Bundesstelle für Seeunfalluntersuchung
Federal Bureau of Maritime Casualty Investigation
Bundesoberbehörde im Geschäftsbereich des Bundesministeriums
für Verkehr, Bau- und Wohnungswesen

Investigation Report 371/04

Very serious marine casualty

Collision of MV MSC ILONA with MV HYUNDAI ADVANCE on 7 December 2004 off Hong Kong / China

15 August 2005

The investigation was conducted in conformity with the law to improve safety of shipping by investigating marine casualties and other incidents (Maritime Safety Investigation Law - SUG) of 24 June 2002.

According to this the sole objective of the investigation is to prevent future accidents and malfunctions. The investigation does not serve to ascertain fault, liability or claims.

The German version shall prevail in the interpretation of the Investigation Report.

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1 Summary of the marine casualty

On 7 December 2004 MV MSC ILONA was on her way from Chiwan, China, to Shanghai, China. MV HYUNDAI ADVANCE was at this time on a voyage from Yantian, China, to Singapore.

At about 21:35 h[1] the two vessels collided. The bulbous bow of MV HYUNDAI ADVANCE hit the port side of MSC ILONA on a level with the forward edge of the superstructures.

Both vessels remained floating. HYUNDAI ADVANCE continued her voyage shortly thereafter and was repaired in a yard in Singapore. MSC ILONA initially anchored at the scene of the accident, and later at an anchor position allocated to the vessel by the authorities. 1283 tonnes heavy oil flowed out of its destroyed wing tanks into the open sea. This largest case of environmental pollution in Chinese waters caused the competent authorities to act extremely conscientiously and cautiously. It was only several weeks after the collision and after extensive cleaning and emergency repair measures had been carried out that therefore MSC ILONA was allowed to leave her allocated anchor position and make for a yard in Singapore.

No personal injury was noted. The damage to the two vessels in the collision was considerable. Nothing is known about cargo damage sustained on board HYUNDAI ADVANCE; 62 twenty-foot and 22 forty-foot containers on board MSC ILONA were damaged by the collision.

[1] All times in this report are local time = UTC + 8h

2 Scene of the accident

Nature of the incident:	Very serious marine casualty, collision
Date/time:	7 December 2004 / approx. 21:35 h
Location:	South China Sea
Latitude/longitude:	φ 22°06,4' N λ 114°27,2' E

Excerpt from sea chart 2702, BSH

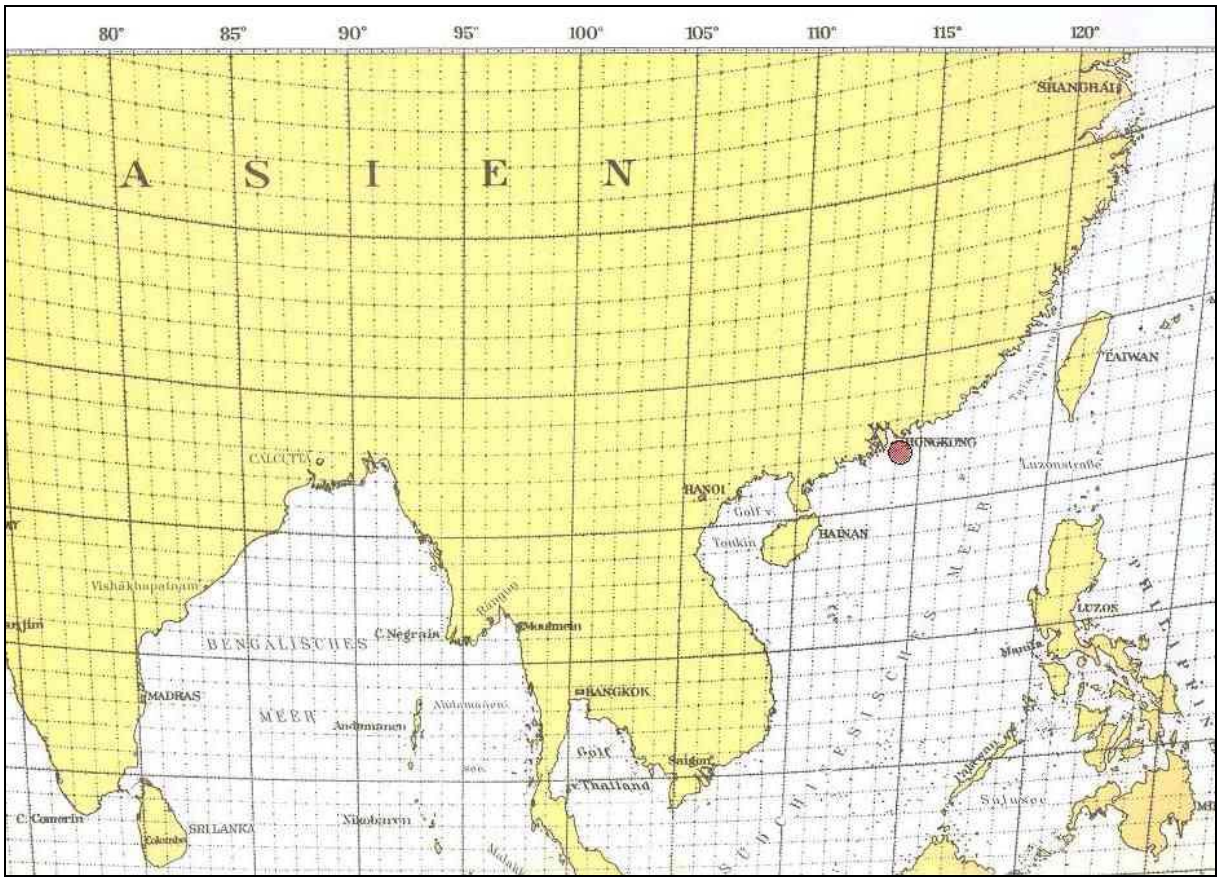

Figure 1: Scene of the accident

3 Vessel particulars

3.1 Photo of MSC ILONA

Figure 2: MSC ILONA
(at the allocated anchor position after the collision, photo BSU)

