing his account of what he had done in response to the emerging circumstances. Whilst we have accepted that very shortly before the collision he began turning the vessel to starboard we are sure that he did not give those sound and light signals. Accordingly, we are satisfied that Mr Chow failed to use warning signals in compliance with Rule 34(d) and Rule 36 of the COLREGS.

III. THE CIRCUMSTANCES IN WHICH THE VESSEL SANK

WHY DID THE LAMMA IV SINK AND DO SO QUICKLY?

THE OPINIONS OF DR ARMSTRONG AND DR CHENG YUK KI

200. It was Dr Armstrong's opinion that the port side bow of the Sea Smooth had struck the port side of the Lamma IV aft of midships at a relative heading of 40° when the Sea Smooth was travelling at over 22.5 knots and the Lamma IV at over 11.5 knots. He and Dr Cheng Yuk Ki agreed that the angle of the gash to the hull of the Lamma IV was about 30°. (**Appendix 8; page A22**. Sketch showing the relative positions of the Sea Smooth and the Lamma IV during collision)

201. Both Dr Armstrong and Dr Cheng described a diagonal gash being caused to the hull of the Lamma IV on its port side, which penetrated the side panels of the vessel at the Engine room extending beneath the waterline. That gash was caused by contact with the stem bar of the port hull of the Sea Smooth. Then, having made contact with the watertight bulkhead between the Engine room and the Tank room, the port hull of the Sea Smooth penetrated the side panels of the Lamma IV at the Tank room beneath the waterline. Eventually the collision bulkhead of the Sea Smooth made contact with the hull of the Lamma IV and her forward motion was stopped. In consequence, there was water ingress into the Engine room and the Tank room. Since there was no watertight door to the bulkhead between the Tank room and the Steering Gear compartment that too flooded. (**Appendices 9-11; pages A23-25**. Photos – port side of the hull, non-

watertight bulkhead between Compartments E and F, and Tank room of the Lamma IV)

The Lamma IV: estimates of the time it took to sink

202. No issue was taken with Dr Armstrong's estimates of the time it took for the Lamma IV to sink and then come to rest with her stern on the seabed. He calculated the rate of ingress of water through the gash and the hole into the Lamma IV, having measured their respective sizes and having made allowance for a 'choke' factor, resulting from presence of debris inhibiting the ingress of water. He said that he was able to calculate the rate of inflow of water in those circumstances by the commonly-used Bernoulli equation. In the result, he calculated that from the moment of collision it took the Lamma IV 96 seconds to sink, that is the point in time at which the deck at the stern of the vessel went below the waterline, and 118 seconds from the moment of collision before the Lamma IV reached an angle of incline to the horizontal of 70°. (**Appendix 12; page A26**. Angles assumed by the Lamma IV after sinking)

203. Unsurprisingly, it was Dr Armstrong's opinion that period of time was a very short one in which to organise an effective evacuation of the passengers.

THE MARINE DEPARTMENT'S REGULATORY GUIDANCE

Watertight Subdivision

204. Dr Armstrong noted that both the Instructions for the Survey of Launches and Ferry Vessels (1989) (commonly known as the 'Blue Book') and the subsequent Instructions for the Survey of Class I and Class II Launches and Ferry Vessels (1995) (the '1995 Instructions')

refer to the need for watertight subdivision in new launches designed to carry more than 100 passengers in accordance with Regulation 6 of the Merchant Shipping (Safety) (Passenger Ship Construction and Survey) (Ship Built on or after 1 September 1984) Regulations, Cap. 369AM. In turn, Regulation 6 required compliance with Schedule 1, which defines the floodable length of a compartment of a ship as meaning:

> "the maximum length of that portion (of a ship) having its centre at a given point in the ship which, at that draught and under such of the assumptions of permeability set forth in Schedule 1 as are applicable in the circumstances, can be flooded without submerging any part of the ship's margin line when the ship has no list."

In turn, the margin line is defined as:

> "... a line drawn at least 76 mm below the upper surface of the bulkhead deck at the side of the ship."

Damage Stability

205. Dr Armstrong also noted that the Marine Department's Damage Stability guidance in force at the time required compliance with Schedule 3 of the same Regulations. In turn, that required that:

> "at the final stage of flooding the margin line shall not be submerged and there shall be a positive residual metacentric height of at least 50 mm as calculated by the constant displacement method."

206. Of that requirement in respect of the margin line, Dr Armstrong said that:

> "(it) is a different requirement to the immersion of the margin line contained in Schedule 1 which has no list or heel. Schedule 3 covers the situation where the lack of stability when damaged might cause the vessel to heel to one side and immerse the margin line at the deck edge, even though the margin line is not immersed at the ends as checked under Schedule 1."

207. In consequence, it was his opinion that both requirements in respect of the margin line must be met.

Aft peak bulkhead

208. Dr Armstrong noted that paragraph 12(iv) of the Blue Book required the Lamma IV to have peak bulkheads at both ends of the vessel. In his opinion, the bulkhead at Frame ½ was the obvious place to locate the aft peak bulkhead since the Steering Gear compartment was of a relatively small volume located in the aft part of the vessel. Since there was an Access Opening in the bulkhead, without there being a watertight door, it could not be considered as an aft peak bulkhead. In his opinion, the aft bulkhead of the Engine room could not be regarded as an aft peak bulkhead because it was too far forward. He suggested that an aft peak bulkhead should be less than $0.1L^3$ of the vessel. It was his experience that this is where aft peak bulkheads were located in fact. He acknowledged that there were no regulations that required the aft peak bulkhead to be located in that manner.

The LAMMA IV: 1996

209. Dr Armstrong noted that the Damage Stability Booklet issued in 1996 considered the Steering Gear compartment as a separate watertight compartment. Clearly, that was on the assumption that it had a watertight fitting to the Access Opening in the bulkhead between the Steering Gear compartment and the Tank room. However, that was a false assumption. There was no watertight fitting to the Access Opening. Nevertheless, in his opinion (2^{nd} Supplemental Expert Report, paragraph 10) notwithstanding the

[3] one-tenth of the length of the ship.

absence of the watertight door in 1996 the vessel did not breach "the requirements for floodable length and for Damage Stability." However, he went on to say that was not the case after lead ballast was added to the Lamma IV in 1998 and thereafter.

THE LAMMA IV: TANK ROOM FLOODED WITH/WITHOUT A WATERTIGHT DOOR TO THE STEERING GEAR COMPARTMENT

210. Dr Armstrong set out his findings in table form in respect of a consideration of the Tank room being flooded at three different times (1996, 1998 and 2005) in two different situations, namely one in which there was a watertight door to the Steering Gear compartment and the other in which there was not such a door. In doing so, he addressed the "… floodable length calculation for margin line immersion in accordance with Schedule 1… with a lightship weight according to the inclining experiment results in 1996, 1998 and 2005 and using the loading of *Lamma IV* as it was believed to be on the night of 1 October 2012".

		Lightship			Condition based on the deadweight (loading) on 1st October 2012		
Condition	Date	Weight [t]	LCG [m]	KG [m]	Weight [t]	LCG [m]	KG [m]
As-constructed	**1996**	48.74	9.862	3.187	62.67	8.397	3.31
With Ballast	**1998**	63.618	8.626	2.430	77.55	8.522	2.66
Raised Ballast	**2005**	60.36	8.397	2.273	74.29	8.473	2.55

TANK ROOM ONLY

Condition	Date	**Depth to margin line [m]**	
As-constructed	**1996**		
With W/T door		1.212	Satisfactory
No W/T door		0.272	Satisfactory
With Ballast	**1998**		
With W/T door		1.007	Satisfactory
No W/T door		**Immersed by 0.115**	**FAIL**
Raised Ballast	**2005**		
With W/T door		1.046	Satisfactory
No W/T door		**Immersed by 0.042**	**FAIL**

Note

W/T: Watertight

LCG: Longitudinal centre of gravity

KG: Vertical centre of gravity

THE LAMMA IV: TANK ROOM AND ENGINE ROOM FLOODED WITH/WITHOUT A WATERTIGHT DOOR TO THE STEERING GEAR COMPARTMENT

211. Then, Dr Armstrong conducted a similar investigation of the margin line immersion under Schedule 1, namely floodable length, in respect of a situation in which both the Engine room and the Tank room were flooded.

		Lightship			Condition based on the deadweight (loading) on 1st October 2012		
Condition	Date	Weight [t]	LCG [m]	KG [m]	Weight [t]	LCG [m]	KG [m]
As-constructed	**1996**	48.74	9.862	3.187	62.67	8.397	3.31
With Ballast	**1998**	63.618	8.626	2.430	77.55	8.522	2.66
Raised Ballast	**2005**	60.36	8.397	2.273	74.29	8.473	2.55

ENGINE ROOM AND TANK ROOM FLOODED

Condition	Date	**Depth to margin line [m]**	
As-constructed	**1996**		
With W/T door		0.378	Satisfactory
No W/T door		**VESSEL SINKS**	**FAIL**
With Ballast	**1998**		
With W/T door		Margin line immersed	**FAIL**
No W/T door		**VESSEL SINKS**	**FAIL**
Raised Ballast	**2005**		
With W/T door		0.021	Satisfactory
No W/T door		**VESSEL SINKS**	**FAIL**

THE LAMMA IV: TANK ROOM AND STEERING GEAR COMPARTMENT FLOODED

212. Dr Armstrong noted (2nd Supplemental Expert Report, paragraph 13):

> "… as constructed in 1996 and as finally modified in 2005, the vessel in this condition would have met the floodable length criteria (the margin line was not immersed) IF a watertight door had been fitted to Bhd 1/2, but that the vessel would sink without the watertight door. There was no requirement for this condition to be checked, but it was relevant to the outcome of the accident. The vessel failed to meet margin line requirements as it was in 1998."

213. As is apparent from those tables, the consequence of the failure of both Cheoy Lee Shipyards and the Marine Department to apply the 0.1L Rule, in particular to consider the Steering Gear compartment and the Tank room together for purposes of the vessel's

stability when flooded, was not material in 1996 in that the margin line was not immersed by water, it being 0.272 metres higher than the waterline. However, it is clear that the addition of the 8.25 tonnes of lead ballast to the increased lightship weight of the Lamma IV in 1998 caused the margin line to be immersed by 0.115 metres. Had the Rule being applied properly, and the true situation become known, there is no doubt that the Lamma IV would not have been allowed to sail.

THE LAMMA IV: CONSEQUENCES TO THE VESSEL ON 1 OCTOBER 2012, IF A WATERTIGHT DOOR HAD BEEN FITTED TO THE ACCESS OPENING

214. It was Dr Armstrong's opinion that if a watertight door had been fitted to the Access Opening in the bulkhead between the Steering Gear compartment and the Tank room, in other words if the flooding had been to two compartments only, that is the Engine room and the Tank room, the Lamma IV would not have sunk immediately, rather it would have become stable and afloat after about one and three quarter minutes from the time of the collision. Dr Armstrong qualified that opinion in his testimony, saying that although the deck of the vessel would not have been immersed the margin line was submerged (6 March 2013; Day 46, page 64-65):

> "So eventually the effect of waves and wash from passing vessels and similar effects, and maybe even people standing on the side of the deck rather than inside the cabin, would have caused the vessel to sink eventually. Which is, of course, the purpose of the margin line: to give you some margin of error. So that is why I used the words "sunk immediately". I think it would have stayed afloat for quite some time, until eventually it was swamped."

(**Appendix 13; page A27**. Two-compartment damage – Engine room and Tank room)

THE THICKNESS OF THE SIDE-PLATING

215. In his first report, Dr Armstrong noted that the average thickness of the side plating of the Lamma IV as measured in June 2005 was 4.5 mm and 4.4 mm in May 2011. Having noted that the hull plans stipulated side-plating of 5 mm thickness, it was his initial opinion that the vessel had been constructed with side-plating of 4.5 mm, namely the thickness as measured in June 2005. In those circumstances, it was his opinion that the issue arose of whether or not the hull of the Lamma IV had been built with adequate thickness in accordance with the Regulations, and whether this may have contributed in some way to the extent of damage and a rapid sinking time.

216. However, in the course of his testimony Dr Armstrong learned that in a letter, dated 4 April 2005, Cheoy Lee Shipyards had advised the Marine Department that there was to be a change in the measured thickness of the 5 mm plating to 0.19 inches or 4.83 mm.

217. In a written witness statement received by the Commission, Mr Zhang Yu, the Chief Surveyor and Senior Engineer of the China Classification Society explained the circumstances in which the Society had come to issue a Survey Report on 6 September 1995 in respect of the hull and Main deck construction of the Lamma IV. He did so without the benefit of any documents from the archives of the Society. The regulations governing such surveys required that documentation be kept for only five years from the date of the survey. He explained that the surveyor who had conducted the actual survey on the vessel on 18 May 1995 had retired and had no memory of the survey.

218. Although the Survey Report referred in terms to an American Bureau of Shipping certificate relating to the plating of the hull, no such certificate was made available to the Commission by either the China Classification Society or Cheoy Lee Shipyards. The American Bureau of Shipping responded to enquiries of the Commission by indicating that they were unable to locate any such certificate.

219. Mr Zhang explained that in the China Classification Society's survey of the Lamma IV its surveyor would have done no more than inspect such certificates against the labels on the plates in question.

220. Having regard to the age of the Lamma IV, the fact that it would have been painted, sanded down and repainted on numerous occasions over the years, and having regard to his lack of experience of the particular effects of Hong Kong pollution acting together with a hot humid climate, Dr Armstrong said that, whilst it was unlikely that the side-plating reduced to 4.5 mm in 2005, had it been 4.83 mm when the vessel was built, nevertheless that was possible.

THE CONSTRUCTION AND CERTIFICATION OF THE LAMMA IV

221. In light of Dr Armstrong's findings and opinions we have considered in detail the evidence that the Commission has received of all the circumstances relevant to the condition of the Lamma IV on 1 October 2012:

(i) the drafting of the design drawings by Naval-Consult Pte Ltd ('Naval-Consult');

(ii) their receipt and use by Cheoy Lee Shipyards, including their submission of the drawings to the Marine Department;

(iii) the approval of those drawings by the Marine Department;

(iv) the construction of the hull of the vessel in the Mainland, followed by the attachment of the superstructure and its fitting out at Cheoy Lee Shipyards in Hong Kong;

(v) the inspection of the hull by the Marine Department;

(vi) the preparation of Stability and Damage Stability calculations in 1996, 1998 and 2005 by Cheoy Lee Shipyards and the submission of those documents to the Marine Department;

(vii) the receipt and processing of those Stability and Damage Stability calculations by the Marine Department;

(viii) the approval by the Marine Department of the addition of 8.25 tonnes of lead ballast in 1998;

(ix) the approval by the Marine Department of the raising of the lead ballast inside the vessel in 2005.

DRAWINGS

Shipyard: Cheoy Lee

222. Mr Ken Lo Ngok Yang, who is and has been a director of Cheoy Lee Shipyards since 1974, testified that on 10 November 1994 Cheoy Lee had been awarded the contract to build a fast passenger launch for the Hongkong Electric Company. By a letter dated 24 November 1994, Cheoy Lee Shipyards advised the Marine Department of those instructions, in particular that they were building a 28 metre fast passenger launch, which became named the Lamma IV, for use in Hong Kong waters and enclosed the General Arrangement

drawing, indicating that they sought the approval of the Marine Department.

Wuzhou Shipyard Guangxi

223. Mr Ken Lo said Cheoy Lee Shipyards contracted construction of the hull of the Lamma IV to Wuzhou Shipyard in Guangxi Province in the Mainland, albeit that Cheoy Lee Shipyards bought the aluminium plating for the construction of the hull from a manufacturer in Florida and caused it to be delivered to Wuzhou Shipyard. Mr Lo said that although the Hull drawings described the side plating of the vessel as being 5 mm thick, by letter dated 4 April 1995 Cheoy Lee Shipyards had informed the Marine Department of a change in that dimension to 0.19 inches or 4.83 mm. Although the Marine Department acknowledged receipt of that letter in their letter dated 27 April 1995, no reference whatsoever was made to the change to the thickness of the 5 mm plating described in the drawings.

High Modulus

224. Cheoy Lee Shipyards contracted the design of the superstructure of the Lamma IV to High Modulus (N.Z.) Limited in Auckland, New Zealand. At Cheoy Lee Shipyards' request in mid-November 1994, High Modulus had proposed a range of options for the construction of the Upper deck of the Lamma IV using "foam cores". Cheoy Lee Shipyards' stated objective was to obtain "savings in weight, labour and materials". In due course, Cheoy Lee Shipyards chose one of the options proposed by High Modulus.

The overall construction of the Lamma IV

225. Mr Ken Lo said that Cheoy Lee Shipyards constructed the superstructure of the Lamma IV from the design plans of High Modulus and, after the hull had been delivered by Wuzhou Shipyard, the two were joined together. The attachment of seats to the decks had been one of the last jobs in fitting out the vessel.

Naval Architects: Naval-Consult

226. The General Arrangement drawing supplied by Cheoy Lee Shipyards to the Marine Department had been drawn by Naval-Consult, a firm of naval architects in Singapore, and bore the date '12.10.94'. The draughtsman of the plan was identified as J Lim, but it is not known whether he was Mr John Lim, the witness from Naval-Consult.

227. In evidence received by way of a video link from Singapore, Mr John Lim, a director of Naval-Consult since 1980, testified that a contract providing for the services of Naval-Consult as naval architect for the project was made between Cheoy Lee Shipyards and Naval-Consult on 8 December 1994. Under the contract Naval-Consult was required to provide multiple drawings of the vessel and an Intact and Damage Stability Report Booklet. Mr Lim said that his role in the project was to oversee the work of his draughtsman.

228. By letter dated 3 January 1995, the Marine Department advised Cheoy Lee Shipyards that there was no objection to their proposal, informing them that the vessel would be surveyed under the Merchant Shipping (Launches and Ferry Vessels) Regulations as a passenger launch. In addition, the Marine Department asked to be provided with no less than 20 stipulated plans, together with 'stability

information', before commencement of construction. Amongst the plans requested were: Profile, Deck and Bulkhead, and Sections and Bulkheads.

FURTHER DRAWINGS

229. By a letter dated 5 January 1995, Cheoy Lee Shipyards provided the Marine Department with various plans, including Profile and Deck, and Sections and Bulkheads. The draughtsman of those plans was identified as KC Tan. Mr Lim said that Mr K C Tan had left his employment in 1995 and he was unaware of his whereabouts. The bulkhead at Frame ½ was identified as 'WT BHD' in the former drawing and an Access Opening identified in that bulkhead in the Sections and Bulkheads drawing. Also, the Marine Department was informed that the drawings were based on the hull of the MV 'Eastern District No 1', which it was asserted had been designed in accordance with "DnV's Light Craft Rules 1991 with a R(45) notation and the vessel was surveyed and approved by the China Classification Society". Various plans of that vessel were enclosed "to assist you in the drawing approval process". It is to be noted that the opening in the bulkhead Frame ½ was described as 'WT DOOR', but otherwise it had the same particulars as stipulated in the Access Opening described in the Sections and Bulkheads drawing for the Lamma IV.

230. Under cover of a letter dated 21 March 1995 from Cheoy Lee Shipyards the Marine Department was provided with revised versions of various drawings dated '20.3.95', including Profile and Deck, Sections and Bulkheads, and Shell Expansion. There was no revision or amendment in the Profile and Deck drawing to the description of the bulkhead at Frame ½ as a watertight bulkhead or in respect of the

Access Opening in the Sections and Bulkhead drawing. It was those revised drawings that were approved ultimately by the Marine Department. (**Appendices 14-15; pages A28-36**. Technical drawings of the Lamma IV provided by the Marine Department and Cheoy Lee Shipyards)

MAY 1995: APPROVAL OF DRAWINGS

Mr Leung Kwong Chow: Ship Inspector

231. Mr Leung Kwong Chow, now a Senior Ship Inspector but then a Ship Inspector of the Marine Department, said that he had been assigned to check the General Arrangement plan and the Sections and Bulkheads plan, but only page 2 and not page 1 of the latter. He said that Mr Wong Chi Kin was responsible for checking page 1 of the Sections and Bulkheads plan, on which was drawn the Access Opening to the bulkhead at Frame ½. He made 15 'Comments' on the General Arrangement plan, which was passed to Mr Wong Chi Kin for his consideration and approval.

Mr Wong Chi Kin: Surveyor of Ships

232. In May 1995, Mr Wong Chi Kin, now retired but then a Surveyor of Ships in the Local Vessels Safety Section of the Marine Department, approved the plans. On 8 May 1995, he approved 'Comments' which had been made on the General Arrangement drawing, together with 'Comments' which had been made by Mr Leung Kwong Chow. Those comments required, at item 9, that "Seats must be firmly secured" and, at item 11, that "Damaged stability and floodable length calculation to be submitted for approval".

233. Mr Wong Chi Kin agreed that the abbreviation 'WT BHD' found on numerous solid lines drawn on the various plans indicated a watertight bulkhead. That abbreviation was to be found on such lines at the bulkhead at Frame ½, namely the bulkhead immediately forward of the transom, just as it was on the other watertight bulkheads that divided the vessel into compartments. He accepted that in the Sections and Bulkheads plan the bulkhead at Frame ½, set out at the bottom left of the plan, a rectangle was drawn with rounded corners which was described as 'ACCESS OPENING 1200 x 600 W/50R AT CORNER (PORT ONLY)'. He said that, having regard to the fact that the bulkhead at Frame ½ was described elsewhere in the drawings as being a watertight bulkhead, including at the top right-hand part of the Sections and Bulkheads plan, he considered that, in context, the plan was to be read as requiring the fitting of "efficient watertight appliances", as required by paragraph 12(v) of the Blue Book, which was the relevant guidance issued by the Marine Department for such vessels. That was the view that he took at the time that he examined the drawing (17 January 2013; Day 17, page 17). (**Appendix 16; pages A37-45**. Excerpts from the Instructions for the Survey of Launches and Ferry Vessels (1989) ('Blue Book'))

234. Mr Wong went on to say that if the bulkhead at Frame ½ had a watertight door fitted to the Access Opening, it could be considered an aft peak bulkhead, as required by paragraph 12(iv) of the Blue Book. If not, it could not be so considered (17 January 2013; Day 17, page 14).

Mr John Lim: Naval-Consult

235. For his part, Mr John Lim of Naval-Consult, confirmed that the plans drawn for the construction of the Lamma IV were based on

earlier plans drawn by Naval-Consult for the 'Eastern District No 1'. That vessel was designed and built to two-compartment flooding standards, whereas the Lamma IV was designed to one-compartment flooding standard. He said that his draughtsman had made mistakes when he had described the bulkhead at Frame ½ in many places on the various plans as being a watertight bulkhead. He said that mistake extended to the description of that bulkhead as being watertight in the top right-hand corner of the Sections and Bulkheads plan. On that basis, he said that the draughtsman was correct to leave the Access Opening in Frame ½, described in the bottom left-hand corner of the same plan, without stipulating a watertight door. He accepted that this view was not one that he held that time but was an ex post facto rationalisation. That is why the drawings were not amended. Although Mr Lim said that it was his role to oversee his draughtsman, he offered no explanation as to why he had not noticed what he now describes as "mistakes" at the time.

Preliminary Trim & Stability Booklet

236. In the course of his evidence, Mr Lim produced for the first time a Preliminary Trim & Stability Booklet for the Lamma IV, which addressed both Intact Stability and Damage Stability. He said that he had found it only in January 2013. From various dates on the document itself he said that the document was made in the period December 1994 to May 1995. The Damage Stability calculations were done on the basis of one-compartment flooding, but considered the Steering Gear compartment and Tank room as one compartment. He accepted that basis of calculation was consistent with the application of the 0.1L Rule, even if that the bulkhead at Frame ½ was in fact watertight.

237. Although the Naval-Consult's contract with Cheoy Lee Shipyards required it to produce Stability calculations, Mr Lim did not give evidence that the Stability Booklet was provided to Cheoy Lee. None of the witnesses employed by Cheoy Lee, who dealt with the stability calculations in 1995 or subsequently, testified of having had sight of that booklet.

THE INSPECTIONS OF THE LAMMA IV AND THE GRANT OF CERTIFICATES OF SURVEY

Inspection of the Hull: 13 November 1995

Mr Fung Wai Man: Senior Ship Inspector

238. Mr Fung Wai Man, a Senior Ship Inspector of the Marine Department, was a Ship Inspector in the Local Vessels Safety Section of the Marine Department in 1995 and 1996 when he conducted inspections of the Lamma IV. He did so on 13 November 1995 and 7 March 1996 at the shipyards of Cheoy Lee. In order to do so, he said that he would have looked at various plans of the vessel, including 'General Arrangement', 'Midship Section', 'Profile, Deck and Bulkhead', 'Shell Expansion' and 'Sections and Bulkheads'. The purpose of his inspection of the hull of the vessel was to ensure that it was constructed in accordance with the approved plans.

239. He accepted that the various plans that he would have inspected described the bulkhead at Frame ½ as being watertight. However, he said that although he could not remember at the time of his testimony whether or not there was watertight door to the Access Opening in the bulkhead between the Steering Gear compartment and the Tank room he would not have considered that an abnormality because the fitting of a watertight door was, as he contended, merely

an ‘Outfitting’ issue which could be addressed at a later stage. In response to being asked whether or not at least he ought to have noted that the fitting of watertight door was outstanding, he said (17 January 2013; Day 17, page 113):

> “When I checked the structure, the fitting of a watertight door would not be considered”.

Documentary records

240. There is no dispute that Mr Fung made no entry whatsoever in the file entries he made on the two occasions on which he inspected the Lamma IV, as to the absence of a watertight door to the Access Opening on the bulkhead described as watertight in the various plans at Frame ½. On the other hand, it is clear from that file note dated 13 November 1995 that having conducted an internal inspection of the hull having regard to the drawings of the vessel, he did note no less than seven ‘outstanding’ items. The purpose of noting those items was so that they could be followed up in subsequent surveys, either by him or his colleagues. (**Appendix 17; pages A46-47**. Survey records of the Lamma IV)

241. Mr Fung said that it was not necessarily the case that, at that stage of the construction of the vessel, the Access Opening would have had a frame around it, to which the hinges and latches of a watertight door could be affixed. That depended on the method of construction, namely whether it was to be welded or held in place by nuts and bolts. Whilst he asserted that it would have been easier to conduct an inspection of the vessel if the plans had marked the Access Opening as requiring a watertight door, he agreed with the suggestion that he had not noticed a watertight door was missing from the Access Opening.

7 March 1996 Inspection

242. Mr Fung's inspection of the vessel on 7 March 1996 related only to items found to be "unsatisfactory" and outstanding in an inspection by a colleague of the vessel on 15 February 1996, which items were unrelated to the hull of the vessel. On his inspection, he found all of the outstanding items to be "in order". In respect of one item relating to the engine, he had found it to be in order having been directed by the Surveyor of Ships that it had been inappropriate for his colleague to have determined that the item was "unsatisfactory", given that his colleague had applied the new 1995 Instructions, whereas the Lamma IV was subject to the guidance set out in the Blue Book.

Short-term Certificate

243. Having determined that the outstanding matters were in order, Mr Fung issued a Short-Term Certificate of three months for the Lamma IV and noted in the file that the issue of a Full-Term Certificate of Survey for the vessel remained pending the approval of the 'Stability report'.

Inspections: 11 January and 15 February 1996

Mr Philip Yu Kick Chuen: Ship Inspector

244. Mr Philip Yu Kick Chuen, now a Senior Ship Inspector in the Local Vessels Safety Section of the Marine Department, inspected the Lamma IV on 11 January and 15 February 1996. On the first occasion, he inspected the rudder plate and those items that had been marked as 'Outstanding' in the hull inspection of the vessel conducted by his colleague Mr Fung Wai Man on 13 November 1995. Since one of those outstanding items concerned Frame 0, namely the frame

between the transom and Frame ½, and was located within the Steering Gear compartment he said that he had entered that compartment in order to conduct his inspection. In order to do so, he had gained entry through the Access Opening. However, he had no memory of having done so and would not have paid any special attention to the Access Opening, since the hull inspection had already been performed by a colleague. He was not asked to conduct an inspection of the hull, other than in respect of the 'Outstanding' items. In particular, he had not been assigned to check whether or not there was a watertight door on the Access Opening to the Steering Gear compartment.

245. In order to conduct his inspection of the rudder he had looked at the plans for the rudder. However, it was not necessary for him to look at the plans of the hull for his inspection of the items described as 'Outstanding' in the hull. Nonetheless, he said that having looked at the plans: the General Arrangement, Profile and Deck, Shell Expansion, and Sections and Bulkheads, he would have concluded that the Frame ½ was a watertight bulkhead, which required the fitting of a watertight door to the Access opening. He agreed with Mr Pao, that it would have been better if the Access Opening described on the Sections and Bulkheads drawing had stipulated that a watertight door was required.

Inspection: 22 January 1996

Mr Ho Kai Tak: Ship Inspector

246. Mr Ho Kai Tak, now retired but then a Ship Inspector of the Marine Department, inspected the Lamma IV on 22 January 1996. In the course of that inspection he entered the Steering Gear

compartment, although he was not sure whether he did so through the Access Opening to the bulkhead at Frame ½ or from the access manhole at the deck level.

Inclining experiment: 31 January 1996

247. On 31 January 1996, Mr Ho Kai Tak witnessed an inclining experiment in respect of the Lamma IV, the purpose of which was to establish its Intact Stability, and made his own handwritten notes and calculations. He had done so in order to be able to check the stability calculations submitted by the shipbuilder. Although he said that he did not have any independent recollection of the particular events, he said that it was his usual practice to look at the General Arrangement drawing before attending an inclining experiment. In response to questions posed of him by Mr Mok, he agreed that he could not really remember whether or not he had looked at the drawings before performing those or subsequent duties in respect of the Lamma IV in 1996.

Inspection of seats

Mr Philip Yu Kick Chuen

248. Mr Philip Yu Kick Chuen said that his inspection of the Lamma IV, which he conducted on 15 February 1996, included an inspection of the seats and their attachment to the deck. He did so by observing their fastenings to the deck to ensure that they were not loose and by checking random seats by applying force to them. He agreed that he was provided with no plans of how the seats were attached to the deck. He said that he would have been able to notice that the seats were not through-bolted but were affixed with self-tapping screw. Notwithstanding that he did not know the length of the

screws or to what they were attached, other than to the deck itself, he made no enquiries of the shipyard to be furnished with any such information.

1996: Damage Stability Booklet

249. By a letter dated 6 March 1996, Cheoy Lee Shipyards provided the Marine Department with a Damage Stability Information Booklet in respect of the Lamma IV, but not a calculation in respect of floodable length, as had been required in the comments on the General Arrangement drawing approved in May 1995. The Stability Booklet provided calculations as to stability in respect of six separate compartments of the vessel, including the Steering Gear compartment. (**Appendix 18; pages A48-55**)

Cheoy Lee's Stability calculations

Mr Cheung Fook Chor: Ship Draughtsman

250. Mr Cheung Fook Chor, now an octogenarian retiree, was employed as a ship draughtsman by Cheoy Lee Shipyards for over 35 years, from 1972 until 2007. In 1969, he had obtained a Higher Certificate in Naval Architecture. He was the author of the calculations in the Damage Stability Information Booklet provided by Cheoy Lee Shipyards to the Marine Department in March 1996. He agreed that those Damage Stability calculations had been made on the basis of six watertight compartments, including the Steering Gear compartment.

251. When asked to prepare such calculations, his method of work was to ask to be provided with the General Arrangement drawing in order to determine the location of the watertight bulkheads. If that

drawing did not provide that information, he would ask to see the Profile and Deck drawing. He agreed that the Sections and Bulkheads drawing provided to the Marine Department bore his handwriting in respect of the identification of the vessel, namely 'Yard No 4625'. That was on the revised version of that drawing dated 20 March 1995. Clearly, that was one year prior to his calculations in respect of Damage Stability of the vessel. He said that it was clear from the Profile and Deck drawing where the watertight bulkheads were located and that there was one located between the Steering Gear compartment and the Tank room. If he had seen the Sections and Bulkheads drawing at the time he was making those calculations, although the matter was "confusing", he would have interpreted the drawings as providing for a watertight bulkhead at that place and made his calculations on that basis. He added (27 February 2013; Day 41, page 68):

> "After I had done, then I would wait for my superior or personnel from the Marine Department and see what they would do."

0.1L Rule

252. Mr Cheung said that he was aware of the effects of the application of the 0.1L Rule in consideration of a Damage Stability calculation, in particular that a compartment of less than 10% of the length of the vessel (0.1L) was not to be considered separately. Rather, it was to be combined with the adjoining compartment. So that, it called for the Steering Gear compartment and the Tank room to be considered together for the purpose of those calculations. He said that he knew at a glance that the Steering Gear compartment was such a short compartment and that it was his "omission" and "negligence"

that he had made calculations without regard to that requirement. He had done so (27 February 2013; Day 41, page 81) :

> "Because I forgot the requirements of the relevant rules."

Marine Department's consideration of the Stability calculations

Mr Ho Kai Tak

253. Mr Ho Kai Tak agreed that the Damage Stability calculations in respect of the Steering Gear compartment assumed that there was a watertight bulkhead between the Steering Gear compartment and the Tank room. He agreed that was also the conclusion he reached from looking at the General Arrangement drawing, namely given that there was a watertight bulkhead at that place then, if there was an opening, it was required to be sealed either with a watertight door or otherwise. Proceeding on that basis, and having checked and been satisfied with the calculations in the Damage Stability Booklet, he had made chop impressions with the words 'Seen' and 'Date 26 July 1996', which he initialled and then passed it to his superior, Mr Leung Wai Hok.

Fundamental error

254. There is no dispute that the assumption upon which the Damage Stability Booklet calculations were predicated, namely that the Steering Gear compartment was watertight, was fundamentally inaccurate. There is not, and never has been, a watertight door to the bulkhead at Frame ½.

Mr Leung Wai Hok

255. For his part, Mr Leung Wai Hok confirmed that he had signed on the chop impression on the Damage Stability Information Booklet,

which he received from Mr Ho Kai Tak. Although Mr Leung is now a Senior Surveyor of Ships, in 1996, when he was assigned to the Local Vessel Safety Section, he was only a Surveyor of Ships. The purpose of his examining the Damage Stability Information Booklet was to ensure that the correct criteria had been used, not to re-check the actual calculations. He agreed that in order to do so it was his usual practice to look at the main drawings of the hull of the vessel, namely the General Arrangement, Shell Expansion, Profile and Deck, and Sections and Bulkheads. He had no independent recollection of what it was that he had actually done. He agreed that the calculations had been done on the assumption that there was a watertight bulkhead at Frame ½, namely between the Steering Gear compartment and the Tank room.

256. There was no dispute that the Frame ½ bulkhead on the Lamma IV is not and never has been made watertight, either by the Access Opening being made so by the addition of a watertight door or otherwise. For his part, Mr Leung said that he did not know that the Frame ½ bulkhead was not watertight. He said (23 January 2013; Day 21, page 36):

> "According to the stability calculations submitted, it was considered as two individual, independent compartments. So of course I assumed it to be watertight."

He made it clear, however, that was not the only basis for his assumption (page 36-37):

> "… my colleagues should have already checked it, and I am only responsible for the final step, which is concerning the licensing. I believe that when the Stability Booklet was submitted to us, our colleagues would follow up again and also when the Damage Stability Booklet was submitted, our colleagues would also check them again."

257. Acknowledging that the main Hull drawings described the bulkhead at Frame ½ as watertight, Mr Leung said that a check to determine that it was actually watertight ought to have been done during the construction period or before the licensing of the vessel. Having been informed that his colleague Mr Fung had said, of his inspection of the hull on 13 November 1995, that the absence of a watertight door was not a matter with which he was concerned because it was merely an 'Outfitting' matter, which was something that could be dealt with later, and that Mr Philip Yu Kick Chuen had said that his inspection of the hull of the Lamma IV in January 1996 was in respect of the items marked 'Outstanding' only, Mr Leung responded to the question " So, where does the buck stop?":

> "I have no supplementary information to provide in relation to this matter."

258. In seeking, by way of ex post facto rationalisation, to explain how it had come about that he had endorsed the Damage Stability Information Booklet by appending his signature to it on the 'Seen' chop impression, Mr Leung suggested various hypotheses: he could have asked Cheoy Lee Shipyards to recalculate on the basis of a consideration of the Steering Gear compartment and Tank room combined, or he could have asked his subordinate to recalculate the figures himself. There was no evidence of either of those courses having been taken. Accordingly, he concluded that he had formed a view himself that the Steering Gear compartment and the Tank room on the Lamma IV when considered together, as they ought to have been, would have satisfied the requirements as to stability. However, he conceded that even if the third hypothesis was valid, and accordingly the information presented in the Damage Stability Booklet had been based on a false premise that the Steering Gear

compartment could be considered separately from the Tank room, he had not documented that error anywhere whatsoever.

259. Following the processing of the Damage Stability Information Booklet by Mr Leung Wai Hok, on 30 July 1996 a full Certificate of Survey was issued in respect of the Lamma IV.

1998: THE ADDITION OF 8.25 TONNES OF LEAD BALLAST TO THE LAMMA IV

260. By a letter dated 10 March 1998, Cheoy Lee Shipyards informed the Marine Department that it proposed installing 8.25 tonnes of 'trimming lead ballast', to be located from the transom to Frame 3 on the hull bottom of the Lamma IV. Enclosed with the letter were copies of a Revised Stability Booklet, a Damage Stability Information and an Arrangement of Lead Ballast. Once again the Damage Stability information was calculated on the basis of a consideration of one only of each of six compartments being flooded in turn, including the Steering Gear compartment. The revised calculation for the lightship weight of the Lamma IV described an increase from the existing 48.74 tonnes to 58.44 tonnes, 8.25 tonnes of which was lead ballast. (**Appendices 19-20; pages A56-65**)

Cheoy Lee's calculations

261. Mr Cheung Fook Chor, the Cheoy Lee ship draughtsman, said that he had made the calculations in the Damage Stability Information Booklet. In doing so, he said that he had used the 1996 Damage Stability calculations (27 February; Day 41, page 98):

> "I will use the figures of 1996, add the 8-odd tonnes of lead ballast and then on that basis we will do the inclining experiment again."

262. He agreed that in performing those calculations he had treated the six compartments on the vessel as watertight, as he had done in 1996.

263. The Marine Department responded to that letter on 25 March 1998, observing that:

> "… the lightship particulars will be changed dramatically when such quantity of ballast is installed on board. In this regard an inclining experiment is required to be conducted under the ballasted condition in the presence of Marine Department Ship Surveyor/Inspector."

Marine Department's consideration of the Stability calculations

Mr Choi Chi Chuen: Surveyor of Ships

264. For his part, Mr Choi Chi Chuen said that, as a Surveyor of Ships in the Local Vessel Safety Section of the Marine Department, he had considered the documents provided by Cheoy Lee Shipyards. He said that he was the Marine Department officer who had required an inclining experiment to be conducted and had written that direction on the Stability Book. Further, he had added the designation 'Estimated' in front of the title of each of the Stability Book and the Damage Stability Information. He signed on the chop impressions 'Seen' and 'Date 25 March 1998'.

Mr Mak Yat Wai: Ship Inspector

265. Mr Mak Yat Wai, now a retired Senior Ship Inspector but then a Ship Inspector of the Marine Department, attended the Inclining experiment conducted on the Lamma IV on 2 April 1998. Mr Mak agreed that the handwritten records of the results of the Inclining experiment, which described him as being present, recorded all six compartments of the vessel, including the Steering Gear compartment,

as being ‘Dry’. He verified that to be the case by sight. He agreed that the Damage Stability Booklet calculated the consequences of flooding to each one of the six compartments in turn, including the Steering Gear compartment. He volunteered (23 January 2013; Day 21, page 79-80):

> “The Damage Stability calculation submitted by the shipyard shows that all the compartments are independent and not combined. This indicates that the bulkheads are watertight.”

266. Of the bulkhead between this Steering Gear compartment and the Tank room, he said:

> “It was not watertight during the course of construction, but the shipyard should make it watertight for the sake of Damage Stability, because during the course of work, it was not permanent because it was there to facilitate the workers to go in and out of it.”

267. However, Mr Mak denied that during the Inclining experiment he had seen the Open Access in that bulkhead, asserting that he might have entered the Steering Gear compartment through the deck access. In any event, he had no recollection of having seen the Open Access in that bulkhead.

268. Mr Mak accepted that there was no significant change in the basis of the calculation of the six separate compartments in the ‘Final’ version of the three booklets provided by Cheoy Lee in a letter dated 21 October 1998. Again, those calculations were based on a consideration of six watertight compartments. The lightship weight of the Lamma IV was described as being 63.618 tonnes, an increase of about 15 tonnes over what had been described as the “lightship weight (existing)” in the revised Stability Booklet provided by Cheoy Lee Shipyards on 10 March 1998. He entered all of that data into Marine Department software in a computer and provided the printout together

with the Booklets for final vetting by Mr Choi Chi Chuen. No copy of the printout was available any longer in the Marine Department. He understood that it might have been destroyed in a microfilming exercise carried out earlier by the Marine Department.

269. Mr Choi Chi Chuen said that it was his usual practice to require the ship Inspector to recalculate the Stability calculations submitted by the shipyard and do so on software available to the Marine Department. However, he could no longer recall whether he had required that to be done in this instance, or whether he had seen such a printout.

270. From the Stability documents themselves he was satisfied that there was the requisite positive GMT value in excess of 0.05 m and that the calculations showed that the margin line, from the waterline, of over 75 mm was satisfied in respect of each of the compartments. Whilst he was aware of the 0.1L Rule, it would not have been obvious to him that any issue arose in respect of its application to the Lamma IV. He assumed that was a matter that the Ship Inspector would have handled. Accordingly, he had signed over 'Seen' and 'Date: 13.1.1999' chop impressions on the Stability Booklet.

2005: RAISING THE LEAD BALLAST ON THE LAMMA IV

271. Mr Louk Hon Ying, a Ship Inspector in the Local Vessels Safety Section of the Marine Department, said that on 16 and 29 June and 13 July 2005 he had conducted a quadrennial survey of the Lamma IV. In his inspections in June he noted on the file that the owners requested "to raise the aft ballast about 10 inches height of original position". Of that request, he went on to note "it should be checked the stability position and confirmed by MD." He went on to

say that on 13 July 2005 he had checked the position of the ballast and, in particular, its stability and made a note to that effect in the file.

The thickness of the plating of the Lamma IV vessel

272. Mr Louk said that during their quadrennial survey of the vessel he had performed a 'Hull gauging' test, in which he checked randomly the figures provided to him in a report by Cheoy Lee Shipyards in respect of the thickness of the plating of the hull of the vessel. He did so by way of an ultrasonic test. Eventually, it was his evidence that it was his practice to test the figures provided by the shipyard by reference to the Shell Expansion drawing which had been approved by the Marine Department. He agreed that that drawing showed the thickness of the side plating of the hull above the waterline to be 5 mm. He accepted that the thickness of that same side plating described in the figures provided by Cheoy Lee, which he checked to be correct, set out measurements in the range of 4.5 to 4.4 mm. That, he said was in the range of its accepted tolerances.

273. By a letter dated 27 June 2005 Cheoy Lee Shipyards confirmed to the Marine Department their request to raise the lead ballast on the Lamma IV.

Inclining experiment

Mr Chau To Yui: Ship Inspector

274. Mr Chau To Yui, a Ship Inspector of the Marine Department, said that he had witnessed the resulting Inclining experiment that had been conducted on the Lamma IV on 19 July 2005. Before that experiment began he said he had checked the position of the lead ballast by entering the two compartments in which it was located,

namely the Steering Gear compartment and the Tank room. He did so in order to confirm the position of the ballast. Having acknowledged that a photograph of the bulkhead between the Steering Gear compartment and the Tank room showed an Access Opening, he said that he was not sure how he had moved from one compartment to the other. Also, he checked each of the six compartments to determine whether or not there was any bilge water present.

Cheoy Lee's calculations

275. By a letter dated 21 September 2005, Cheoy Lee Shipyards provided the Marine Department with a Stability Booklet, in which the issues addressed included both Intact Stability and Damage Stability calculations. (**Appendix 21; pages A66-71**.)

Mr Cheung Fook Chor

276. Mr Cheung Fook Chor, the Cheoy Lee Shipyards' ship draughtsman, said that he had not done those calculations. Rather, Mr Kwok Hing Yin had done the 2005 calculations. Although the Stability Booklet stated, by reference to his initials, that he had checked those calculations, he had not done so. After the inclining experiment had been performed he had handed over the matter to Mr Kwok Hing Yin for him to do the calculations with a new computer software 'Auto Hydro Pro'.

Mr Kwok Hing Yin

277. For his part, Mr Kwok Hing Yin, a graduate in Ship Design of the South China University of Technology in 1991, said that he worked as a ship designer for Cheoy Lee Shipyards in the period 1998 to August 2005. He was the prime author of the Stability Booklet dated 21 July 2005. He readily acknowledged that the six 'Damage

Case' scenarios that he set out in the Booklet as calculations for Damage Stability were predicated on the assumption that all six compartments were watertight. He had no specific memory of the work he performed in making those calculations, but it was his usual practice to look at various plans of the vessel, namely: Lines, General Arrangement, and Profile and Deck. Also, given that it was an existing rather than a new vessel he would speak to colleagues if he had enquiries to make. He said that if he had made enquiries that would have been of Mr Cheung Fook Chor. As noted earlier, Mr Cheung is described in the Stability Booklet as having checked the Booklet.

278. Mr Kwok agreed that he would have interpreted the Profile and Under deck plan of the General Arrangement drawing as describing watertight bulkheads at various places in the vessel, including at Frame ½. Similarly, he accepted that the Shell profile and the Centreline profile of the Profile and Deck drawings described that same bulkhead, as it did other bulkheads, as corrugated 'WT BHD', which he took to be a watertight bulkhead. From that information and what Mr Cheung had told him he made his calculations on the basis of six watertight compartments. Those calculations provided a satisfactory value of GMT and indicated that the 'margin line' was not submerged.

279. He said that he was not aware of the relevance of the 0.1L Rule in the calculations he made, in particular, given the size of the Steering Gear compartment that he ought to have made his calculations considering the Steering Gear compartment and the Tank room together, as one compartment.

280. Of the issue of his knowledge as to whether or not there was a watertight door to the Access Opening on Frame ½, he said that, if he had noticed the drawing of the Access Opening in the Sections and Bulkheads plan, he would have confirmed with Mr Cheung that there was a watertight door fitted at that place. Given the basis on which he proceeded he would have received an affirmative answer to that enquiry. He said of his role as a naval architect (4 March 2013; Day 44, page 58) :

> "… the only thing you need is to input the data given. So that means no need to check actually it's there, the bulkhead, because that's other people's job."

Marine Department's consideration of the Stability calculations

Mr Chau To Yui

281. Mr Chau To Yui, a Ship Inspector of the Marine Department, said that he had checked the calculations contained in the 2005 Stability Booklet against the Stability Booklet provided in 1998. Other than a minor discrepancy in the two periods in respect of both lightship weight and the vertical centre of gravity, which discrepancy he drew to the attention of his superior, Mr Barry Liu Chiu Fai, he noticed nothing of significance. He agreed that the basis upon which the Damaged Stability calculations had been calculated was on there being six watertight compartments, including the Steering Gear compartment. Similarly, he agreed that the General Arrangement drawing included in the Stability Booklet reflected the same position. (**Appendix 21; pages A66-71**.)

Mr Barry Liu Chiu Fai: Senior Surveyor of Ships

282. Mr Barry Liu Chiu Fai, Senior Surveyor of Ships in the Marine Department, said that he had seen the Stability Booklet enclosed with the letter of 21 September 2005 from Cheoy Lee Shipyards. He had signed on the chop impressions marked 'Seen' and 'Date: 6.1.2005' on that Booklet. When he vetted the booklet he had regard in particular to the residual value of the transverse metacentric height or GMT, which required a positive value in excess of 0.05 metres. There was a substantial residual margin in the respective GMT values and no inconsistency between them and the 1998 calculations. He agreed that that was not the only value to which regard was to be had and that, in particular, it was required that in a consideration of one compartment flooding of a vessel it was necessary that not only there be a positive residual metacentric value of at least 50 mm but also that "the margin line shall not be submerged".

283. Mr Liu Chiu Fai accepted that the consideration of Damage Stability in the report was based on six watertight compartments, in particular treating the Steering Gear compartment and the Tank room as two separate compartments. He was aware of the 0.1L Rule, which required that if the distance between two adjacent watertight bulkheads is less than 10% of the length of the vessel, only one of the bulkheads shall be regarded as forming part of the watertight subdivision of the vessel. But, in looking at the Stability Booklet in 2005 it never occurred to him that there was any issue concerning the 0.1L Rule. He said (18 January 2013; Day 18, page 51):

> "Because in my vetting, the vessel was already built for a long time. And there was no major modification of the vessel. There is no structure change. It's just because of the ballast weight was lifted.

> And I based on the previous stability booklet, which is also same condition like the one submitted to me. So I assume that the bulkhead between the Steering Gear compartment and the Tank room is watertight."

284. He agreed that implied if there was an Access Opening in that bulkhead, it was fitted with a watertight appliance. He agreed that he had relied on what had gone before.

A CONSIDERATION OF THE EVIDENCE

285. It is readily apparent from the description that we have given of the various steps taken in the process of designing, constructing and surveying the Lamma IV that there was a litany of errors committed at almost every stage by many different people.

NAVAL-CONSULT

286. Although Mr John Lim, of Naval-Consult, described his role as overseeing his draughtsman in the project in which Naval-Consult provided drawings to Cheoy Lee Shipyards for the latter to submit them for approval to the Marine Department and then for them to be used to construct the Lamma IV, he accepted that he realised now, but not at the time, that the draughtsman had made a mistake. He said that mistake was to describe the bulkhead at Frame ½ as watertight.

287. Whether or not that was indeed a mistake, or whether the mistake was not to stipulate a watertight door to the Access Opening, it is clear that the drawings provided by Naval-Consult were at least "confusing", as Mr Cheung Fook Chor, the ship draughtsman at Cheoy Lee Shipyards, testified he found them to be when he made calculations of Damage Stability in 1996. The obvious confusion arose from the fact that, although the bulkhead at Frame ½ was

described in many places in the main Hull drawings as a watertight bulkhead, one part of the Sections and Bulkheads drawing described an Access Opening in the bulkhead, but did not condescend to describe any watertight appliance to be affixed to the opening. Elsewhere in the same Sections and Bulkheads drawing, the bulkhead at Frame ½ was described in terms as a watertight bulkhead.

288. If, as he said was the case, Mr John Lim's role in Naval-Consult was to oversee his draughtsman, then he ought to have identified the conflict that arose on the face of the drawings produced by Naval-Consult and caused the drawings to be revised to reflect accurately the vessel that it was intended be built. He failed to do so. In consequence, the conflict apparent on the drawings themselves remained unresolved throughout.

CHEOY LEE SHIPYARDS

289. Whilst we understand why it was that Mr Cheung Fook Chor determined to proceed on the basis that the design required a watertight bulkhead at Frame ½, given that is how it was described in so many of the main Hull drawings, clearly such ambiguity as there was ought to have been addressed and resolved and, in particular, documented by an amendment or addition to the drawings themselves. Mr Cheung Fook Chor said that he had made his Damage Stability calculations, on the basis that the bulkhead at Frame ½ was watertight, in the expectation that his work would be reviewed by his "superior" at Cheoy Lee Shipyards or by personnel from the Marine Department.

290. It would appear that Mr Cheung's reference to his "superior" was a reference to Mr JA Leizaola, from whom he said he would have requested provision of the drawings of the Lamma IV in order to make

the calculations he had been requested to make. Certainly, Mr JA Leizaola was the signatory on behalf of Cheoy Lee Shipyards in many of the letters written to the Marine Department in 1995-6, including the letter dated 24 November 1994 enclosing the General Arrangement plan and the letter dated 21 March 1995 enclosing revised drawings, including both pages of the Sections and Bulkheads plan. The Commission was given to understand that Mr JA Leizaola is no longer an employee of Cheoy Lee Shipyards. Certainly, no contact has been made with him during these proceedings.

291. For his part, in his closing submissions, Mr Pao submitted that, as the person in Cheoy Lee Shipyards responsible for giving Mr Cheung Fook Chor instructions to make the Damage Stability calculations, Mr JA Leizaola "should be responsible for seeing to it that clear instructions had been given to the draughtsman". We are satisfied that Mr Cheung Fook Chor was correct to describe as "confusing" the conflict between the description of the bulkhead at Frame ½ as watertight and the drawing of the Access Opening without the additional stipulation that it was to be fitted with a watertight door. That confusion ought to have been identified by anyone reading those plans either at Cheoy Lee Shipyards or at the Marine Department. It is noted that Mr Ken Lo was the signatory of the letter dated 5 January 1995, which enclosed various drawings of the Lamma IV including both pages of the Sections and Bulkheads plan and the Profile and Deck drawing. A perusal of those drawings would have readily identified the conflict.

292. Mr Ken Lo speculated that it was to be inferred that, given the absence of the fittings that would be used to attach a watertight door to that bulkhead when the vessel was received from Wuzhou Shipyard,

it was intended that no watertight door be fitted to the Frame ½ bulkhead. He suggested that the costs involved were minimal, only thousands of dollars. If that was the case, then the main Hull plans in which that bulkhead was described as watertight ought to have been revised and fresh approval of those plans sought from the Marine Department. Cheoy Lee Shipyards took no steps whatsoever in that regard.

MARINE DEPARTMENT

1996

293. In light of the testimony of Mr Leung Kwong Chow, who appears to have been the first of officers of the Marine Department to consider the plans of the Lamma IV provided by Cheoy Lee Shipyards, in particular his evidence that he did not have page 1 of the Sections and Bulkheads plans, in which the Access Opening to the bulkhead at Frame ½ was depicted, it was clear that there was nothing on the available material to alert him to the conflict that arose from the drawings.

294. By contrast, the conflict between the main Hull drawings and the description of the Access Opening on the Frame ½ bulkhead on the Sections and Bulkheads drawing ought to have been identified by Mr Wong Chi Kin at the time that he considered and approved the drawings. Had the conflict been identified, as it ought to have been readily by him or any of those other persons described earlier, then the obvious necessary steps ought to have been taken to revise the drawings to resolve the conflict unambiguously. Sadly, such a simple and obvious step was never taken by any of the parties involved. For

his part, clearly Mr Wong Chi Kin ought not to have approved the drawings without having required them to be revised.

The inspection of the hull by the Marine Department

295. The inspection of the hull by Mr Fung Wai Man, then a Ship Inspector of the Marine Department, on 13 November 1995 was clearly the occasion on which it ought to have been noticed that there was no watertight door to the Access Opening in the Frame ½. Clearly, the purpose of the inspection was to compare the hull as built with the design drawings of the Hull. The absence of such a watertight fitting was clearly in conflict with the descriptions on the main Hull plans, in particular that the bulkhead in question was watertight. We accept that his job would have been rendered easier if the conflict had been identified at an earlier stage when the plans were considered by all of the parties to whom we made reference earlier. Nevertheless, we are satisfied that he ought to have noted the absence of a watertight door and included it in his list of 'Outstanding' items. We do not accept his evidence that he was entitled to ignore it as a mere 'Outfitting' item.

296. The inspection of the hull by Mr Philip Yu Kick Chuen on 11 January 1996 was another opportunity lost by officers of the Marine Department to note the absence of a watertight door at the bulkhead at Frame ½. We accept that his job would have been made easier if Mr Fung Wai Man had noted the absence of that watertight door on his earlier inspection and included in the list of 'Outstanding' items. Nevertheless, part of Mr Philip Yu's inspection on 11 January 1996 required him to enter the Steering Gear compartment to inspect the rudder. He did so through the Access Opening in the

bulkhead at Frame ½. In order to conduct a proper inspection of the 'Outstanding' items, from the earlier hull inspection by Mr Fung, he ought to have had regard to the main Hull drawings. If he had done so, he was well placed to have noted the absence of the watertight door on the bulkhead.

297. Similarly, yet another opportunity to note the absence of a watertight door of the bulkhead at Frame ½ was lost in the inspection conducted by Mr Ho Kai Tak on 22 January 1996 when he too entered the Steering Gear compartment.

1996: DAMAGE STABILITY BOOKLET

298. As was noted earlier, the preparation of the 1996 Damage Stability Booklet was an opportunity for Mr Cheung Fook Chor, who noted the 'confusion' on the various drawings of the Lamma IV as to whether or not the bulkhead at Frame ½ was watertight given the description of an Access Opening at the bulkhead, to have raised the matter with his superiors in Cheoy Lee Shipyards. Proceeding on the assumption that it was watertight, having noted the conflict, and relying on his superior or the Marine Department to pick up the issue was not good enough. Nevertheless, we are satisfied that not only the conflict ought to have been noted by his superiors, including Mr Ken Lo, but also it ought to have been resolved by the drawings being revised, if not much earlier at the least by that stage.

299. Mr Cheung Fook Chor's flawed assumption that the bulkhead at Frame ½ was watertight led him to make the Damage Stability calculations on a false basis, namely of six watertight compartments including the Steering Gear compartment. It seems that his method of proceeding in that way created the template which led him to make the

calculations for the 1998 Stability Booklet on the same flawed basis and, it seems, played a part in Mr Kwok's calculation of Damage Stability in 2005.

300. In any event, there is no dispute that Mr Cheung Fook Chor was in error in considering the Steering Gear compartment as a separate watertight compartment. Clearly, given its size, and by application of the 0.1L Rule it ought to have been considered together with the Tank room.

Materiality of the errors

301. We accept Dr Armstrong's evidence that in 1996 Mr Cheung's error in this respect was not material, given that the margin line was not immersed. Equally, we accept as evidence that it was material in the 1998 Damage Stability calculation, in particular if the calculation had been made as required it would have become known that the addition of 8.25 tonnes of lead ballast in the increased lightship weight of the vessel would have immersed the margin line.

1996: the Marine Department's role

302. Given the clear conflict that arose on a perusal of the plans of the Lamma IV as to whether or not the Access Opening at Frame ½ was fitted with a watertight door, so that it was consistent with the main Hull drawings, clearly, Mr Leung Wai Hok was at fault in being prepared to deal with the matter on the "assumption" that it was watertight. Why assume that to be the case when the issue could have been resolved easily by enquiries of Cheoy Lee Shipyards or an inspection of the vessel? The simple answer, namely that the bulkhead was not watertight, would have required recalculation, in

particular a consideration of the Tank room together with the Steering Gear compartment as one compartment for purposes of flooding.

303. Clearly, given our findings in respect of the basis of Mr Cheung's calculation for the Damage Stability Booklet in 1996, the Marine Department officers, Mr Ho Kai Tak and Mr Leung Wai Hok, who checked the calculations failed to note that they were made in error in that they did not take into account the application of the 0.1L Rule in respect of the Steering Gear compartment.

304. Notwithstanding the various hypotheses which Mr Leung has advanced for how it came about that he signed on the chop impression 'Seen' on the 1998 Stability Booklet, given the absence of any documented record of the discovery by Mr Leung of the false basis on which the Steering Gear compartment had been considered separately from the Tank room for purposes of the Damage Stability calculation, we are satisfied that in light of his admission that he did not know that the Frame ½ bulkhead was not watertight, in fact he simply did not consider the relevance of the 0.1L rule at all.

1998: STABILITY AND DAMAGED STABILITY BOOKLET

Cheoy Lee Shipyards

305. As we found earlier, Mr Cheung was in error not only in making his Stability calculations on the basis that the Steering Gear compartment was watertight but also by failing to calculate Damage Stability by the application of the 0.1L Rule, so that the Steering Gear compartment was considered together with the Tank room. The basis of those calculations by Cheoy Lee Shipyards was flawed and the results materially misleading.

The Marine Department's role

306. It is clear that the Marine Department was conscious that the addition of the lead ballast to the Lamma IV would have a dramatic effect on its lightship particulars. The Marine Department said so specifically in its letter of reply to Cheoy Lee Shipyards, having been informed of the proposal. In those circumstances, it was to be expected that officers of the Marine Department who were involved in processing the proposal would be all the more alert to ensure that the calculations were made on a correct basis. Unfortunately, that was not the case.

307. Although Mr Mak Yat Wai attended the Inclining experiment and inspected all the individual compartments of the vessel to ensure that there was no water in the bilges, an issue that would affect that experiment, he said that he did not notice that there was an Access Opening in the bulkhead to the Steering Gear compartment. It is difficult to comprehend how, in the context of a change which had a dramatic effect on the vessel's lightship weight by the addition of lead ballast to that very compartment and the adjoining compartment, as a professional officer failed to observe the obvious presence of a large hole in the watertight bulkhead, which gave the lie to the whole basis of the calculations.

308. He was aware that the Damage Stability booklet considered six separate compartments for purposes of flooding. Neither he, nor his superior, noticed that the calculations did not take into account an application of the 0.1L Rule, so that the Steering Gear compartment and the Tank room had to be considered together. Had they required the calculations to be done on that basis, as they ought to have done, they would have come to know that the margin line of the vessel was

immersed. No doubt, then they would have refused to allow the vessel to sail.

2005: STABILITY AND DAMAGE STABILITY CALCULATIONS

Cheoy Lee Shipyards

309. We accept Mr Kwok Hing Yin's protestations that, as a naval architect calculating the 2005 Stability and Damage Stability calculations for the Lamma IV, it was not for him to check the vessel to ensure that there was a watertight bulkhead at Frame ½. Clearly, it was for others to do so and to have done so years earlier. Given that his work in 2005 was the first time that he had done work in respect of the vessel it was reasonable for him to seek assistance from Mr Cheung and to rely on what he was told. No doubt, it was in those circumstances that he made his calculations on the basis that there were six watertight compartments, including the Steering Gear compartment.

310. If, years earlier, the conflict between the drawings had been identified and resolved, the drawings available to him would have been amended to reflect the reality. Then, his calculations would have been based on fact. As it was, there was no watertight bulkhead to the Steering Gear compartment and his calculations were based on fiction.

311. In any event, it is clear that in making his calculations he failed to have regard to the 0.1L Rule, in particular its application to a consideration of the Steering Gear compartment, in particular that the calculations for one compartment flooding ought to be in respect of a combination of the Steering Gear compartment and the Tank room. If he had done so, his calculations would have demonstrated that the margin line would have been immersed.

312. Very frankly, but wholly unacceptably, Mr Kwok said that he was unaware of the applicability of that rule to the calculations that he made.

The role of the Marine Department

313. Once again the officers in the Marine Department concerned with the processing of the 2005 Stability and Damage Stability Booklet calculations accepted the calculations on the flawed basis of six watertight compartments.

314. Mr Chau To Yui, a Ship Inspector of the Marine Department who conducted the Inclining experiment, testified that he had inspected the raised lead ballast *in situ*, namely in the Tank room and the Steering Gear compartment. Somehow, he failed to notice the presence of the Access Opening in the bulkhead at Frame ½, which on any view would have given the lie to the consideration of the Steering Gear compartment as a separate watertight compartment.

315. For his part, Mr Barry Liu Chiu Fai signed on the 'Seen' chop impression on the Booklet. Clearly, his admission that although he was aware of the 0.1L Rule, it had never occurred to him that it was relevant to his consideration of the Stability calculations is significantly revealing of his failing. Having compared the 1998 Stability booklet with that of 2005 and being satisfied that there was no inconsistency between them was no sufficient basis not to have regard to the applicability of the 0.1L Rule. If he had done so, and required the calculations to be redone on that basis he would have come to know that the margin line was immersed. No doubt, in his knowledge he would refuse to allow the vessel to sail.

IV. WHY WERE SO MANY LIVES LOST ON THE LAMMA IV?

316. Of course, the answer to the question of why it was that the loss of life on the Lamma IV was so great is intimately bound up with the fact that the vessel sank so quickly and at such a dramatic angle to the horizontal. It is clear that various consequences flowed from the circumstances in which the vessel sank:

(i) the fact that the attachment of the seats on the Upper deck failed caused both seats and passengers to be thrown down so that they slid towards the stern of the cabin where some passengers were hurt and trapped;

(ii) passengers had difficulty not only in retrieving lifejackets but also in donning them properly; and

(iii) those passengers who were responsible for children were unable to ensure that the children donned child lifejackets, since the vessel carried none.

AS TO (i): THE FAILURE OF THE ATTACHMENTS TO THE SEATS

Dr Armstrong

317. As Dr Armstrong noted that the Upper deck of the Lamma IV was made of glass fibre composite structure made up of:

(i) 2.1 mm thickness of woven rovings and chopped strand mat;

(ii) 25 mm thickness of foam; and

(iii) 2.1 mm thickness of woven rovings and chopped strand mat.

(**Appendix 22; page A72**. Sketch of the seat foundation arrangement on the Upper deck of the Lamma IV)

318. Dr Armstrong said that a layer of vinyl was laid on the surface of the Upper deck, between the deck and the base of the seats. He observed that most of the self-tapping screws that were used to attach the seats to the deck were 25 mm long only. Accordingly, apart from the 2.1 mm of the screw in the woven roving, the rest of the screw was merely embedded in foam. That was an inadequate method of attaching a seat to that deck. He noted that some of the screws had pulled out of their holes on earlier occasions and had been re-screwed to the deck. He said there was an engineering rule of thumb that self-tapping screws, even in metal, should have at least 2½ threads of the screw in the metal. In his opinion, the majority of the screws used in the Upper deck did not even have one thread of the screw engaged with the woven rovings.

319. Of the woven rovings, he said (Expert Report; paragraph 43):

> "It has limited strength perpendicular to the deck and is therefore quite unsuited to the use of screws to attach seats."

320. In his opinion, the seat attachments on the Upper deck ought to have been through-bolted so that:

> "… a bolt should have been used that had a nut under the deck with a washer sufficiently large to spread the load so as not to crush the foam."

Dr Cheng Yuk Ki

321. Dr Cheng Yuk Ki confirmed in broad terms Dr Armstrong's evidence in respect of the attachments of the seats to the Upper deck. At the time of his examination there was only one seat still attached to the Upper deck. Of it, he noted that it had:

> "a white plastic seat with four metal legs, each having a rectangular mounting plate at the base which was secured to the deck by a pair of 2.7 cm screws; bolts were used in the main-deck cabin."

(**Appendix 23; page A73**. Photo of the rectangular mounting plate at the base of seat in the Upper deck cabin of the Lamma IV and the screw for affixing the seat)

322. In respect of the missing seating, he noted:

> "Rectangular imprints with a pair of holes agreeing in size and shape with the mounting plates of the legs were found on the deck of the upper-deck cabin, and the arrangement of the imprints was found to agree with seating arrangement as depicted in the deck plan, having eight rows. Numerous screws, agreeing in dimension and general appearance with those for securing the only seat in the upper-deck cabin, were found at the rear end of the cabin."

323. Of the rectangular imprints he had observed on the deck of the Upper deck cabin, he noted that whilst most of them had a pair of holes 6 cm apart:

> "... at least 10 of them having one or two additional holes, suggesting that the seats for these positions could have been remounted for at least once previously."

(**Appendix 24; page A74**. Photos of the rectangular imprint on the deck of the Upper deck cabin of the Lamma IV and the mounting holes)

324. Dr Cheng went on to testify that, having matched a row of five detached seats to matching imprints on the deck of the Upper deck cabin, matching rivet tails and rivet heads "strongly indicated" that the middle front leg of that row of seats have been affixed to the deck using two rivets. Beneath the plate used to attach those rivets, he found two holes in the deck which were larger than the screw holes for mounting the other seats. In his opinion, since they were made from aluminium, rivets were not normally strong enough for this purpose. (**Appendix 25; page A75**. Photo of the mounting plate with heads of two rivets and the rectangular metal plate with rivet tails)

325. Dr Cheng testified that he performed a simulated test for the force required to dislodge the attachment of a seat which he affixed to the Upper deck. Applying a horizontal force to the back of the top of the seat, at 190 kg the row of seats was detached from the deck. Applying a similar force to the metal seat frame of the sole seat that remained attached to the Upper deck required a force of 230 kg to detach it from its mounts.

THE CAUSE OF THE FAILURE OF THE SEAT ATTACHMENTS

Dr Armstrong and Dr Cheng Yuk Ki

326. Of the cause of the failure of the seat attachments to the Upper deck, Dr Armstrong noted that they had failed only in the abnormal condition where the vessel had an excessive stern trim and the weight of the seated person generated an abnormal tipping force.

327. Dr Cheng Yuk Ki said of the cause of the failure of the attachment of the seats in the Upper deck that (Witness Statement dated 12 December 2012, paragraph 6.4):

> "… rows of seats were originally secured to the fibreboard deck by screws. However, when the bow of the Lamma IV was tilting up, it would have taken the weight of only two or three adult passengers, who might have been sitting on, standing on and/or holding the row of seats to get balance, to cause the seats to be broken off from its mounts on the fibreboard deck as the fibreboard was not strong enough to grip the mounting screws and yielded under such pulling force."

Mr Ken Lo Ngok Yang: Cheoy Lee Shipyards

328. Mr Ken Lo, of Cheoy Lee Shipyards, confirmed that the seating on the Lamma IV had been supplied and installed by Cheoy Lee Shipyards. He said that the seating had been attached to the aluminium deck on the Main deck and the GRP deck of the Upper deck by self-tapping stainless steel screws. That method of fastening seating to passenger launches which plied local waters was and is common in the industry. He noted that before the Marine Department issued the Certificate of Survey dated 30 July 1996 it was a requirement that they be satisfied that "all seats are properly secured in position" on the Lamma IV.

329. He disagreed with Dr Armstrong that the use of self-tapping screws on the Upper deck to attach the seating to the deck was inadequate. In his opinion, the seats were adequately secured to that deck. He pointed out (18 January 2013; Day 18, page 121):

> "Well, it has lasted that many years and has been in use and I can assure you this is the same practice we do on a lot of boats and it's still in use."

330. When the possibility was raised with him of using additional methods in order to ensure the security of the attachment of the seating to the Upper deck, for example a wooden base beneath the fibreglass/foam Upper deck, he said (page 123):

> "Well, I'm sure there are a lot of methods that can be used. As I mentioned earlier, before the ship is finished it's very hard to allocate where the seats will go. So it would be very hard to pre-insert a piece of wood into the structure to accept this type of fastening. It is not practical."

331. Nevertheless, Mr Ken Lo did say that it would have been possible in certain places on the Upper deck to have used a through-bolt with a washer beneath the deck to reduce the load, rather than using a self- tapping screws. However, he said that one difficulty was that the seating was attached at the final stage of construction, at which point in time there was wiring and piping underneath the deck. He said that it was not practical to thicken the fibreglass at certain places in the deck, at which fastenings could be attached.

332. Finally, he said that he agreed with Mr Wong Chi Kin of the Marine Department, that the requirement that seating be securely fastened to the deck, was not a requirement that the attachments to the seating withstand abnormal pulling out forces.

333. Mr Ken Lo said that, having built the Lamma IV for Hongkong Electric Company in 1996, Cheoy Lee Shipyards had not been engaged to service the vessel until 2003. Thereafter, Cheoy Lee Shipyards had been engaged to perform only specific stipulated work on the vessel.

Mr Wong Chi Kin: Marine Department

334. For his part, Mr Wong Chi Kin said that the requirement that the seating on the vessel be "properly secured" in position, as required by paragraph 26 of the Blue Book, referred to dynamic and static loading in normal conditions, not abnormal conditions. Of dynamic loading, he said that the requirements were normal and favourable

weather conditions with sea wave heights of about 1.2 metres. In particular, he said in his witness statement:

> "The securing of the seats was not intended to withstand the abnormal pulling out force due to impact, tilting, excessive trim of the vessel and the subsequent bending induced by the weight of the seated person during tilting of the vessel."

335. He said that on vessels where the deck to which the seating was attached was thin fibreglass, an inspector might ask that a wooden base be used to secure the attachment of the seating to the fibreglass. However, given that no drawings of the method by which the seating was attached to the deck was supplied to an inspector, such a request would only arise if the inspector found the seating to be loose.

Mr Tang Wan On: Hongkong Electric Company

336. Mr Tang Wan On, the Marine Officer of the Hongkong Electric Company, said that the crew of the Lamma IV attended on an 'as needed' basis to re-screwing the attachments to the seating on the Upper deck of the vessel. If more was needed to re-secure a seat, the work was referred to the Company's maintenance team. Mr Chow Chi Wai, the coxswain of the Lamma IV, confirmed that to be the case.

Passengers on the Lamma IV – detachment of seats

(**Appendix 26; page A76** provides a seating plan)

337. Mr Lau Kam Bor was sitting at seat number 31 on the port side of the Upper deck cabin of the Lamma IV when the collision occurred. At the point at which Lamma IV sank to its stern he took out lifejackets, which he distributed to his friend, at which point the seats on the Upper deck began to detach (17 December 2012; Day 4, page 10):

> "… we were hit by the seats and the miscellaneous items sliding down from the front."

338. Of the angle at which the vessel had reached when the seats began to detach, he said (page 16):

> "After it had sank to less than 30°, the seats began to detach."

339. He agreed that the seats did not become detached at the impact of the collision but he rejected the suggestion that the vessel was almost vertical before the seats began to detach (page 16):

> "In fact the seats had become detached before the water went into the vessel. The seats had already been dislodged before the water rose up to the Upper deck."

340. Madam Lo Lai Ngan, the wife of Mr Lau, described the collapse of seating on the Upper deck towards the stern of the vessel, saying (17 December 2012; Day 4, page 26):

> "Those passengers sitting at the back were pressed by those seats which collapsed."

341. Mr Lee Ming Sun testified that he was sitting with his two-year-old son in the front row on the port side of the Upper deck cabin of the Lamma IV when the collision occurred. At his shouted request, his wife and nine-year-old daughter joined him from the stern of the Open Upper deck. As the vessel was sinking to its stern, and he was helping his son to don a lifejacket, the vessel rose to 70° to the horizontal with the result that he and his son, together with the chairs, slid towards the stern of the Upper deck cabin.

Divers: the retrieval of bodies trapped by seating

(**Appendix 27; A77** provides a seating plan)

342. The Commission received evidence from a number of divers from the Emergency Services who had retrieved the bodies of deceased persons whom they had found entangled in and trapped by seating in both the Upper deck and Main deck cabins of the Lamma IV.

343. During a dive that he commenced at 23:15 Fire Services Diver, Senior Fireman 11314, Yuen Ka Wai, entered the Main deck cabin of the Lamma IV. At the area of the third and fourth row of seats in the cabin he located the body of a female trapped by some benches. After he had removed them, he was able to recover her body and take it to the surface.

344. During a dive that he commenced at about 06:00 on 2 October 2012, Firemen Yuen Kin Pun, a Senior Station Officer, descended to the rear portion of the Upper deck and found a female body entangled in two 5-seater rows of seats. Using ropes and with the assistance of colleagues on the surface he recovered the body of the female, having taken 25 minutes to remove the seating.

345. During a dive that he commenced at about 05:25 Fire Services Diver, Fireman 12230, Leung Kin Kie recovered the body of a male adult that he had found trapped beneath a bench on the starboard side of the Upper deck. He was able to do so only after he removed the bench by the use of a rope with assistance from colleagues on the surface.

346. One of the police officers who gave evidence in circumstances of anonymity, testified that he had retrieved the body of a male

passenger whom he had found trapped underneath a seat on the port side of the Main deck cabin at about the position of seat number 99.

AS TO (ii) – DIFFICULTIES IN RETRIEVING AND DONNING ADULT LIFEJACKETS

347. There is no dispute that the adult lifejackets that were carried on the Lamma IV conformed entirely with the Marine Department's technical requirements for lifejackets and the law.

Passengers

(**Appendices 26 and 27; page A76 and A77** provide a seating plan)

348. As noted earlier, Mr Lau Kam Bor, was seated together with his wife and friends on the port side of the Upper deck cabin of the Lamma IV when the collision occurred. He said that as soon as the vessel began to tilt to its stern he had taken out four or five lifejackets and handed them to others in his party. But, before they were able to don the lifejackets they were immersed in water. When his friend Madam Szeto Pui Wah's lifejacket strap became trapped in the seat he removed the lifejacket from her.

349. Madam Lo Lai Ngan, the wife of Lo Kam Bor, said that after her husband had retrieved lifejackets for them she and her friends had put them on. They had done so by just slipping them on, without tying up the straps.

350. Of why she did not tie up the straps, she said (17 December 2012; Day 4, pages 35-36):

> "Because it was very chaotic at that time ... It was very difficult to find the string. So we just slipped it on ... we didn't think about how to tie it

> up and we don't know how to tie them on … It was very chaotic at that time."

351. Madam Lau Hau Yin was travelling on the starboard side of the Upper deck of the Lamma IV with her husband and two children, aged seven and ten years. After the collision, the three members of the family joined her son, who was sitting at the front row of seats on the starboard side behind the wheelhouse. There, she and her husband took out lifejackets from underneath the seats and began to put them on to their children. She had difficulties with the first lifejacket which she retrieved (19 December 2012; Day 6, page 103):

> "When I put the first one on, a string at the neck was entangled when I pulled it .... When I tried to pull out the life jacket, I had difficulty pulling them out because I was feeling very nervous and I was in a rush and the string was entangled. The string went into – there were knots in the string which were unable to be untangled. My husband helped us to pull out the second lifejacket, and I helped to put it on."

In the result, she said that she had no time to don a lifejacket herself.

352. Mr Kwok Yin Tang and his wife, Madam Wong Yee Yi, were seated with their son and daughter, aged three and four years respectively at the starboard side of the stern in the last row of seats in the Main cabin of the Lamma IV at the time of the collision. Sadly, both their children lost their lives. Both Mr Kwok and Madam Wong said that they had no time to put a lifejacket on their children or don one themselves. Each of them handed over one of their children to another person, Madam Wong to one of the crew, in the hope that they could be saved. Clearly, on the evidence that was the engineer, Leung Pui Sang, whom she described as hurdling over the seats to reach the stern where she was with her daughter. However, they were immersed in water very soon and sadly he lost hold of the young girl.

353. In the absence of any lifejackets whatsoever on the Open Upper deck, albeit that there were multiple lifebuoys stacked up at the stern of the vessel, some passengers made their way into the Upper deck cabin in order to retrieve a lifejacket.

354. After the collision Mr Chan Kam Ho first reported the collision by a '999' telephone call and then made his way into the Upper deck cabin where he retrieved three lifejackets. On his return to the Open Upper deck he gave one to each of his mother and brother, retaining one for himself. By contrast, Mr Chan Wing Hang said that he had been on the Open Upper deck of the vessel at the time of the collision, but had gone with his wife into the Upper deck cabin in order to retrieve lifejackets. There, he said (18 December 2012; Day 5, page 89-90):

> "I took a lifejacket, and then I heard a big sound of explosion. Later, I suddenly got a blackout and I felt lots of things and people stacked on my body. I sensed that I needed to push away all those things. After that, I swam back to the sea surface, but I saw that the whole cabin had already sunk into the sea vertically. I was totally trapped in the cabin, but not completely drowned. I could still breathe."

Dr Cheng Yuk Ki

355. Dr Cheng Yuk Ki said that in his examination of the stowage of lifejackets on the vessel he observed that they were located under the seats in the Main deck cabin and the Upper deck cabin. Of the lifejacket stowage he noted that (Witness Statement dated 12 December 2012, paragraph 3.8.3):

> "… each was attached to the two longitudinal bottom rails of the seat frame by pieces of Velcro, leaving a gap of about 10 cm between the opening of the stowage and the bottom of the seat. The front and the back of each lifejacket were made up of 10 cm thick foam and they were folded to a total of 20 cm thick and tied by the waist strap in order

> to fit the stowage, so they could not be taken out through the gap without unfastening the pieces of Velcro."

(**Appendix 28; page A78**. Photos of the lifejacket stowage beneath the seats of the Lamma IV)

356. For his part, Dr Armstrong, who also examined the lifejackets, said that the plastic bags in which some of the lifejackets were found to be contained were easy enough to rip open, although the knot to the plastic bag had proved troublesome to undo.

357. The relative complexity involved in the task of tying up the straps to the lifejackets on the Lamma IV that some passengers encountered is illustrated by a photograph of one of the lifejackets. (**Appendix 29; page A79**)

AS TO (iii) THE ABSENCE OF CHILD LIFEJACKETS ON THE LAMMA IV

358. There is no dispute that at the time of the collision on 1 October 2012 the Lamma IV was not carrying any child lifejackets whatsoever. The Hongkong Electric Company said that none had been bought for the vessel and none had ever been on board the vessel.

THE 2007 REGULATIONS

359. As Mr Wong Wing Chuen said in his statement (2nd Supplemental Witness Statement, paragraph 92) pursuant to Table 1 of Part 2 of the Merchant Shipping (Local Vessels) (Safety and Survey) Regulations, Cap 548G, Class I vessels, of which Lamma IV is one, are required to carry the lifejackets as stipulated, namely :

> "100% adult lifejacket + 5% children lifejacket"

Note 1 explains:

> "Where the required quantity of life-saving appliances is expressed as a percentage, it means the percentage of the total number of persons on board."

360. Again, as Mr Wong Wing Chuen explained, by operation of paragraph 9(1) of Schedule 8 to that Ordinance, the legislation came into force in January 2008.

THE MARINE DEPARTMENT'S POLICY OF NON-ENFORCEMENT OF THE LAW

361. By questions asked of Mr Wong Wing Chuen in his oral testimony by Mr McGowan for the first time focus was given to an extraordinary assertion that had been made at paragraph 92 in his witness statement of 8 February 2013. There, he said that, notwithstanding the fact that the law in respect of the number of adult and child lifejackets required to be carried on board a Class 1 vessel had come into force in January 2008:

> "Mardep (Marine Department) has not strictly enforced that requirement in the case of Class1 vessels since a substantial number of their operators are small-scale operations (one-man or two-men operations) and they have lobbied very hard that the proposed change would impose a very heavy financial burden on them (since it is not merely a matter of buying more lifejackets but the arrangement on board would have to be changed to accommodate the increased number) and might drive many of them out of business altogether. Having regard to the practical reality in relation to a substantial number of operators, for existing vessels Mardep did not insist on full compliance with the new requirement on the number of lifejackets and instead encouraged the owners to gradually increase the numbers to meet the requirement."

362. In his testimony Mr Wong went on to describe the entirely informal genesis of the so-called 'policy' or 'short-term measure', the complete lack of documentation internal to the Marine Department or

by way of general public promulgation that evidenced the 'policy' (1 March 2013; Day 43, page 45-50).

> "THE CHAIRMAN: Which aspect of that law did Mardep (Marine Department) choose not to enforce?
>
> A: In the aspect of 100 per cent for adult passengers and 5 per cent for child passengers.
>
> THE CHAIRMAN: Both aspects?
>
> A: Yes.
>
> THE CHAIRMAN: And who in the Marine Department determined not to enforce the law?
>
> A: The management.
>
> THE CHAIRMAN: Who is "the management"?
>
> A: The general manager at the time.
>
> THE CHAIRMAN: Who was he?
>
> A: Mr So.
>
> THE CHAIRMAN: Was the Director of Marine informed that the Department was choosing not to enforce the law?
>
> A: It was the policy of the time. Whether he was informed or not, I'm not sure.
>
> THE CHAIRMAN: Was this a written policy?
>
> A: According to my knowledge, no.
>
> THE CHAIRMAN: And nothing in writing that evidenced this policy?
>
> A: I feel that at that time, this was not a policy but only a short-term measure.
>
> THE CHAIRMAN: "Short-term" being what length of time?
>
> A: It should be around – within one year.
>
> THE CHAIRMAN: So by 2009, was the law being enforced by the Marine Department?
>
> A: Actually by 2008, the Marine Department had already been encouraging the industry to conform to these new regulations concerning the lifejackets.
>
> THE CHAIRMAN: And by 2009, was the Marine Department actually enforcing the law in this respect? Adult lifejackets 100 per cent, children's lifejackets 5 per cent?