3.2 Particulars MSC ILONA

Name of vessel:	MSC ILONA
Type of vessel:	Container vessel
Nationality/flag	Federal Republic of Germany
Port of registry:	Hamburg
IMO number:	9225641
Call sign:	DARU
Operator:	NSB Niederelbe Schiffahrtsgesellschaft mbH & Co. KG, Buxtehude, Germany
Year built:	2001
Building yard/building number:	Daewoo Shipbuilding & Heavy Machinery Ltd., Okpo, Korea
Classification society:	Germanischer Lloyd
Length overall:	299.98 m
Width overall:	40 m
Gross tonnage:	75,590 gt
Deadweight:	85,890 t
Draft at the time of the accident:	F: 9.60 m / M: 10.25 m / A: 10.90 m
Engine rating:	57,100 kW
Main engine:	HSD / MAN B&W 10K98MC-C
Speed:	25.5 kn
Hull material:	Steel
Number of crew:	23

3.3 Photo of HYUNDAI ADVANCE

Figure 3: HYUNDAI ADVANCE

3.4 Particulars HYUNDAI ADVANCE

Name of vessel:	HYUNDAI ADVANCE
Type of vessel:	Container vessel
Nationality/flag:	Panama
Port of registry:	Panama
IMO number:	9149859
Call sign:	3FTS7
Operator:	Hyundai Merchant Marine, Seoul, Korea
Year built:	1997
Building yard/building number:	Hyundai Heavy Industry Co., Ltd., Ulsan, Korea / H-1035
Classification society:	Korean Register of Shipping
Length overall:	182.12 m
Width overall:	30.20 m
Gross tonnage:	21,611 gt
Deadweight:	24,766 t
Engine rating:	19,667 kW
Main engine:	Hyundai B & W 7S70MC MK VI
Speed:	23.1 kn
Hull material:	Steel
Number of crew:	22

4 Course of the accident

4.1 Description HYUNDAI ADVANCE

HYUNDAI ADVANCE had sailed from Yantian in China at 19:18 h on 7 December 2004, bound for Singapore. The 3rd Nautical Officer of the watch had taken over the bridge watch at 20:30 h and the Master had left the bridge. A new course of 196° had been set at the planned waypoint at 21:07 h and the speed had been 19 kn.
At 21:10 h the Nautical Officer of the watch had picked up MSC ILONA on the radar for the first time. At a distance of 12 nm, about 45° starboard ahead, the other vessel in the subsequent collision was plotted with a course of 090° and a speed of 15 kn at this time. Based on these values the Nautical Officer of the watch on HYUNDAI ADVANCE had expected to pass MSC ILONA at a passing distance of more than one mile and accordingly maintained his course and speed.
At 21:25 h HYUNDAI ADVANCE had gone onto a course of 202° in order to evade a fishing vessel on port. At 21:31 h the 3rd Nautical Officer had noticed that MSC ILONA was changing her course to starboard and the relative bearing to MSC ILONA remained unchanged. Two minutes later the Nautical Officer of the watch had put the helm 20° to starboard in order to avoid the collision. Despite this a collision had occurred at 21:35 h.

4.2 Description MSC ILONA

MSC ILONA had sailed from Chiwan in China at 17:30 h on 7 December 2004, bound for Shanghai. The Hong Kong pilots had left the vessel at 20:18 h. At 20:42 h, on passing buoy LCS1 the vessel had left the traffic separation scheme East Lamma Channel running southeast. MSC ILONA had been running at half speed ahead in order to allow an eastward-sailing vessel to pass. Behind this vessel at about 21:00 h MSC ILONA had changed to an easterly course too, following the provisionally established Zhujiang Kou Trial Traffic Separation Scheme, and the main engine had been ordered to full ahead.
Shortly before 21:00 h the 4th Nautical Officer of the watch had appeared on the bridge in order to start her bridge watch. The Chief Mate had handed over the watch to her, the Master had still been in command. At this time the vessel had been sailing a course of 087° at a speed of 17 kn; the speed had been increased slowly to service speed of 25.5 kn. The 4th Nautical Officer had entered the 21:00 h position in the chart; about five minutes later MSC ILONA had reported to Vessel Traffic Services Hong Kong that she was outbound. The engine data had been asked for and noted.
At 21:10 h the Master had handed over the command to the Nautical Officer of the watch and about three minutes later had left the bridge. Visibility and the traffic situation had been clear. There had been a few small radar echoes more or less drifting at a distance of 6 nm on the starboard side about 2 nm away from the course line. There had been no contacts in the 10-mile range on the port side. Apart from the Nautical Officer of the watch there had been a lookout on the bridge.

The 4th Nautical Officer had switched the port radar from the 3 nm to the 6 nm range, offset, and the starboard radar to the 12 nm range. At about 21:20 h she then recognised the other vessel in the subsequent collision for the first time as a dangerous vessel. It had been four points to port and she had been able to see the two top lights and the green sidelight clearly. The Nautical Officer had acquired the contact as an ARPA[2] target, the distance had been 3.5 nm. There had been no AIS[3] signal for the vessel. She had instructed her lookout to keep the vessel under constant observation. After about one minute a course of 198° and a speed of 18 kn had been determined for the other vessel, on a crossing course with a bow crossing range of less than 2 cables. The 4th Nautical Officer had immediately gone to starboard with the automatic steering system, but could not remember exactly which course she had ordered. At the same time she had ordered the lookout as helmsman and to switch over to manual steering and put the helm 10° to starboard. It had not been possible to change the course more to starboard since there had been a fishing vessel on the starboard side.
At 21:22 h the Nautical Officer had called the other vessel in the subsequent collision on VHF Channel 16. Since no AIS signal had been received the Nautical Officer of the watch had called the other vessel with its position, but not received any answer. She had informed the Master and shortly before 21:30 h the Master had appeared on the bridge. At this time the other vessel in the collision had been about 2 cables away. The Master remembered the current rudder position at the time he appeared on the bridge as 10° to port. He had immediately ordered "midships" and "hard to starboard" as well as "stop engine" and given a warning signal with the whistle, but without being able to prevent the collision. The collision had occurred about 90 seconds later.
Directly after the collision the Master had activated the general alarm.
After ascertaining that there were no injured persons on board and after checking for damage to the fuel tanks, attempts had been made to minimise the spillage of fuel by trimming MSC ILONA forward and to starboard.

4.3 Analysis of the electronic chart MSC ILONA

4.3.1 Additional information on the voyage planning

On the basis of his experience in the sea area the Master knew that the Yantian-Singapore route being used by HYUNDAI ADVANCE was one of the most frequently used routes in this sea area. Since this route crossed the track of MSC ILONA, the Master had entered this route manually into electronic chart. This crossing route was not noted as an area requiring special attention on the paper chart used (BA[4] 937) and in the voyage plan.
The electronic chart system on board MSC ILONA had been type-approved as an electronic chart display and information system (ECDIS). However, the system was

[2] Automatic Radar Plotting Aids
[3] Automatic Identification System
[4] British Admiralty

operated with the use of C-Map charts in the ECS[5] mode. Accordingly it had been used as a navigational aid, while the primary means of navigation and voyage planning had been the paper chart. The electronic chart had been overlaid on the starboard radar that the Master used while he was on the bridge. The Master's additional information on the electronic chart concerning the crossing traffic route had been available to the 4th Nautical Officer on the starboard radar too.

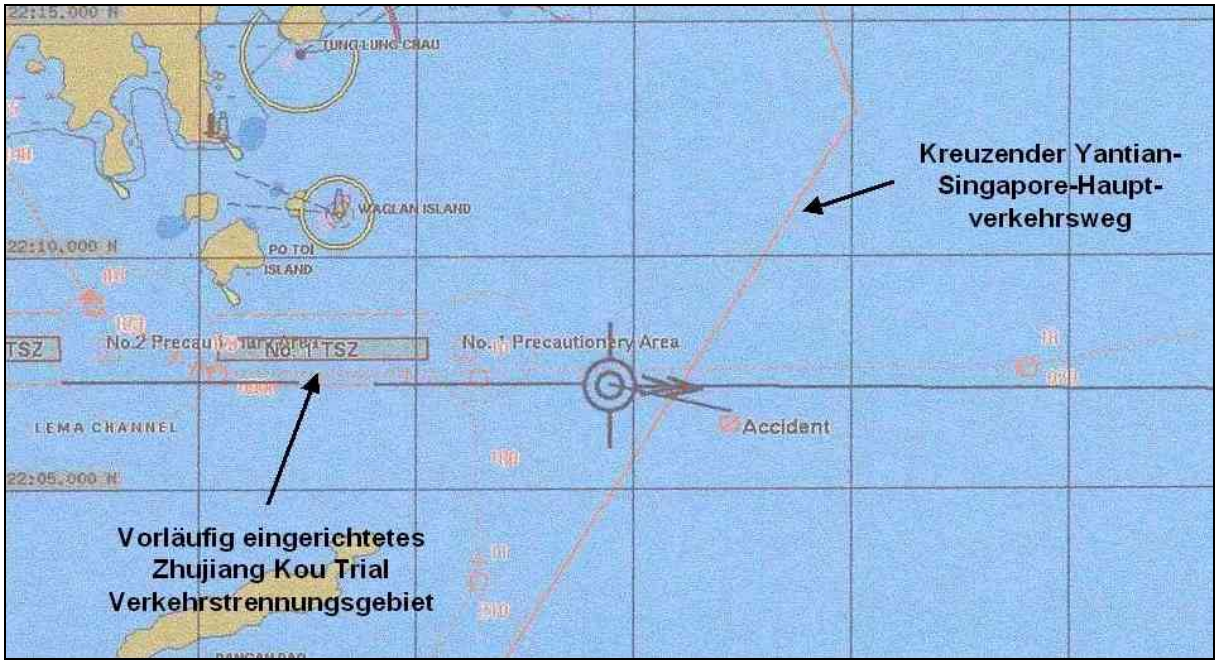

Figure 4: Display of the electronic chart of MSC ILONA
with manual supplements by the vessel's command

4.3.2 Course of the voyage of MSC ILONA

The data recorded in the electronic chart system were only available in the long-term recording mode. Every 30 minutes the current image of the chart was stored. ARPA targets acquired on the starboard radar could also have been recorded via interface. The working radar of the Nautical Officer of the watch was the port radar, however, so that no corresponding data could be stored.
The half-hourly recordings the voyage data of MSC ILONA showed a course of 135° and a speed of 15.3 kn at 20:27 h. After leaving the East Lamma Channel traffic separation scheme that ran in a south-easterly direction, MSC ILONA turned to an eastern course, following the course of the provisionally established Zhujiang Kou Trial Traffic Separation Scheme.
At 20:57 h a course of 090° and a speed of 14.4 kn were recorded for MSC ILONA. Up to the time of the collision the vessel was subsequently in an acceleration phase. The last data stored at 21:27 h shortly before the collision showed a course of 093° at a speed of 19.7 kn.

[5] Electronic Chart System

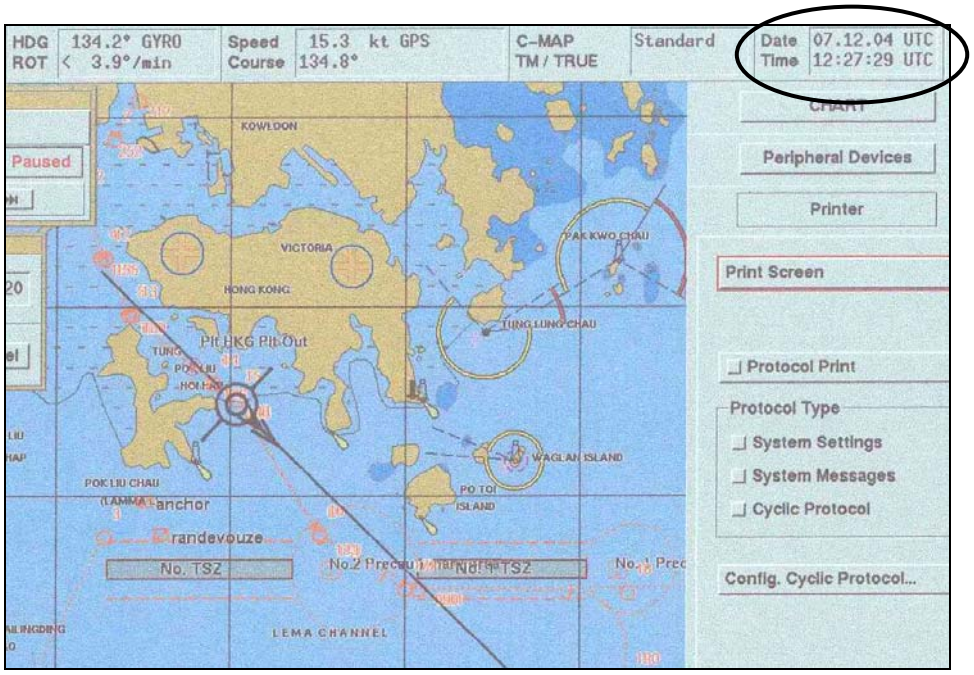
HDG 134.2° GYRO
ROT < 3.9°/min
Speed 15.3 kt GPS
Course 134.8°
C-MAP
TM / TRUE
Standard
Date 07.12.04 UTC
Time 12:27:29 UTC
Paused
KOWLOON
VICTORIA
HONG KONG
PAK KWO CHAU
TUNG LUNG CHAU
Pit HKG Pit Out
WAGLAN ISLAND
PO TOI ISLAND
POK LIU CHAU
anchor
randevouze
No. TSZ
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CHART
Peripheral Devices
Printer
Print Screen
Protocol Print
Protocol Type
System Settings
System Messages
Cyclic Protocol
Config. Cyclic Protocol...