A: Yes, we had continued to enforce it, to enforce part of it.

THE CHAIRMAN: I'm sorry?

THE INTERPRETER: "We had continued to enforce part of it."

THE CHAIRMAN: Which part did you choose to enforce?

A: Some vessels already updated their rules concerning the lifejackets. For those vessels, they had enforced this rule.

THE CHAIRMAN: I'm asking you about the Marine Department. You said you enforced part of the rules. Which part did you enforce in 2009?

A: In the aspect of 100 per cent for adult passengers and 5 per cent for child passengers.

THE CHAIRMAN: So in 2009, the Marine Department started to enforce the law as it was?

A: Let me put it this way. I'll explain it this way.

THE CHAIRMAN: No, Mr Wong. You must be able to answer that "yes" or "no". Was it enforced or not in 2009? By all means give an explanation after you've answered, but that surely is susceptible to being answered "yes" or "no".

A: No, we didn't enforce it."

MARINE DEPARTMENT SURVEYS OF THE LAMMA IV – LIFEJACKETS

363. The Certificates of Survey for the Lamma IV for the period 8 May 2011 to 7 July 2012 and 8 May 2012 to 7 July 2013 were in a partly new format, apparently as revised in April 2011. In each case, it stated:

"THIS IS TO CERTIFY:

(1) That the above-mentioned vessel has been duly surveyed in accordance with the applicable requirements of the Merchant Shipping (Local Vessels) Ordinance, its subsidiary legislations and the Merchant Shipping (Prevention of Air Pollution) Regulation.

(2) this vessel is provided with the following life-saving appliances and radio equipment

- motor lifeboat(s)

1 inflatable liferaft(s)

\- buoyant apparatus(es)

* adult lifejacket(s)

* child lifejacket(s)

[other items]

* One lifejacket for each person on board"

364. In 2011, for the first time in the Marine Department surveys of the Lamma IV, the format of certifying that lifejackets were on board the vessel by the use of an asterisk was employed.

2011 Survey

365. Ship Inspector Lau Wing Tat testified that he had conducted the inspection which resulted in the issue of the 2011 Certificate of Survey for the Lamma IV. He testified before Mr Wong Wing Chuen gave his evidence, in particular in respect of the policy of non-enforcement of the 2007 Regulations. (**Appendix 30; page A80**. Certificate of Survey for the Lamma IV issued on 8 July 2011)

366. Following the Commission's receipt of the oral testimony of Mr Wong Wing Chuen at the behest of the Marine Department and, in particular having regard to his testimony of a 'policy' within the Marine Department not to enforce the 2007 Regulations, which came into force in January 2008, in respect of requirements for existing vessels to carry stipulated numbers of adult and child lifejackets, Mr Lau Wing Tat and the Ship Inspector responsible for the inspection and issue of the 2012 Certificate of Survey, Mr Wong Kam Ching, were recalled to give further testimony.

367. Mr Lau Wing Tat testified that he no longer had any clear recollection of the particular inspection of the Lamma IV and gave his evidence in respect of that inspection based on his general practice. He was aware at the time of his inspection that the Lamma IV was required to have on board one adult lifejacket for each person on board and child lifejackets for 5% of that number. In placing an asterisk next to the phrases 'adult lifejacket(s)' and 'child lifejacket(s)' on the 2011 Certificate of Survey he was certifying that there were 232 adult lifejackets and 12 child lifejackets on board the vessel.

368. In the course of his testimony, the following interchange ensued in questions by Mr Grossman:

> "Mr Grossman: ... Can you remember if you saw children's lifejackets?
>
> A: If you ask me about the Lamma IV, I am sorry to tell you that I have absolutely no recollection about the procedures and what happened.
>
> Q: So is it possible you did not see children's lifejackets?
>
> A: I cannot comment on what I have no recollection at all."

369. On being recalled to give further evidence on 5 March 2013, he said that he was aware of a 'policy' in the Marine Department to issue Certificates of Survey to vessels that were in existence at the time the 2007 Regulations came into force, notwithstanding that they did not comply with those Regulations, so long as they complied with the previous Code. He had been informed of that policy during his period of training to become a Ship Inspector, September 2009 to January 2010, by the Chief Inspector of Ships, Mr Wong Hon Chung, in response to his own general enquiry. Whilst he was told that those were "instructions from the top", he was not shown anything in

"black-and-white". He said that he had applied that 'policy' in the course of his practice as an inspector.

370. When asked if, in those circumstances, it was possible that he would have passed the Lamma IV in his 2011 inspection, even if there were no child lifejackets on board, he said (5 March 2013; Day 45, page 34-35):

> "Yes. My answer would be, first of all, yes, I would. However, I would also base my passing in reference to the number stated on the certificate of survey in 2010. I would not have made my passing in reference to the two asterisks as stated on the Certificate of Survey."

Of that testimony he was asked (page 36):

> "THE CHAIRMAN: So if you would have passed this vessel even though it didn't have children's lifejackets on (board), would you nevertheless have put an asterisk there saying that there were lifejackets, as provided for in this form, for children-if there had been none?
>
> A: No, I wouldn't have done that."

Later, he explained (page 42):

> "By putting an asterisk there, it means that it conformed with the new regime, 105%; that is, 100% for the adults and 5% for the children."

2012 Survey

371. Mr Wong Kam Ching, a Senior Ship Inspector, conducted the survey of the Lamma IV on 8 May 2012, after which he issued a Certificate of Survey for the vessel valid from that date until 7 July 2013. In his witness statement, dated 5 February 2013, he has said that given the numerous inspections that he had carried out he was unable to recall the particular inspection of 8 May 2012. However, in his oral testimony he said that he did not mean that he had no recollection at all of that inspection. His evidence proceeded on the basis that he would indicate his specific memory, as opposed to

his general practice. (**Appendix 31; page A81**. Certificate of Survey for the Lamma IV issued on 8 May 2012)

372. Mr Wong agreed that he had signed the Final Inspection Record dated 8 May 2012, in which he had ticked the appropriate box for 'Life-Saving Appliances'. He said that he had counted the number of lifejackets on board and remembered having done that. Having referred to the Certificate of Survey, which stipulated the maximum number of persons permitted to be on board as being 232, he said that he had calculated that 12 child lifejackets were required, on the basis that was 5% of 232. Then, he had placed an asterisk on the form opposite the two items, namely adult lifejacket(s) and child lifejacket(s).

373. When counsel for the Commission informed him of the effect of the evidence of Mr Tang Wan On, the Marine Officer of the Hongkong Electric Company, to the effect that there were no child lifejackets aboard the Lamma IV at the inspection of the vessel on 8 May 2012, Mr Wong said (18 February 2013; Day 34, page 30):

> "It was inspected by me and not Mr Tang … I mean that I did see children's lifejacket on 8 May during the survey."

He confirmed that he had the specific recollection of seeing child lifejackets on board the vessel during his inspection.

374. When asked by Mr Grossman, on behalf of the Hongkong Electric Company, whether or not he wished to reconsider his evidence having regard not only to the evidence of Mr Tang Wan On, but also that of Mr Francis Cheng, the General Manager of the Generation Division of the Company that there never were any child lifejackets on the Lamma IV, together with the prospective evidence of the crew of the vessel to the same effect, Mr Wong said that there

was no need and he confirmed that he stood by his evidence that he did see lifejackets for children on board the vessel on 8 May 2012.

375. On his recall to give further evidence on 5 March 2013, Mr Wong confirmed that he was aware of a 'policy' within the Marine Department under which old or existing vessels would be inspected to the standards of the previous Code but encouraged to implement and conform with the new regime. It had not been necessary for him to mention that 'policy' previously because "the Lamma IV by then was already… conforming with the new regime, the new law; that is Cap 548G." When asked if he had passed the Lamma IV on 8 May 2012, "even though it didn't have children's lifejackets on board?" He said, "It's not correct." He remained adamant that he had inspected child lifejackets on board the vessel on 8 May 2012 (5 March 2013; Day 45, page 26):

> "Mr McGowan: That's what you expected to be shown, correct, Mr Wong? 12 children's lifejackets?
>
> A: This is not what I expected. This is part of my job. This is what I did during my inspection.
>
> THE CHAIRMAN: Did you find there were 12 children's lifejackets on the vessel on 8 May 2012?
>
> A: It should be more than 12".

376. Finally, Mr McGowan suggested to him yet again that there were no child lifejackets on board the Lamma IV in May 2012, to which he answered:

> "It was there during my inspection on 8 May."

2009-2010 Surveys

377. Subsequent to the revelation of Mr Wong Wing Chuen of the non-enforcement by the Marine Department of the 2007 Regulations

on existing vessels, the Marine Department officers who had conducted the surveys of the Lamma IV in 2009 and in 2010 were called to give evidence of their inspections. The respective Certificates of Survey for those two years did not employ the format in which an asterisk was described as indicating "one lifejacket for each person on board". However, in other respects the list of life-saving appliances and radio equipment, certified as being on board in item (2), was the same as in the Certificates of Survey for 2011 and 2012. In each of the 2009 and 2010 certificates, the number of adult lifejackets certified to be on board the vessel was stipulated to be 92. Similarly, the form was marked to indicate that there were no child lifejackets on board the vessel.

378. Ship Inspector Mr Tam Yun Sing confirmed that he had conducted the inspection which resulted in the issue of the 2009 Certificate of Survey for the Lamma IV. He said that he should have been aware of the fact that the 2007 Regulations had come into force by the time of his inspection in 2009. However, he had been told that it was the policy of the Marine Department to certify vessels, in existence at the time that the new Regulations came into force, as having passed the requirements of the survey so long as they complied with the previous Regulations. Accordingly, having looked at the 2008 Certificate of Survey, which certified that the vessel was provided with 92 adult lifejackets, but no child lifejackets and, on being satisfied that there were at least 92 adult lifejackets on board the vessel, he issued the Certificate of Survey for 2009 on the same basis.

379. Mr Tam went on to say that he had never seen the policy in "black and white", but said that possibly he had been given the

instructions orally by a superior whose identity he could no longer recall.

380. Ship Inspector Mr Yuen Chin Wai confirmed that he had conducted the inspection which resulted in the issue of the 2010 Certificate of Survey for the Lamma IV. He too said that he was aware that the 2007 Regulations were in force but also said that he had conducted the survey on the basis of the 'policy' that the previous Regulations were in force. He could not recall how it was that he had come to learn of the 'policy', but believed that he had been told about by a superior officer. It was the practice, as he called it, to note down the minimum number of adult lifejackets required whether or not there were in fact more than the minimum number of adult lifejackets on the vessel.

THE EVIDENCE OF HONGKONG ELECTRIC COMPANY EMPLOYEES

381. As noted earlier, it was the effect of the evidence of various Hongkong Electric Company employees that not only did the Lamma IV not have child lifejackets on board on 1 October 2012 but also there were never child lifejackets on board the vessel.

382. Mr Tang Wan On, the Marine Officer of the Hongkong Electric Company, testified to that effect. He said that he had been present at all the various surveys of the Lamma IV from 2009 to that conducted in 2012. On none of those occasions had any child lifejackets been aboard the vessel. When challenged as to the contrary in respect of 2012 he repeated several times (5 February 2013; Day 30, page 60):

> "Let me repeat. When the survey was conducted, we had absolutely no child lifejackets on board."

383. In that regard, his evidence was supported by the coxswain of the Lamma IV who had been present at the 2012 survey and who was able to speak to several years of experience at the vessel as coxswain. Mr Hui Sum Wai, an assistant technician of Cheoy Lee Shipyards, was present at the annual inspections of the Lamma IV in 2010, 2011 and 2012. He confirmed that Mr Tang Wan On was present in 2012. He had seen Mr Wong Kam Ching counting lifejackets but was not sure whether or not there were both adult and child lifejackets.

Mr Francis Cheng Cho Ying: General Manager

384. The testimony of Mr Francis Cheng Cho Ying, the General Manager of the Generation Division of the Hongkong Electric Company, perhaps went some way to explaining why it was that Hongkong Electric Company did not have any child lifejackets on board the Lamma IV on 1 October 2012. In his witness statement, dated 6 January 2013, he said of that fact:

> "There were however no children's life-jackets on board. *The operating licence did not contain any such requirement*. The shipbuilder prepared the launch for her annual survey by the Marine Department; neither raised any issue concerning this and the Lamma IV passed its annual survey without children's lifejackets." [Italics added.]

Needless to say, Mr Cheng was wholly wrong in his assertion that the Lamma IV was not required to carry any child lifejackets.

A CONSIDERATION OF THE EVIDENCE

AS TO (i) THE FAILURE OF THE ATTACHMENTS TO THE SEATS

385. We accept that none of the attachments to the seats on the Upper deck of the Lamma IV failed at the time of the collision. There is unanimity in that regard in the evidence of the passengers on the

Upper deck of the Lamma IV. Whilst many of them were thrown forward, some of them to the floor, none spoke of the seats failing at that stage. Rather, the effect of the evidence of the passengers was that the seats failed as the vessel sank and rose to an angle to the horizontal. Clearly, that involved the application of different forces to the attachment of the seats to the deck. By contrast, not one single seat on the Main deck, which was made of aluminium, failed. Given that those seats, as Dr Cheng Yuk Ki testified, were secured by through-bolts, it is clear that the integrity of the attachments to the seats on the Upper deck were of a different nature.

386. We accept the evidence of Dr Armstrong that it was wholly inappropriate to use self-tapping screws to secure the attachments of the seating of the seats on the Upper deck of the Lamma IV to the fibreboard/foam sandwich which constituted that deck. We accept his evidence that the frailty of that method of fastening the seats to the deck was, in part, due to the fact that only a small part of the thread of the screw was actually in contact with the fibreglass. The rest was either in vinyl or foam, which offered no real resistance to pulling forces.

387. It is to be remembered from the evidence described earlier that the foam sandwich nature of the Upper deck of the Lamma IV was a proposal that Cheoy Lee Shipyards had accepted from High Modulus having initiated a consideration of the re-engineering of the deck themselves. In those circumstances, Cheoy Lee Shipyards had all the more reason to be alert and cautious as to how the seating on the Upper deck was attached to the deck.

388. It was the tenor of the evidence of Mr Ken Lo that the method of securing seats to fibreboard by using self-tapping screws was of

long standing in Cheoy Lee Shipyards and of current use. He was dismissive of the alternatives suggested to him of how a greater integrity of the attachments of the seats to the deck might have been achieved, for example by the use of through-bolts with a backing plate, or fastening by screws through the foam sandwich into a wooden under plate. Thickening the fibreglass at places where the seats were to be attached was too difficult and not practical. He left the strong impression that his view was: "This is how we do it and that's it!"

389. We are satisfied that the initial attachment by Cheoy Lee Shipyards of the seating on the Upper deck of the Lamma IV was wholly unacceptable. We received no evidence that suggested in any way that Cheoy Lee Shipyards has given any thought whatsoever to designing or fastening the attachments of the seats to the particular fibreglass/foam sandwich deck.

390. In addition to our finding in respect of the original attachments of the seating to the Upper deck of the vessel we are satisfied that some of the repairs that were done to failed seat attachments were improperly performed. We accept the evidence of Dr Cheng that the use of aluminium rivets to attach the plate of a seat to the deck was not acceptable. However, we have no evidence of who performed that particular work. Nevertheless, ultimately the Hongkong Electric Company was responsible for ensuring that repairs to attachments of seating be of an adequate nature.

The requisite standard: 'properly secured'

391. In our judgment, the standard required under the Blue Book, that the seating be "properly secured", required that it be so secured for purposes of safety not only in normal operating conditions but also

in circumstances of a collision, having the likely range of consequences flowing from the latter event. Clearly, one of the obvious likely consequences was of the vessel sinking. Within the obviously foreseeable range of such an event was that the vessel would sink at an angle. The fact that the Lamma IV sank by her stern at an angle to the horizontal was within an easily contemplated range of possibilities. Accordingly, we reject Mr Wong Chi Kin's evidence that the standard was set at wholly different and much lower level.

392. The failure of the attachments of the seating to the Upper deck cabin of the Lamma IV had disastrous consequences to the passengers on board the vessel. The panic of finding themselves on a vessel that was rapidly sinking, and which was soon plunged into darkness, was rendered terrifying by the fact that as the incline of the vessel to the horizontal increased so did directly the rate of failure of the seating. The result was that passengers and seats were thrown to the aft end of the cabin and into the sea, which was making its way into the Upper cabin rapidly. No doubt, as a result some passengers were hurt and others were trapped, but all were terrified in the chaos that ensued.

393. By contrast, the attachments of the seats to the aluminium Main deck were unaffected by the manner in which the vessel was lost. Those seats remained secured throughout. That was what was required of the attachments of the seating to the Upper deck.

Marine Department

394. It is difficult to comprehend how the Marine Department satisfied themselves, for purposes of the initial survey in 1996, that the seating on the Upper deck of the Lamma IV was "properly secured". As noted earlier, Cheoy Lee Shipyards was not required to provide the

Marine Department with any drawings in respect of the attachment of the seating to the decks of the Lamma IV. Mr Philip Yu Kick Chuen's inspection of the seating on 15 January 1996 was rudimentary to say the least: he noticed that the attachments were secured to the deck by self-tapping screws and was not through-bolted; then, he merely applied force to a selected number of seats to see if they were or became loose. He accepted that he made no enquiries of the Shipyard itself as to the manner in which the seats had been attached to the Upper deck. In those circumstances, he could not be other than blissfully ignorant as to whether or not the seats were in fact properly secured. But, he did not act alone. We are satisfied that the Marine Department as a whole failed to ensure that it was provided with adequate information to ensure that its officers were in a position in which to determine whether or not the seating was properly secured on the Upper deck.

Conclusion

395. We are satisfied that the failure of the attachments of the seating to the Upper deck played a contributing part in the loss of life amongst the passengers of the Lamma IV.

AS TO (ii) THE DIFFICULTIES IN RETRIEVING AND DONNING THE ADULT LIFEJACKETS

396. There is no doubt that the location of the adult lifejackets in pouches beneath the seats in the cabins of the Main deck and the Upper deck place them in the closest and most convenient place for each passenger to retrieve a lifejacket. The same could not be said for those who were seated or standing on the Open Upper deck area. Whilst there were lifebuoys stored at the stern and readily available,

there were no lifejackets immediately available for those passengers. Clearly, from the accounts the Commission has received in the evidence of some passengers of their journey into the Upper deck cabin in order to retrieve lifejackets, some passengers appear to have had a preference for lifejackets over lifebuoys. As it happens, on 1 October 2012, there were many surplus lifejackets stored under seats that were not occupied by passengers, given that there were only a total of 127 persons on board of the maximum number of 232 persons permitted to be on board. There were lifejackets for every passenger on board. Having said that, the lifejackets not stored underneath seats in the two cabins were not obviously available to passengers, given that they were stored in the Crew quarters beneath the Main deck and that there were no notices at all to that effect.

397. Whilst a number of passengers testified of the difficulty of tying up the straps of the lifejackets to secure them to their body and at finding those straps to be knotted or entangled, it is clear that the most significant impediment to retrieving and donning the lifejackets lay in the chaotic circumstances on board the Lamma IV as she sank. Nevertheless, it is also clear that a number of passengers found that the loose straps on the lifejackets trapped them in their movements. Indeed, the Commission has received evidence from a passenger on the Sea Smooth, who encountered exactly that difficulty with a similar type of lifejacket which required tying up with straps, as he exited the Main cabin to find refuge on the bow of the vessel.

398. The Commission received evidence from the Hongkong Electric Company that, in the aftermath of the disaster and at the specific request of their employees that other lifejackets be made available in future, the Company has purchased lifejackets that enable

the wearer to secure the lifejackets to himself by the use of two simple buckles, in which the male part fits simply and easily into a female part of the buckle. It is to be noted that, whereas the adult lifejackets on board the Lamma IV on 1 October 2012 cost $70 each, those with two buckle attachments cost $250 each, a mere $180 more. (**Appendix 32; page A82**. Photo of buckle-type lifejackets)

AS TO (iii) THE ABSENCE OF CHILD LIFEJACKETS ON THE LAMMA IV

399. There is no dispute that on 1 October 2012 no child lifejackets whatsoever were carried on board the Lamma IV. Equally, there is no dispute that the law required that the Lamma IV carry child lifejackets for 5% of the persons on board the vessel. Given that there were 127 persons on the vessel, the Lamma IV was required to carry seven child lifejackets. As it was, of the children on board the Lamma IV that night, tragically eight of them died. Four of them were ten years, two were seven years, one was four years and another three years of age. It follows that even if those responsible for the Lamma IV had complied with the law, and provided child lifejackets for 5% of the persons on board, there would not have been enough child lifejackets on board even for the eight children who died, let alone the 24 children who survived.

Size criteria for lifejackets

400. A child lifejacket is designed to fit and is suitable to be worn by children in the weight range of 15 to 43 kg and the height range of 100 to 155 cm. An Adult lifejacket is designed to fit and to be suitable to be worn by persons above 43 kg and 155 cm. The International Maritime Organisation ('IMO') provides 'lifejacket

sizing criteria' for a third category, namely for an infant, that is someone less than 15 kg in weight and less than 100 cm in height. It is clear that there were a number of infants on board the vessel that night, for example as noted earlier Mr Lee Ming Sun testified that at the time of the collision he was sitting together with his two-year-old son in the front row on the port side of the Upper deck cabin.

The Marine Department's policy not to enforce the law for existing vessels

401. The issue of the absence of child lifejackets on the Lamma IV was an issue to which attention was given from the outset of the hearings of the Commission. That issue was given even more focus in the context of the Marine Department's Notice No. 131/2012 in respect of the 1 October 2012 National Day celebrations in Victoria Harbour, in particular in respect of the advice given to owners, operators and coxswains of vessels that they should ensure that children donned lifejackets at all times. However, it was not until the 2nd Supplemental Witness Statement of Mr Wong Wing Chuen dated 8 February 2013 that it was asserted to the Commission for the first time by anyone in the Marine Department that after the 2007 Regulations came into effect in January 2008 a 'policy' had been used in which the law was not applied to existing vessels.

402. The fact that the so-called 'policy' had not been drawn to the attention of the Commission earlier is perhaps less surprising given the absence of any contemporaneous documentation of the genesis of the decision-making: by whom and when was the matter considered? On whose authority was the decision made, in particular was the Director of Marine even aware of the policy let alone had he

authorised it? Was the Government and the Legislative Council informed of a policy not to enforce recently enacted legislation? Was the public informed of those matters?

403. Needless to say, none of the Marine Department officers who spoke to the existence of the 'policy' had ever seen it documented in writing, or in "black and white" as several of them described it. No doubt, if such documentation existed it would have been produced to the Commission. On the evidence that the Commission has received it appears that the 'policy' was disseminated by word of mouth only among Marine Department officers.

404. In his closing speech, when asked by the Chairman as to why the Commission had not received any evidence from anyone of a higher rank than Mr Wong Wing Chuen, in particular the "top of the Marine Department as to what its position was". In respect of this issue Mr Mok said (12 March 2013; Day 50, page 27):

> "No, because that correctly reflects the position."

405. When asked why it was, in those circumstances, the Commission had not been provided with "anything in writing that documents this policy", Mr Mok said (page 27):

> "I think from the evidence, it is there was simply no such document."

406. Similarly, he said that he understood it to be the case that nothing was documented in writing to inform the public of the position taken by the Marine Department.

Conclusion

407. We are astonished and deeply dismayed to have learned of the manner in which the Marine Department conducted itself in respect of the enforcement of the 2007 Regulations. In the first place, it is wholly unacceptable that a major department of Government should make important decisions of policy without documenting the matters considered and the reasons for reaching the decision. Without such records, as is the case with which we are dealing, discerning what those matters and reasons were is left to the frailties of human memory.

408. Secondly, if it had been determined to pursue such a policy, and in the event do so for more than four years after the legislation came into effect, it was incumbent upon the Marine Department to inform interested parties not only of the fact of the policy but how and why it had been reached and to do so in a permanently recorded form. Those interested parties would include not only all vessel owners and operators but also other parts of Government, the Legislature and the general public. Transparency of that nature would permit the opportunity for informed debate and criticism of the policy.

409. Thirdly, an undocumented policy passed by word of mouth and not made publicly known exposed the Marine Department and its officers to the obvious risk of corruption. It provided no proper and appropriate protection to individual Marine Department officers against allegations of impropriety in that that they had issued Certificates of Survey to vessels which did not comply with the law, namely the 2007 Regulations. It meant that, in those circumstances, they were left hoping that some senior officer would come forward on their behalf and standby the undocumented oral ‘policy’.

The 2012 survey of the Lamma IV

410. We have no hesitation whatsoever in accepting the evidence of Mr Tang Wan On, the Marine Officer of the Hongkong Electric Company, supported as it is by the evidence of the coxswain of the Lamma IV Mr Chow Chi Wai, that there were no child lifejackets on board the Lamma IV on 8 May 2012 when the vessel was inspected by Ship Inspector Wong Kam Ching. The inherent improbability that employees of the Hongkong Electric Company would make false admissions of their culpability in failing to ensure that the Lamma IV carried the requisite number of child lifejackets on the vessel on 1 October 2012 is compelling. We reject the evidence of Mr Wong Kam Ching to the contrary. In doing so, we note that he asserted that he remembered counting children's lifejackets on the Lamma IV. That evidence is not true. There were none to count.

2011 survey

411. Although Mr Lau Wing Tat testified that he had no recollection of the specific inspection of the Lamma IV on 8 July 2011, which led to him issuing the Certificate of Survey for the vessel, the inexorable logic in his evidence was clear: he would not have fixed an asterisk in respect of the item 'child lifejacket(s)' unless, having calculated the requisite value of the 5% child lifejackets required to be on board, he had counted such a number as being on board the vessel. Since he had fixed an asterisk at that place, he had counted the requisite number of child lifejackets as being on board the vessel on that date. We reject that evidence. That evidence is not true.

412. We accept the evidence of Mr Tang Wan On, who was present at that survey in July 2011, that there were no child lifejackets on board the vessel then, or ever.

Conclusion

413. We are satisfied that the absence of child lifejackets on the Lamma IV on 1 October 2012, they being 'life-saving appliances' required by law to be carried on the vessel, played a contributing part in the loss of life among passengers on the vessel.

MINIMUM NUMBER OF CREW

414. As mentioned throughout this report on 1 October 2012 the Lamma IV was manned by three crew members: a coxswain, an engineer and a deckhand. However, the 2012 Certificate of Survey stipulated the minimum number of crew required to be aboard the vessel:

> "(4) That the minimum safe manning of crew 4"

2008: Certificate of Survey

415. That stipulation of four crew members, as the minimum number of crew required to be aboard the Lamma IV, had been in place since the issue of the 2008 Certificate of Survey, on 2 June 2008. On that occasion, having conducted an inspection of the vessel, Ship Inspector Tam Yun Sing had increased the requirement from two crew members, as stipulated in the 2007 Certificate of Survey, to four crew members.

2006 and 2007: Certificate of Survey

416. The stipulation as to the minimum number of crew to be aboard the vessel had been introduced first in the 2007 Certificate of Survey, which stipulated that be two crew members. The 2006 Certificate of Survey stipulation as to the number of crew required to be aboard the vessel was in general, rather than specific, terms :

> "(10) That the crew is sufficient for the requirements of the vessel and both the master and engineer are in possession of the appropriate Certificates of Competency issued by the Director of Marine."

THE REASONS FOR THE CHANGE IN THE STIPULATED MINIMUM NUMBER OF CREW

417. Mr Tam Yun Sing said that he was unable to explain by relying on his memory alone why it is that he had increased the specified minimum number of crew from two to four members of crew. However, having regard to the information available as to the particulars of the Lamma IV, he said (24 January 2013; Day 22, page 42):

> "I was required to inspect the fire drill and emergency drill once, and if I — I have the right to judge with my professional knowledge whether there is enough personnel to handle such situation. And if I decide that the crew members are not enough to deal with the situation, I have the right to make such change.
>
> In the case of Lamma IV, it has two decks and with a substantial number of passengers, I believe that two crew members is not enough to handle the fire or emergency situations."

418. Mr Tam explained that, depending on the characteristics of a particular vessel, a fire drill might require the coxswain to remain in the wheelhouse to monitor the position of the vessel and to maintain

contact with the Marine Department and the Fire Services Department, whilst other members of crew might be required to man the manual fire pump and yet others to deploy the nozzle of the firehose at the seat of the fire.

THE ABSENCE OF WRITTEN REASONS FOR THE CHANGE IN THE STIPULATED MINIMUM NUMBER OF CREW

419. Mr Tam accepted that he made no record of the reasons that he had determined that an increase to four crew members was required in the stipulated minimum number of crew members. Of why it was that there was no record of those reasons, he said (page 44):

> "Because it is our usual practice not to make such record."

420. Mr Tam said that it was his usual practice to inform the parties submitting the boat for inspection orally at the time of the inspection of his reasons for a change in the stipulated minimum manning level for crew members. Then, Mr Tam explained that if the owner or operator of the vessel was dissatisfied with the change in the stipulated manning level for crew members it was open to them to raise the matter with his senior officers. However, he accepted that he did not provide his senior officers with any written or oral explanation for the stipulated change that he had directed in the minimum manning level for the Lamma IV.

THE HONGKONG ELECTRIC COMPANY

Mr Tang Wan On

421. Mr Tang Wan On said that notwithstanding that the 2007 Certificate of Survey stipulated a minimum of two crew members to

be aboard the Lamma IV, in fact the vessel had been operated with three crew members for reasons of safety and smooth operations. Although he was not present at the 2008 inspection of the vessel and the issue of its Certificate of Survey, with the stipulation as to increase the minimum number of crew required to be aboard the vessel, he was informed by the coxswain of the vessel who had been present that the Marine Department officers had made no adverse comments. In particular, he was told that "no indication was given that the number or the performance of the crew was in any way inadequate."

422. As a result, Mr Tang said that he had made telephone enquiries to the Local Vessel Licensing Section at the Marine Department and eventually had received a return telephone call from a Marine Department officer, whose name he could not recall, in which he had been told that (4 February 2013; Day 29, page 48):

> "Lamma IV has an Upper deck and lower deck, at the same time, and the Hongkong Electric Company have the resources, that is, there won't be any problem for us to hire one more crew member."

423. He was not told what it was that the extra crew member should do on board the vessel.

424. Mr Tang said that having discussed the matter with his superiors at the Hongkong Electric Company it had been determined not to take the matter any further. He supported that view "because we don't want to make our relationship too bad". Also, he said that he was "concerned that they might also increase another crew member for the Lamma II". At that time the minimum safe manning level stipulated for the Lamma II was two crew members, although it was in fact operated with three crew members, for the same reasons that the Lamma IV had been operated with three crew members.

425. Mr Tang said that the upshot of his discussions with his colleagues was that it was decided not to employ an additional member of crew to serve as a fourth crew member on the Lamma IV. Rather, it was determined to regard one of the persons travelling on board the vessel on any particular voyage as the fourth member of the crew. In determining to proceed in that manner reliance was placed on information obtained in research conducted by Mr Victor Chow, then Senior Materials Handling Engineer at the Hongkong Electric Company, of the relevant statutory definition of 'crew' in the Merchant Shipping (Local Vessels) Ordinance, Cap. 548, namely:

> "the coxswain and any other person employed or engaged in any capacity on board a local vessel on the *business of the vessel*." [Italics added.]

426. Mr Tang said that he and his colleagues noted that no qualification or experience was stipulated in the legislation other than in respect of the coxswain. Employees travelling on the Lamma IV to and from work were regarded as being on the vessel "on the business of the vessel".

427. Mr Francis Cheng, the General Manager of the Generation Division of Hongkong Electric Company, confirmed Mr Tang Wan On's account of the discussions within the company in respect of the stipulation of an increase of minimum manning level on the Lamma IV and the decision that was reached as to dealing with that issue.

428. Mr Tang said that the coxswain of the Lamma IV had been informed of the arrangement and that a book was maintained in which such nominated employees signed when so designated. He said that as the Marine Officer he was not required to sign the book, his status being understood.

1 October 2012

429. The use of the Lamma IV on 1 October 2012 was for purposes of the excursion trip to Victoria Harbour and not its normal use in ferrying employees and others to and from the power station. Mr Francis Cheng said that, although there were a number of employees from the Wellness Programme and other staff members on board the vessel that evening whom he said could be regarded as making up the complement of four crew members, he accepted that none of them were told that they were going to be the fourth crew member that night. Mr Lai Ho Yin, who said that he was responsible for organising quiz games on the voyage to Victoria Harbour and who said that he was in the wheelhouse at the time of the collision, was not told that he was a crew member on the vessel that night. In any event, he said that he had no maritime experience.

CAPTAIN PRYKE

430. Of the change of the minimum crew required to be aboard the Lamma IV, Captain Pryke said (5 March 2013; Day 45, page 98):

> "Yes, I would have said for a vessel like that, when you prepare the muster list, I'm sure you would also find that you need four people. If, for example, two men were fighting a fire with a hose or something, you've got one in the wheelhouse and you've got one other preparing the passengers for whatever they need to do. So I would find it extremely unlikely that you would ever get less than four on a two-deck ship of that nature."

431. When asked to give his opinion about the method by which the Hongkong Electric Company purported to provide a fourth crew member on the Lamma IV, as required by the Marine Department, Captain Pryke said (page 95):

> "Well, it's totally unacceptable, of course. The whole point of having weekly emergency drills is that the crew work as a team and they all understand what their role is in the event of an emergency. And you can't have somebody just turning up on one day who has never been to a drill with the crew. It doesn't make any sense."

A CONSIDERATION OF THE EVIDENCE

432. We accept Captain Pryke's opinion that a stipulation of a minimum safe manning crew level of four crew members for the Lamma IV was justified and appropriate.

433. What was not appropriate was for the decision to have been made by Ship Inspector Tam without him being required to document his reasons for reaching what we have found to be a justified determination. The failure to make any record at all of the use of a discretionary power, which impacts adversely, at least in terms of cost, on the owner and operator of the vessel is wholly unacceptable. It is unacceptable to the owner and operator who is entitled to know why it is that the changes being made, not least so that he can consider whether or not to seek redress from a superior officer in the Marine Department. Next, it is unacceptable that a change involving an issue of fundamental safety on a vessel should not be documented so that the superior officer in the Marine Department can be apprised of the circumstances in which the decision to double the minimum safe manning level on the vessel was reached. Finally, it was unfair to Ship Inspector Tam who, years later when called upon to explain the circumstances and the reasons for his decision, was unable to rely on contemporaneous documentation of those matters.

434. Of course, responsibility for the absence of a system in which such reasons were to be documented, made available to the owner and

operator and to the Ship Inspector's superior officer lays with the Marine Department not with the individual officer. It was for them to have laid down appropriate procedures to achieve the objectives described above. They failed to do so.

HONGKONG ELECTRIC COMPANY'S PURPORTED COMPLIANCE WITH THE STIPULATION THAT FOUR CREW MEMBERS BE ABOARD THE VESSEL

435. We are satisfied that the *ad hoc* arrangement that the Hongkong Electric Company chose to implement in purported compliance with the Marine Department's stipulation that there be four crew members aboard the Lamma IV did not satisfy the requirement. It is regrettable that a public utility company with a reputation of long-standing should have found it appropriate to seek to defeat the obvious purpose of the Marine Department's stipulation as to the minimum number of crew to be aboard the vessel, namely to secure the safety of the vessel in particular in extreme circumstances.

436. For the reasons that he articulated, we accept Captain Pryke's opinion that the regime that the Hongkong Electric Company implemented in purported compliance was wholly unacceptable.

V. PASSENGER VESSELS: GENERAL CONDITIONS OF MARITIME SAFETY – ADEQUACY OF THE SYSTEM OF CONTROL

437. In its consideration of the general conditions of maritime safety of passenger vessels in Hong Kong, the adequacy of the present system of control and the need, if any, to make recommendations to prevent a recurrence of the incident, namely the collision between the Sea Smooth and the Lamma IV with the loss of the latter with 39 lives, the Commission has been assisted by the receipt of detailed reports and/or oral testimony not only from its own expert witnesses, namely:

- Dr Armstrong; and
- Captain Pryke;

but also, from witnesses called on behalf of the Marine Department, namely:

- Mr Wong Wing Chuen, Senior Surveyor of Ships in the Local Vessels Safety Section;
- Mr Chung Siu Man, Assistant Director of the Port Control Division;
- Mr Leung Wing Fai, General Manager in the Local Vessels Safety Branch;
- Mr Lai Ying Keung, Senior Surveyor of Ships in the Seafarers' Certification Section; and
- Mr Cheng Yeung Ming, Principal Surveyor of Ships and Chief of the Marine Accident Investigation and Shipping Security Policy.

CAPTAIN PRYKE

438. Captain Pryke said that the port of Hong Kong enjoyed an "exceptionally high level of traffic", but nevertheless acknowledged that its overall safety record was "very good in such a diverse and busy port".

439. Captain Pryke said that the thrust of the suggestions that he made was directed at local vessels carrying more than 100 passengers. In the first of his several reports, Captain Pryke observed (Expert Report, paragraph 31):

> "… the definition of Lamma IV as a "Class 1 Launch" and not a "Class 1 Ferry Vessel" makes a big difference to the safety inspection regime for such vessels. In my opinion, a vessel permitted to carry more than two hundred people should be considered a "high risk" vessel regardless of whether those people are "fare paying" passengers."

440. He went on to note that local passenger vessels are surveyed according to local rules, in particular, the 'Code of Practice – Safety Standards for Classes I, II and III Vessels' (December 2006 Edition) ('Code of Practice'). He observed that in consequence, local passenger vessels were not required to carry a VHF radio, radar or AIS equipment. Furthermore, he noted that local passenger vessels were not required to carry a child lifejacket for every child actually on board the vessel. Next, he noted that there was no requirement to carry liferafts sufficient for all persons on board or to carry equipment to break open sealed windows. Also, he noted that whilst there was a requirement that the coxswain pass an eyesight test, there was no such requirement for members of the crew. There was no requirement that a look-out be stationed on the bridge to assist the coxswains of either the Sea Smooth or the Lamma IV.

441. Having noted that the crew of the Sea Smooth was required to work in shifts of 24 hours 'On' followed by 24 hours 'Off' and that no stipulated times for meal breaks were provided to the crew, Captain Pryke noted that on 1 October 2012 the issue of fatigue of the crew of the Sea Smooth arose for consideration.

Mr Lee Kwok Keung

442. In his helpful testimony Mr Lee Kwok Keung, the Chairman of the Hong Kong & Kowloon Trades Union Council, informed the Commission of the practice of other ferry companies in Hong Kong as to the maximum working hours and the provision or not of stipulated times for meal breaks: seafarers of First Ferry also work a 24-hour shift; coxswains on the Star Ferry work for eight hours per day and are provided with a one-hour meal break; seafarers on Shun Tak vessels work a maximum of 11 hours per day and have a 45 minute meal break. Furthermore, he said that drivers of Kowloon Motor Bus vehicles and of Mass Transit Railway trains work a maximum of 11 hours and 10 hours per day respectively.

443. Captain Pryke summarised the areas in which, in his opinion, consideration of change was merited :

(1) Whether safety legislation for ferries and launches carrying more than 100 passengers is made common.

(2) Whether operators of ferries carrying more than 100 passengers should be required to implement a safety management system. It would be appropriate for Marine Department to arrange or specify suitable training courses for owners and coxswains.

(3) Whether all ferries or launches carrying more than 12 passengers should be fitted with VHF radio. All ferries or launches carrying more than 100 passengers should

be fitted with AIS, collision avoidance radar and VHF radio.

(4) Whether serious consideration is given to the provision of liferaft capacity for all passengers on longer voyages outside the harbour. It may be considered that this could be implemented over several years.

(5) Whether sufficient child lifejackets are carried for every child on board, and whether the statutory requirement for child lifejackets should be one lifejacket for every child actually on board the vessel.

(6) Whether all coxswains of vessels carrying more than 100 passengers should have a basic medical examination and eyesight test at intervals not exceeding five years, and whether all seamen required to keep a look-out should have an eyesight test.

(7) Whether legislation should permit the harbour police to randomly test for drug and alcohol consumption.

(8) Whether all vessels carrying more than 100 passengers should have a look-out on the bridge in addition to the coxswain during the hours of darkness and in reduced visibility, and whether high speed craft should have a look-out on the bridge at all times.

(9) Whether all passenger vessels carrying more than 100 passengers should have a muster list so that every member of the crew is aware of his duties in the event of emergency.

(10) Whether a small adjustment should be made to the VTS boundary between the Channel 67 area and Channel 14 area.

(11) Whether a new speed limit should be introduced in the approaches to Lamma Island. As there is no specific port control for Lamma Island berths a speed limit would be an improvement to the local safety regime. This would have a negligible effect on the passage time of Lamma Island ferries.

(12) Whether high speed craft built before 2007 should be required to have a route operating manual and a training manual, and whether the Marine Department should clarify the issue regarding carriage of a quick flashing amber light by high speed craft. Evidence has been given that the Sea Smooth was not required to display this light, however it would appear that there might be a general impression that having the light gives right of way over other vessels.

(13) Given the frequency of collisions in this very busy harbour and the extreme hazard associated with high speed collisions, whether the Marine Department should consider the mandating of a high speed radar simulator course for all coxswains of high speed craft (built before and after 2007).

(14) Whether consideration should be given to removing Marine Accident Investigation and Shipping Security Policy Branch ('MAISSPB') from the Marine Department organisation in accordance with the Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code), IMO resolution MSC.255(84).

DR ARMSTRONG

1995: THE SYSTEM OF CONTROL OF MARITIME SAFETY FOR LOCAL VESSELS

444. Dr Armstrong described the system of control of maritime safety for local craft in Hong Kong in 1995, the date at which the Lamma IV was constructed, as best described as "informal". He noted (Expert Report Part 2, paragraph 3):

> "The instructions under which local vessels were surveyed and certificated were not supported by legislation, and consequently there were few mandatory requirements. The surveyors and inspectors, and those carrying out the plan approval on local craft, in many cases

learned the requirements on the job from more senior people, and knowledge on maritime safety issues appears to have been mainly passed on verbally."