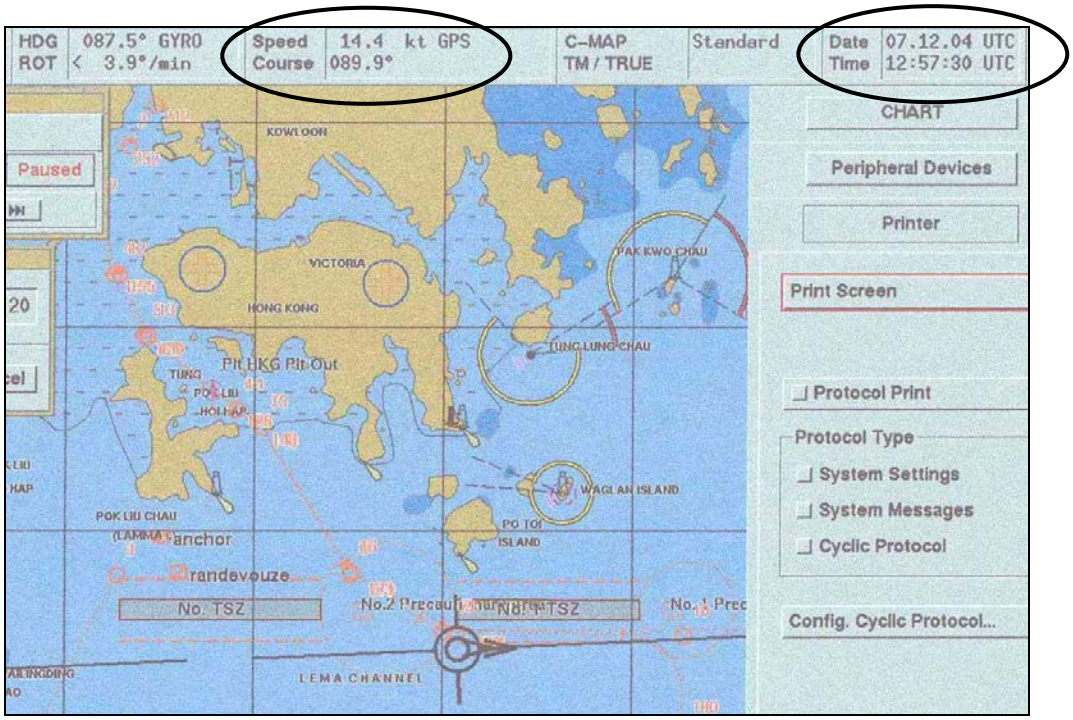
HDG 087.5° GYRO
ROT < 3.9°/min
Speed 14.4 kt GPS
Course 089.9°
C-MAP
TM / TRUE
Standard
Date 07.12.04 UTC
Time 12:57:30 UTC
Paused
KOWLOON
VICTORIA
HONG KONG
PAK KWO CHAU
TUNG LUNG CHAU
Pit HKG Pit Out
WAGLAN ISLAND
PO TOI ISLAND
POK LIU CHAU
anchor
randevouze
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CHART
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Printer
Print Screen
Protocol Print
Protocol Type
System Settings
System Messages
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Config. Cyclic Protocol...