445. Dr Armstrong went on to note (paragraphs 4-6) that:

"Different persons appear to have been carrying out the plan approval to those carrying out the survey, and there was a general 'disconnect' between these two phases of the safety checks, which led to errors in the case of the *Lamma IV*.

Ownership of fundamental safety issues such as Ship Stability was not taken by anyone, with documentation being noted as 'Seen' by the Marine Department, rather than being carefully assessed and approved.

The requirements of the instructions in use in 1995 were basic, sometimes detailing quite trivial matters, and at other times missing some fundamental issues."

PRESENT SYSTEM OF CONTROL OF MARINE SAFETY FOR LOCAL VESSELS

446. Dr Armstrong observed that the present system of control of marine safety for local vessels has its origins in the Merchant Shipping (Local Vessels) Ordinance, Cap. 548, which is supported by the Merchant Shipping (Local Vessels) (Safety and Survey) Regulation, Cap. 548G. Pursuant to section 9 of that Ordinance, a Code of Practice was issued in 2006.

RECOMMENDATIONS

447. In formulating no less than 59 recommendations Dr Armstrong condescended on many occasions to providing detailed redrafting instructions of existing legislation or suggested drafting for new legislation. Without in any way detracting from the merits of such a detailed approach, for our purposes, it suffices to identify his primary recommendations and we do so by referring to some of those

referred to in the summary set out in the closing written submissions of counsel for the Commission:

(1) a high level statement of safety objectives be documented, as in Australia;

(2) consideration be given to the question of whether the division of plan approval and survey by Marine Department might lead to errors;

(3) the Certificate of Survey, the Certificate of Inspection and other like documents should record the vessel lightship particulars;

(4) the Code of Practice be modified to include reference to the impact of modification on Damage Stability and watertight subdivision;

(5) the annual Certificate of Survey catalogue a number of additional features, including watertight doors, location of battery supply and modifications;

(6) the definition of the term "lifejacket" in the legislation be amended to incorporate a reference to International Organization for Standardization ('ISO') 12402-3:2006 (Personal Flotation Devices-Part 3: lifejackets, performance level 150-Safety Requirements) or equivalent;

(7) the legislation be amended to require child lifejackets on all classes of vessels and consideration be given to the need for infant lifejackets;

(8) the legislation be amended to require in addition to the 5% requirement in respect of the persons aboard the vessel a requirement that a child lifejacket be provided for each child actually on board;

(9) the Code of Practice be amended to require a source of emergency electrical power separate from the main power supply, to be located outside the machinery space and above the waterline;

(10) the Code of Practice, in particular Annex F, be re-written to cover adequately the issues of watertight

subdivision and Damage Stability, stipulating the outcome to be achieved by watertight subdivision;

(11) the Code of Practice to be amended to provide for an empirical value or standard against which the attachment of seats is to be judged and a Regulatory Impact Assessment to be made of the work and cost required to attach seats to decks constructed of GRP foam sandwich more robustly;

(12) the Certificate of Survey and the Certificate of Inspection contain a statement, signed by the surveyor, that the vessel has been built in accordance with the approved plans;

(13) rocket parachute flares be carried in the wheelhouse;

(14) watertight doors be fitted with alarms to the wheelhouse indicating whether they are open or closed and that the doors be appropriately marked;

(15) vessels certified before 1 January 2007 to carry more than 100 passengers be checked to identify the standard of watertight subdivision;

(16) a Regulatory Impact Assessment to be carried out in respect of the feasibility and cost of fitting Voyage Data Recorders to all passenger craft.

THE MARINE DEPARTMENT

448. In his written closing submissions Mr Mok acknowledged on behalf of the Marine Department that the events of 1 October 2012 had revealed that "improvement is called for in its work" concerning:

- plan approval and initial survey;
- stability calculations;
- annual final survey;
- periodic survey; and
- enforcement of standards concerning life-saving appliances.

PLAN APPROVAL AND INITIAL SURVEY

449. Mr Wong Wing Chuen testified that the Marine Department had engaged Lloyd's Register of Shipping to carry out an independent review of the drawing approval and survey procedures of the Local Vessels Safety Section and to recommend changes and improvements. In addition, he said that consideration was being given to an enhanced internal audit by way of a regular separate audit of drawing approvals and survey work of the Local Vessels Safety Section.

STABILITY CALCULATIONS

450. Mr Wong Wing Chuen acknowledged (2nd Supplemental Witness Statement, paragraph 36) that enquiries into the events of 1 October 2012 had revealed shortcomings in the system for checking Stability calculations. He informed the Commission that, in order to improve the documentation and record-keeping in respect of Stability calculations, the Marine Department proposes to:

- adopt the stability declaration (for intact stability) applicable in respect of Hong Kong registered passenger ships (i.e. ocean-going vessels);

- adopt the declaration used by classification societies for Damage Stability calculations.

451. Furthermore, he testified that the Marine Department proposes to cease using the description 'Seen' as the endorsement for various categories of documentation submitted to the Marine Department, instead endorsing the documents with 'Approved', 'Not Approved' or 'For Record Purpose'.

FINAL INSPECTIONS: IN RESPECT OF INITIAL OR PERIODIC SURVEYS

452. Acknowledging that there might be ambiguities or deficiencies in some of the forms used in respect of inspections and surveys, Mr Wong Wing Chuen said that the Marine Department proposes changes, so that:

- the Certificate of Survey should make a certification in respect of only the stipulated statutory minimum requirement of the particular item;

- establish procedures by which an owner would be informed of the reasons for a change of requirements, which change would require the approval of a superior officer and would stipulate a time limit and procedures for the owner to raise objections;

- to make provision for minimum manning requirements, following a study and consultation in order to establish a uniform, statutory minimum for all Class I ferries and vessels by reference to (among other things) vessel length, number of decks and passenger-carrying capacity.

LIFE-SAVING EQUIPMENT

453. Mr Wong Wing Chuen testified that the Marine Department is reviewing the current system of requirements for the provision of life-saving equipment and procedures for their use.

CHILD LIFEJACKETS

454. Mr Wong Wing Chuen said that, although the review was still underway, the requirements in respect of child lifejackets had received consideration already. In the first place, consideration is being given to increasing the percentage of child lifejackets required to be on

board from 5% of the total number of persons on board a vessel to 8% or 10%. Alternatively, consideration is being given to require that the "quantity of child lifejackets on board every voyage should match the actual number of children carried on board".

HAMMERS

455. Further, Mr Wong said that consideration is being given to requiring vessels to carry hammers, so that the fixed windows of passenger cabins of vessels could be broken in an emergency.

MUSTER LISTS

456. Finally, he said that consideration is being given to requiring Class I vessels to devise muster lists, in which crew are designated specific tasks in the event of an emergency, and that the crew would be required to train for such emergencies twice a month.

VHF RADIO AND AIS EQUIPMENT

457. Mr Chung Siu Man testified that in the course of its review of marine safety, following the events of 1 October 2012, the Marine Department was considering the introduction of additional measures on local vessels, in particular that vessels licensed to carry 100 or more passengers to install:

- VHF radio; and
- AIS equipment.

458. However, he emphasised that in the event that the requirement was determined to be appropriate it was not intended that local vessels should then fall within the VTS' control, rather it was intended to

facilitate communication in an emergency and to provide more information as to the identity of vessels and their passage tracks to the Marine Department.

SAFE MANAGEMENT SYSTEM

459. Mr Leung Wing Fai said that following the events of 1 October 2012 discussions had ensued as to whether or not it would be appropriate to introduce the ISM Code for local vessels. A preliminary evaluation demonstrated that it could (Witness Statement paragraph 20):

> "… provide for safe practices in vessel operation and a safe working environment, assess all identified risks, personnel and the environment and establish appropriate safeguards and continuously improve safety management skills of personnel ashore and aboard vessels including preparing for emergencies related both to safety and environmental protection."

460. In the result, it was concluded that large-scale local ferry and launch operators "should be able to cope with the establishment and implementation of the safety management system". On the other hand, it was thought that its implementation was beyond the abilities of small-scale operators.

461. Mr Leung said that implementation of the ISM Code for local vessels would require the Marine Department to have the "… capacity to train the ship inspectors on the ISM discipline and conducting certification audit for the companies and their vessels."

MARINE ACCIDENT INVESTIGATION AND SHIPPING SECURITY POLICY BRANCH ('MAISSPB')

462. Mr Cheng Yeung Ming, Principal Surveyor of Ships and Chief of MAISSPB, which is a branch of the Multi-lateral Policy Division of the Marine Department, said that its main function was to carry out maritime accident investigations. Its staff comprised himself, a Senior Surveyor of Ships, three Surveyors of Ships and one Clerical Assistant. He said that its investigations were impartial and independent.

463. Mr Cheng said that he was aware of the IMO recommendation that such accident investigation departments should have a functional independence from the parties involved in a marine incident and anyone who may take administrative or disciplinary action against an individual or organisation involved in a marine casualty. He said that the existing procedures required that the:

> "... Investigation Officer ("IO") would complete the investigation report and send it via the Senior Surveyor of Ships to the Principal Surveyor of Ships for endorsement before it is submitted to the Deputy Director of Marine ("DD"). Upon receipt of the report, DD would decide whether a Review Panel ("RP") should be appointed to study the report. The RP should consist of experts from those divisions in Mardep (Marine Department) that do not have an interest in the incident. The only term of reference for the RP is to see whether Mardep agrees with the conclusions and recommendations made in the report. The RP is not to instruct or tell the IO how the investigation should have been carried out or how the report should have been written."

464. In the result, Mr Cheng took issue with Captain Pryke's recommendation that MAISSPB should be made separate from the Marine Department. He said:

> "It is considered that with all the built-in measures in hand, the independency of investigation into marine accidents is ensured. The establishment of an independent accident investigation board similar to the United Kingdom or Australia may not be appropriate for Hong Kong's situation."

ADEQUACY OF THE SYSTEM OF CONTROL

CONCLUSIONS

465. As is apparent from the content of the report hitherto, the primary focus of the Commission's attention has been on the circumstances that led to the collision between the Sea Smooth and the Lamma IV and the circumstances in which it came to sink so quickly and with such great loss of life. The overwhelming volume of evidence received by the Commission addressed those issues. Accordingly, it is first and foremost through that prism that the Commission has considered the adequacy of the present system of control in respect of general conditions of maritime safety concerning passenger vessels in Hong Kong. Equally apparent from the findings made in the report hitherto is the fact that it is clear that there were and are serious systemic failings in the past and present system of control.

466. Even Mr Mok, on behalf of the Marine Department, conceded that "improvement" was required in various aspects of the work of the Marine Department. In our view, much more is required. What is required is systemic change, in particular a change in attitude to responsibility and transparency.

467. The fact that the Marine Department has responded to the tragic events of 1 October 2012 by initiating consultations with various stakeholders in the industry and has initiated an independent review to be conducted by Lloyd's Register of Shipping in respect of its drawing approval and survey procedures is to be welcomed. Similarly, to be welcomed is the assertion that the Marine Department is considering the recommendations made by Dr Armstrong and Captain Pryke, some of which recommendations it appears to be ready

to initiate in proposed changes to the system of control and the way in which it is administered and enforced. However, whilst consideration, consultation and proposed changes are laudable, in themselves they are not sufficient. Of course, we acknowledge that some areas of change will require preparation and training before they can be implemented. However, others do not. In those areas, what is required is action, and action now. It is to our recommendations that we turn finally.

VI. RECOMMENDATIONS TO PREVENT A RECURRENCE OF THE INCIDENT

THE RECOMMENDATIONS

468. The following are measures we would recommend to the Administration in order to prevent the recurrence of similar incidents in future –

(1) The Marine Department should check and verify the standard of watertight subdivision of all vessels permitted to carry more than 100 passengers first certified before 1 January 2007.

(2) The same safety requirements should apply to ferries and launches carrying more than 100 passengers. Operators of such vessels should be required to implement a safety management system approved by the Marine Department.

(3) All ferries and launches permitted to carry more than 12 passengers should be required to carry a VHF radio and be equipped with rocket parachute flares in the wheelhouse, and vessels permitted to carry more than 100 passengers be equipped with AIS, collision avoidance radar, a VHF radio and rocket parachute flares, the latter to be carried in the wheelhouse.

(4) All coxswains of vessels permitted to carry more than 100 passengers should have a basic medical examination and eyesight test at intervals not exceeding five years and all seamen required to keep a look-out should have an eyesight test at the same intervals.

(5) All vessels permitted to carry more than 100 passengers:

- should have a look-out on the bridge, in addition to the coxswain, during the hours of darkness and in reduced visibility and high speed craft should have a look-out on the bridge at all times;

- should have a muster list, so that every member of the crew is aware of his duties in the event of emergency.

(6) Sufficient child lifejackets should be carried for every child on board all classes of vessels and consideration should be given to the provision of infant lifejackets.

(7) The Marine Department should –

(i) revise the format of the Certificate of Survey to state only the statutory minimum requirement, and substitute the use of " * " with stipulated numbers;

(ii) require ship owners to print the name of the vessel on each of the lifejackets on board;

(iii) revise the practice of checking of lifejackets to ensure that lifejackets are properly stowed in easily accessible locations and that they are actually on board;

(iv) require ship owners to provide sufficient signs designating the locations of lifejackets;

(v) require demonstration (by crew or through graphic display) of how lifejackets are donned; if possible, installation of video facilities for safety briefing and demonstration purposes; and

(vi) require owners and operators that all piers used to embark and disembark passengers broadcast via video, or put up posters, demonstrating the donning of lifejackets.

(8) High speed crafts built before 2007 should be required to have an operating manual, a route operating manual and a training manual and their coxswains be required to attend a high speed radar simulator course.

(9) The Code of Practice should be amended to provide for an empirical value or standard against which the attachment of seats to the deck is to be judged, which value or standard should take into consideration their loading not only during a normal voyage but must also cater to excessive stern trim in the course of a marine casualty.

(10) The Marine Department should require its Ship Surveyors and Inspectors to document fully in writing the reasons for any changes to the licensing conditions of vessels and communicate them in writing to their superior officers and the respective owners/operators. It should do so to ensure that its procedures are resistant to corrupt practices and to strengthen its management monitoring.

(11) The Marine Department should stipulate the division of responsibilities in the approval of its plans and the survey of a vessel by its officers. Certificates of Survey/ Certificates of Inspection should contain a statement

signed by the surveyor that the vessel has been built in accordance with the approved plans.

(12) The Marine Department should require watertight doors be fitted with alarms to the wheelhouse to indicate whether they are open or closed and that they be appropriately marked.

(13) We agree with and accept the principle set out in the Code of the International Standards and Recommended Practices for a Safety Investigation into a Marine Casualty or Marine Incident (Casualty Investigation Code), IMO resolution MSC. 255(84), that the MAISSPB be independent of the Marine Department. However, we consider that the establishment of a wholly independent accident investigation board may not be entirely appropriate for the scale of activities in Hong Kong. Therefore, we recommend that an independent qualified professional be appointed specifically to take charge of marine accident investigation, as head of MAISSPB in the Marine Department, who shall report directly to the Director of Marine. This would enable the MAISSPB to benefit from the support and expertise in the Marine Department while maintaining its impartiality.

EPILOGUE

469. The Emergency Services are to be congratulated on their expeditious and efficient response to the incident on 1 October 2012. There is no doubt, that all necessary resources were deployed in the attempts to rescue survivors and then to locate and retrieve the dead.

COMMENDATIONS

470. Whilst all those who participated in the sustained attempts to rescue survivors are to be congratulated on those efforts, some merit special mention. As we did at the time of their evidence, we commend all the firemen and policemen, in particular divers from both services, who were involved in rescuing or attempting to rescue survivors from both the sea and inside the Lamma IV. Obviously, entering the sunken vessel, let alone diving down through the waters that had swamped the vessel, bore great risks. Those officers took those risks in attempts to save the lives of others. Often, on being commended in the proceedings for their bravery, those officers gave the same reply: "It was my duty". Hong Kong is fortunate to have the services of such officers.

471. In addition to officers of the Emergency Services, it is right that we commend the actions of various passengers who testified of having helped others in distress. Following the collision, the three crew members of the Lamma IV conducted themselves in the best tradition of seafarers, attending as best they could to the needs of those entrusted to their care at sea. The crew of the Lamma II did likewise, in coming to the aid of those in peril at sea.

ACKNOWLEDGEMENTS

472. The Commission acknowledges the debt it owes to the Hong Kong Police Force, the Fire Services Department and the Marine Department for the provision by them of the hundreds and hundreds of witness statements taken so expeditiously after the incident on 1 October 2012. It was the foundation of those statements which enabled the Commission to extend the ambit of its enquiries so widely.

473. Next, the Commission wishes to thank Mr Laurie Lo, Secretary to the Commission and his staff in the Secretariat and all those whose efforts enabled the proceedings to proceed so expeditiously and smoothly. In particular, we wish to thank counsel for the Commission and Messrs Lo & Lo on whose shoulders fell the huge burden of determining which evidence, of the huge volume of witness statements, the Commission ought to be invited to receive.

IN MEMORIAM

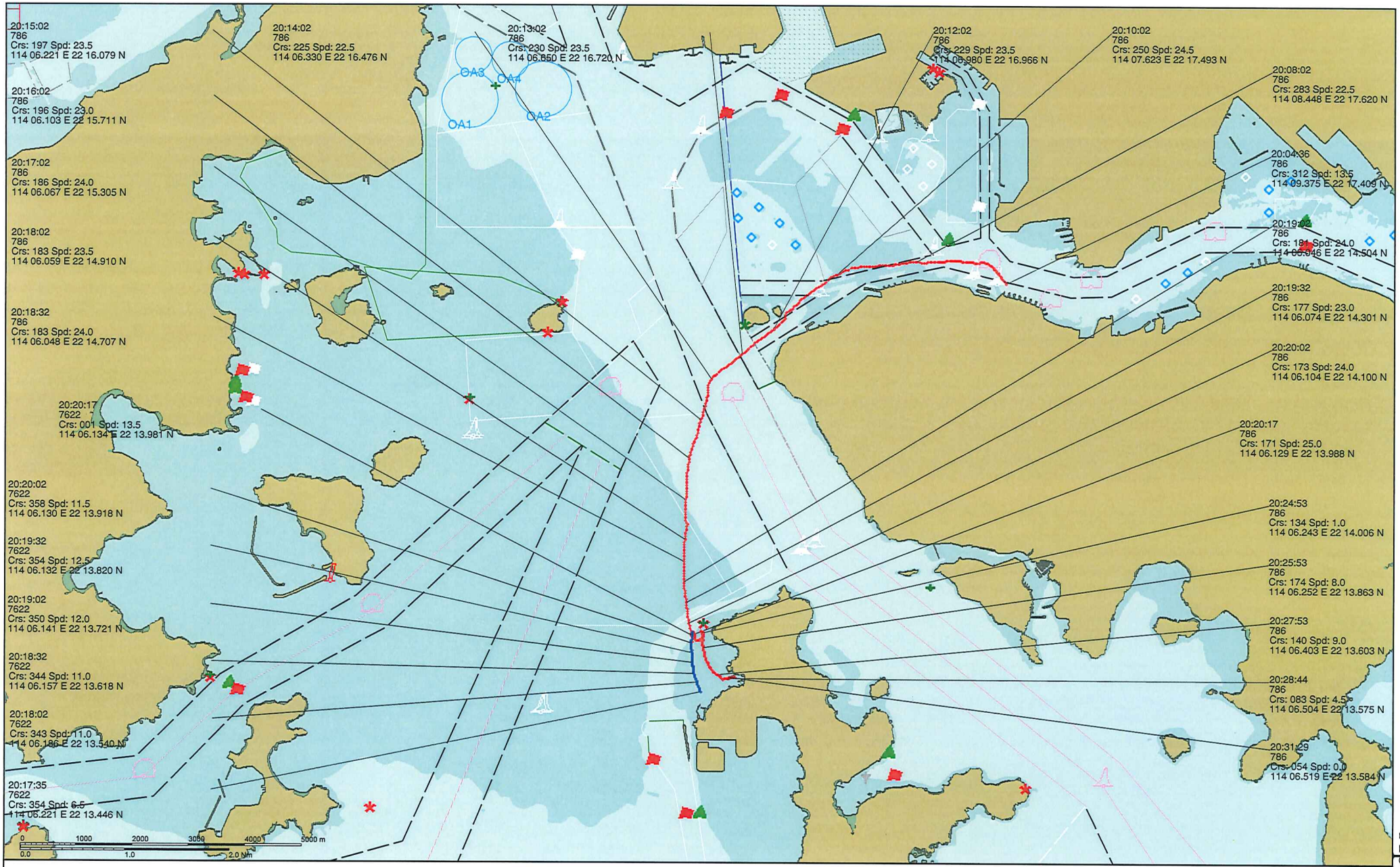
474. The final words of our report must be in remembrance of those who died in the incident and in condolences to their loved ones, who have suffered such devastating losses made all the more difficult to bear by the terrible and shocking circumstances of their deaths. The swift adoption of the remedial measures so obviously required, so as best to prevent a recurrence of the incident, is perhaps one way in which Hong Kong can best acknowledge their memory.

Michael Lunn
Justice of Appeal

Benjamin Tang, GBS, JP

Dated 19 April 2013

APPENDICES



Plot centre [WGS84]: 22 15.948 N 114 06.202 E
Range: 4.13 NM

Start time: 01-10-2012 20:04:36
Stop time: 01-10-2012 20:31:29

Plot interval [Sec]: 3
Vector Length: 3 min

Prepared at: 08-10-2012 11:14:03 hour
Prepared by: _____

MARINE DEPARTMENT, HKSAR GOVERNMENT
RADAR PLOT

HITT

Appendix 1

COMMISSION OF INQUIRY

DIRECTIONS

(made at the Preliminary Hearing on 5 December 2012)

Public hearings

1. Unless otherwise directed, the hearings of the Inquiry will be open to the public.

Prohibition on photography, audio/video recordings without the authorisation of the Commission

2. Without the authorisation of the Commission, no photographs may be taken or audio/video recordings made in the hearing room, the overflow room or the other rooms in the Main Wing of Central Government Offices used for the purposes of this Inquiry.

Language

3. The proceedings will be conducted in English, although witnesses may give their evidence in any language or dialect that they wish to do so. Then, the testimony will be translated into English.

Dates and times of the hearings

4. The Commission will commence the substantive hearing of the Inquiry on 12 December 2012 and will continue on weekdays until 21 December 2012. The hearings will resume on 7 January and continue until 8 February 2013. Then, the hearings will resume on 18 February 2013 and continue until completion. Such hearing dates are subject to

change by further directions of the Commission. The hearing time each day will be from 10:00 a.m. to 1:00 p.m. and from 2:30 to 4:30 p.m. On 17 December 2012 the hearing will be from 2:00 p.m. to 6:00 p.m.

The hearing procedure

Opening addresses

5. Counsel for the Commission may make an opening address. Counsel for the parties permitted to participate and be legally represented (the "involved parties ") may apply to the Commission to make their own opening addresses. If the Commission accedes to such an application, the addresses will be made immediately after the address of counsel for the Commission. The Commission may determine the sequence and length of such addresses.

Evidence

6. The Commission notes that section 4 (1) of the Commissions of Inquiry Ordinance, Cap. 86 provides that in conducting the inquiry it may:

> " (a) receive and consider any material whether by way of oral evidence, written statement, documents or otherwise, notwithstanding that such material would not be admissible as evidence in civil or criminal proceedings;".

The examination of witnesses

7. Oral evidence will be given under oath or affirmation.

8. The procedure by which the Commission will receive oral evidence is as follows:

(i) counsel for the Commission will lead the evidence of witnesses called by the Commission; counsel for the involved parties may

apply to the Commission for leave to question a particular witness or witnesses; the Commission will determine the sequence in which counsel representing different parties may question a witness;

(ii) counsel for an involved party who is not a corporate entity ("individual involved party"), may lead his evidence, after which counsel for the other involved parties may apply to the Commission for leave to question such person; the Commission will determine the sequence in which evidence is led from the involved parties and in which counsel representing other involved parties may question such person; thereafter, counsel for the Inquiry may question such person; finally, counsel for that involved party may re-examine him;

(iii) counsel for an individual involved party may apply to the Commission to call other oral witnesses or to receive any other material; if the Commission permits oral evidence to be led on behalf of that party, it will be received by the Commission in the same manner as set out at (ii);

(iv) counsel for an involved party who is a corporate entity ("corporate involved party") may apply to the Commission to call oral witnesses or to receive any other material on behalf of that party; if the Commission permits oral evidence to be led on behalf of the corporate involved party it will be received by the Commission in the same manner as set out at (ii);

(v) at any stage in the receipt of oral evidence the Commission may ask questions of the witness;

(vi) the Commission may recall any person who has given oral evidence to answer further questions.

Written witness statements

9. All involved parties shall provide to the Commission written witness statements, addressing the subject matter of their testimony, and of all witnesses they are permitted to call, at least 7 clear days before the testimony is to be received.

Closing addresses

10. Counsel for the Commission and counsel for the involved parties may make closing addresses. The Commission may determine the sequence and length of such addresses.

The participation and legal representation of other parties

11. At any stage in the hearings the Commission may determine to permit the participation and legal representation of other parties in the hearings.

Access to documents

12. The Commission Secretariat has compiled, and will update regularly, an index of all documents and material provided to the Commission for the purpose of the Inquiry. Any involved party who wishes to gain access to such documents or material may apply in writing to the Commission Secretariat. At its discretion the Commission shall determine whether or not and to what extent access may be permitted.

13. Any involved party who wishes to obtain copies of documents to which access has been permitted by the Commission may apply to the Commission Secretariat to be provided with such copies. At its discretion the Commission shall determine whether or not such copies are to be provided. The cost of obtaining such copies shall be borne by the party obtaining such copies.

(An excerpt of relevant provision of the COLREGS)

MERCHANT SHIPPING (SAFETY) (SIGNALS OF DISTRESS AND PREVENTION OF COLLISIONS) REGULATIONS

INTERNATIONAL REGULATIONS FOR PREVENTING COLLISIONS AT SEA 1972

PART A. GENERAL

RULE 1

Application

(a) These Rules shall apply to all vessels upon the high seas and in all waters connected therewith navigable by seagoing vessels.
(b) Nothing in these Rules shall interfere with the operation of special rules made by an appropriate authority for roadsteads, harbours, rivers, lakes or inland waterways connected with the high seas and navigable by seagoing vessels. Such special rules shall conform as closely as possible to these Rules.
(c) Nothing in these Rules shall interfere with the operation of any special rules made by the Government of any State with respect to additional station or signal lights, shapes or whistle signals for ships of war and vessels proceeding under convoy, or with respect to additional station or signal lights or shapes for fishing vessels engaged in fishing as a fleet. These additional station or signal lights, shapes or whistle signals shall, so far as possible, be such that they cannot be mistaken for any light, shape or signal authorized elsewhere under these Rules.
(d) Traffic separation schemes may be adopted by the Organization for the purpose of these Rules.
(e) Whenever the Government concerned shall have determined that a vessel of special construction or purpose cannot comply fully with the provisions of any of these Rules with respect to the number, position, range or arc of visibility of lights or shapes, as well as to the disposition and characteristics of sound-signalling appliances, such vessel shall comply with such other provisions in regard to the number, position, range or arc of visibility of lights or shapes, as well as to the disposition and characteristics of sound- signalling appliances, as her Government shall have determined to be the closest possible compliance with these Rules in respect of that vessel. (L.N. 365 of 1989)

RULE 2

Responsibility

(a) Nothing in these Rules shall exonerate any vessel, or the owner, master or crew thereof, from the consequences of any neglect to comply with these Rules or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

(b) In construing and complying with these Rules due regard shall be had to all dangers of navigation and collision and to any special circumstances, including the limitations of the vessels involved, which may make a departure from these Rules necessary to avoid immediate danger.

RULE 3

General definitions

For the purpose of these Rules, except where the context otherwise requires:
(a) The word "vessel" (船隻、船) includes every description of water craft, including non-displacement craft and seaplanes, used or capable of being used as a means of transportation on water.
(b) The term "power-driven vessel" (機動船) means any vessel propelled by machinery.
(c) The term "sailing vessel" (帆船) means any vessel under sail provided that propelling machinery, if fitted, is not being used.
(d) The term "vessel engaged in fishing" (從事捕魚的船隻) means any vessel fishing with nets, lines, trawls or other fishing apparatus which restrict manoeuvrability, but does not include a vessel fishing with trolling lines or other fishing apparatus which do not restrict manoeuvrability.
(e) The word "seaplane" (水上飛機) includes any aircraft designed to manoeuvre on the water.
(f) The term "vessel not under command" (失控船隻) means a vessel which through some exceptional circumstance is unable to manoeuvre as required by these Rules and is therefore unable to keep out of the way of another vessel.
(g) The term "vessel restricted in her ability to manoeuvre" (操縱能力受到限制的船隻) means a vessel which from the nature of her work is restricted in her ability to manoeuvre as required by these Rules and is therefore unable to keep out of the way of another vessel. The term "vessels restricted in their ability to manoeuvre" (操縱能力受到限制的船隻) shall include but not be limited to:

(i) a vessel engaged in laying, servicing or picking up a navigation mark, submarine cable or pipeline;
(ii) a vessel engaged in dredging, surveying or underwater operations;
(iii) a vessel engaged in replenishment or transferring persons, provisions or cargo while underway;
(iv) a vessel engaged in the launching or recovery of aircraft;
(v) a vessel engaged in mine clearance operations;
(vi) a vessel engaged in a towing operation such as severely restricts the towing vessel and her tow in their ability to deviate from their course.

(h) The term "vessel constrained by her draught" (受吃水限制的船隻) means a power-driven vessel which, because of her draught in relation to the available depth and width of navigable water, is severely restricted in her ability to deviate

from the course she is following. (L.N. 365 of 1989)
(i) The word "underway" (在航) means that a vessel is not at anchor, or made fast to the shore, or aground.
(j) The words "length" (長度) and "breadth" (寬度) of a vessel mean her length overall and greatest breadth.
(k) Vessels shall be deemed to be in sight of one another only when one can be observed visually from the other.
(l) The term "restricted visibility" (有限能見度) means any condition in which visibility is restricted by fog, mist, falling snow, heavy rainstorms, sandstorms or any other similar causes.

PART B. STEERING AND SAILING RULES

Section I. Conduct of vessels in any condition of visibility

RULE 4

Application

Rules in this Section apply in any condition of visibility.

RULE 5

Look-out

Every vessel shall at all times maintain a proper look-out by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision.

RULE 6

Safe speed

Every vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within a distance appropriate to the prevailing circumstances and conditions.
In determining a safe speed the following factors shall be among those taken into account:
(a) By all vessels:
(i) the state of visibility;
(ii) the traffic density including concentrations of fishing vessels or any other vessels;
(iii) the manoeuvrability of the vessel with special reference to stopping distance and turning ability in the prevailing conditions;

(iv) at night the presence of background light such as from shore lights or from back scatter of her own lights;
(v) the state of wind, sea and current, and the proximity of navigational hazards;
(vi) the draught in relation to the available depth of water.

(b) Additionally, by vessels with operational radar:
(i) the characteristics, efficiency and limitations of the radar equipment;
(ii) any constraints imposed by the radar range scale in use;
(iii) the effect on radar detection of the sea state, weather and other sources of interference;
(iv) the possibility that small vessels, ice and other floating objects may not be detected by radar at an adequate range;
(v) the number, location and movement of vessels detected by radar;
(vi) the more exact assessment of the visibility that may be possible when radar is used to determine the range of vessels or other objects in the vicinity.

RULE 7

Risk of Collision

(a) Every vessel shall use all available means appropriate to the prevailing circumstances and conditions to determine if risk of collision exists. If there is any doubt such risk shall be deemed to exist.
(b) Proper use shall be made of radar equipment if fitted and operational, including long-range scanning to obtain early warning of risk of collision and radar plotting or equivalent systematic observation of detected objects.
(c) Assumptions shall not be made on the basis of scanty information, especially scanty radar information.
(d) In determining if risk of collision exists the following considerations shall be among those taken into account:
(i) such risk shall be deemed to exist if the compass bearing of an approaching vessel does not appreciably change;
(ii) such risk may sometimes exist even when an appreciable bearing change is evident, particularly when approaching a very large vessel or a tow or when approaching a vessel at close range.

RULE 8

Action to avoid collision

(a) Any action taken to avoid collision shall, if the circumstances of the case admit, be positive, made in ample time and with due regard to the observance of good seamanship.
(b) Any alteration of course and/or speed to avoid collision shall, if the circumstances of the case admit, be large enough to be readily apparent to another vessel observing visually or by radar; a succession of small alterations of course and/or speed should be avoided.

(c) If there is sufficient sea room, alteration of course alone may be the most effective action to avoid a close-quarters situation provided that it is made in good time, is substantial and does not result in another close-quarters situation.
(d) Action taken to avoid collision with another vessel shall be such as to result in passing at a safe distance. The effectiveness of the action shall be carefully checked until the other vessel is finally past and clear.
(e) If necessary to avoid collision or allow more time to assess the situation, a vessel shall slacken her speed or take all way off by stopping or reversing her means of propulsion.
(f) (i) A vessel which, by any of these Rules, is required not to impede the passage or safe passage of another vessel shall, when required by the circumstances of the case, take early action to allow sufficient sea-room for the safe passage of the other vessel.

(ii) A vessel required not to impede the passage or safe passage of another vessel is not relieved of this obligation if approaching the other vessel so as to involve risk of collision and shall, when taking action, have full regard to the action which may be required by the Rules of this Part.

(iii) A vessel the passage of which is not to be impeded remains fully obliged to comply with the Rules of this Part when the 2 vessels are approaching one another so as to involve risk of collision. (L.N. 365 of 1989)

Section II. Conduct of vessels in sight of one another

RULE 11

Application

Rules in this Section apply to vessels in sight of one another.

RULE 14

Head-on situation

(a) When 2 power-driven vessels are meeting on reciprocal or nearly reciprocal courses so as to involve risk of collision each shall alter her course to starboard so that each shall pass on the port side of the other.
(b) Such a situation shall be deemed to exist when a vessel sees the other ahead or nearly ahead and by night she could see the masthead lights of the other in a line or nearly in a line and/or both sidelights and by day she observes the corresponding aspect of the other vessel.
(c) When a vessel is in any doubt as to whether such a situation exists she shall assume that it does exist and act accordingly.

RULE 15

Crossing situation

When 2 power-driven vessels are crossing so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way and shall, if the circumstances of the case admit, avoid crossing ahead of the other vessel.

RULE 16

Action by give-way vessel

Every vessel which is directed to keep out of the way of another vessel shall, so far as possible, take early and substantial action to keep well clear.

RULE 17

Action by stand-on vessel

(a) (i) Where one of 2 vessels is to keep out of the way the other shall keep her course and speed.

(ii) The latter vessel may however take action to avoid collision by her manoeuvre alone, as soon as it becomes apparent to her that the vessel required to keep out of the way is not taking appropriate action in compliance with these Rules.

(b) When, from any cause, the vessel required to keep her course and speed finds herself so close that collision cannot be avoided by the action of the give-way vessel alone, she shall take such action as will best aid to avoid collision.

(c) A power-driven vessel which takes action in a crossing situation in accordance with paragraph (a)(ii) of this Rule to avoid collision with another power-driven vessel shall, if the circumstances of the case admit, not alter course to port for a vessel on her own port side.

(d) This Rule does not relieve the give-way vessel of her obligation to keep out of the way.

PART C. LIGHTS AND SHAPES

RULE 20

Application

(a) Rules in this Part shall be complied with in all weathers.

(b) The Rules concerning lights shall be complied with from sunset to sunrise, and during such times no other lights shall be exhibited, except such lights as cannot be mistaken for the lights specified in these Rules or do not impair their visibility

or distinctive character, or interfere with the keeping of a proper look-out.
(c) The lights prescribed by these Rules shall, if carried, also be exhibited from sunrise to sunset in restricted visibility and may be exhibited in all other circumstances when it is deemed necessary.
(d) The Rules concerning shapes shall be complied with by day.
(e) The lights and shapes specified in these Rules shall comply with the provisions of Annex I to these Regulations.

RULE 21

Definitions

(a) "Masthead light" (桅燈) means a white light placed over the fore and aft centreline of the vessel showing an unbroken light over an arc of the horizon of 225^0 and so fixed as to show the light from right ahead to 22.5^0 abaft the beam on either side of the vessel.
(b) "Sidelights" (舷燈) means a green light on the starboard side and a red light on the port side each showing an unbroken light over an arc of the horizon of 112.5^0 and so fixed as to show the light from the right ahead to 22.5^0 abaft the beam on its respective side. In a vessel of less than 20 m in length the sidelights may be combined in one lantern carried on the fore and aft centreline of the vessel.
(c) "Sternlight" (尾燈) means a white light placed as nearly as practicable at the stern showing an unbroken light over an arc of the horizon of 135^0 and so fixed as to show the light 67.5^0 from right aft on each side of the vessel.
(d) "Towing light" (拖曳燈) means a yellow light having the same characteristics as the "sternlight" defined in paragraph (c) of this Rule.
(e) "All-round light" (環照燈) means a light showing an unbroken light over an arc of the horizon of 360^0.
(f) "Flashing light" (閃光燈) means a light flashing at regular intervals at a frequency of 120 flashes or more per minute.

RULE 22

Visibility of lights

The lights prescribed in these Rules shall have an intensity as specified in paragraph 8 of Annex I to these Regulations so as to be visible at the following minimum ranges:
(a) In vessels of 50 m or more in length:
- a masthead light, 6 miles;
- a sidelight, 3 miles;
- a sternlight, 3 miles;
- a towing light, 3 miles;
- a white, red, green or yellow all-round light, 3 miles.

(b) In vessels of 12 m or more in length but less than 50 m in length:

– a masthead light, 5 miles; except that where the length of the vessel is less than 20 m, 3 miles;
– a sidelight, 2 miles;
– a sternlight, 2 miles;
– a towing light, 2 miles;
– a white, red, green or yellow all-round light, 2 miles.

(c) In vessels of less than 12 m in length:
– a masthead light, 2 miles;
– a sidelight, 1 mile;
– a sternlight, 2 miles;
– a towing light, 2 miles;
– a white, red, green or yellow all-round light, 2 miles.

(d) In inconspicuous, partly submerged vessels or objects being towed:
– a white all-round light, 3 miles.

RULE 23

Power-driven vessels underway

(a) A power-driven vessel underway shall exhibit:
(i) a masthead light forward;
(ii) a second masthead light abaft of and higher than the forward one; except that a vessel of less than 50 m in length shall not be obliged to exhibit such light but may do so;
(iii) sidelights;
(iv) a sternlight.

(b) An air-cushion vessel when operating in the non-displacement mode shall, in addition to the lights prescribed in paragraph (a) of this Rule, exhibit an all-round flashing yellow light.

(c) (i) A power-driven vessel of less than 12 m in length may in lieu of the lights prescribed in paragraph (a) of this Rule exhibit an all-round white light and sidelights;
(ii) a power-driven vessel of less than 7 m in length whose maximum speed does not exceed 7 knots may in lieu of the lights prescribed in paragraph (a) of this Rule exhibit an all-round white light and shall, if practicable, also exhibit sidelights;
(iii) the masthead light or all-round white light on a power-driven vessel of less than 12 m in length may be displaced from the fore and aft centreline of the vessel if centreline fitting is not practicable, provided that the sidelights are combined in one lantern which shall be carried on the fore and aft centreline of the vessel or located as nearly as practicable in the same fore and aft line as the masthead light or the all-round white light.

PART D. SOUND AND LIGHT SIGNALS

RULE 32

Definitions

(a) The word "whistle" (號笛) means any sound signalling appliance capable of producing the prescribed blasts and which complies with the specifications in Annex III to these Regulations.
(b) The term "short blast" (短聲) means a blast of about one second's duration.
(c) The term "prolonged blast" (長聲) means a blast of from 4 to 6 seconds' duration.

RULE 33

Equipment for sound signals

(a) A vessel of 12 m or more in length shall be provided with a whistle and a bell and a vessel of 100 m or more in length shall, in addition, be provided with a gong, the tone and sound of which cannot be confused with that of the bell. The whistle, bell and gong shall comply with the specifications in Annex III to these Regulations. The bell or gong or both may be replaced by other equipment having the same respective sound characteristics, provided that manual sounding of the prescribed signals shall always be possible.
(b) A vessel of less than 12 m in length shall not be obliged to carry the sound signalling appliances prescribed in paragraph (a) of this Rule but if she does not, she shall be provided with some other means of making an efficient sound signal.

RULE 34

Manoeuvring and warning signals

(a) When vessels are in sight of one another, a power-driven vessel underway, when manoeuvring as authorized or required by these Rules, shall indicate that manoeuvre by the following signals on her whistle:
- one short blast to mean "I am altering my course to starboard";
- 2 short blasts to mean "I am altering my course to port";
- 3 short blasts to mean "I am operating astern propulsion".

(b) Any vessel may supplement the whistle signals prescribed in paragraph (a) of this Rule by light signals, repeated as appropriate, whilst the manoeuvre is being carried out:
(i) these light signals shall have the following significance:
- one flash to mean "I am altering my course to starboard";
- 2 flashes to mean "I am altering my course to port";
- 3 flashes to mean "I am operating astern propulsion";

(ii) the duration of each flash shall be about one second, the interval between flashes shall be about one second, and the interval between successive signals shall be not less than 10 seconds;
(iii) the light used for this signal shall, if fitted, be an all-round white light, visible at a minimum range of 5 miles, and shall comply with the provisions of Annex I to these Regulations.

(c) When in sight of one another in a narrow channel or fairway:

(i) a vessel intending to overtake another shall in compliance with Rule 9(e)(i) indicate her intention by the following signals on her whistle:

— 2 prolonged blasts followed by one short blast to mean "I intend to overtake you on your starboard side";

— 2 prolonged blasts followed by 2 short blasts to mean "I intend to overtake you on your port side";

(ii) the vessel about to be overtaken when acting in accordance with Rule 9(e)(i) shall indicate her agreement by the following signal on her whistle:

— one prolonged, one short, one prolonged and one short blast, in that order.

(d) When vessels in sight of one another are approaching each other and from any cause either vessel fails to understand the intentions or actions of the other, or is in doubt whether sufficient action is being taken by the other to avoid collision, the vessel in doubt shall immediately indicate such doubt by giving at least five short and rapid blasts on the whistle. Such signal may be supplemented by a light signal of at least 5 short and rapid flashes.

(e) A vessel nearing a bend or an area of a channel or fairway where other vessels may be obscured by an intervening obstruction shall sound one prolonged blast. Such signal shall be answered with a prolonged blast by any approaching vessel that may be within hearing around the bend or behind the intervening obstruction.

(f) If whistles are fitted on a vessel at a distance apart of more than 100 m, one whistle only shall be used for giving manoeuvring and warning signals.

RULE 36

Signals to attract attention

If necessary to attract the attention of another vessel any vessel may make light or sound signals that cannot be mistaken for any signal authorized elsewhere in these Rules, or may direct the beam of her searchlight in the direction of the danger, in such a way as not to embarrass any vessel. Any light to attract the attention of another vessel shall be such that it cannot be mistaken for any aid to navigation. For the purpose of this Rule the use of high intensity intermittent or revolving lights, such as strobe lights, shall be avoided.

ANNEX III

Technical details of sound signal appliances

1. Whistles

(a) Frequencies and range of audibility
The fundamental frequency of the signal shall lie within the range 70-700Hz. The range of audibility of the signal from a whistle shall be determined by those frequencies, which may include the fundamental and/or one or more higher frequencies, which lie within the range 180-700 Hz (± 1%) and which provide the sound pressure levels specified in subparagraph (c).

(b) Limits of fundamental frequencies
To ensure a wide variety of whistle characteristics, the fundamental frequency of a whistle shall be between the following limits:
(i) 70-200 Hz, for a vessel 200 m or more in length;
(ii) 130-350 Hz, for a vessel 75 m but less than 200 m in length;
(iii) 250-700 Hz, for a vessel less than 75 m in length.

(c) Sound signal intensity and range of audibility
A whistle fitted in a vessel shall provide, in the direction of maximum intensity of the whistle and at a distance of 1 m from it, a sound pressure level in at least one 1/3rd-octave band within the range of frequencies 180-700 Hz (± 1%) of not less than the appropriate figure given in the table below.

Length of vessel in metres	1/3rd-octave band level at 1 metre in dB referred to 2×10^{-5} N/m^2	Audibility range in nautical miles
200 or more	143	2
75 but less than 200	138	1.5
20 but less than 75	130	1
Less than 20	120	0.5

The range of audibility in the table above is for information and is approximately the range at which a whistle may be heard on its forward axis with 90% probability in conditions of still air on board a vessel having average background noise level at the listening posts (taken to be 68 dB in the octave band centred on 250 Hz and 63 dB in the octave band centred on 500 Hz).
In practice the range at which a whistle may be heard is extremely variable and depends critically on weather conditions; the values given can be regarded as typical but under conditions of strong wind or high ambient noise level at the listening post the range may be much reduced.

(d) Directional properties
The sound pressure level of a directional whistle shall be not more than 4 dB below the prescribed sound pressure level on the axis at any direction in the horizontal plane within $\pm 45^0$ of the axis. The sound pressure level at any other direction in the horizontal plane shall be not more than 10 dB below the prescribed sound pressure level on the axis, so that the range in any direction will be at least half the range on the forward axis. The sound pressure level shall be measured in that 1/3rd-octave band which determines the audibility range.

(e) Positioning of whistles
When a directional whistle is to be used as the only whistle on a vessel, it shall be installed with its maximum intensity directed straight ahead.
A whistle shall be placed as high as practicable on a vessel, in order to reduce interception of the emitted sound by obstructions and also to minimize hearing damage risk to personnel. The sound pressure level of the vessel's own signal at listening posts shall not exceed 110 dB(A) and so far as practicable should not exceed 100 dB(A).

(f) Fitting of more than one whistle
If whistles are fitted at a distance apart of more than 100 m, it shall be so arranged that they are not sounded simultaneously.

(g) Combined whistle systems
If due to the pressure of obstructions the sound field of a single whistle or of one of the whistles referred to in subparagraph (f) is likely to have a zone of greatly reduced signal level, it is recommended that a combined whistle system be fitted so as to overcome this reduction. For the purposes of the Rules a combined whistle system is to be regarded as a single whistle. The whistles of a combined system shall be located at a distance apart of not more than 100 m and arranged to be sounded simultaneously. The frequency of any one whistle shall differ from those of the others by at least 10 Hz.

(An excerpt of the Annex to Marine Department Notice No.131 of 2012)

Marine Traffic Control Measures for the 2012 National Day Fireworks Display

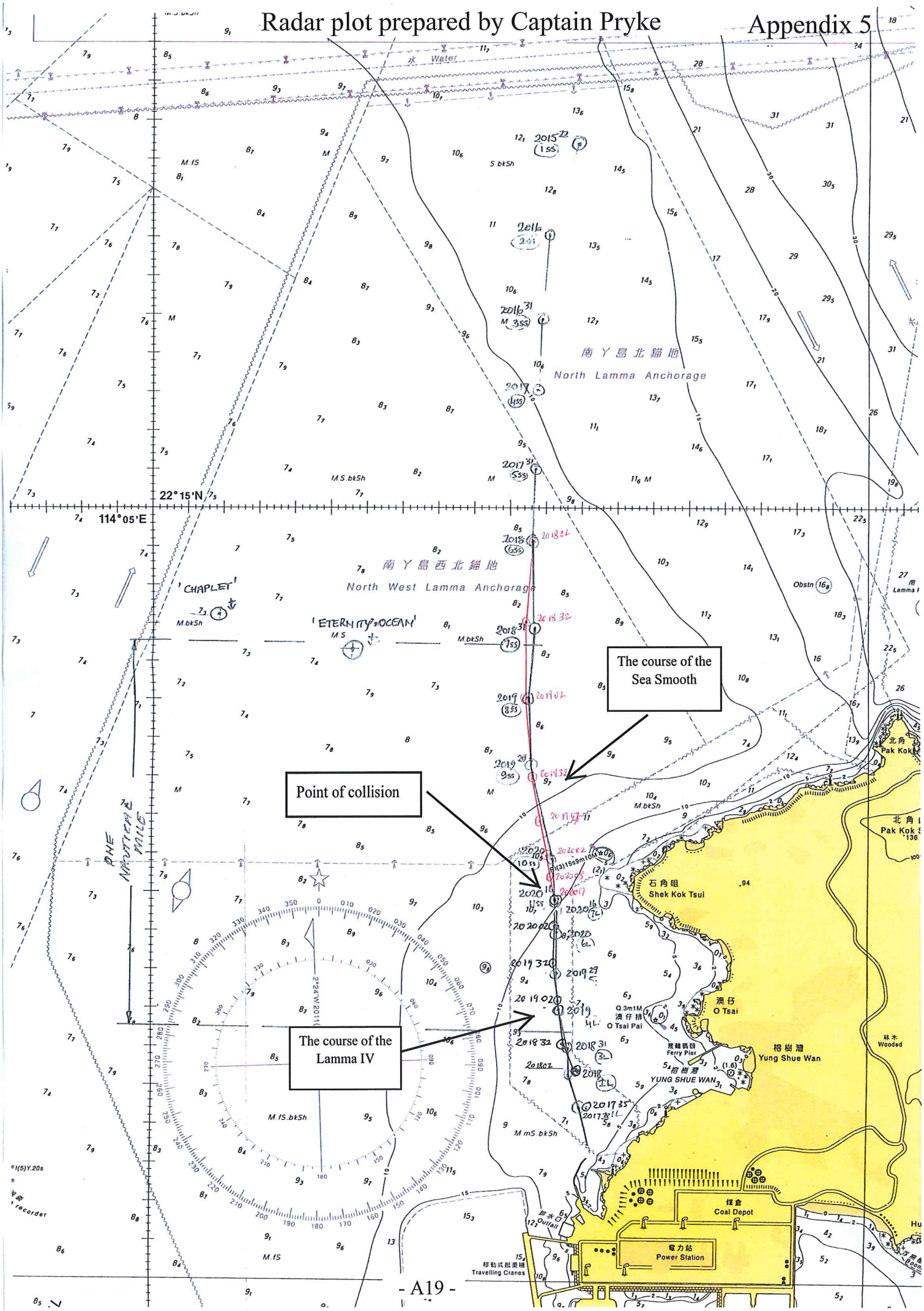
Safety Measures by All Vessels

6. Masters, coxswains, owners and operators of all vessels are advised to take the following steps before the start of the voyage:

(a) all persons on board are made aware of the location of all lifesaving appliances and instructed on the proper way to don a lifejacket;
(b) all children on board are required to don a lifejackets at all times;
(c) a passenger list containing the names of passengers and crew on board is kept by the master/coxswain for emergency purposes; and
(d) the carrying capacity specified in the operating licence of the vessel is adhered to.

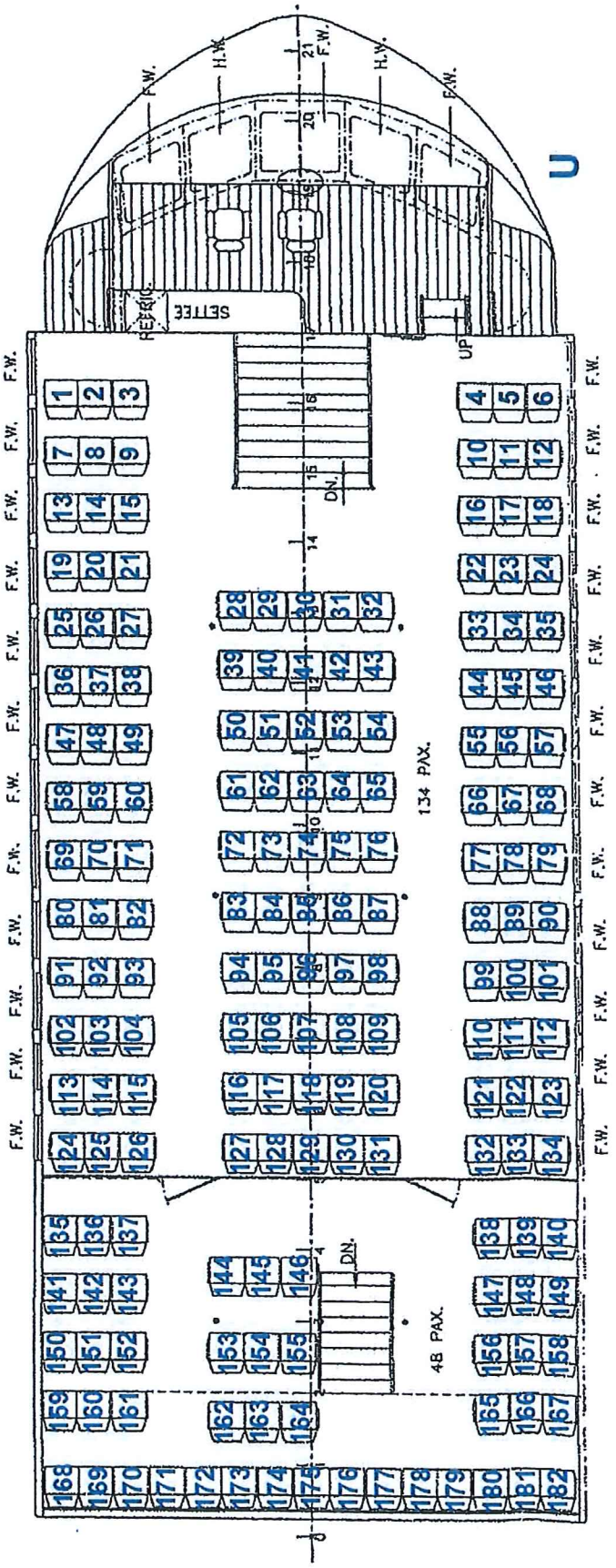
Radar plot prepared by Captain Pryke

Appendix 5



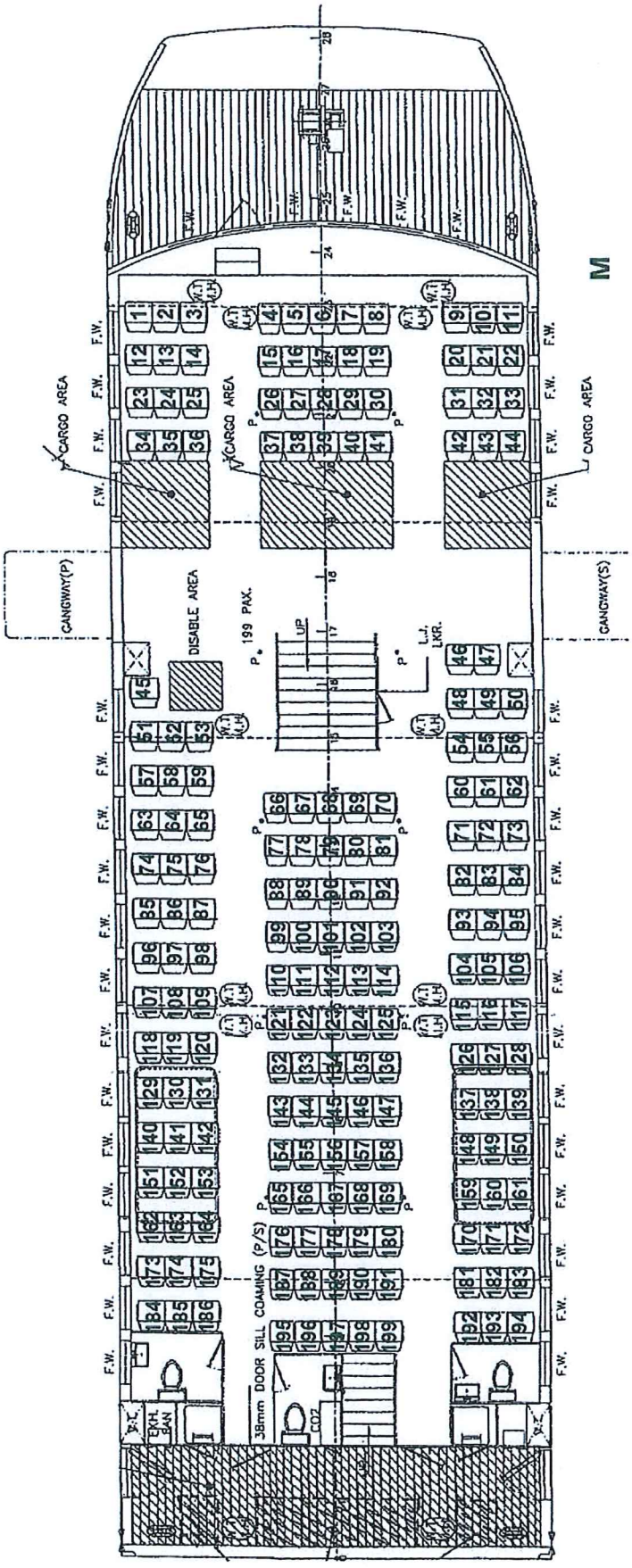
Appendix 6

Upper deck plan of the Sea Smooth



Appendix 7

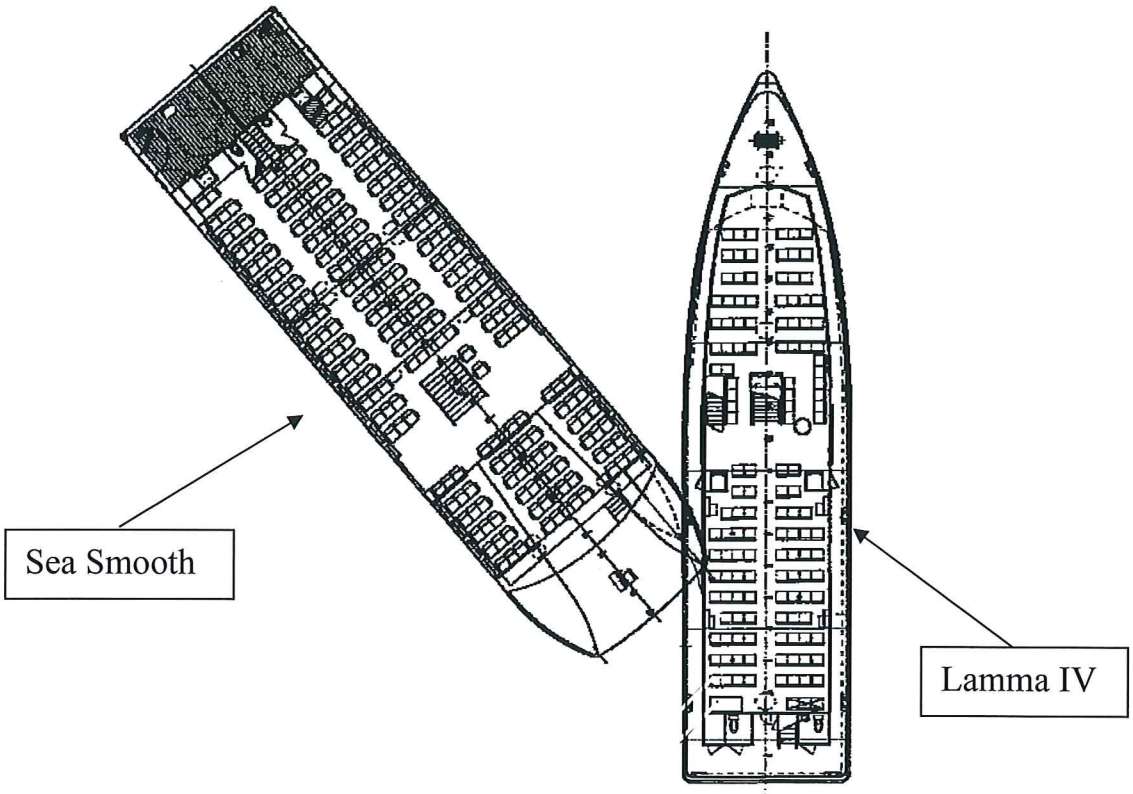
Main deck plan of the Sea Smooth



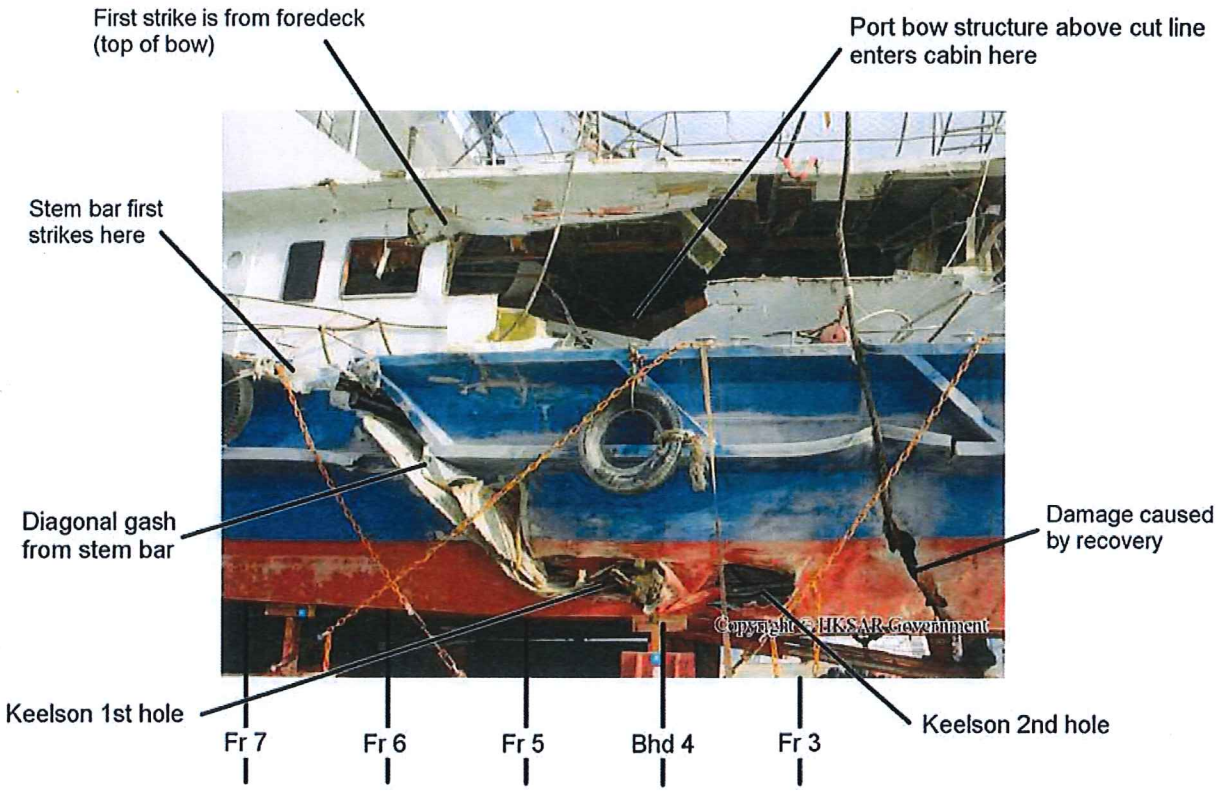
Sketch in plan view showing the relative positions of the Sea Smooth and the Lamma IV during collision

Time = 0 secs

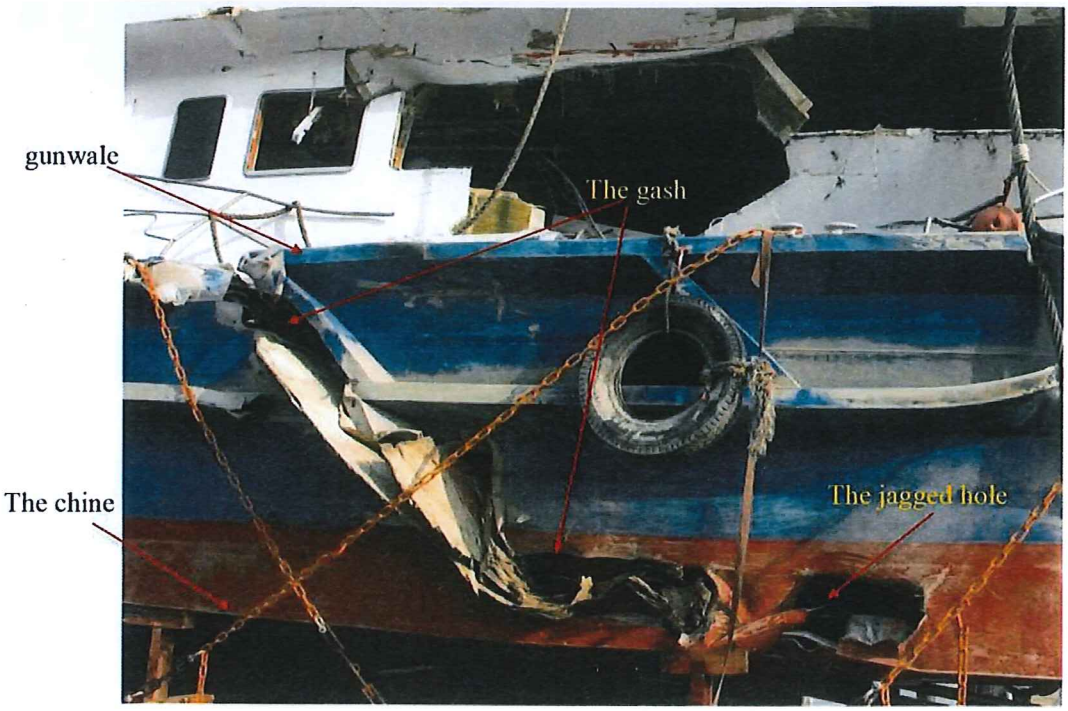
Lamma IV at 11.5 kn, Sea Smooth at 22.5 kn, relative heading 40°



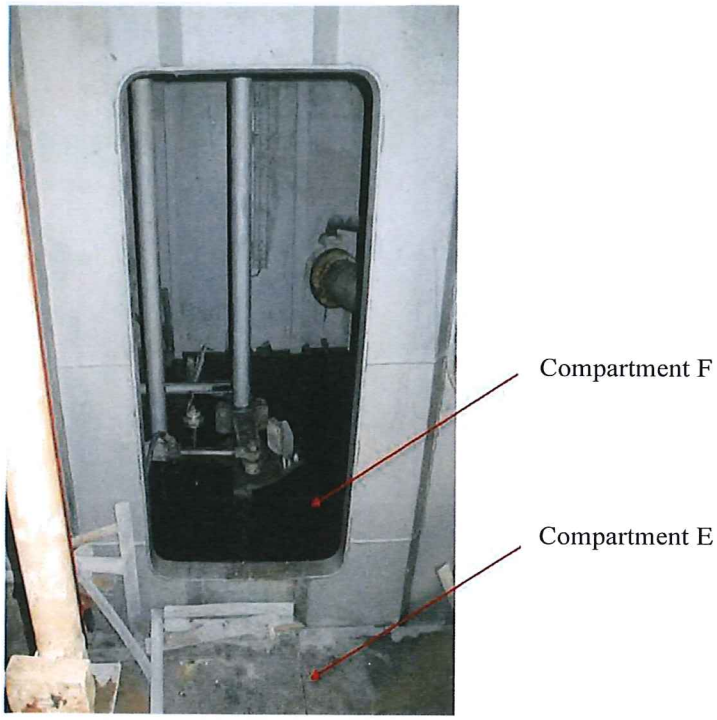
Principal damage to the Lamma IV watertight integrity



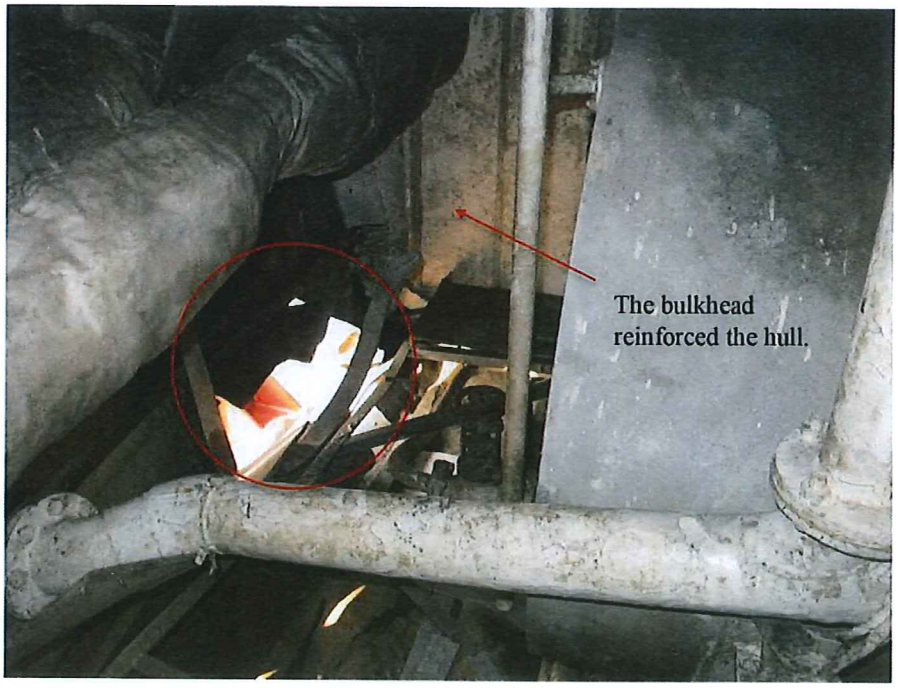
The gash and the jagged hole on the port side of the hull of the Lamma IV



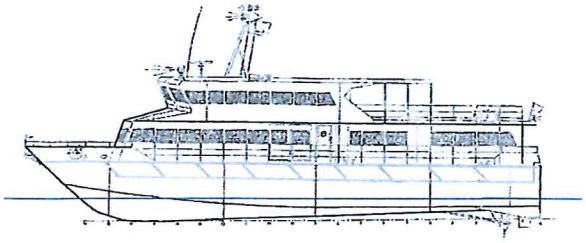
The non-watertight bulkhead between Compartments E and F with an opening



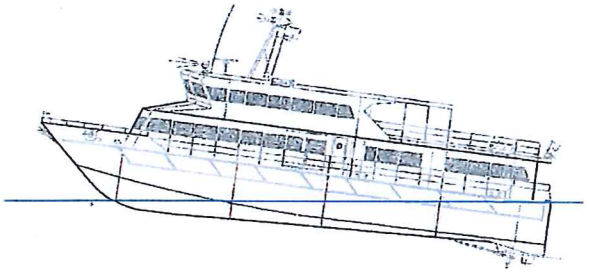
The jagged hole (red circled) in the tank room (Compartment E) of the Lamma IV



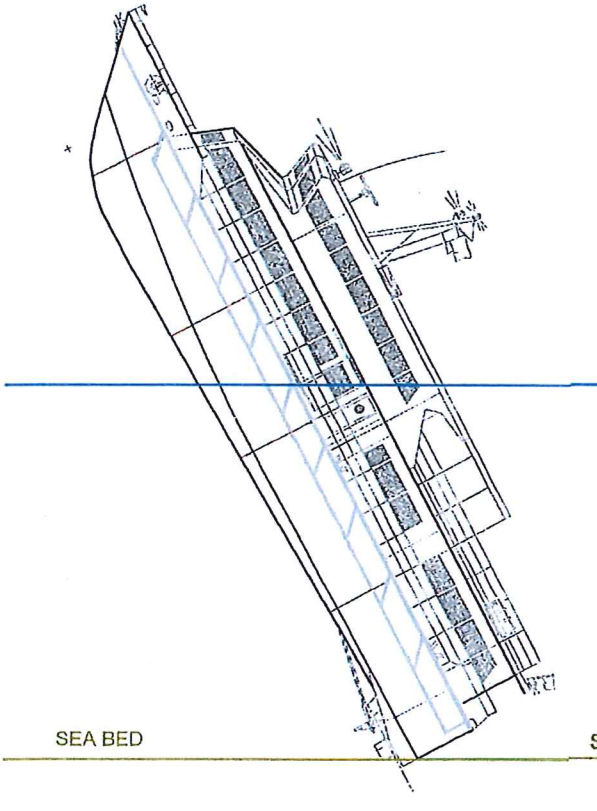
Angles assumed by the Lamma IV after sinking



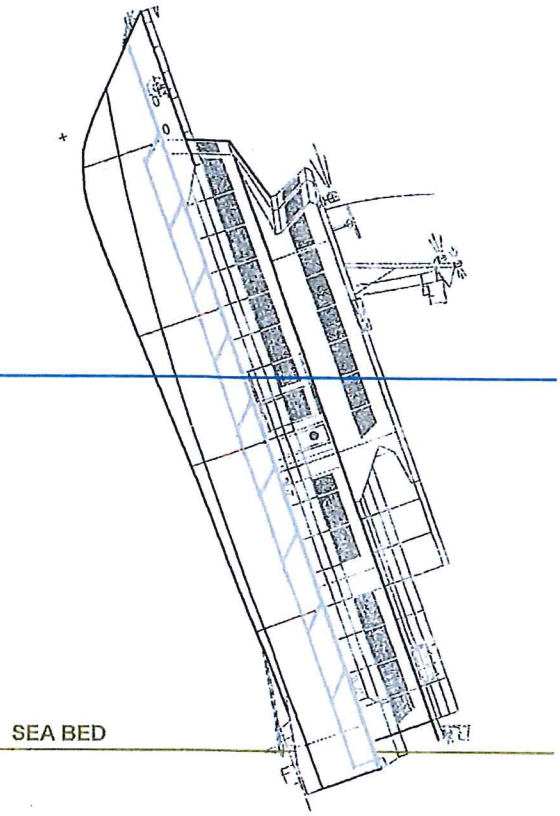
Level trim



End of Phase 1: Transom immersed at 6.5°



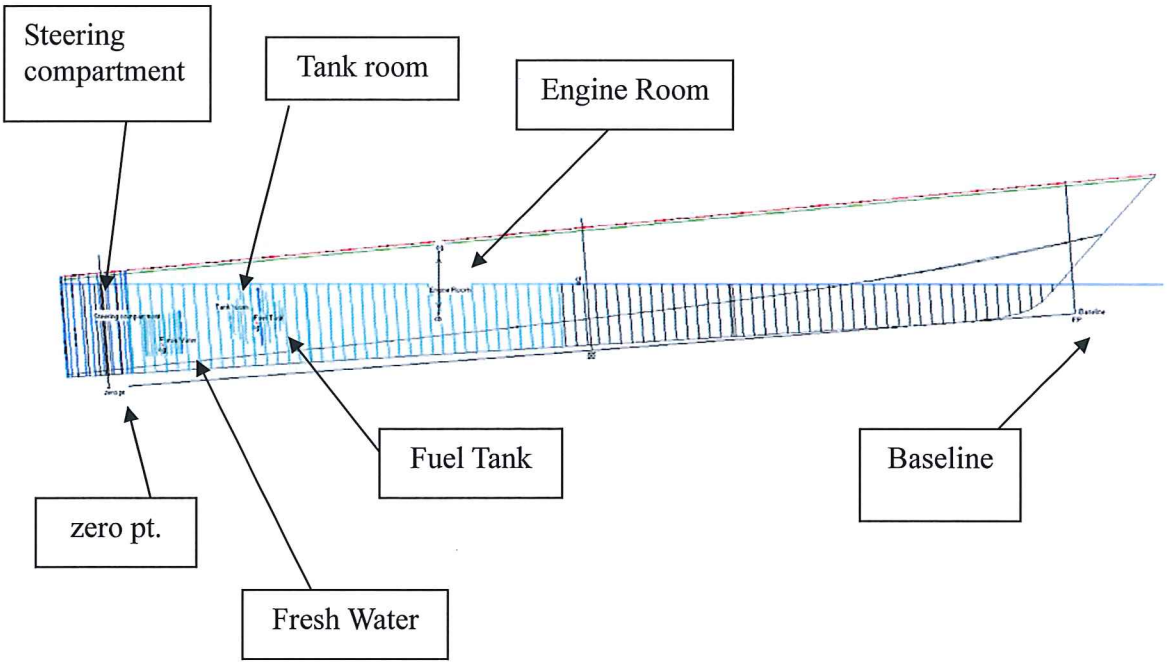
End of Phase 2: Transom in contact with sea bed.

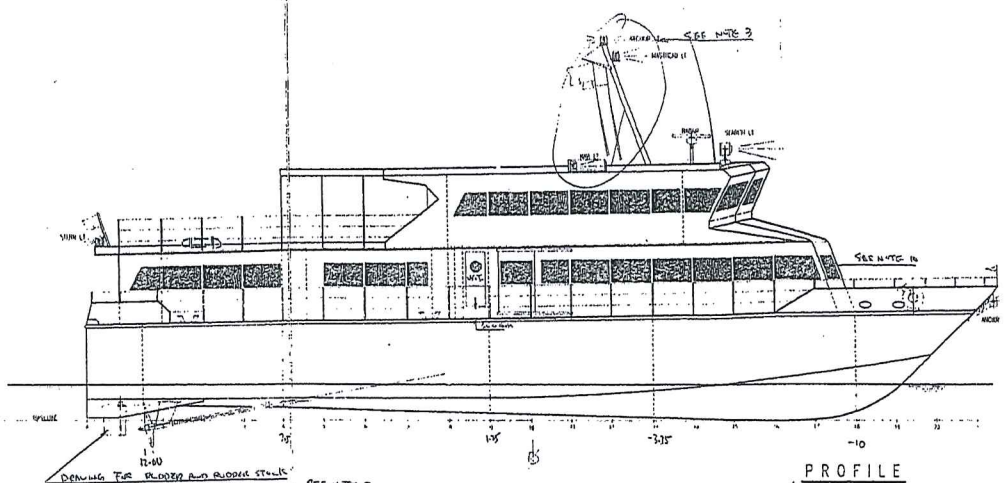


End of Phase 2a: Vessel settles into the mud on the sea bed.

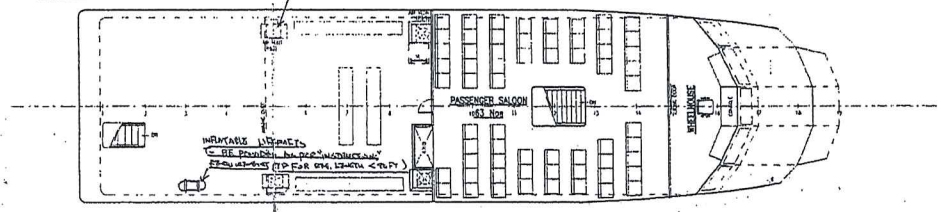
Two-compartment Damage – Engine room and Tank room

Note that the stern is almost submerged, but the vessel remains afloat

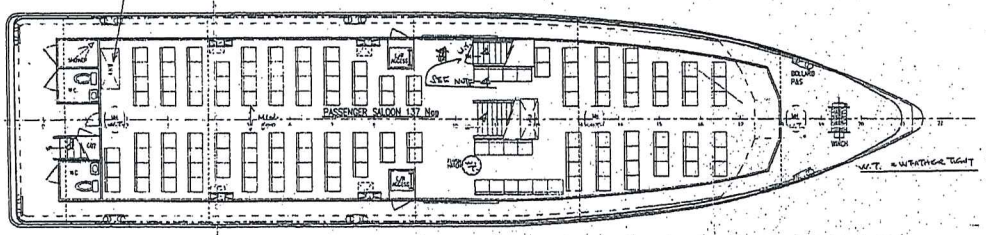




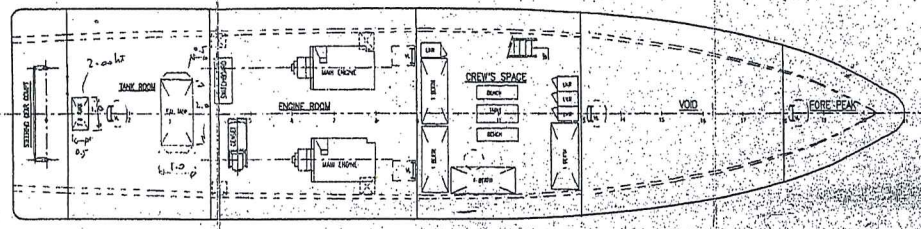
PROFILE



UPPERDECK PLAN



MAINDECK PLAN



UNDERDECK PLAN

HONG KONG MARINE DEPARTMENT COMMENTS:

1. Vessel will be licensed for plying within waters of Hong Kong including Specified Sheltered Waters.
2. *"Instructions for the Survey of Launches and Ferry Vessels"* are to be complied with.
3. Lights, shapes and sound signals are to be of approved type. The "International Regulations for Preventing Collisions at sea 1972" to be complied with.
4. All air pipes and access hatches that lead down to main deck to be of 300mm coaming height.
5. Two cowl natural ventilators or mechanical vent with damper and one of which to be led well down into the engine room near the floor level.
6. If LPG cooking appliances is fitted, detail drawing to be submitted for approval.
7. If batteries fitted in E/R, steel batteries locker with effective air pipe extend above deck to be provided.
8. Inclining experiment to be carried out upon completion of the vessel.
9. Number of passengers permitted to carry on board vessel will be determined by actual measurement. Seats must be firmly secured.
10. All windows to be of safety glass and all sliding windows should be capable of being closed weathertight.
11. Damaged stability and floodable length calculation to be submitted for approval.
12. Angle of stairway should not be less than 37° from the vertical.
13. Good ventilation and lighting to the provided for crew space below main deck.
14. All void space to be provided with air pipe and sounding pipe with striking pod.
15. Survey to be arranged.

HONG KONG MARINE DEPARTMENT COMMENTS

All other requirements of the Rules and Regulations for grnting a Local Licence shall be complied with so far as they are applicable.