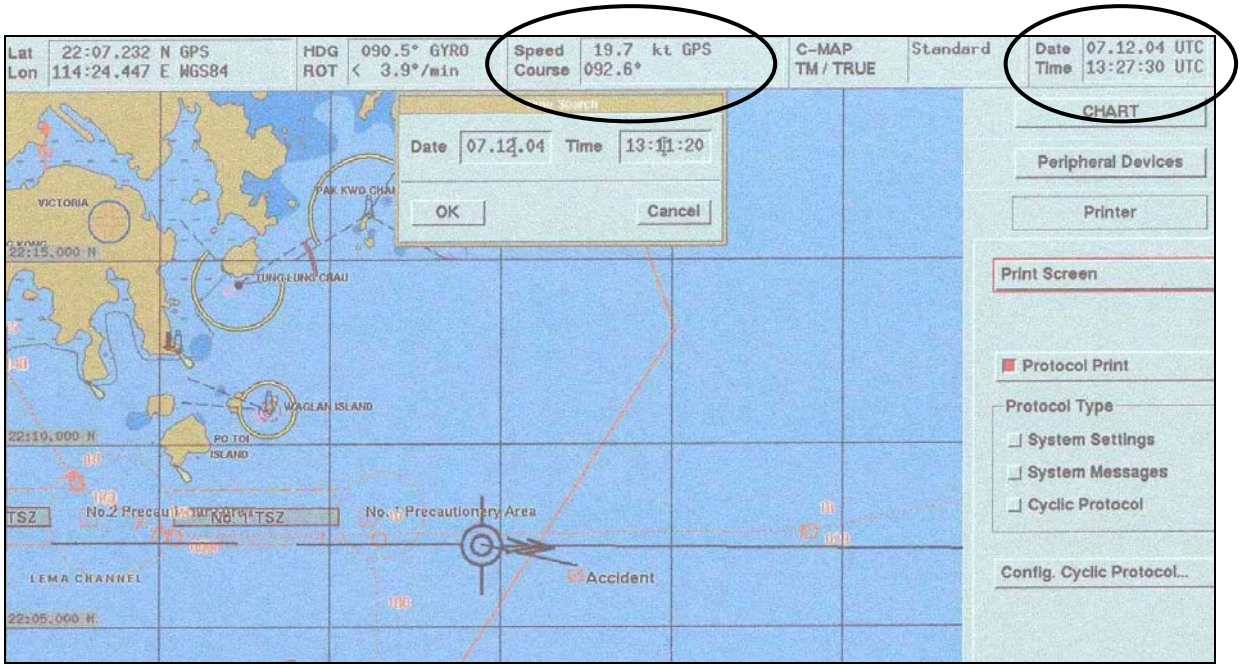


Figure 5: Course of voyage of MSC ILONA
from 20:27:30 h to 21:27:30 h

4.4 Analysis of the radar records of the Vessel Traffic Services Hong Kong

The collision location was in the territorial waters of the People's Republic of China. Even though the radar surveillance of this area thus no longer fell in the responsibility of Hong Kong, the radar station of the Marine Department Hong Kong also covered this area. The corresponding radar records were made available to the BSU for further evaluation.

MSC ILONA was tracked by the Radar Station Hong Kong on an easterly course between 085° and 093° as of 21:00 h. Its plotted speed increased continuously from an initial 14.5 kn to 22.5 kn at 21:33 h. At 21:32 h the vessel changed her track course to 109°, in the following minutes by 10° per minute to starboard up to 150° at 21:35 h.
HYUNDAI ADVANCE was recorded on a southern course of 170° from 21:00 h to 21:06 h. After this up to 21:21 h she was on a somewhat more westerly course of 195°. From 21:21 h to 21:34 h she then had a track of 202°. At 21:34 h a course change to starboard to 226° was plotted. Throughout this entire period her track speed lay between 18 kn and 20 kn.
At 21:10 h both vessels were about 12 nm apart from each other, and at 21:27 h the distance was still about 3.5 nm.
According to the records of Radar Station Hong Kong the collision between MSC ILONA and HYUNDAI ADVANCE occurred a few seconds after 21:34 h. At the time of the collision the radar showed a relatively small contact in the direct vicinity south of the collision location and a somewhat larger radar contact a little further away.

Figure 6: Radar plot of Radar Station Hong Kong at 21:00 h
[at the lower image edge MSC ILONA on an easterly course, on the right HYUNDAI ADVANCE on a south/south-westerly course]
(Source: Marine Department Hong Kong)

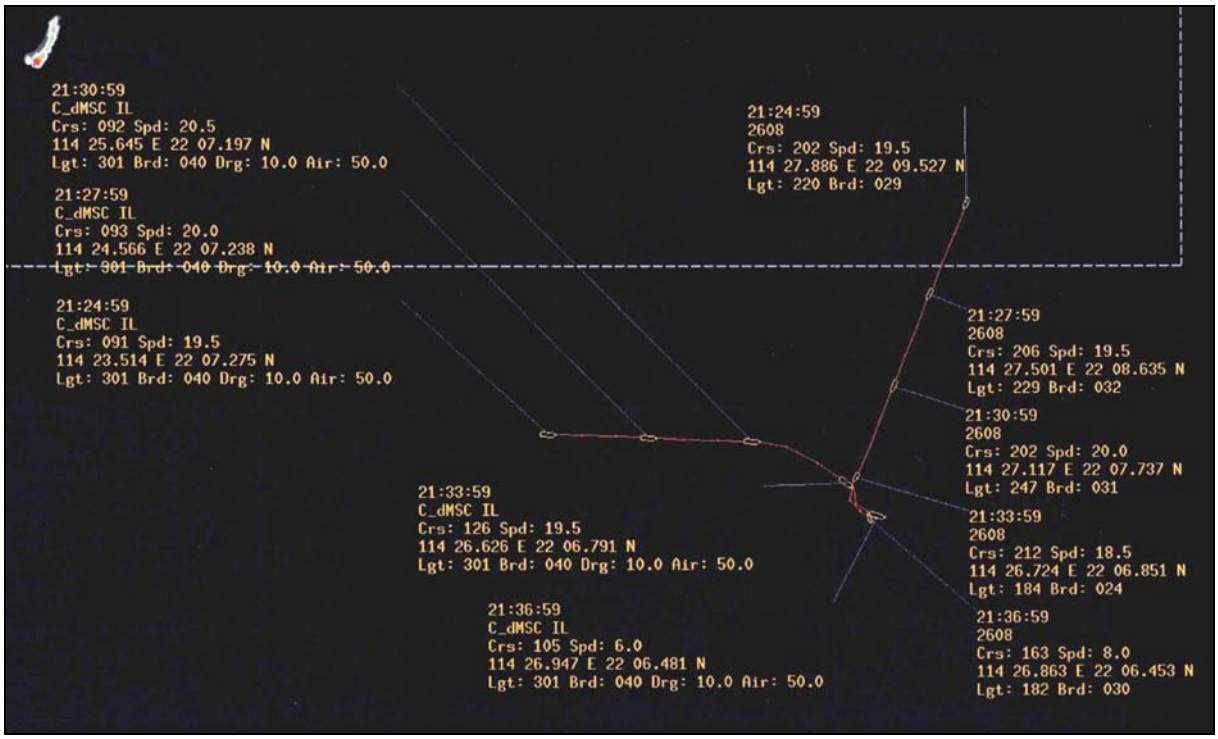


Figure 7: Radar plot of Radar Station Hong Kong at 21:25 h
(source: Marine Department Hong Kong)