PRINCIPAL DIMENSIONS

LENGTH OVERALL	28.00	M
BREADTH MOULDED	6.80	M
DEPTH MOULDED	2.80	M
DRAFT DESIGN ABOVE KEEL	1.10	M
PASSENGERS SEATS	200	Nos

SEE NOTE 9

MARINE DEPARTMENT
SHIPPING DIVISION
HONG KONG

DRAWING FOR

APPROVED SUBJECT TO MODIFICATIONS INDICATED THEREON AND OBSERVATIONS OF MARINE DEPARTMENT LETTER

REF. DATED

DATE 29 MAY 1995

SIGNATURE

CHEOY LEE SHIPYARDS LTD
HOK 22-33, MO LIN STREET (EXTENSION), 14 CO NOS.
KOWLOON, HONG KONG.
TEL 3076111 FAX 3075577

PROJECT
28M FAST ALUMINIUM/GRP PASSENGER LAUNCH

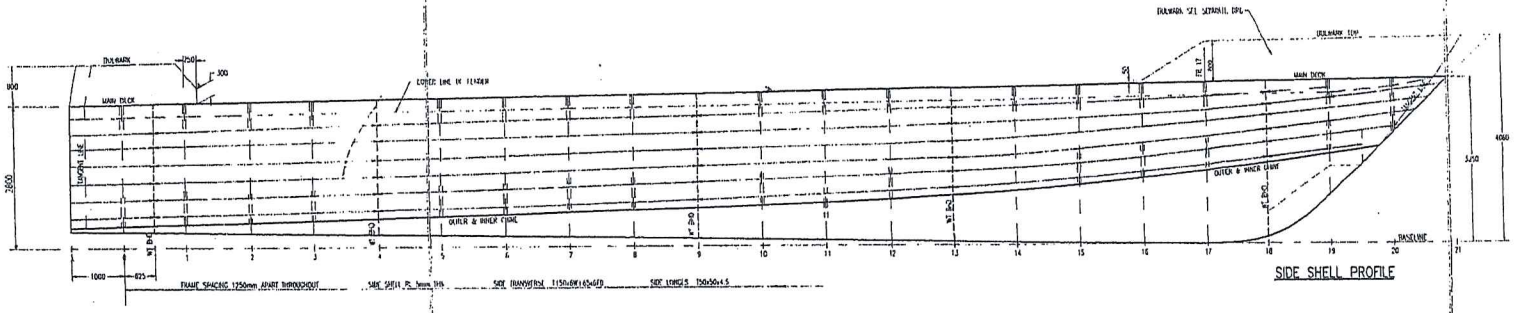
TITLE
GENERAL ARRANGEMENT

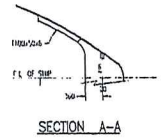
OWNER HONGKONG ELECTRIC CO., LTD

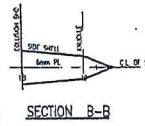
CLASSIFICATION	HKUD			HULL NO	3625	
DRAWN	AM	12.95	SCALE	DRAWING NO.	HC-391-1	REVISION A
CHECKED			1:75			

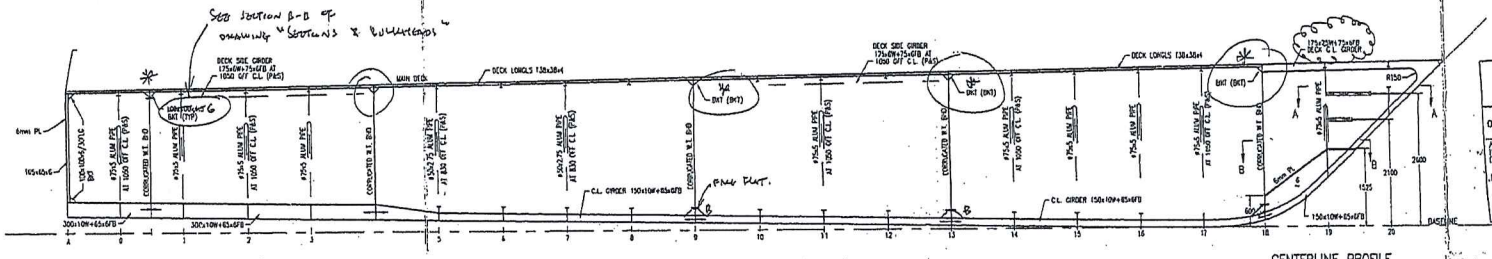
NAVAL ARCHITECT Naval-Consult Pte Ltd
12 WEST COAST WALK #07-11A, WEST COAST RECREATION CENTRE, SINGAPORE 0511
TEL 7793630/7793635 FAX 7777161

01-1961









MARINE DEPARTMENT
SHIPPING DIVISION
HONG KONG

DRAWING FOR S.V. 776

APPROVED SUBJECT TO MODIFICATIONS INDICATED THEREON AND OBSERVATIONS OF MARINE DEPARTMENT LETTER

REF. DATED

DATE 3-5-95

SIGNATURE

HONG KONG MARINE DEPARTMENT'S COMMENTS

All other requirements of the Rules and Regulations for granting a Local Licence shall be complied with so far as they are applicable.

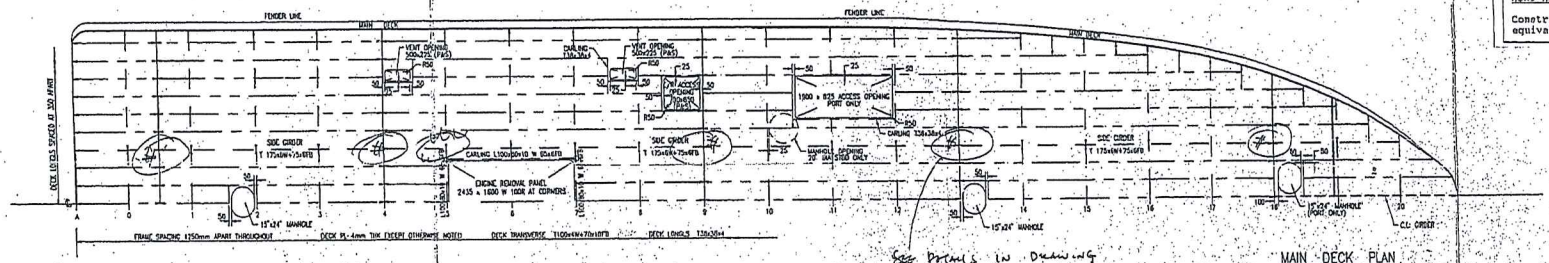
HONG KONG MARINE DEPARTMENT COMMENTS:

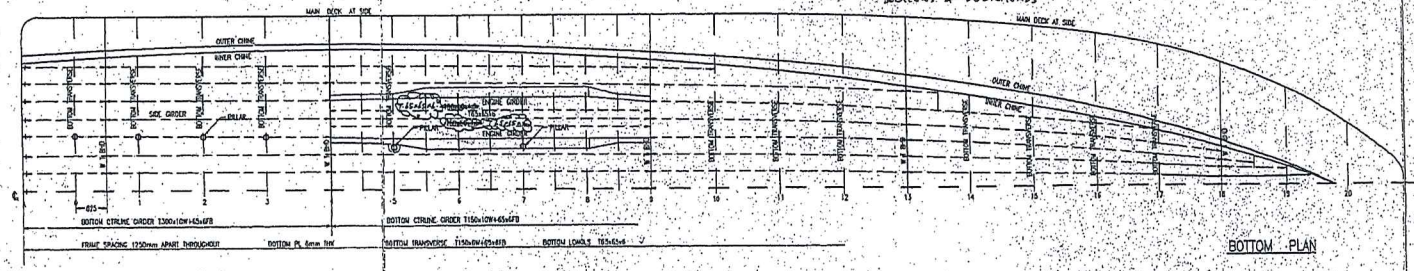
Construction material properties should be DNV Class or equivalent and comply with the scantling calculation.

NOTES :

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE FOLLOWING DRAWINGS:

1	WORKMP SECTION	HC-391-3
2	SECTIONS AND BULKHEADS	HC-391-5 SHT.1 & 2
3	ENGINE GIRDER	HC-391-6





CHEOY LEE SHIPYARDS, LTD
HWAI, 32-33, PO LUN STREET (EXTENSION), LAI CHI KOK,
KOWLOON, HONG KONG
TEL: 3076333 FAX: 3075377

PROJECT YARD NO. 4625
28M FAST ALUMINIUM/GRP PASSENGER LAUNCH

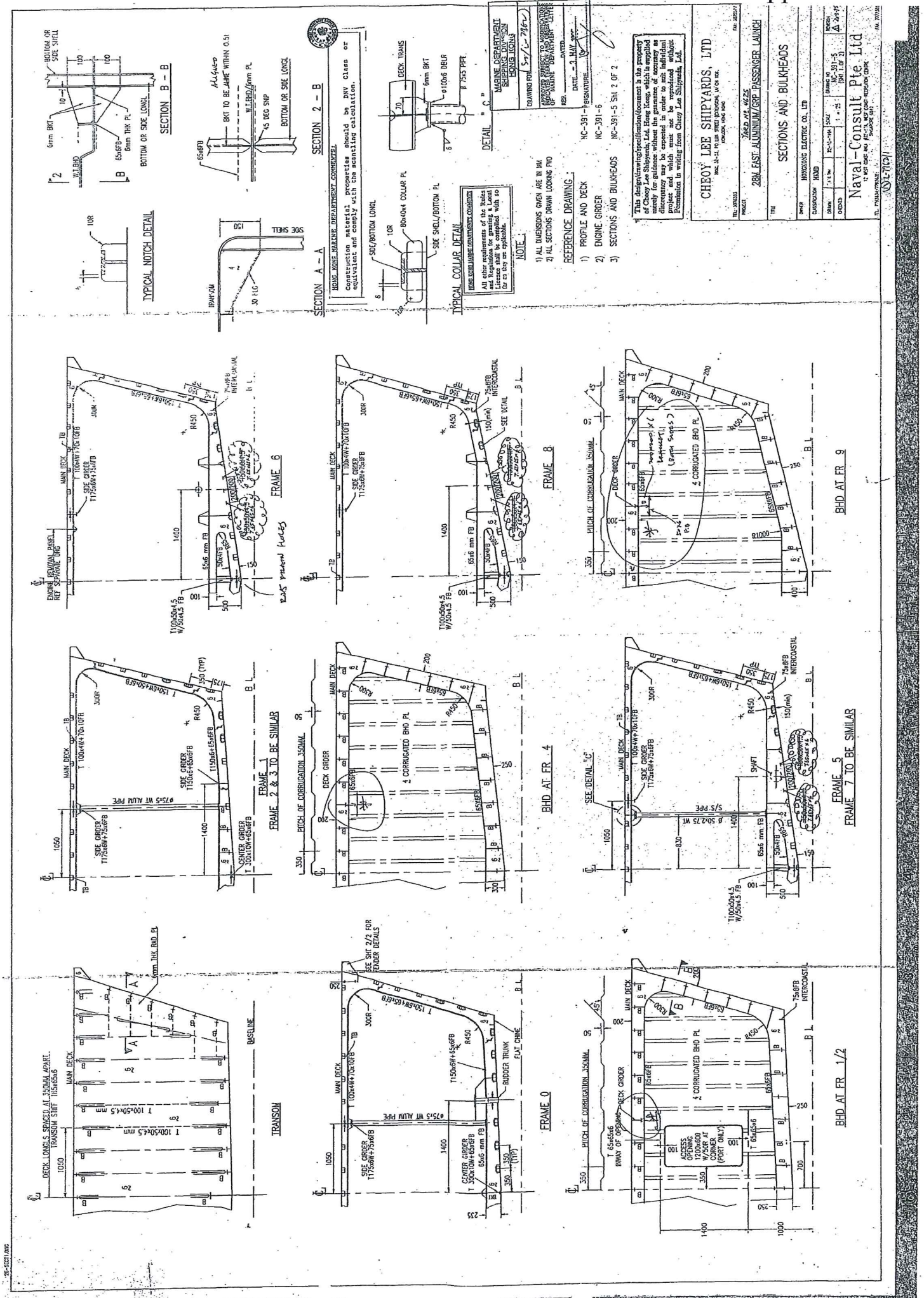
TITLE PROFILE AND DECK

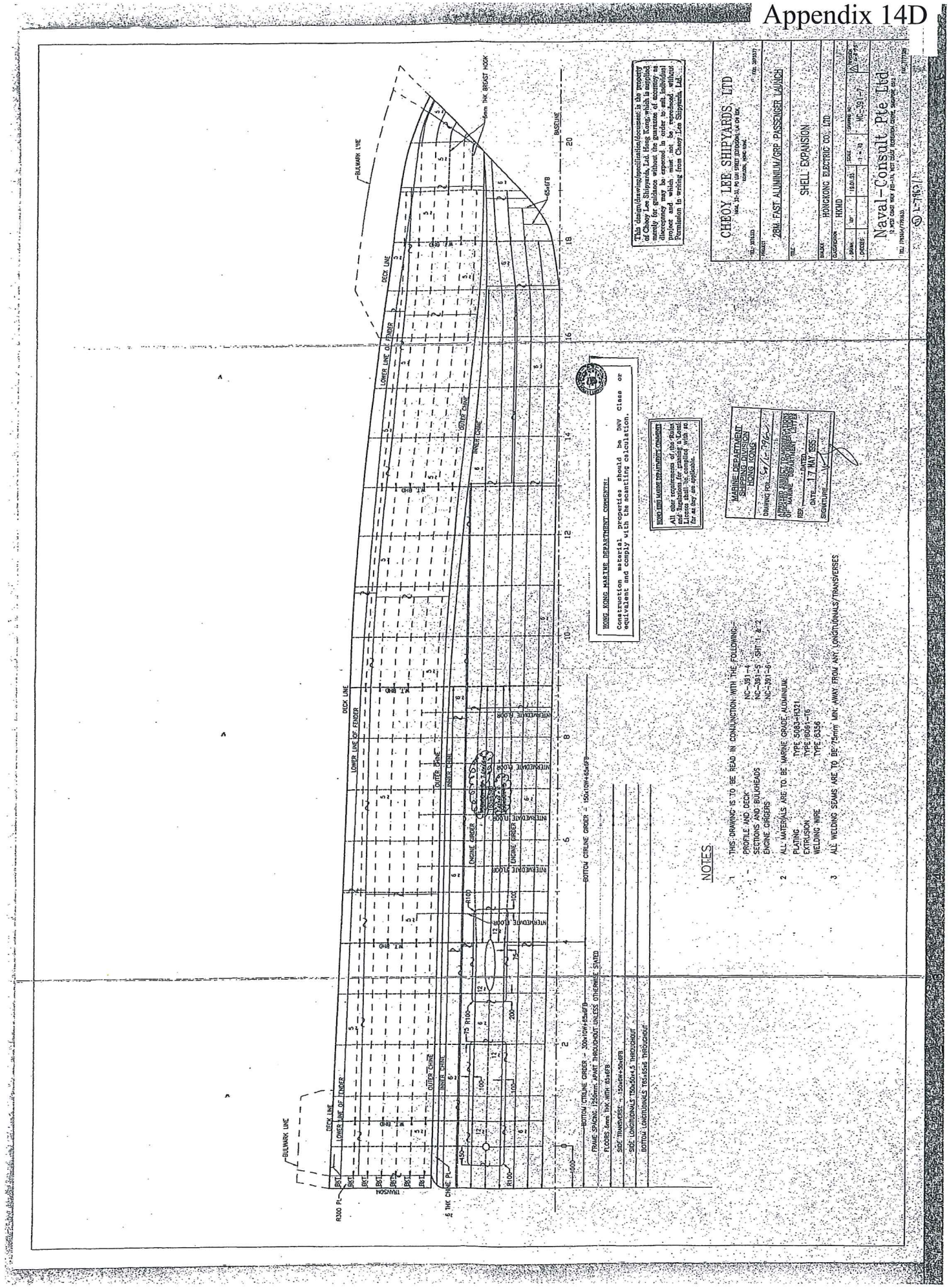
OWNER HONGKONG ELECTRIC CO., LTD

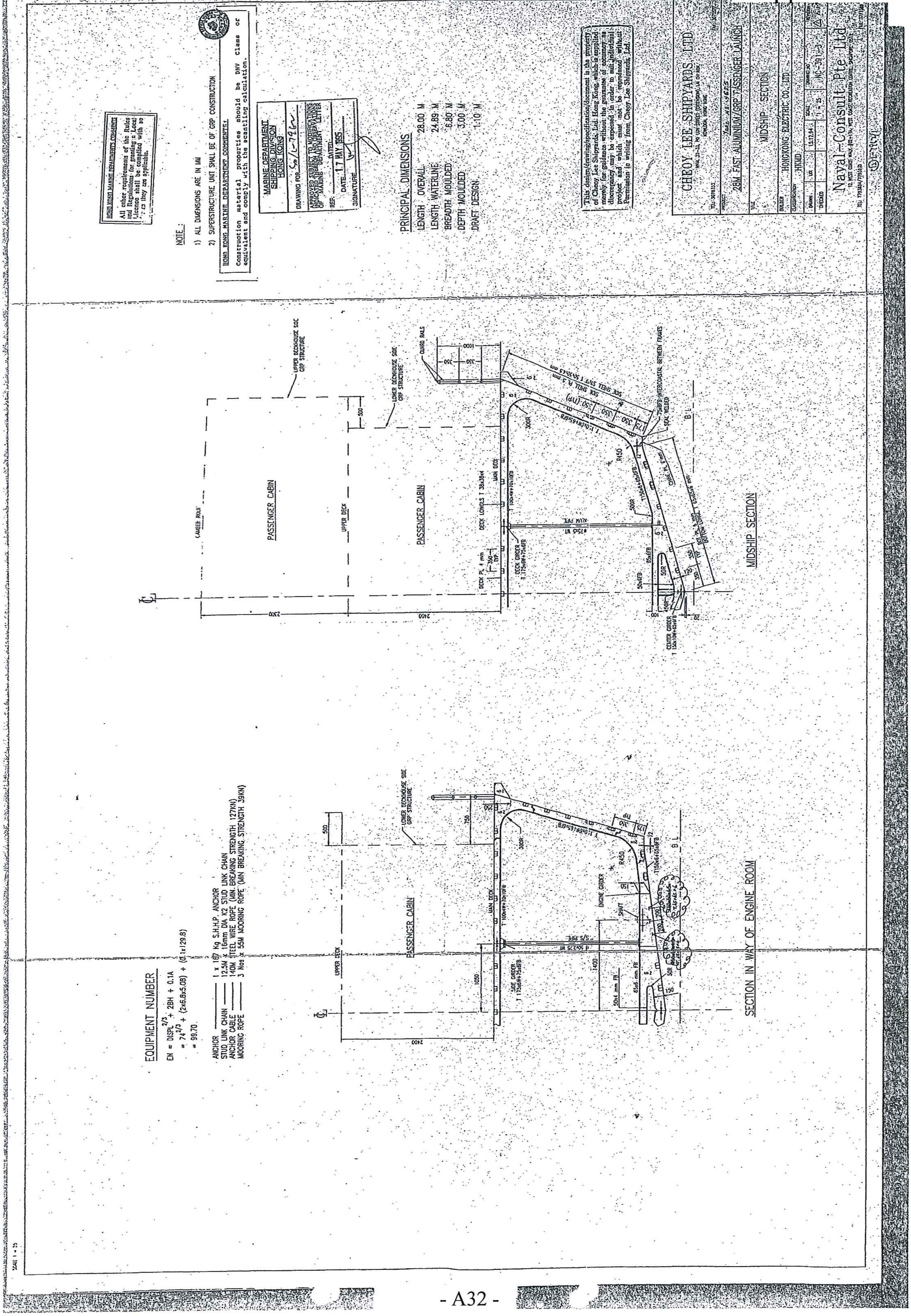
CLASSIFICATION HKMD

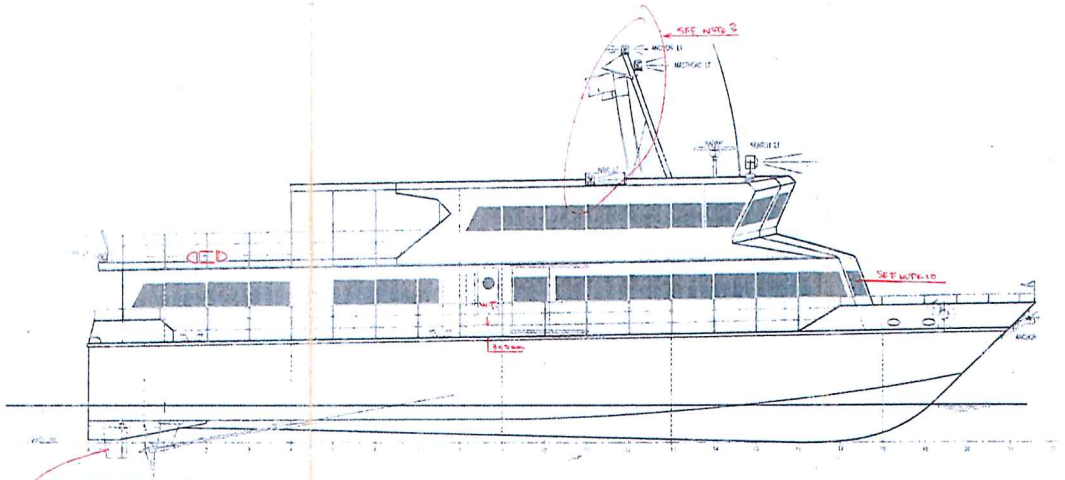
DRAWN	K.C.Tan	20-12-1994	SCALE 1 : 50	DRAWING NO. HC-391-4	REVISION A 23-3-95
CHECKED					

Naval-Consult Pte Ltd
13, WEST COAST WALK (105-113A), WEST COAST PLAZA CENTRE,
SINGAPORE 0512.
TEL: 7783834/7783835

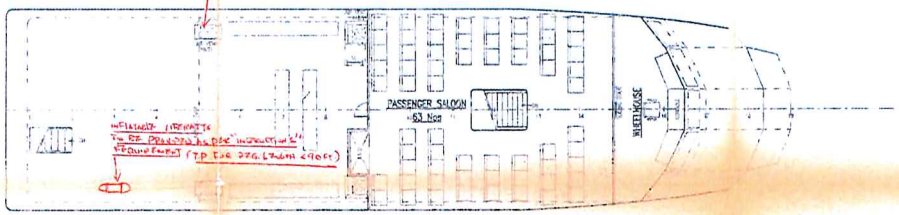

SECTION B – B
TYPICAL NOTCH DETAIL
SECTION A – A
SECTION 2 – B
TYPICAL COLLAR DETAIL
DETAIL "C"
NOTE :
1) ALL DIMENSIONS GIVEN ARE IN MM
2) ALL SECTIONS DRAWN LOOKING FWD
REFERENCE DRAWING :
1) PROFILE AND DECK NC-391-4
2) ENGINE GIRDER NC-391-6
3) SECTIONS AND BULKHEADS NC-391-5 SHT 2 OF 2
CHOY LEE SHIPYARDS, LTD
28M FAST ALUMINUM/GRP PASSENGER LAUNCH
SECTIONS AND BULKHEADS
Naval-Consult Pte Ltd
FRAME 6
FRAME 8
BHD AT FR 9
FRAME 1
FRAME 2 & 3 TO BE SIMILAR
BHD AT FR 4
FRAME 5
FRAME 7 TO BE SIMILAR
TRANSOM
FRAME 0
BHD AT FR 1/2


CHEOY LEE SHIPYARDS, LTD
28kt FAST ALUMINUM/GRP PASSENGER LAUNCH
SHELL EXPANSION
HONGKONG ELECTRIC CO. LTD.
HKMD
NC-391-7
Naval-Consult Pte Ltd
This design/drawing/specification/document is the property of Cheoy Lee Shipyards, Ltd. Hong Kong, which is supplied merely for guidance without the guarantee of accuracy as discrepancy may be expected. In order to suit individual project and which must not be reproduced without Permission in writing from Cheoy Lee Shipyards, Ltd.
HONG KONG MARINE DEPARTMENT COMMENTS
All other requirements of the Rules and Regulations for grating a Local Light Vessel Certificate shall be met for as boy are applicable.
HONG KONG MARINE DEPARTMENT COMMENTS
Construction material properties should be DNV class or equivalent and comply with the scantling calculation.
MARINE DEPARTMENT
SHIPPING DIVISION
HONG KONG
APPROVED UNLESS TO MODIFICATIONS OF MARINE DEPARTMENT'S
DATE 17 MAY 05
SIGNATURE
NOTES
1 THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE FOLLOWING:-
PROFILE AND DECK NC-391-4
SECTIONS AND BULKHEADS NC-391-5 SHT 1 & 2
ENGINE GIRDERS NC-391-6
2 ALL MATERIALS ARE TO BE MARINE GRADE ALUMINUM
PLATING TYPE 5083-H321
EXTRUSION TYPE 6061-T6
WELDING WIRE TYPE 5356
3 ALL WELDING SEAMS ARE TO BE 75mm MIN. AWAY FROM ANY LONGITUDINALS/TRANSVERSES
BULWARK LINE
DECK LINE
LOWER LINE OF FENDER
OUTER CHINE
INNER CHINE
TRANSOM
BOTTOM CHINE GIRDER - 300x10W+65x6FB
FRAME SPACING 1250mm APART THROUGHOUT UNLESS OTHERWISE STATED
FLOORS 8mm THK WITH 65x6FB
SIDE TRANSVERSE - 150x6W+50x6FB
SIDE LONGITUDINALS T80x50x4.5 THROUGHOUT
BOTTOM LONGITUDINALS T80x65x6 THROUGHOUT
INTERMEDIATE FLOOR
ENGINE GIRDER
INTERMEDIATE ENGINE GIRDER
BASELINE
5mm THK BRKT HOOK
65x6FB
6 THK CHINE PL
R300 PL

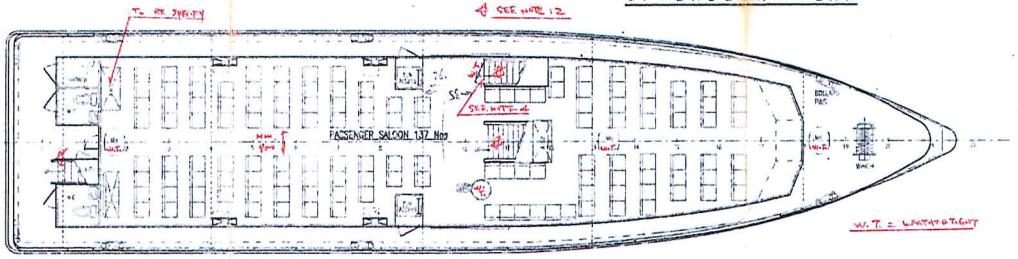

EQUIPMENT NUMBER
EN = DISPL^2/3 + 2BH + 0.1A
= 74^2/3 + (2x6.8x5.08) + (0.1x129.8)
= 99.70
ANCHOR — 1 x 187 Kg S.H.H.P. ANCHOR
STUD LINK CHAIN — 12.5M x 16mm DIA K2 STUD LINK CHAIN
ANCHOR CABLE — 140M STEEL WIRE ROPE (MIN. BREAKING STRENGTH 127KN)
MOORING ROPE — 3 Nos x 55M MOORING ROPE (MIN BREAKING STRENGTH 39KN)
UPPER DECK
PASSENGER CABIN
LOWER DECKHOUSE SIDE GRP STRUCTURE
MAIN DECK
SIDE GIRDER
ENGINE GIRDER
SHAFT
R450
300R
50R
B L
SECTION IN WAY OF ENGINE ROOM
CAMBER ROOF
UPPER DECKHOUSE SIDE GRP STRUCTURE
GUARD RAILS
DECK PL 4 mm
DECK LONGLS T 38x38x4
DECK GIRDER
CENTER GIRDER
75x6FB INTERCOASTAL BETWEEN FRAMES
SEAL WELDED
MIDSHIP SECTION
HONG KONG MARINE DEPARTMENT'S COMMENTS
All other requirements of the Rules and Regulations for granting a Local Licence shall be complied with so far as they are applicable.
NOTE :
1) ALL DIMENSIONS ARE IN MM
2) SUPERSTRUCTURE UNIT SHALL BE OF GRP CONSTRUCTION
HONG KONG MARINE DEPARTMENT COMMENTS:
Construction material properties should be DNV Class or equivalent and comply with the scantling calculation.
MARINE DEPARTMENT SHIPPING DIVISION HONG KONG
DRAWING FOR
APPROVED SUBJECT TO MODIFICATIONS OR OBSERVATIONS OF MARINE DEPARTMENT LETTER
REF. DATED
DATE 17 MAY 1995
SIGNATURE
PRINCIPAL DIMENSIONS
LENGTH OVERALL 28.00 M
LENGTH WATERLINE 24.89 M
BREADTH MOULDED 6.80 M
DEPTH MOULDED 3.00 M
DRAFT DESIGN 1.10 M
This design/drawing/specification/document is the property of Cheoy Lee Shipyards, Ltd. Hong Kong, which is supplied merely for guidance without the guarantee of accuracy, as discrepancy may be expected in order to suit individual project and which must not be reproduced without Permission in writing from Cheoy Lee Shipyards, Ltd.
CHEOY LEE SHIPYARDS, LTD
28M FAST ALUMINIUM/GRP PASSENGER LAUNCH
MIDSHIP SECTION
HONGKONG ELECTRIC CO. LTD
HKMD
15.12.94
1 : 25
NC-391-3
Naval-Consult Pte Ltd



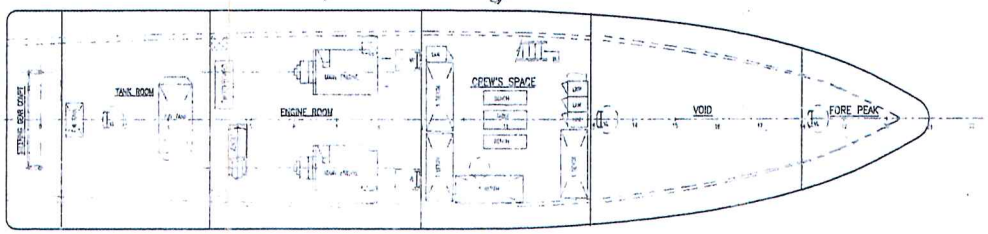
PROFILE



UPPERDECK PLAN



MAINDECK PLAN



UNDERDECK PLAN

HONG KONG MARINE DEPARTMENT COMMENTS:

1. Vessel will be licensed for plying within waters of Hong Kong including Specified Sheltered Waters.
2. "*Instructions for the Survey of Launches and Ferry Vessels*" are to be complied with.
3. Lights, shapes and sound signals are to be of approved type. The "International Regulations for Preventing Collisions at sea 1972" to be complied with.
4. All air pipes and access hatches that lead down to main deck to be of 300mm coaming height.
5. Two coal natural ventilators or mechanical vent with damper and one of which to be led well down into the engine room near the floor level.
6. If LPG cooking appliances is fitted, detail drawing to be submitted for approval.
7. If batteries fitted in E/R, steel batteries locker with effective air pipe extend above deck to be provided.
8. Inclining experiment to be carried out upon completion of the vessel.
9. Number of passengers permitted to carry on board vessel will be determined by actual measurement. Seats must be firmly secured.
10. All windows to be of safety glass and all sliding windows should be capable of being closed weathertight.
11. Damaged stability and floodable length calculation to be submitted for approval.
12. Angle of stairway should not be less than 37° from the vertical.
13. Good ventilation and lighting to be provided for crew space below main deck.
14. All void space to be provided with air pipe and sounding pipe with striking pad.
15. Survey to be arranged.

PRINCIPAL DIMENSIONS

LENGTH OVERALL	28.00	M
BREADTH MOULDED	6.80	M
DEPTH MOULDED	2.80	M
DRAFT DESIGN ABOVE KEEL	1.10	M
PASSENGERS SEATS	200	Nos

SEE NOTE 9

HONG KONG MARINE DEPARTMENTS COMMENTS

All other requirements of the Rules and Regulations for granting a Local Licence shall be complied with so far as they are applicable.

MARINE DEPARTMENT
SHIPPING DIVISION
HONG KONG

DRAWING FOR

APPROVED SUBJECT TO MODIFICATIONS INDICATED THEREON AND OBSERVATIONS OF MARINE DEPARTMENT LETTER

REF. DATED

DATE 8 MAY 1995

SIGNATURE

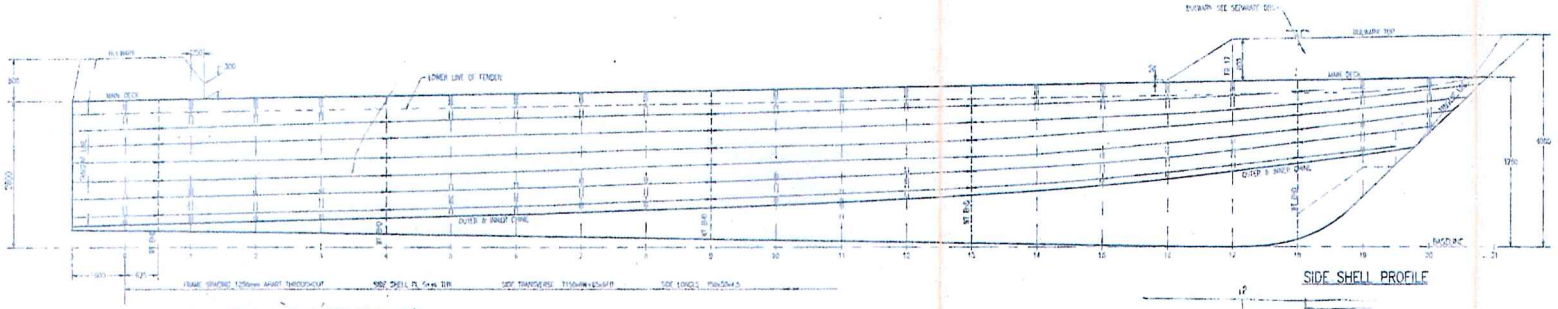
CHEOY LEE SHIPYARDS, LTD

PROJECT: 25M FAST ALUMINIUM/GRP PASSENGER LAUNCH

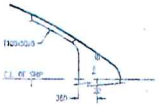
TITLE: GENERAL ARRANGEMENT

DRAWN: HONGKONG ELECTRIC CO., LTD. | SCALE: 1:100 | DRAWING NO. NC-391-1 | REVISION A

Naval-Consult Pte Ltd



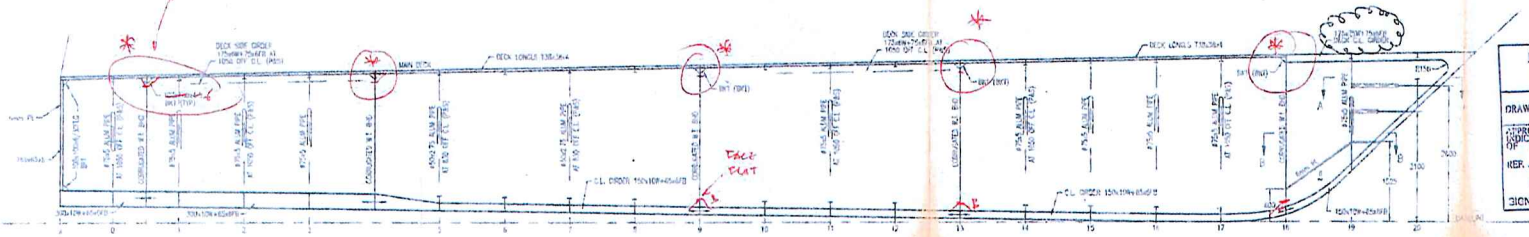
SIDE SHELL PROFILE



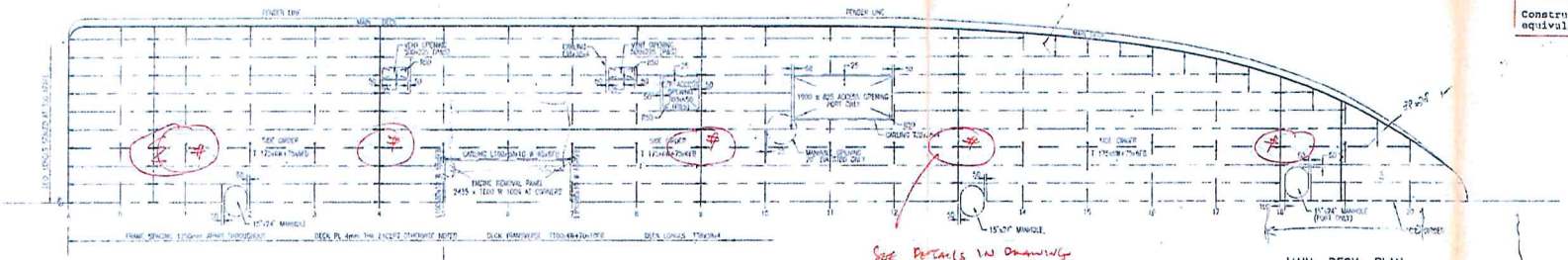
SECTION A-A

SECTION B-B

See Section B-B of Drawing "Sections & Bulkheads"

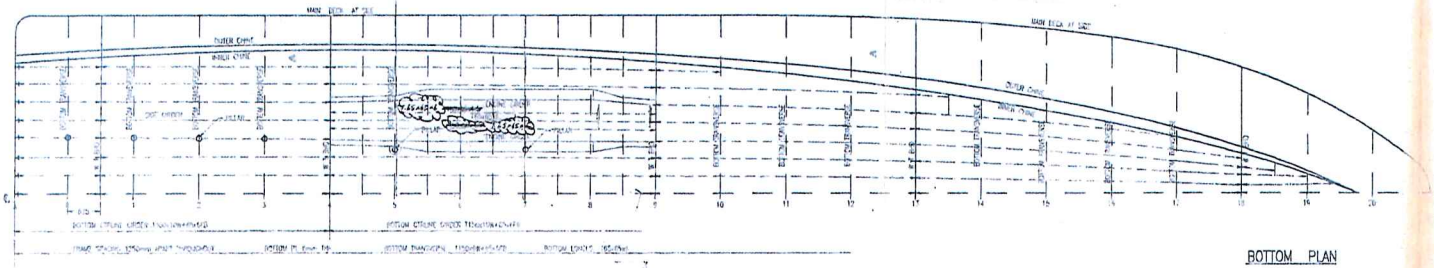


CENTERLINE PROFILE



MAIN DECK PLAN

See Details in Drawing "Sections & Bulkheads"



BOTTOM PLAN

MARINE DEPARTMENT
SHIPPING DIVISION
HONG KONG

DRAWING FOR (SO/L-796~)

APPROVED SUBJECT TO MODIFICATIONS INDICATED THEREON AND OBSERVATIONS OF MARINE DEPARTMENT LETTER

REF. _____ DATED _____

DATE 3-5-95

SIGNATURE

HONG KONG MARINE DEPARTMENTS COMMENTS

All other requirements of the Rules and Regulations for granting a Local Licence shall be complied with so far as they are applicable.

HONG KONG MARINE DEPARTMENT COMMENTS:

Construction material properties should be DNV Class or equivalent and comply with the scantling calculation.

NOTES :

THIS DRAWING IS TO BE READ IN CONJUNCTION WITH THE FOLLOWING DRAWINGS:

1	MIDSHIP SECTION	NC-391-3
2	SECTIONS AND BULKHEADS	NC-391-5 (NO 1 & 2)
3	ENGINE GIRDER	NC-391-6

CHOEY LEE SHIPYARDS, LTD

PROJECT: YARD NO. 1625
28M FAST ALUMINIUM/GRP PASSENGER LAUNCH

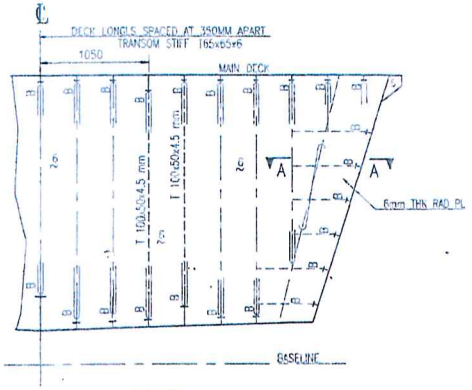
TITLE: PROFILE AND DECK

OWNER: HONGKONG ELECTRIC CO., LTD

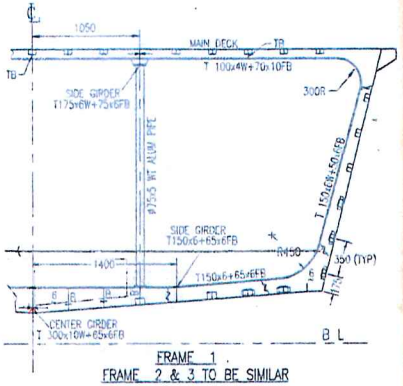
CLASSIFICATION: HKMD

DRAWN	K.F.NG	25-10-1994	SCALE: 1:50	DRAWING NO: NC-391-4
CHECKED				

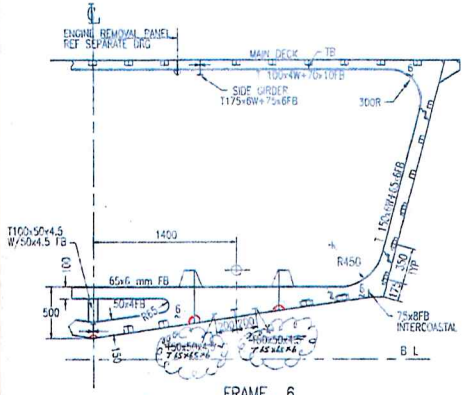
Naval-Consult Pte Ltd



TRANSOM

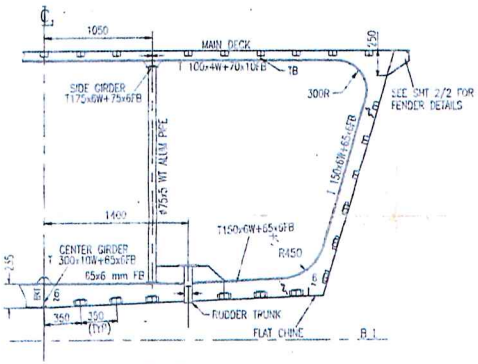


FRAME 1
FRAME 2 & 3 TO BE SIMILAR

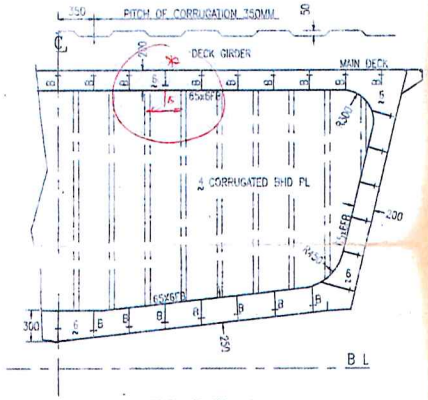


FRAME 6

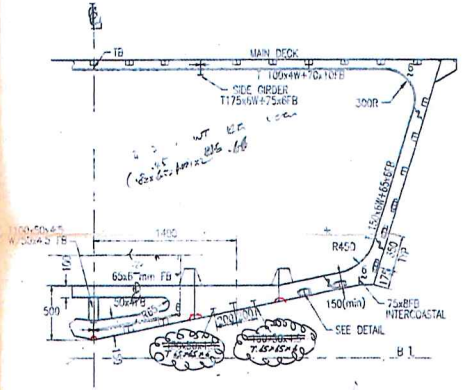
R25 DRAIN Holes



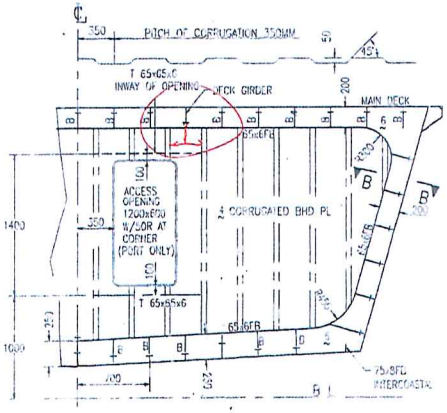
FRAME 0



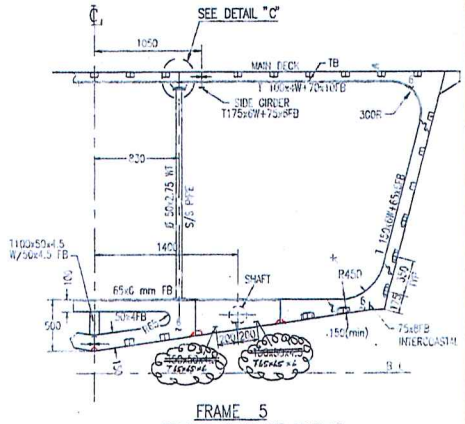
BHD AT FR 4



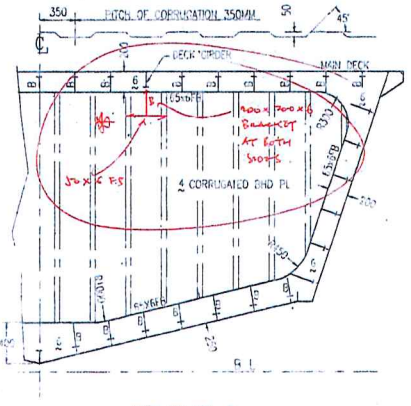
FRAME 8



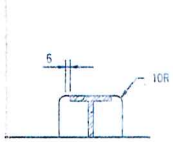
BHD AT FR 1/2



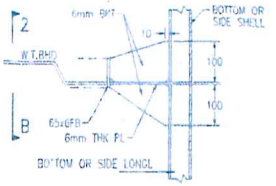
FRAME 5
FRAME 7 TO BE SIMILAR



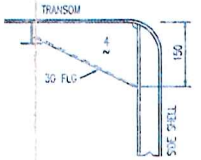
BHD AT FR 9



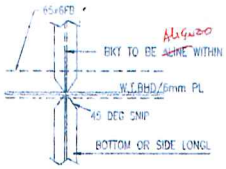
TYPICAL NOTCH DETAIL



SECTION B – B



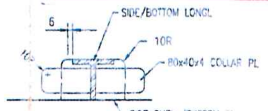
SECTION A – A



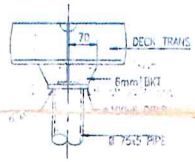
SECTION 2 – B

HONG KONG MARINE DEPARTMENT COMMENTS:

Construction material properties should be DNV Class or equivalent and comply with the scantling calculation.



TYPICAL COLLAR DETAIL



DETAIL " C "

HONG KONG MARINE DEPARTMENTS COMMENTS

All other requirements of the Rules and Regulations for granting a Local Licence shall be complied with as far as they are applicable.

MARINE DEPARTMENT
SHIPPING DIVISION
HONG KONG

DRAWING FOR (SO/L-7962)

APPROVED SUBJECT TO MODIFICATIONS INDICATED THEREON AND OBSERVANCE OF MARINE DEPARTMENT LETTER

REF. ..... DATED .....

DATE - 3 MAY 1995

SIGNATURE .....

NOTE :

1) ALL DIMENSIONS GIVEN ARE IN MM
2) ALL SECTIONS DRAWN LOOKING FWD

REFERENCE DRAWING :

1)	PROFILE AND DECK	NC-391-4
2)	ENGINE GIRDER	NC-391-6
3)	SECTIONS AND BULKHEADS	NC-391-5 Sht 2 OF 2

CHEOY LEE SHIPYARDS, LTD

YARD No. 4625
28M FAST ALUMINIUM/GRP PASSENGER LAUNCH

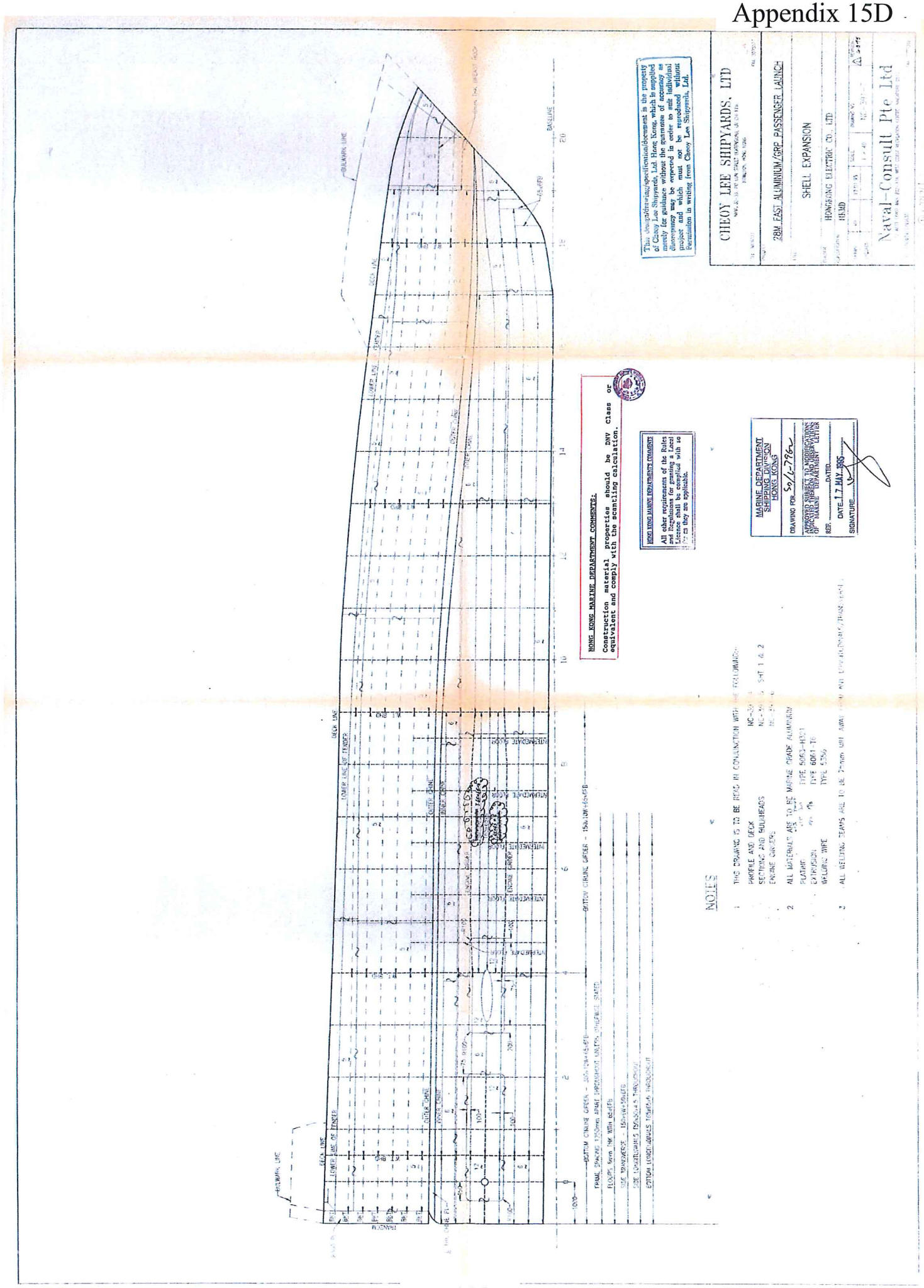
SECTIONS AND BULKHEADS

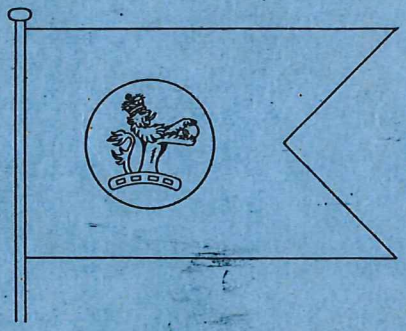
HONGKONG ELECTRIC CO., LTD

HKMD

1 : 1m	22-12-1994	SCALE 1 : 25	DRAWING NO. NC-391-5 (SHT 1 OF 2)	REVISION A 20-3-95

Naval-Consult Pte Ltd





INSTRUCTIONS FOR THE SURVEY OF LAUNCHES AND FERRY VESSELS

MARINE DEPARTMENT

HONG KONG

INSTRUCTIONS FOR THE SURVEY OF LAUNCHES AND FERRY VESSELS

MARINE DEPARTMENT
HONG KONG

PRINTED AND PUBLISHED BY THE GOVERNMENT PRINTER, HONG KONG

ARRANGEMENT OF INSTRUCTIONS

CHAPTER I

GENERAL

CHAPTER II

REQUIREMENTS AND CONSTRUCTION OF HULL

CHAPTER III

PASSENGER ACCOMMODATION

CHAPTER I

GENERAL

1. **Object of Instructions**

These instructions are issued by the Director of Marine for the guidance of Surveyors and Inspectors in respect of surveys of launches and ferry vessels. They are also intended to guide owners and builders of such vessels in the procedure of the surveys involved. The instructions are not necessarily exhaustive and in no way absolve compliance with other Acts, Ordinances, Regulations etc. that may be in or come into force and which apply to launches and ferry vessels.

2. **Statutory Regulations Applicable to the Survey of Launches and Ferry Vessels**

These Instructions have been based upon those provisions of the following Regulations applicable to the Survey of Launches and Ferry Vessels. They also incorporate, where considered useful, relevant parts of other Instructions:

(i) As provided for by section 35 of the Shipping and Port Control Ordinance, the Merchant Shipping (Launches and Ferry Vessels) Regulations, apply to launches not exceeding three hundred tons and to ferry vessels of any tonnage.

(ii) The Merchant Shipping (Life Saving Appliances) Regulations, made under section 38 of the Merchant Shipping Ordinance, apply to launches not exceeding three hundred tons and ferry vessels, as ships of Class L being ships plying exclusively within the waters of Hong Kong and as ships of Class H being ships plying without passengers in Class IV limits. < 300T

(iii) The Merchant Shipping (Fire Appliances) Regulations, made under section 27 of the Merchant Shipping Ordinance, apply to launches not exceeding three hundred tons and ferry vessels as ships of Group 5.

(iv) The Merchant Shipping (Fees) Regulations made under section 114 of the Merchant Shipping Ordinance.

(v) The Shipping and Port Control Regulations made under section 80 of the Shipping and Port Control Ordinance.

(vi) The Merchant Shipping (Tonnage) Regulations 1983 made under section 1 of the Merchant Shipping Acts, 1965.

(vii) The International Regulations for Preventing Collisions at Sea 1972.

(viii) The Regulations made under the Dangerous Goods Ordinance as appropriate to ships conveying dangerous goods, and

(ix) The Merchant Shipping (Prevention of Oil Pollution) Regulations 1984.

3. **Class of Vessels**

In these Instructions launches and ferries are classed according to the plying limits in which the vessel is authorized to ply. The Plying Limits are defined

in the First Schedule of the Merchant Shipping (Launches and Ferry Vessels) Regulations.

A Class I vessel is a launch or ferry licensed to ply in Class I plying limits which is defined as Harbour and Specified Sheltered Waters.

A Class II vessel is a launch or ferry licensed to ply in Class II plying limits which is defined as Partly Sheltered Waters, Specified Areas.

A Class III vessel is a launch or ferry licensed to ply in Class III plying limits which is defined as Waters of the Colony.

Passengers may be carried in Class I, II, III and IV vessels plying in the foregoing limits, provided that the vessel is not towing nor carrying dangerous goods and that the conditions of the Certificate of Survey and Licence are fulfilled.

A Class IV vessel is a launch or ferry licensed to ply in Class IV limits which is defined as River Trade Limits.

Passengers are not permitted on any launch or ferry operating in Class IV plying limits.

4. **Certificates of Survey and Licences**

In order to be licensed to carry passengers, launches and ferries have to be surveyed and a Certificate of Survey issued. A vessel may be certificated and licensed to ply in Class I to IV limits, and the number of persons eligible to be carried appropriate to each particular limit will be shown on both the Certificate of Survey and the Licence. According to the particulars of the Certificate of Survey a vessel may be issued with a Class I, II, III or IV Licence.

5. **Fees**

The fees chargeable for survey and licensing are prescribed in the Merchant Shipping (Fees) Regulations. Survey fees are payable when the Application for Survey Form 6A is submitted in advance of the date arranged for the survey.

6. **Approved Equipment, Appliances and Machinery**

The term "approved" when used in relation to equipment, appliances, apparatus, machinery or any fittings or materials to be used in a launch or ferry means approved by the Director of Marine, unless otherwise specified.

7. **Penalties**

Vessels must at all times conform to the conditions of the certificate of survey and the licence. Failure to comply with any of the conditions may result in withdrawal of the certificate of survey and suspension of the licence and proceedings may be taken against the owner and/or his agent or employee as provided for under the Shipping and Port Control Ordinance and the appropriate regulations made thereunder.

CHAPTER II

REQUIREMENTS AND CONSTRUCTION OF HULL

8. **First Survey**

Following an application for the first survey of a proposed or existing vessel for which a licence is required, particulars should be submitted to the Senior Surveyor of Ships/Local Craft (Inspection and Licensing) Section showing the construction, material and scantlings of the hull. The plans should also show details of the passenger accommodation including the particulars of the entrances and exits if the passenger accommodation is enclosed. (See Chapter VIII—Submission of Plans).

9. **Construction**

In the case of new vessels, the Surveyor or Inspector will examine the construction so as to ensure that the approved plans are adhered to in respect of the vessel's dimensions, materials, scantlings, fastenings etc., and no material departure from any approved plan will be allowed without the concurrence of the Senior Surveyor of Ships/Local Craft (Inspection and Licensing) Section or Senior Surveyor of Ships/Registry Surveys Section as may be appropriate.

10. **Registered or Identification Dimensions**

Registered dimensions are particularly important in respect of regulations, and Surveyors and Inspectors should be guided by sketches Nos. 1 and 2 in the Appendix showing how these dimensions should be taken. Particular care should be given to the registered length of a launch and its general construction as these are two of the factors which determine the plying limits in which it may be permitted to ply. The plying limits are stipulated in the First Schedule to the Merchant Shipping (Launches and Ferry Vessels) Regulations, 1965. Regulation 6(3) is to the effect that there is no restriction on length for a vessel to ply in Class I, whereas to ply in Class II, III and IV limits the vessels must be decked and of registered length not less than 40 feet.

11. **Coamings**

(i) For a "decked launch" all deck openings are to be protected by weathertight coamings, of the following heights unless as otherwise provided in (ii)

Class I — 9″
Class II —12″
Class III & IV—15″

(ii) When steel or substantial wood weathertight covers are fitted over the openings and are capable of being battened down and secured, coamings are not required at the openings so dealt with.

(iii) Class I launches need not be decked and a reduction in the 9″ height of coamings may be granted to open or decked vessels of Class I whose freeboards exceed those determined in accordance with Instruction 14, but in no case shall the coamings of an open vessel be less than 4″.

12. **Bulkheads**

Launches should be provided with the following bulkheads:—

(i) All open launches shall have at least one watertight collision steel bulkhead. Oiltight bulkheads extending to the height of the load water line shall be fitted at the ends of the machinery spaces, and shall be constructed of steel or other fire resistant material or of wood adequately protected on both sides by steel lining.

(ii) All decked-in launches are to be fitted with watertight bulkheads at each end of the machinery space in addition to the collision bulkhead: these bulkheads should preferably be made of steel. Where the machinery is placed forward, the collision bulkhead may, depending on the general arrangement of the launch, form one of these machinery bulkheads.

(iii) When any compartment exceeds 2/5ths of the registered length, an additional watertight bulkhead should be constructed in the launch at a position determined by a Surveyor of Ships (Ship).

(iv) In all double-ended launches and launches over 70′ long, peak bulkheads will be required at both ends.

(v) When any access opening is fitted in a watertight bulkhead, it is to have an efficient closing appliance.

13. **Casings**

Machinery and boiler casings should generally be made of steel, but in existing launches wood may be accepted, if of substantial construction and adequately insulated from hot points.

14. **Freeboard**

All new launches and ferries where applicable, when in the loaded condition should have at least the following freeboard or freeboard corresponding to each approved subdivision load line whichever is the greater:—

15″ at a registered length of 20 feet increasing proportionately to 30″ for vessels of 60 feet or over.

When determining the freeboard of a vessel, Surveyors and Inspectors should satisfy themselves that weights representing the full number of passengers and crew at 150 lb. for each person are onboard and that all fuel and fresh water tanks are filled. The length is to be measured from the forward side of the stem to the after side of the stern post. The clear side should be measured to the top of the covering board or top of the wash strake if fitted above the covering board. If, however, a halfdeck is fitted, measurement should be to the top of the deck at the side or the top of the gunwale, whichever gives the smaller freeboard. In a decked vessel the freeboard should be measured from the top of the deck at the side.

Name of Vessel ..... Page 1

Cheoy Lee Yd. No.4625

Report	Date	Surveyor
Hull construction (internal) inspected with approved drgs. and o/s items found as below: (1) Brackets to be added at outtest deck longitudinals (P & S) of transom. (2) Rudder trunk stiffening structrues to be checked when ready (at frame 0). (3) Collar plates to be fitted at frame 0. (4) Sharp-edge of brackets i.w.o. engine girder end at E/R aft. bhd. (fore & aft) to be cut. (5) Sufficient brackets to be added at opposite side of carling of pillar top joints in E/R. (6) Completely sealed space at fore peak bottom to be made opened for inspection. (7) Brackets on centre girder at bhd. #9, 13 & 18 to be made connected to face bar of bhd. transverse floor.	13.11.95	W.M. Fung

SD/I-7962

page (2)

Name of Vessel .....

Cheoy Lee Yd No. 4625

Report	Date	Surveyor
The following items were inspected/witnessed: a) rudder plate (P & S) construction. b) O/S items 1,3,4,6 & 7 of dated 13.11.95.	11.1.96	K.C. Yu
The following items were inspected:- a) Rudder blades H.T. to 2.5 psi. b) Rudder trunk construction. d) S.G. piping H.T. to 1,600 psi. e) F/O piping H.T. to 60 psi. f) Measurement of principal dimensions, draft marks, tonnage and seating capacity. g) O/S item of survey dated 13/11/95 of item 5) only.	22.1.96	K.T. Ho
The following items were inspected/witnessed:- a) Rudder construction. b) Principal dimensions. c) Draft marks & tonnage. d) Seating capacity.	22.1.96	K.T. Ho

SD/L-7962

Name of Vessel Lamma IV Page 4

Report	Date	Surveyor
Final survey was carried out and found unsatisfactory, det. refer MO539SN009038.	15.2.96	K.C. Yu
O/s items of final survey dated 15.2.96 were inspected afloat. Item no.2,3,4,5 & 6 were found in order, but item no.1 was not so complied with the requirement of new 'Instructions for The Survey of Launches & Ferry Vessels' of 1995 edition. I Consulted with Surveyor (M) of Ship, Mr.Norman T. Lee, and he agreed that the vessel had to follow the pervious instructions as she had been built before that new edition took effect in 1996. An S.T.C. for 3 months (i.e. from 7.3.96 to 6.6.96) was issued and the full-term Cert. of Survey can be issued pending the approval of stability report.	7.3.96	W.M. Lung

Appendix 18

財 利 船 廠 有 限 公 司
Cheoy Lee Shipyards Limited
NKML 32-33, PO LUN STREET (EXTENSION), LAI CHI KOK
P.O. BOX 80040 CHEUNG SHA WAN, KOWLOON
HONG KONG
TEL: (852) 2307 6333 FAX: (852) 2307 5577 CABLE: CHEOYLEE

OUR REF : L96-0218 YOUR REF : SD/L-7962 HONG KONG 6 March, 1996

The Director of Marine
Marine Department
Local Craft Safety Section
Harbour Building
38 Pier Road
Hong Kong

Attn: Mr. W.S. Ho

Dear Sir,

file pls

Re: Our Yard No. 4625, M.L. "Lamma IV"
28M Aluminium / GRP Passenger Launch

⑥ L-7962/2

Please find enclosed two (2) copies each of the "Damage Stability Information" booklet.

We trust the attached information will be found in order and look forward to timely approval of the enclosed. Thank you.

Yours faithfully,

For and on behalf of
CHEOY LEE SHIPYARDS, LIMITED

J.A. Leizaola
Asst. Engineering Manager

J.A. Leizaola

JAL/sl

Encl.

MARINE DEPARTMENT
SHIPPING DIVISION
HONG KONG
7 MAR 1996

Seen
7/3/96

YARD NO. " 4625 "

M.V. " LAMMA IV "

28M FAST ALUMINIUM PASSENGER LAUNCH

FINAL

DAMAGE STABILITY INFORMATION

PRINCIPAL DIMENSIONS

LENGTH O.A.	28.000 M.
LENGTH W.L.	24.890 M.
BREADTH MLD.	6.814 M.
DEPTH MLD.	2.880 M.

MARINE DEPARTMENT
SHIPPING DIVISION
HONG KONG

SEEN

DATE 26 JUL 1996

SIGNATURE

CHEOY LEE SHIPYARDS LTD.

1996

(16) L-7963/2

Lost Buoyancy Data
DAMAGED COMPARTMENT:- FORE PEAK COMPT.

Corporate

Displacement	70.32	Tonnes
Longitudinal Centre of Gravity	-1.913	Metres
Vertical Centre of Gravity	3.361	Metres
Shiplength	24.890	Metres
Specific Gravity of Water	1.0250	
Mean Shell Thickness	0.0053	Metres

Longitudinal Datum	Midships
Vertical Datum	Base Line

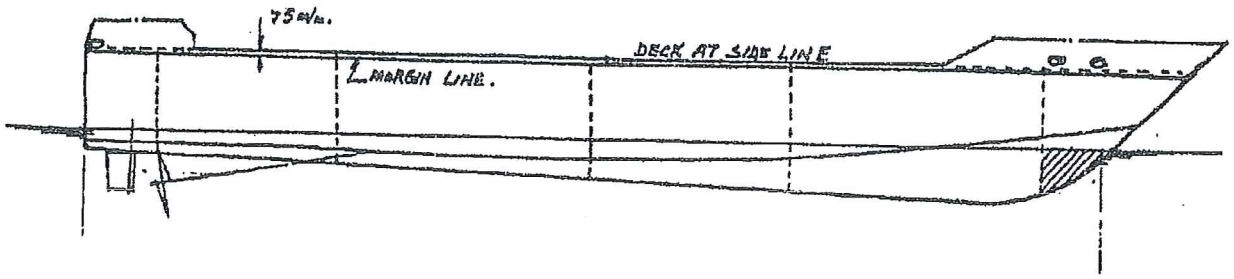
Compartment Aft BHD Metres	Fwd BHD Metres	DB Level Metres	Perm.	WL Metres	Trim Metres	VCB Metres	GMT Metres	Added Volume Metres³
11.055	12.445	Nil	0.950	1.109	-0.456	0.740	1.461	0.48

DRAFT.

FORWARD. = 1.337 METRES.

AFT. = 0.881 METRES.

MEAN = 1.109 METRES.



Lost Buoyancy Data
DAMAGED COMPARTMENT:- VOID SPACE.

Displacement	70.32	Tonnes
Longitudinal Centre of Gravity	-1.913	Metres
Vertical Centre of Gravity	3.361	Metres
Shiplength	24.890	Metres
Specific Gravity of Water	1.0280	
Mean Shell Thickness	0.0053	Metres

Longitudinal Datum	Midships
Vertical Datum	Base Line

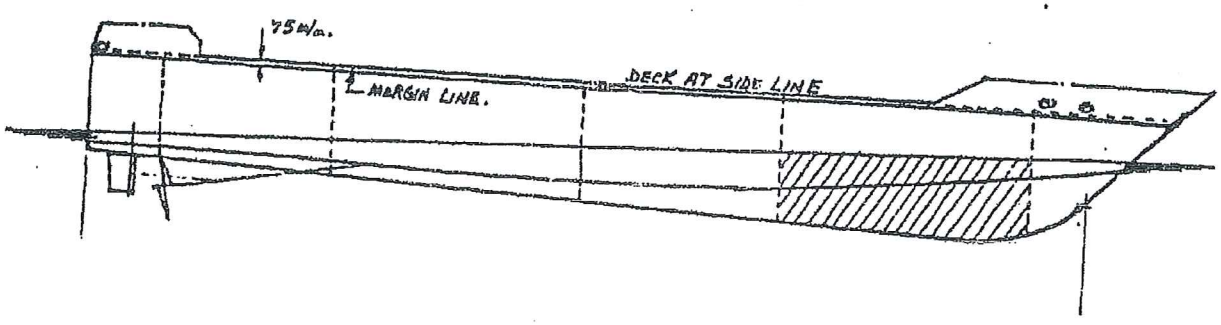
Compartment Aft BHD Metres	Fwd BHD Metres	DB Level Metres	Perm.	WL Metres	Trim Metres	VCB Metres	GMT Metres	Added Volume Metres^3
4.805	11.055	Nil	0.950	1.350	-1.438	0.946	1.458	22.47

DRAFT

FORWARD = 2.069 M

AFT. = 0631 M.

MEAN. = 1.350 M.



Lost Buoyancy Data
DAMAGED COMPARTMENT:- CREW'S SPACE.

Displacement	70.32	Tonnes
Longitudinal Centre of Gravity	-1.913	Metres
Vertical Centre of Gravity	3.261	Metres
Shiplength	24.890	Metres
Specific Gravity of Water	1.0250	
Mean Shell Thickness	0.0055	Metres

Longitudinal Datum Midships
Vertical Datum Base Line

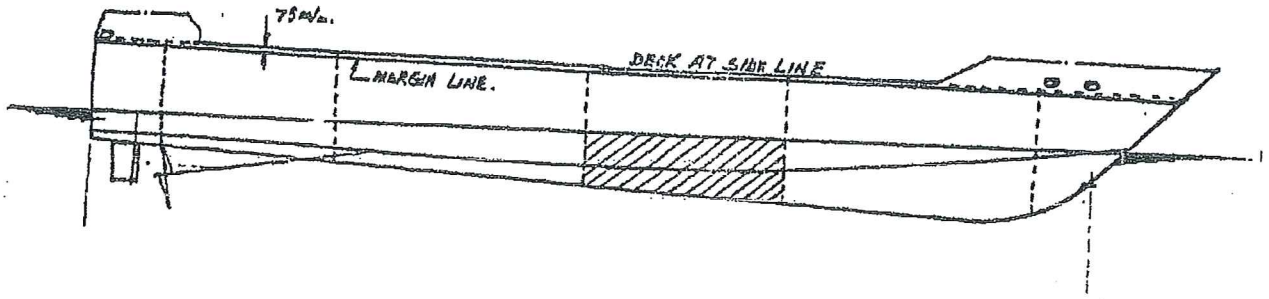
Compartment Aft BHD Metres	Fwd BHD Metres	DB Level Metres	Perm.	WL Metres	Trim Metres	VCB Metres	GMT Metres	Added Volume Metres³
-0.195	4.805	Nil	0.950	1.308	-0.960	0.844	0.996	21.1

DRAFT

FORWARD = 1.738 M

AFT. = 0.878 M.

MEAN. = 1.308 M.



Lost Buoyancy Data
DAMAGED COMPARTMENT:- ENGINE ROOM COMPT.

Displacement	70.32	Tonnes
Longitudinal Centre of Gravity	-1.913	Metres
Vertical Centre of Gravity	3.361	Metres
Shiplength	24.890	Metres
Specific Gravity of Water	1.0250	
Mean Shell Thickness	0.0053	Metres
Longitudinal Datum	Midships	
Vertical Datum	Base Line	

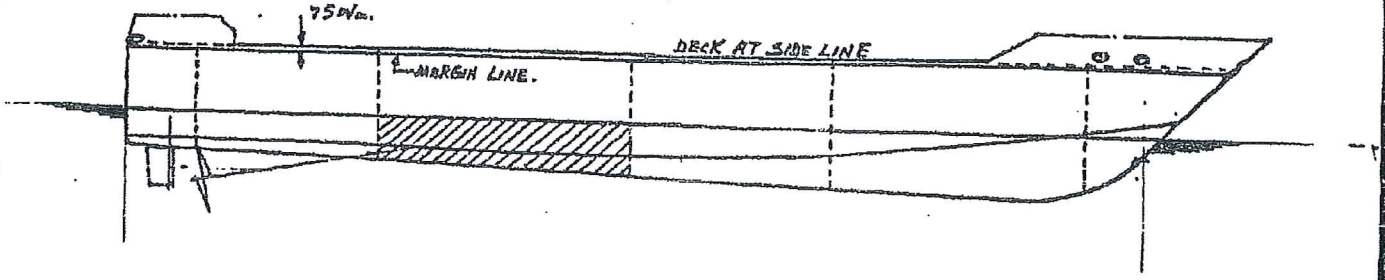
Compartment Aft BHD Metres	Fwd BHD Metres	DB Level Metres	Perm.	WL Metres	Trim Metres	VCB Metres	GMT Metres	Added Volume Metres^3
-7.200	-0.195	Nil	0.850	1.331	-0.132	0.877	0.462	30.09

DRAFT

FORWARD = 1.397 M

AFT. = 1.265 M.

MEAN. = 1.331 M.



Lost Buoyancy Data
DAMAGED COMPARTMENT:- TANK.ROOM

Displacement	70.32	Tonnes
Longitudinal Centre of Gravity	-1.913	Metres
Vertical Centre of Gravity	3.361	Metres
Shiplength	24.890	Metres
Specific Gravity of Water	1.0250	
Mean Shell Thickness	0.0053	Metres

Longitudinal Datum	Midships
Vertical Datum	Base Line

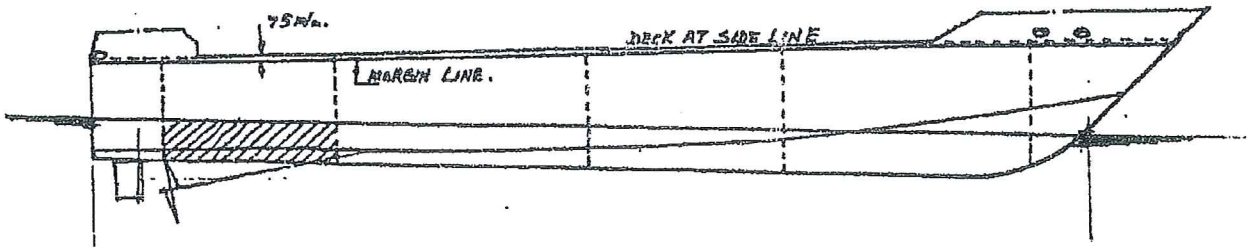
Compartment Aft BHD Metres	Fwd BHD Metres	DB Level Metres	Perm.	WL Metres	Trim Metres	VCB Metres	GMT Metres	Added Volume Metres^3
-11.575	-7.200	Nil	0.950	1.229	0.679	0.848	0.636	26.60

DRAFT

FORWARD = 0.890 M

AFT. = 1.569 M.

MEAN. = 1.229 M.



Lost Buoyancy Data
DAMAGED COMPARTMENT:- STEERING GEAR COMPT.

Displacement	70.32	Tonnes
Longitudinal Centre of Gravity	-1.913	Metres
Vertical Centre of Gravity	3.361	Metres
Shiplength	24.890	Metres
Specific Gravity of Water	1.0250	
Mean Shell Thickness	0.0053	Metres
Longitudinal Datum	Midships	
Vertical Datum	Base Line	

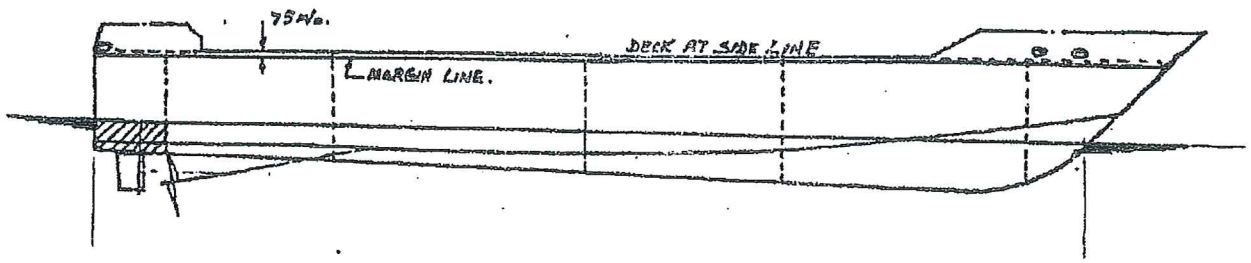
Compartment Aft BHD Metres	Fwd BHD Metres	DB Level Metres	Perm.	WL Metres	Trim Metres	VCB Metres	GMT Metres	Added Volume Metres^3
-12.445	-11.575	Nil	0.950	1.114	-0.265	0.749	1.299	2.80

DRAFT

FORWARD = 1.247 M

AFT. = 0.982 M.

MEAN. = 1.114 M.



財 利 船 廠 有 限 公 司
Cheoy Lee Shipyards Limited
NKML 32-33, PO LUN STREET (EXTENSION), LAI CHI KOK
P.O. BOX 80040 CHEUNG SHA WAN, KOWLOON
HONG KONG
TEL: (852) 2307 6333 FAX: (852) 2307 5577 CABLE: CHEOYLEE

OUR REF : L98-0212 YOUR REF : HONG KONG 10 Mar 98

The Director of Marine
Marine Department
Local Craft Safety Section

Harbour Building
38 Pier Road
Hong Kong
Attn: Mr. W. S. Ho

BY HAND

URGENT

Dear Mr Ho,

Re: ***Yard No. 4625, M/L "LAMMA IV", 28M Fast Aluminium Passenger Launch***

We wish to keep you informed that as requested by the shipowner, the Hong Kong Electric Co., we are going to install onboard the captioned vessel trimming ballast of 8.25 tonnes of lead in fibre glass container some time next week. The location of the ballast weight is from transom to Fr No. 3 on the hull bottom shell generally as shown in the attached arrangement of Lead Ballast (Dwg. No. 4625/50).

With the aforesaid trimming ballast, the stability of the captioned vessel will be improved with the vanishing angle not less than 55° in normal operating conditions and a good stable stability in damaged condition. Trust you would have no objections in this.

Accordingly, we are pleased to submit herewith two copies each of the following for your examination/reference and record purpose:-

a. Revised Stability Booklet
b. Damage Stability Information (Revised B)
c. Arrangement of Lead Ballast

Thank you for your attention. We trust you would find it in order and have no objections to this, if not, kindly let us know immediately by return.

Yours faithfully,

For and on behalf of
CHEOY LEE SHIPYARDS, LIMITED

.....
Engineering Manager

C. Y. Cheung
cyc/ju
Encl.
cc HK Electric Co Ltd - Mr A Fretwell

MARINE DEPARTMENT
SHIPPING DIVISION
HONG KONG
16 MAR 1998

YARD NO. " 4625 "

M.V. " LAMMA IV "

28M FAST ALUMINIUM PASSENGER LAUNCH

REVISED STABILITY BOOKLET (Estimation)

(ADDED 2ND. ROW AND VERTL. FENDERS)
AND TRIMMING LEAD BALLAST

Including Experiment Should Be Conducted In The Presence of MD Surveyor / Inspector

PRINCIPAL DIMENSIONS

LENGTH O.A. — — —	28.000 M.
LENGTH W.L. — — · —	24.890 M.
BREADTH — — —	6.814 M.
MARINE DEPTH — — · —	2.880 M.

香港特別行政區 政府
HKSAR

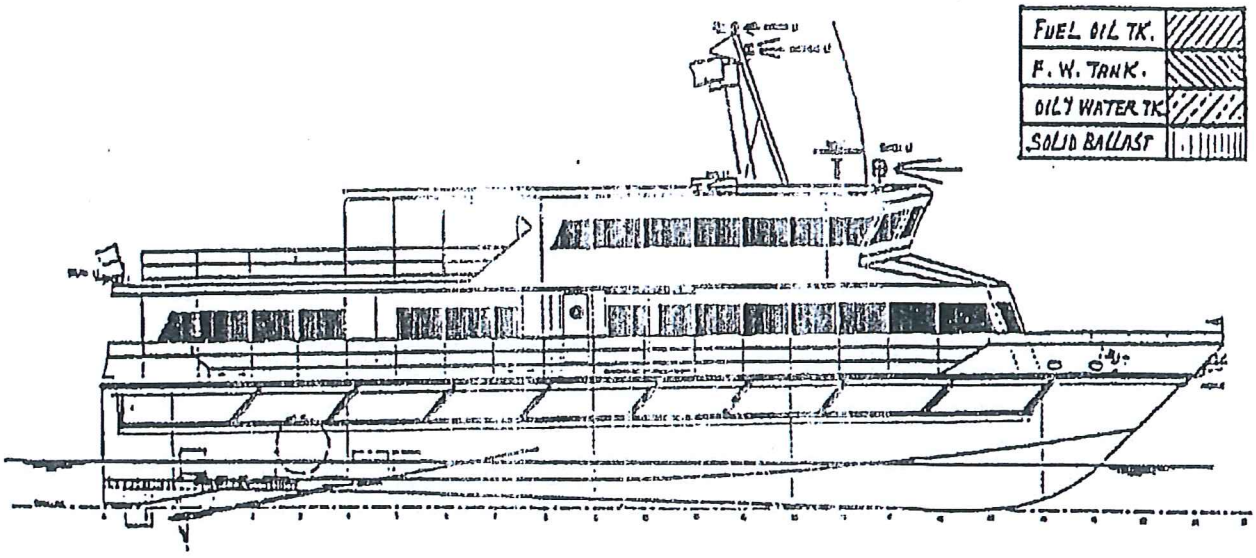
SEEN

FILE NO.: SO/C-7962
SIGNATURE:
DATE: 25 MAR 1998

CHEOY LEE SHIPYARDS. LTD.

OFFICE COPY 1998

(21) L-7962/2



CONDITION NO :- 1 LIGHTSHIP CONDITION

Description	Wt. in Tonnes	L. in M	Mom. in T-M	L. in M	T. in T-M	T. in T.M
added alm sides fenders wt	1.344	2.610	3.508	2.5	[illegible]	—
light ship weight (existing)	48.740	3.187	155.334	-1.563	-77.455	-3.545
add ballast wt.boteee fr 1-4	8.250	0.922	5.115	-10.312	-85.239	—
boxes for ballast	0.106	2.[illegible]	3.068	-25.132	.025	—
Lightship	58.440	2.667	64.023	-2.[illegible]	-164.612	-3.545
Displacement	58.440	2.8[illegible]	64.023	[illegible]	[illegible]	[illegible]

L. C. B. = -3.[illegible]

Lever = [illegible]

Sailing state	
[illegible] C. F. above B. L.	0.968 M
Draft at aft. perp. above B. L.	0.930 M
Draft at fwd. perp. above B. L.	1.026 M
[illegible] above B. L.	0.978 M
[illegible] bow	-0.096 M
KMt above B. L.	5.255 M
[illegible] B. L.	2.807 M
GM (solid)	2.448 M
[illegible] surface	-0.061 M
GM (fluid)	2.309 M
[illegible] T.C.	1.683 T.M
[illegible] C.F.	-2.563 M
[illegible] Lspl. x lever M.C.T.C.	-9.6 CM

Sign for L.C.G. & L.Mom. :-

+ Forward

- Aft

Sign for trim :-

- Trim by bow

Trim by stern

YARD NO. " 4625 "

M.V. " LAMMA IV "

28M FAST ALUMINIUM PASSENGER LAUNCH

FINAL (Estimated)

DAMAGE STABILITY INFORMATION

"REVISED B"

PRINCIPAL DIMENSIONS

LENGTH O.A.	28.000 M.
LENGTH W.L.	24.890 M.
BREADTH MLD.	6.814 M.
DEPTH MLD.	2.680 M.

CHEOY LEE SHIPYARDS. LTD.

1998

OFFICE COPY

(22)-7962/2

[illegible] Stability Data
[illegible] NO. 4 FORE PEAK COMPT. FLOODED

Displacement	80.00	Tonnes
Longitudinal Centre of Gravity	-2.774	Metres
Vertical Centre of Gravity	2.100	Metres
Metacentric	[illegible]	Metres
Specific Gravity of Water	1.025	
Mean Shell Thickness	[illegible]	Metres

Longitudinal Datum Midships
Vertical Datum Base Line

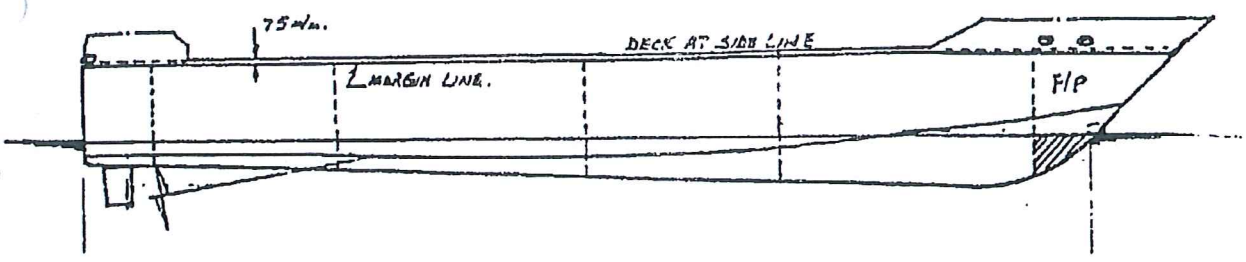
Compartment									
Aft Bhd	Fwd Bhd	Up to Level	Perm.	KG	Trim	VCG	GMT	Ullage
Metres	Metres	Metres		Metres	Metres	Metres	Metres	Metres
11.050	13.446	Incl	0.95	[illegible]	[illegible]	[illegible]	1.441	[illegible]

DRAFT

FOWARD = 1.198 M

AFT = 1.117 M

MEAN. = 1.157 M.