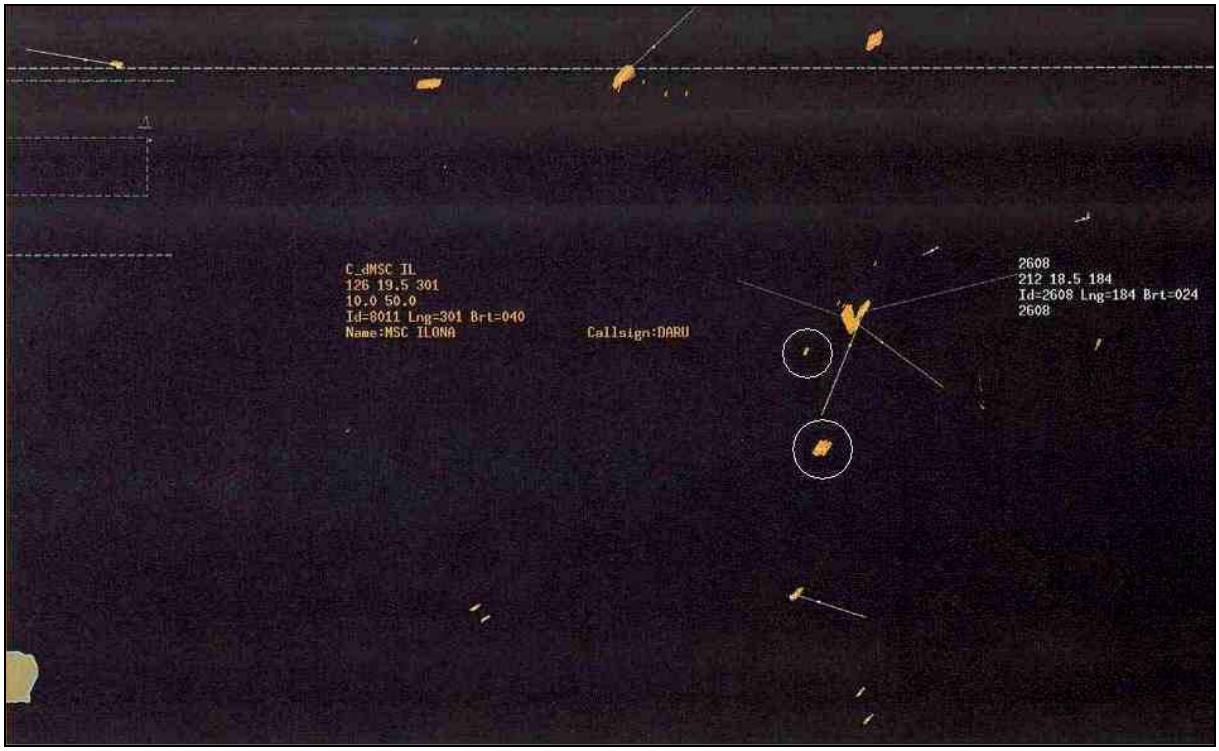


Figure 8: Further radar contacts south of the collision location
(Source: Marine Department Hong Kong)

4.5 Weather

According to the official weather expertise a north-easterly wind of medium strength between 3 bft and 4 bft was blowing in the sea area off Hong Kong in the evening of 7 December 2004; there were no notable gusts.
The characteristic wave height of the sea was between 2 m and 3 m.
It was cloudy to very cloudy and dry, with the sky only clearing in the second half of the night.
The horizontal visibility was about 10 km.
The waning moon was in the last quarter, and the moon only rose at 01:40 h.

5 Examination

On 7 December 2004 MSC ILONA was on the way from Chiwan to Shanghai and HYUNDAI ADVANCE on a voyage from Yantian to Singapore. The two vessels collided at about 21:35 h, whereby the bulbous bow of HYUNDAI ADVANCE hit the port side of MSC ILONA on a level with the forward edge of the superstructures. No personal injury was sustained and both vessels remained floating.

The damage to the two vessels involved in the collision was substantial. The fore ship and the bulbous bow of HYUNDAI ADVANCE were badly damaged. However the vessel was able to continue her voyage shortly afterwards and was repaired at a yard in Singapore. Nothing is known about cargo damage sustained on board HYUNDAI ADVANCE.

Figure 9: Damage to HYUNDAI ADVANCE
(Photo: Korean Maritime Safety Tribunal)

On MSC ILONA the port side was ripped open on a level with the forward edge of the superstructures. The heavy oil tank 7 port, the bunker tank port and the settling tank port were heavily damaged. Furthermore 62 twenty-foot and 22 forty-foot containers in hold 7 on the port side were damaged by the collision.

Figure 10: Damage to MSC ILONA
(Photo: BSU)

1283 tonnes of heavy oil flowed into the open sea from the destroyed wing tanks of MSC ILONA. This largest case of environmental pollution in Chinese waters occasioned the competent authorities to work extremely conscientiously and cautiously. It was only several weeks after the collision and after execution of extensive cleaning and emergency repair measures that therefore MSC ILONA was allowed to leave her allocated anchor position and steer for a yard in Singapore.
Nothing is known about environmental damage caused by pollutants spilling out from HYUNDAI ADVANCE.

Figure 11: Oil boom around MSC ILONA
(Photo: BSU)

6 Analysis

6.1 Obligation to give way

6.1.1 Procedure

The times of the events and measures contained in the statements made by the individual parties involved deviate from each other by a few minutes. Since the proceedings had to be reconstructed in the aftermath, these time deviations were only natural. In the following analysis the time data that coincide in particular with the radar recordings from the Vessel Traffic Services Hong Kong are used.
Under the visibility conditions prevailing on the day and at the time of the collision HYUNDAI ADVANCE and MSC ILONA were considered to be in sight of one another for the sections of the Collision Regulations[6] to be applied.
Rule 5 of the Collision Regulations requires that a lookout be kept at all times, Rule 7 states that every vessel shall use all available means to determine if risk of collision exists. According to Rule 15 of the Collision Regulations when two 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. If the circumstances allow, it must avoid crossing ahead of the other vessel. The other vessel is obliged under Rule 17 to keep her course and speed as the stand-on vessel. However it may manoeuvre as soon as it becomes apparent to her that the give-way vessel is not acting appropriately, and it must take action if the collision cannot be avoided by the action of the give-way vessel alone.
The two vessels involved in the collision were approaching each other on crossing courses. Coming from the north, HYUNDAI ADVANCE had the eastward bound MSC ILONA on its starboard side and was fundamentally obliged to give way. At 21:10 h the Nautical Officer of the watch on HYUNDAI ADVANCE recorded MSC ILONA on the radar for the first time and plotted the vessel. At a distance of 12 nm the ARPA radar calculated a course of 090° and a speed of 15 kn. The Nautical Officer of the watch therefore expected to pass ahead of MSC ILONA at a distance of more than one mile. He did therefore not assume that there was a risk of collision and did not consider it necessary to take action as give-way vessel. Evidently HYUNDAI ADVANCE proceeded at unchanged course and the same speed without checking the first course and speed values noted for MSC ILONA again. At 21:23 h the Nautical Officer of the watch increased the passing distance to a fishing vessel on the port side by changing his course 6° to starboard. In doing so he also turned towards MSC ILONA, so that the previously expected passing distance of more than one mile before the bow was necessarily reduced. The crossing situation with regard to MSC ILONA was evidently not checked at this time either. It was only shortly after 21:30 h that the Nautical Officer of the watch on HYUNDAI ADVANCE stated that he perceived a starboard course change of MSC ILONA and then also a steady bearing.

[6] Convention on the International Regulations for Preventing Collisions at Sea, 1972 (COLREGs)

At 21:34 h HYUNDAI ADVANCE changed its course significantly to starboard, but without being able to avoid the imminent collision.
MSC ILONA as stand-on vessel was fundamentally obliged to keep its course and speed. After turning to an easterly course at 21:00 h full speed ahead was ordered. At this time HYUNDAI ADVANCE was still 16 nm away. The speed was continuously increased from initially 14.5 kn to 22.5 kn shortly before the collision.
While Rule 17 of the Collision Regulations describes three stages of actions of the stand-on vessel, in which initially the course and speed must be kept, then manoeuvres are allowed to avoid a collision, and ultimately manoeuvres must be carried out to avoid a collision, A. N. Cockcroft and J. N. F. Lameijer set a further phase ahead of this in their comments on the Collision Regulations [7]:

1. *At long range, before risk of collision exists, both vessels are free to take any action.*
2. *When risk of collision first begins to apply the give-way vessel is required to take early and substantial action to achieve a safe passing distance and the other vessel must keep her course and speed.*
3. *When it becomes apparent that the give-way vessel is not taking appropriate action in compliance with the Rules the stand-on vessel is required to give the whistle signal prescribed in Rule 34(d) and is permitted to take action to avoid collision by her manoeuvre alone, but a power-driven vessel must not alter course to port to avoid another power-driven vessel crossing from her own port side. The give-way vessel is not relieved of her obligation to keep out of the way.*
4. *When collision cannot be avoided by the give-way vessel alone the stand-on vessel is required to take such action as will best aid to avoid collision.*

After this Cockcroft and Lameijer explain that the distances at which the individual phases start depend substantially on the circumstances from case to case. For two vessels running under engine power on crossing courses in an open sea area the outer limit of the second phase is suggested to be a distance between the two vessels of 5 nm to 8 nm.
When MSC ILONA started her sea passage at 21:00 h and the main engine was ordered to run full speed ahead, HYUNDAI ADVANCE was 16 nm away. At this distance the two vessels were still free in their manoeuvres.
When the Nautical Officer of the watch on HYUNDAI ADVANCE first noted MSC ILONA on the radar at 21:10 h, the latter was still at a distance of 12 nm. He could thus therefore by no means rely on MSC ILONA not changing course and speed any more. Instead he should have checked the first course and speed values after this. At a distance of 8 nm at 21:18 h MSC ILONA had already reached a speed of 18 kn. A new assessment of the possibility of the risk of a collision would have had to lead to a distinctly different result on the bridge of HYUNDAI ADVANCE at this time than it did at 21:10 h.
The Nautical Officer of the watch on board MSC ILONA used the port radar as working radar. It was switched offset to the 6 nm range. The HYUNDAI ADVANCE approaching from port ahead must accordingly have been detectable on the radar screen for almost 10 minutes before being acquired at 21:27 h as an ARPA target at

[7] A.N. Cockcroft and J.N.F. Lameijer: A Guide to the Collision Avoidance Rules, 6th edition, 2004, S. 114f

a distance of 3.5 nm and being recognised as a dangerous vessel with a bow crossing range of less than 2 cables. During this period MSC ILONA's speed increased from 18 kn to 20 kn.
After the other vessel in the subsequent collision was identified as a dangerous vessel, the Nautical Officer of the watch immediately began to change MSC ILONA's course to starboard. Although the vessel approaching from port was without doubt liable to give way and thus her own vessel was identified as stand-on vessel, in her opinion HYUNDAI ADVANCE had not acted appropriately up to this time so that her own manoeuvre to avoid a collision was justified.
The warning signal specified under Rule 34(d) of the Collision Regulations was not given. MSC ILONA's options for preventing a collision by means of its own manoeuvres were limited. A change of course to port or reduction of speed up to taking all her way off were not admissible under any circumstances, since such actions would have counteracted any evasive manoeuvres or last minute manoeuvres to starboard by HYUNDAI ADVANCE. MSC ILONA's scope for manoeuvre to starboard was restricted by the fishing vessels drifting or sailing slowly there.
Consequently an earlier detection of HYUNDAI ADVANCE approaching from port would not have left much more scope for MSC ILONA to take collision prevention measures itself, but would have left more time to try and point out to HYUNDAI ADVANCE that it should give way via a call on VHF. When the call was finally made shortly after HYUNDAI ADVANCE was perceived as a dangerous vessel, no AIS information was available from the vessel. Consequently the call could not be made directly with the vessel's name and was ultimately not answered.
When the Master of MSC ILONA appeared on the bridge he initiated his last moment manoeuvres with "hard to starboard" and "stop engine" and used the whistle. However, since HUYNDAI ADVANCE had already approached within less than 2 cables, these measures were more of a "cosmetic nature", even in the Master's assessment.
During the investigations it was not possible to clarify two discrepancies completely. The Nautical Officer of the watch on MSC ILONA claims to have ordered 10° to starboard, while the Master claims that he remembers that when he appeared on bridge the helm was 10° to port. The Nautical Officer on the watch claims not to have ordered the helm more than 10° since a fishing vessel did not allow a stronger turn to starboard, while the Master ordered "hard to starboard" directly after appearing on the bridge, even though he had perceived the fishing vessel on the starboard side. However both these circumstances were not assessed as causal for the collision.

6.1.2 Summary assessment

After detecting MSC ILONA for the first time on the radar at a distance of 12 nm, the Nautical Officer of the watch on HYUNDAI ADVANCE failed to observe the vessel adequately. The course and speed data were not checked further. This led to a faulty assessment regarding the existing risk of a collision. Consequently HYUNDAI ADVANCE did not take any substantial action in ample time to avoid a collision. In particular after changing course to starboard about 10 minutes before the collision to increase the passing distance to a fishing vessel, the crossing situation to the other

vessel involved in the subsequent collision was not checked again. This was causal for the collision between HYUNDAI ADVANCE and MSC ILONA. The last moment manoeuvre then initiated was started too late to be able to avoid the collision.