Lost Buoyancy Data
YARD NO. 4625 (VOID SPACE. FLOODED)

Displacement	80.03	Tonnes
Longitudinal Centre of Gravity	-2.774	Metres
Vertical Centre of Gravity	3.031	Metres
Shiplength	24.600	Metres
Specific Gravity of Water	1.0250	
Mean Shell Thickness	0.0056	Metres

Longitudinal Datum Midships
Vertical Datum Base Line

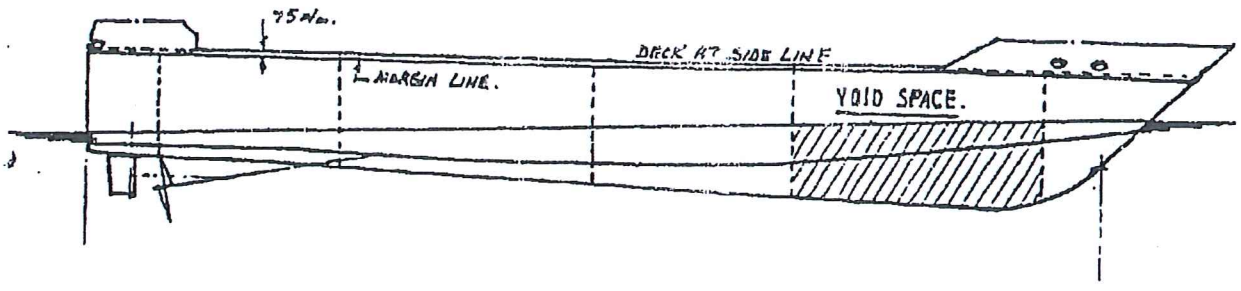
Compartment Aft BHD Metres	Fwd BHD Metres	DB Level Metres	Perm.	WL Metres	Trim Metres	VCB Metres	GMT Metres	Added Volume Metres^3
4.805	11.055	Nil	0.950	[illegible]	-1.200	0.856	1.432	20.06

DRAFT

FOWARD = 1.884 M

AFT = 0.884 M

MEAN. 1.384 "



Lost Buoyancy Data
YARD NO. 4625 (CREW'S SPACE. FLOODED)

Displacement	80.03	Tonnes
Longitudinal Centre of Gravity	-2.774	Metres
Vertical Centre of Gravity	3.00[illegible]	Metres
Shiplength	34.[illegible]	Metres
Specific Gravity of Water	1.0250	
Mean Shell Thickness	0.0053	Metres

Longitudinal Datum Midships
Vertical Datum Base Line

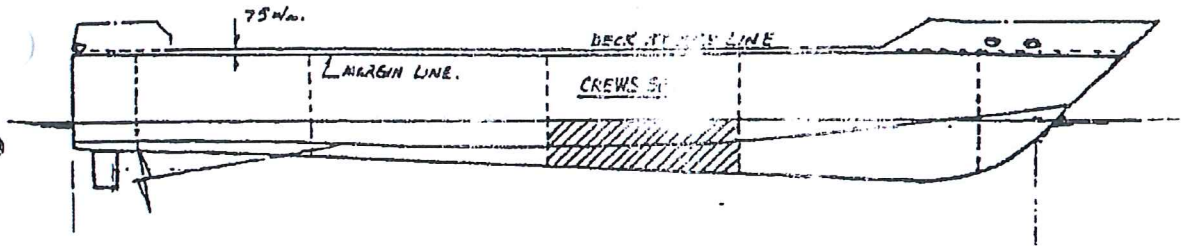
Compartment Aft BHD Metres	Compartment Fwd BHD Metres	DB Level Metres	Perm.	%L Metres	Trim Metres	VCB Metres	GMT Metres	Added Volume Metres^3
-0.195	4.805	Nil	0.950	1.99[illegible]	-0.[illegible]89	0.674	1.040	21.81

DRAFT

FOWARD = 1634 M

AFT = [illegible]05 M

MEAN = [illegible]19 M.



Lost Buoyancy Data
YARD NO. 4625 (ENGINE ROOM COMPT. FLOODED)

Displacement	80.03	Tonnes
Longitudinal Centre of Gravity	-2.774	Metres
Vertical Centre of Gravity	3.008	Metres
Shipl[illegible]gth	24.[illegible]	Metres
Specific Gravity of Water	1.0[illegible]	
Mean Shell Thickness	0.00[illegible]3	Metres

Longitudinal Datum Midships
Vertical Datum Base Line

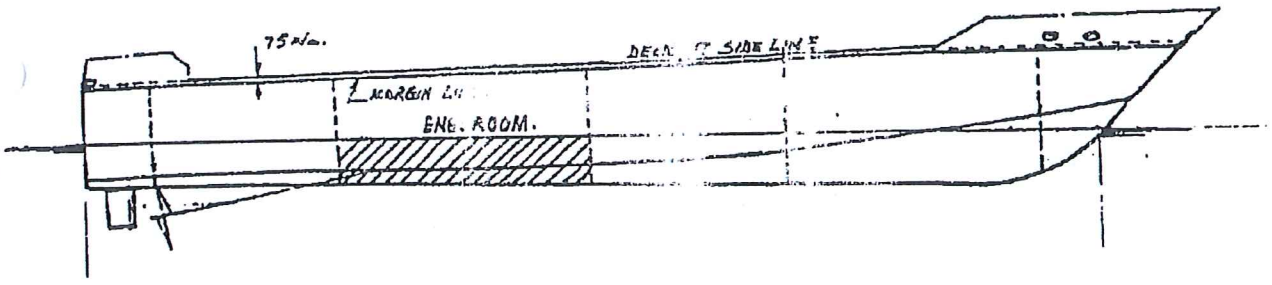
Compartment Aft BHD Metres	Compartment Fwd BHD Metres	DB Level Metres	Perm.	WL Metres	Trim Metres	VCB Metres	GMT Metres	Added Volume Metres^3
-7.200	-0.195	Nil	0.850	1.[illegible]18	0.276	0.941	0.622	35.41

DRAFT

FOWARD = 1.281 M

AFT = 1.557 M

MEAN. = 1.415 M.



Lost Buoyancy Data
YARD NO. 4625 (TANK SPACE FLOODED)

Displace	[illegible]	Tonn
Longitudinal Centre of Gravity	-2.7[illegible]	metres
Vertical Centre of Gr[illegible]	[illegible]	Metres
[illegible]	[illegible]	[illegible]
Specific Gravity of Water	1.025[illegible]	
Mean Shell Thickness	0.005[illegible]	Metres

Longitudinal Datum Midship[illegible]
Vertical Datum Base Line

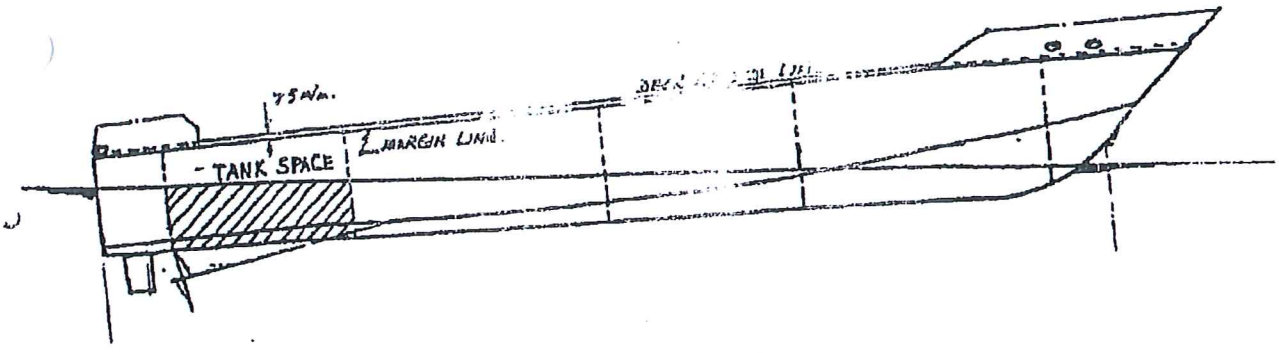
Compartment Aft BHD Metres	Compartment Fwd BHD Metres	DB Level Metres	Perm.	[illegible]	[illegible]	VCB Metres	GMT Metres	Added Volume Metres^3
-11.575	-7.300	Nil	0.950	1.[illegible]	1.[illegible]61	0.949	0.783	36.30

DRAFT

FOWARD = 9.581 M

AFT .042

MEAN. .311 M



Lost Buoyancy Data
YARD NO. 4625 (STEERING GEAR COMPT FLOODED)

Displacement	80.03	Tonnes
Longitudinal Centre of Gravity	-2.774	Metres
Vertical Centre of Gravity	3.008	Metres
Shipl[illegible]	[illegible]	Metres
Specific Gravity of Water	1.0250	
Mean Shell Thickness	0.0053	Metres

Longitudinal Datum Midships
Vertical Datum Base Line

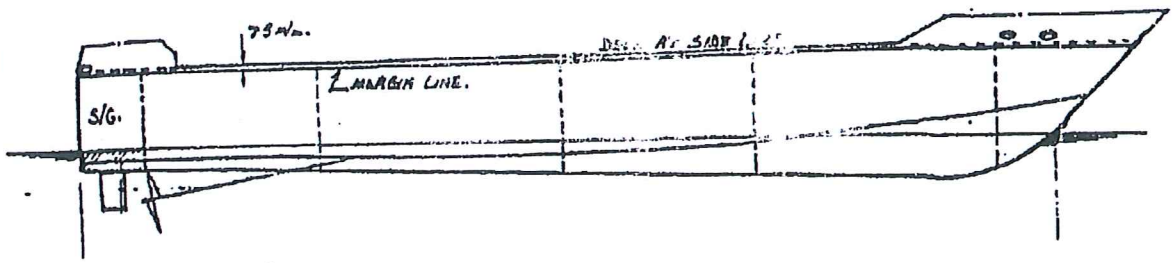
Compartment Aft BHD Metres	Fwd BHD Metres	DB Level Metres	Perm.	WL Metres	Trim Metres	VCB Metres	GMT Metres	Added Volume Metres^3
-12.445	-11.575	Nil	0.950	1.166	0.175	0.796	1.296	4.07

DRAFT

FOWARD = 1.079 M

AFT = 1.254 M

MEAN. = 1.166 M.



財 利 船 廠 有 限 公 司
Cheoy Lee Shipyards Limited
89 & 91 HING WAH STREET WEST, LAI CHI KOK,
P.O. BOX 80040 CHEUNG SHA WAN, KOWLOON
HONG KONG
TEL: (852) 2307 6333 FAX: (852) 2307 5577 CABLE: CHEOYLEE
E-MAIL : info@cheoylee.com

OUR REF : L2005-0787 YOUR REF : HONG KONG 21 September, 2005

The Director of Marine
Marine Department
Local Craft Safety Section
Harbour Building
38 Pier Road
Hong Kong.

BY HAND

Dear Sir,

Re: M/L "LAMMA IV" Licence No. 9153

With reference to our letter L2005-0539 dated 27 June, 2005, please be informed that the aluminium frames support works have been completed and an inclining experiment on the vessel was carried out. We enclose herewith the "Stability Booklet" for your reference.

Thank you for your attention.

Yours faithfully,

For and on behalf of
CHEOY LEE SHIPYARDS, LIMITED

Director

S.Y. Lo

SYL/nl
Encl.

c.c. The Hongkong Electric Co., Ltd.

(3)

M.V. "LAMMA IV"

28 M ALUM./GRP PASSENGER LAUNCH

STABILITY BOOKLET

Yard No. 4625

Revision: -

Date: July 21, 2005

香港特別行政區海事處
MARINE DEPARTMENT
HKSAR
[illegible]
[illegible]LN
FILE NO.: SP/L-7962
SIGNATURE: C.T.L.
DATE: 6.1.2005

Cheoy Lee Shipyards Ltd

OFFICE COPY

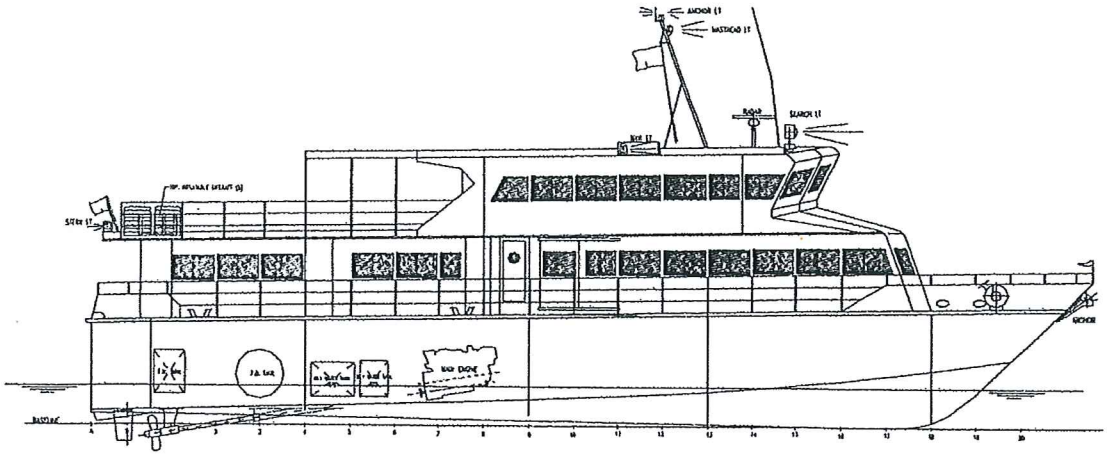
(1) L-7962 [illegible] IVS 111125

Revision notes

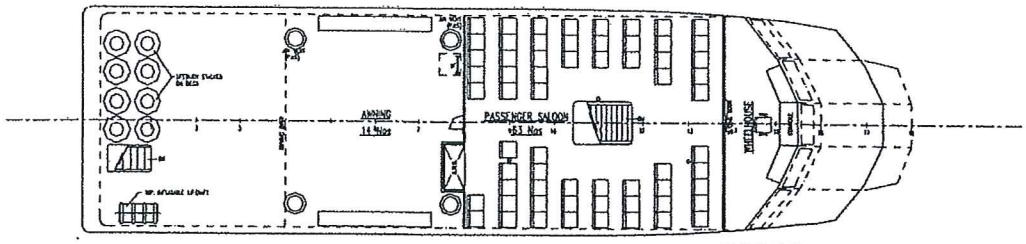
Revision	Date	By	Check By	Note
-	21-Jul-05	HYK	FCC	Issued after inclining experiment.

Content

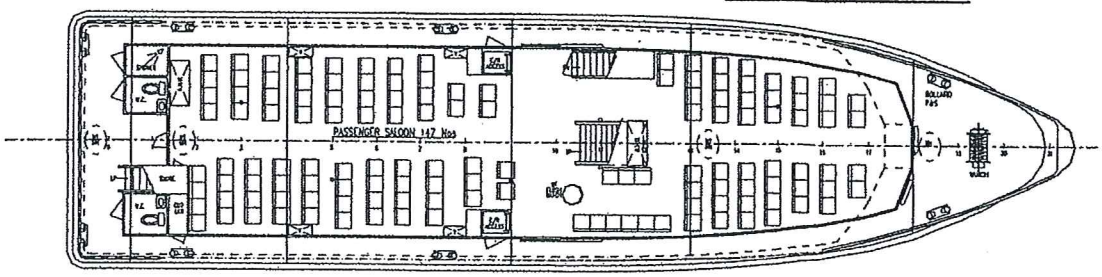
General arrangement



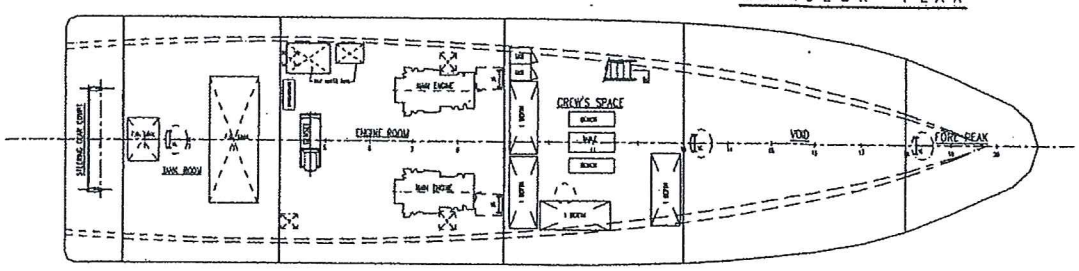
PROFILE



UPPERDECK PLAN

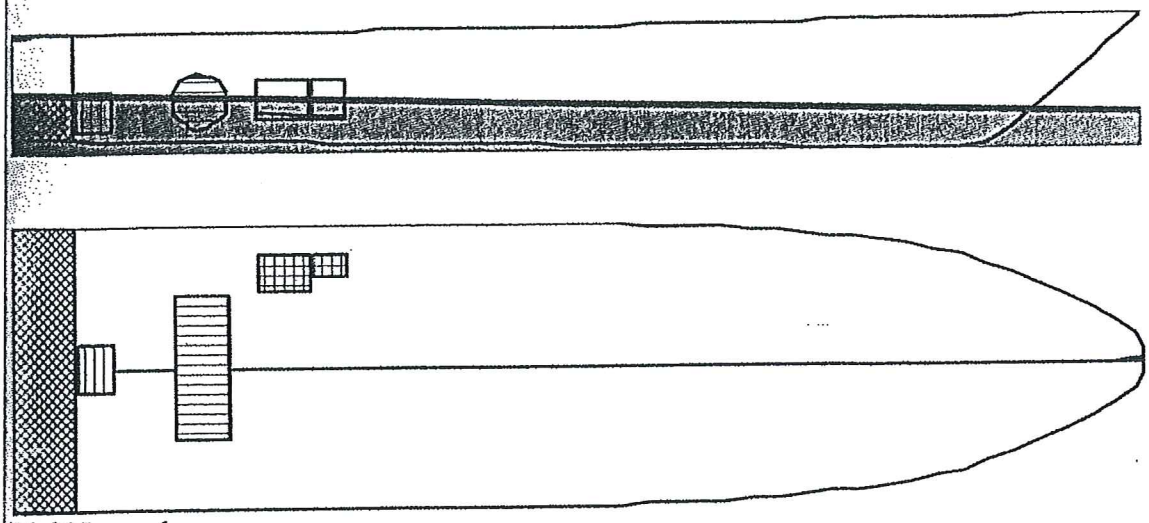


MAINDECK PLAN



UNDERDECK PLAN

Damage Case 1 : After Peak damaged



Fluid Legend

Fluid Name	Legend	Weight (MT)	Load%
SEA WATER		9.42	3.00%
FUEL OIL		4.17	97.99%
FRESH WATER		1.04	100.00%
oily WATER		.14	10.00%

Floating Status

Draft FP	0.939 m	Heel	port 0.15 deg.	GM(Solid)	1.438 m
Draft MS	1.191 m	Equil	Yes	F/S Corr.	0.022 m
Draft AP	1.443 m	Wind	0.0 kn	GM(Fluid)	1.416 m
Trim	aft 0.504/23.890	Wave	No	KMT	4.054 m
LCG	8.496f m	VCG	2.616 m	TPcm	1.09

Loading Summary

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
Light Ship	60.36	8.397f	0.000	2.273
Deadweight	21.62	8.773f	0.015p	3.572
Displacement	81.98	8.496f	0.004p	2.616

Fixed Weight Status

Item	Weight (MT)	LCG (m)	TCG (m)	VCG (m)
LIGHT SHIP	60.36	8.397f	0.000	2.273u
CREW 8P	0.54	11.445f	0.000	3.642u
PASSENGERS BRIDGE DECK AFT 14P	0.95	7.495f	0.000	6.050u
PASSENGERS BRIDGE DECK FWD 63P	4.28	13.195f	0.000	6.050u

PASSENGERS MAIN DECK CABIN 147P	10.00	9.495f	0.000	3.642u
STORE AND SPARE	0.50	14.445f	0.000	1.800u
Total Fixed:	76.64	8.858f	0.000	2.716u

Tank Status

FUEL OIL (SpGr 0.850)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	Perm	FSM (MT-m)
FO TANK	97.99%	4.17	3.750f	0.001p	1.225	1.000	1.76
Subtotals:	97.99%	4.17	3.750f	0.001p	1.225		1.76

FRESH WATER (SpGr 1.000)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	Perm	FSM (MT-m)
FW TANK	100.00%	1.04	1.150f	0.000	1.000	0.960	0.00
Subtotals:	100.00%	1.04	1.150f	0.000	1.000		0.00

oily WATER (SpGr 0.980)

Tank Name	Load (%)	Weight (MT)	LCG (m)	TCG (m)	VCG (m)	Perm	FSM (MT-m)
NO1 OILYW TK.P	10.00%	0.09	5.748f	2.252p	0.873	1.000	0.06
NO2 OILYW TK.P	10.00%	0.04	6.889f	2.426p	0.850	1.000	0.01
Subtotals:	10.00%	0.14	6.104f	2.306p	0.866		0.07

Displacer Status

Item	Status	Spgr	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	Eff /Perm
HULL	Intact	1.025	91.44	7.566f	0.009p	0.844	1.000
AFTER PEAK	Flooded	1.025	-9.42	0.203a	0.008p	0.919	0.950
SubTotals:			82.02	8.459f	0.009p	0.835	

Least freeboard is 1.393 m at 1.000a
Least freeboard (to margin line) is 1.317 m at 1.000a

Hydrostatic Properties with Damage

Trim: aft 0.504/23.890, heel: port 0.15 deg.

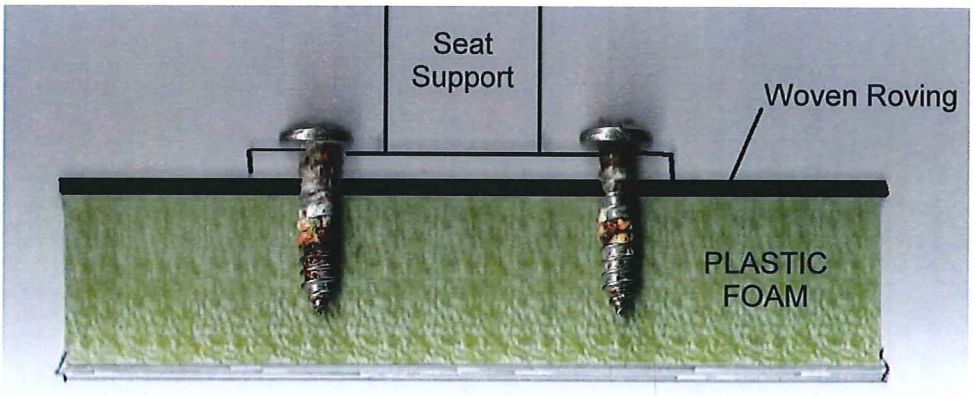
Depth (m)	Displ (MT)	LCB (m)	TCB (m)	VCB (m)	WPA (m^2)	LCF (m)	BML (m)	BMT (m)
1.443	82.016	8.459f	0.009p	0.835	105.9	9.744f	42.851	3.197

Water Specific Gravity = 1.025.

Damage Case 2 : Tank Space damaged

Sketch of the seat foundation arrangement on the Upper deck of the Lamma IV

This sketch is drawn to scale from the construction drawings, using two of the actual screws remaining on the upper deck.



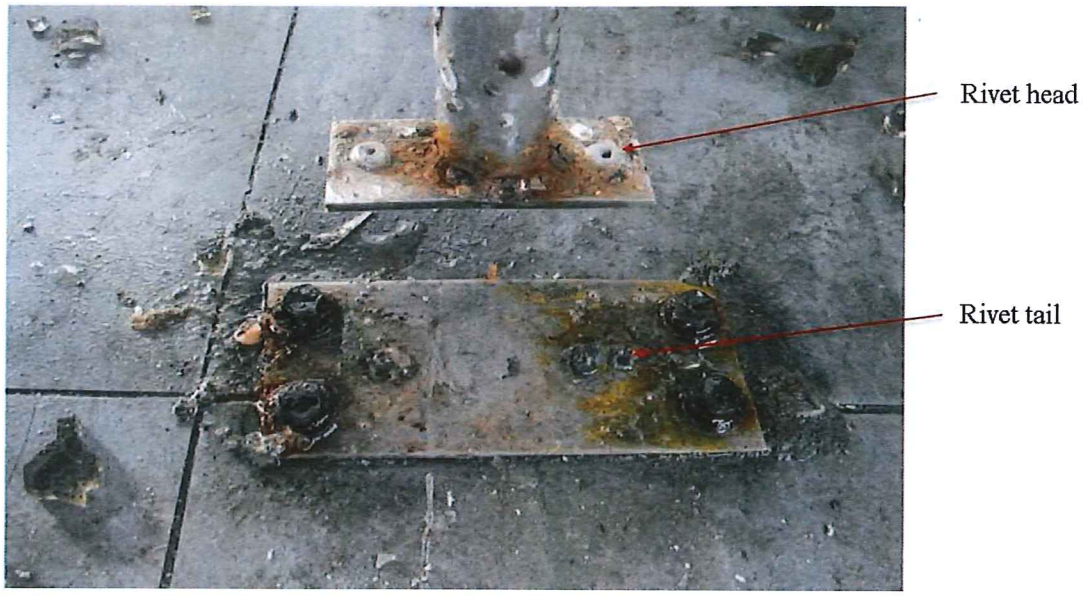
Only the black part marked as "Woven Roving" makes a structural connection with the screws, the plastic foam having no strength to resist "pull-out".

The rectangular mounting plate at the base of the leg of seat in the Upper deck cabin of the Lamma IV and the screw for affixing the seat

The rectangular imprint on the deck of the Upper deck cabin of the Lamma IV

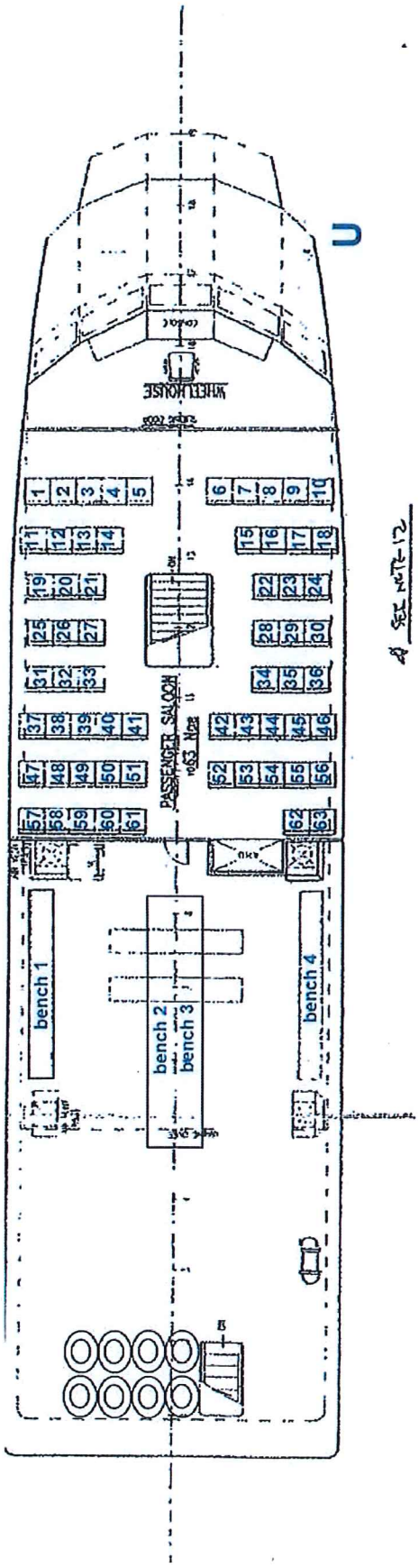
The mounting place had more than a pair of mounting holes

The mounting plate of the leg attached with heads of two rivets and the rectangular metal plate attached with rivet tails



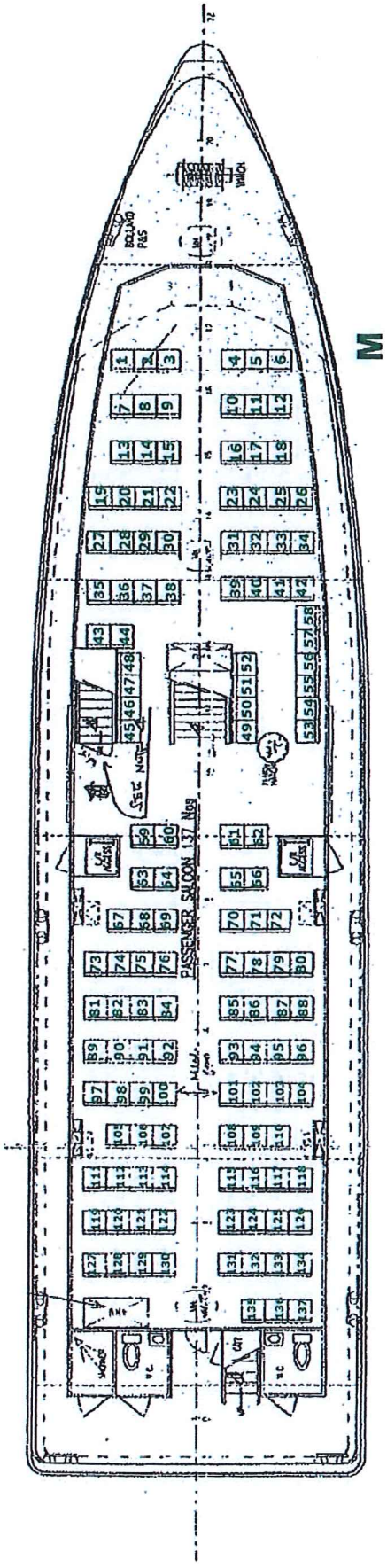
Appendix 26

Upper deck plan of the Lamma IV

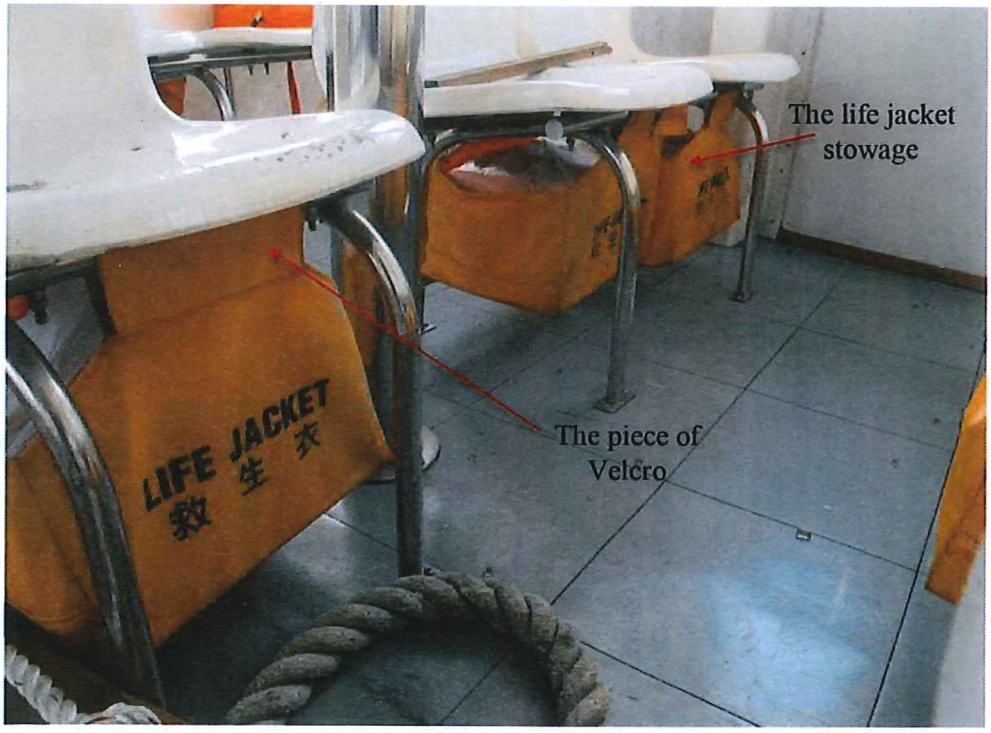


Appendix 27

Main deck plan of the Lamma IV



The lifejacket stowage beneath the seats in the Main deck cabin of the Lamma IV



The white plastic bag containing the lifejacket

Appendix 29

Lifejackets retrieved from the Lamma IV (lace-type)

證書編號
Certificate No. 12A1101920 Page 1 of 2

MERCHANT SHIPPING (LOCAL VESSELS) ORDINANCE
CERTIFICATE OF SURVEY
商船(本地船隻)條例
驗船證明書

船隻名稱 Name of Vessel	LAMMA IV			擁有權證明書號碼 Certificate of Ownership Number	A9153
類別 Class	I	類型 Type	LAUNCH	分類 Category	A
總長度(米) Length Overall (m)	27.21	長度(L)(米) Length (L) (m)	26.15	最大寬度(米) Extreme Breadth (m)	6.81
總噸 Gross Tonnage	184.07	淨噸 Net Tonnage	119.92	船體物料 Material of Hull	鋁 ALUMINUM

現證明:
THIS IS TO CERTIFY:

(1) 上述船隻已依照《商船(本地船隻)條例》、其附例及《商船(防止空氣污染)條例》的適用規定完成檢驗。
That the above-mentioned vessel has been duly surveyed in accordance with the applicable requirements of the Merchant Shipping (Local Vessels) Ordinance, its subsidiary legislations and the Merchant Shipping (Prevention of Air Pollution) Regulation.

(2) 此船已裝置下列救生配備及無線電設備
This vessel is provided with the following life saving appliances and radio equipment:

- 機動救生艇 motor lifeboat(s)
1 氣脹式救生筏 inflatable liferaft(s)
- 救生浮具 buoyant apparatus(es)
* 成人救生衣 adult lifejacket(s)
* 小童救生衣 child lifejacket(s)
65 救生圈 lifebuoy(s), 包括 including:
  - 連自亮燈 with self-igniting light(s)
  - 自發煙霧 self activating smoke(s)
  2 連漂浮救生索 with buoyant lifeline(s)
- 拋繩裝置 line-throwing appliance(s)
- 火箭降落傘火焰信號 rocket parachute flare(s)
- 甚高頻無線電裝設 V.H.F. radio installation
- 雷達應答器 radar transponder
- 無線電通訊設備 radio communications equipment

* 船上每人一件救生衣 One lifejacket for each person on board

(3) 此船已裝置下列滅火器具:
That the vessel is provided with the following fire fighting apparatus:

1 火警探測與失火警報系統 fire detection and alarm system(s)
1 固定式二氧化碳滅火系統 fixed CO_2 fire extinguishing system(s)
1 非手提式滅火器 non-portable fire extinguisher(s),
包括 including:
  1 45L泡沫 foam - 16kg 二氧化碳 CO_2
10 手提式滅火器 portable fire extinguisher(s), 包括 including:
  8 泡沫 foam - 二氧化碳 CO_2
  2 乾粉 dry powder - 水劑 water type
2 消防泵 fire pump(s), 包括 including:
  1 手動 manual 1 動力 power
- 消防龍頭 fire hydrant(s) 4 消防喉 fire hose(s)
4 噴水嘴嘴 jet nozzle(s) - 消防員裝備 fireman's outfit(s)
2 裝有繩的消防桶 fire buckets with lanyard(s)
- 滅火沙箱連鏟 fire sand boxes with scoop(s)
- 滅火毯 fire blanket(s)
- 國際通岸接頭裝置 international shore connection(s)

(4) (a) 此船之最低安全船員人數
That the minimum safe manning of crew 4

(b) 此船可運載之最高人數如下:
That the number of passengers the vessel can carrry are as follow:

甲板層 Deck Level		乘客人數 No.of Passengers
第二上甲板層	2nd upper deck level	-
第一上甲板層	1st upper deck level	77
主甲板層	Main deck level	147
低甲板層	Sunken deck level	-
其他層	Other level	-

允許乘客人數的上限
Maximum number of passengers permitted onboard 224

(c) 允許運載總人數
Total number of persons permitted to carry 232

(5) 此船需配置雷達。 That the vessel is required to be fitted with radar. [~~需要~~/不需要] [~~Required~~ / Not required]

此外, 此船之雷達操作員需完成海事處處長核准的雷達訓練課程。 In addition, the radar operator is required to complete a radar training course approved by the Director.

(6) 此船獲准由一位兼任船長與輪機操作員的人士航。 That the vessel is permitted to ply with a Combined Coxswain and Engine operator. [准/不准] [~~Yes~~/No]

(7) 此船獲准拖曳。 (拖曳時不准載客) That the vessel is permitted to tow. (No passengers can be carried when towing) [~~准~~/不准] [~~Yes~~/No]

(8) 此船的安全航限為 That the safe navigation limit of the vessel is:
香港水域

Waters of Hong Kong

附註: 此驗船證明書須時刻存放於該船隻上。載客船隻須時刻將本證明書展示於該船隻上顯眼地方。
Note: This Certificate of Survey shall at all times be kept on board.
For passenger carrying vessel, this Certificate shall be displayed at all times in a conspicuous place on the vessel.

本證書在 2011年7月8日 The Certificate is issued on 8 July 2011 發出及有效期至 2012年7月7日 and shall be valid until 7 July 2012

LAU Wing-tat

海事處處長(本地船舶安全組)
Local Vessels Safety
for Director of Marine

M.O. 207 (Rev. April 2011)

證書編號
Certificate No. 12A1201064 Page 1 of 2

MERCHANT SHIPPING (LOCAL VESSELS) ORDINANCE
CERTIFICATE OF SURVEY
商船(本地船隻)條例
驗船證明書

船隻名稱
Name of Vessel LAMMA IV

擁有權證明書號碼
Certificate of Ownership Number A9153

類別
Class I

類型 小輪
Type LAUNCH

分類
Category A

總長度 (米)
Length Overall (m) 27.21

長度 (L) (米)
Length (L) (m) 26.15

最大寬度 (米)
Extreme Breadth (m) 6.81

總噸
Gross Tonnage 184.07

淨噸
Net Tonnage 119.92

船體物料 鋁
Material of Hull ALUMINUM

現證明:
THIS IS TO CERTIFY:

(1) 上述船隻已依照《商船(本地船隻)條例》、其附例及《商船(防止空氣污染)條例》的適用規定完成檢驗。
That the above-mentioned vessel has been duly surveyed in accordance with the applicable requirements of the Merchant Shipping (Local Vessels) Ordinance, its subsidiary legislations and the Merchant Shipping (Prevention of Air Pollution) Regulation.

(2) 此船已裝置下列救生配備及無線電設備
This vessel is provided with the following life saving appliances and radio equipment :

- 機動救生艇 motor lifeboat(s)
1 氣脹式救生筏 inflatable liferaft(s)
- 救生浮具 buoyant apparatus(es)
* 成人救生衣 adult lifejacket(s)
* 小童救生衣 child lifejacket(s)
65 救生圈 lifebuoy(s), 包括 including:
  - 連自亮燈 with self-igniting light(s)
  - 自發煙霧 self activating smoke(s)
  2 連漂浮救生索 with buoyant lifeline(s)
- 拋繩裝置 line-throwing appliance(s)
- 火箭降落傘火焰信號 rocket parachute flare(s)
- 甚高頻無線電裝設 V.H.F. radio installation
- 雷達應答器 radar transponder
- 無線電通訊設備 radio communications equipment

* 船上每人一件救生衣 One lifejacket for each person on board

(3) 此船已裝置下列滅火器具 :
That the vessel is provided with the following fire fighting apparatus:

1 火警探測與失火警報系統 fire detection and alarm system(s)
1 固定式二氧化碳滅火系統 fixed CO_2 fire extinguishing system(s)
1 非手提式滅火器 non-portable fire extinguisher(s), 包括 including:
  1 45L泡沫 foam - 16kg 二氧化碳 CO_2
10 手提式滅火器 portable fire extinguisher(s), 包括 including:
  8 泡沫 foam - 二氧化碳 CO_2
  2 乾粉 dry powder - 水劑 water type
2 消防泵 fire pump(s), 包括 including:
  1 手動 manual 1 動力 power
- 消防龍頭 fire hydrant(s) 4 消防喉 fire hose(s)
4 噴水噴嘴 jet nozzle(s) - 消防員裝備 fireman's outfit(s)
2 裝有桶繩的消防桶 fire buckets with lanyard(s)
- 滅火沙箱連鏟 fire sand boxes with scoop(s)
- 滅火毯 fire blanket(s)
- 國際通岸接頭裝置 international shore connection(s)

(4) (a) 此船之最低安全船員人數
That the minimum safe manning of crew 4

(b) 此船可運載之最高人數如下:
That the number of passengers the vessel can carrry are as follow:

甲板層 Deck Level		乘客人數 No.of Passengers
第二上甲板層	2nd upper deck level	-
第一上甲板層	1st upper deck level	77
主甲板層	Main deck level	147
低甲板層	Sunken deck level	-
其他層	Other level	-

允許乘客人數的上限
Maximum number of passengers permitted onboard 224

(c) 允許運載總人數
Total number of persons permitted to carry 232

(5) 此船需配置雷達。 That the vessel is required to be fitted with radar. [需要/~~不需要~~] [~~Required~~ / Not required]

此外, 此船之雷達操作員需完成海事處處長核准的雷達訓練課程。 In addition, the radar operator is required to complete a radar training course approved by the Director.

(6) 此船獲准由一位兼任船長與輪機操作員的人士航。 That the vessel is permitted to ply with a Combined Coxswain and Engine operator. [准/不准] [~~Yes~~ / No]

(7) 此船獲准拖曳。 (拖曳時不准載客) That the vessel is permitted to tow. (No passengers can be carried when towing) [~~准~~/不准] [~~Yes~~ / No]

(8) 此船的安全航限為 That the safe navigation limit of the vessel is:
香港水域

Waters of Hong Kong

附註: 此驗船證明書須時刻存放於該船隻上。載客船隻須時刻將本證明書展示於該船隻上顯眼地方。
Note : This Certificate of Survey shall at all times be kept on board.
For passenger carrying vessel, this Certificate shall be displayed at all times in a conspicuous place on the vessel.

本證書在 2012年5月8日 發出及有效期至 2013年7月7日
The Certificate is issued on 8 May 2012 and shall be valid until 7 July 2013

海事處處長 (本地船舶安全組)
Local Vessels Safety
for Director of Marine

M.O. 207 (Rev. April 2011)

WONG Kam-ching

(Left) Child lifejacket (buckle-type)　　(Right) Adult lifejacket (buckle-type)