MSC ILONA had just started her sea passage and was consistently increasing speed. This promoted the erroneous estimate of the existing risk of a collision by the Nautical Officer of the watch on HYUNDAI ADVANCE and in so far indirectly promoted the collision.

The Nautical Officer of the watch on MSC ILONA acquired HYUNDAI ADVANCE as an ARPA target for the first time when the vessel had approached to about 3.5 nm. The time remaining up to the collision with inadequate manoeuvring space to starboard and an relative speed of the two vessels to one another of more than 20 kn was too short to be able to avoid the collision by the own vessels' manoeuvres. The period up to the collision was furthermore too short to draw the attention of the vessel approaching from port to its obligation to give way via VHF. This promoted the collision. The lack of AIS information, in particular the name of the vessel, made it more difficult to address the other vessel in the subsequent collision directly via VHF and in this respect additionally promoted the collision.

The Nautical Officer of the watch on MSC ILONA obtained a target speed of 18 kn and a passage distance of 2 cables ahead of MSC ILONA as the first ARPA data for HYUNDAI ADVANCE. There were no indications that the approaching vessel would carry out its obligation to give way. Although basically a stand-on vessel, in this case MSC ILONA was allowed to take action herself in order to avoid a collision.
The Nautical Officer of the watch on HYUNDAI ADVANCE only noticed the existing risk of a collision as a result of the starboard manoeuvre of MSC ILONA. The question as to whether the two vessels could have passed, possibly at extreme close quarters, if the original course of MSC ILONA had been retained is inconsiderable here. The inadequate observation of the developing situation by the Nautical Officer of the watch on HYUNDAI ADVANCE and the resulting failure to initiate a substantial evasive manoeuvre in ample time led the Nautical Officer of the watch on MSC ILONA to act herself. This did not in itself promote the collision.

MSC ILONA only gave an acoustic warning signal shortly before the collision. Consequently this was ineffective for attracting the attention of the Nautical Officer of the watch on HYUNDAI ADVANCE at an early stage and leading him to take appropriate action. It was only about four minutes before the collision that the Nautical Officer of the watch on HYUNDAI ADVANCE became aware of the danger. This promoted the collision.

The traffic situation was such that in the minutes before the collision the attention of MSC ILONA and of HYUNDAI ADVANCE was partly diverted to fishing vessels. It was not possible to concentrate exclusively on the other vessel in the subsequent collision. This promoted the collision.

6.2 Voyage planning

According to the STCW[8] Code, Section A-VIII/2, Part 2, a voyage plan must be drawn up that contains complete and updated information regarding the restrictions and dangers for shipping.
The location of the collision between HYUNDAI ADVANCE and MSC ILONA was near the eastern approach to Hong Kong. In addition to a large number of firmly established traffic separation schemes in this approach zone, NtM[9] 2589(T)/04 announced the establishment of a further provisional traffic separation scheme by the Maritime Safety Agency of China as of 1 June 2004. The Zhujiang Kou traffic separation scheme with its adjacent Precautionary Areas exists provisionally for a test phase of 12 months (see annex).
The collision occurred east of this region. At the same time it must have been known to the two Masters that the vessels were moving in an area of great traffic density where main traffic routes crossed. Such information on danger for shipping should have been taken into account in the voyage plan. Since the plan of HYUNDAI ADVANCE has not been submitted, the following remarks refer solely to the plan of MSC ILONA.
The electronic chart system on board MSC ILONA was being used in the ECS mode. Consequently it was being used not as a primary navigational aid, but simply as a supporting measure. The vessel's track crossing the Yantian-Singapore main traffic route, known to the Master, was noted on the ECS. The ECS was overlaid on the starboard radar, so that the additional information of the electronic chart was available to the Nautical Nautical Officers. No additional warning was entered on the paper chart, nor in the Sail Plan Notes "Chiwan to Shanghai". The Nautical Officer of the watch primarily used the port radar and the paper chart. Consequently the additional information on the ECS was not directly before her. This information might have been able to give the Nautical Officer of the watch supplementary information about the crossing traffic to be expected in this sea area.
HYUNDAI ADVANCE was proceeding in a southerly direction, crossing the track of MSC ILONA running east from port and was obliged to give way. Consequently the direct presence of additional information from the ECS would not have influenced the course of events substantially. The fact that individual items of information regarding dangers to be expected during the voyage existed at different points in the voyage planning of MSC ILONA did not promote the collision.

[8] Seafarers‘ Training, Certification and Watchkeeping
[9] Notice to Mariners

6.3 Fatigue

Both vessels had left their last ports of call in the afternoon and early evening of 7 December 2004.
On board HYUNDAI ADVANCE the 3rd Nautical Officer of the watch was responsible on the bridge at the time of the collision. The three Nautical Nautical Officers worked a 4-8 watch system on board with four hours bridge watch and eight hours free.
On board MSC ILONA the 4th Nautical Officer of the watch was responsible. Here the four Nautical Officers worked a 3-9 system at sea with a corresponding three-hour watch and nine hours free.
There were no inadmissibly long working times or non-observation of minimum rest periods.
The collision occurred in the evening shortly after 21:30 h.
Fatigue did not promote the collision.

7 Safety Recommendations

7.1 Lookout

The BSU recommends the operators of the vessels involved to remind the shipboard management vigorously of the importance of keeping a proper lookout. In order to take the given circumstances and conditions into account, it is also and in particular important to consider the traffic density, geographic and navigational hazards, and approach speeds to be expected. With an own speed of more than 20 kn and speeds to be expected of other vessels in the same range, in the least favourable case relative speeds of two vessels to one another of more than 40 kn result. This corresponds to an approach of about 7 cables per minute. In other words: when a radar in the 12 nm range is set centred, there are only 18 minutes between the first contact and the collision. If the available manoeuvring space is restricted on the grounds of the traffic situation or special geographic or navigational features, it is important to identify a possible close quarter situation at an early stage (depending on one's own manoeuvre data) to be able to take effective action. In order to be able to obtain and maintain a complete overview of the existing risk of a collision, an approach situation must be continuously checked and reviewed.

7.2 AIS

The BSU recommends that the operators of HYUNDAI ADVANCE in co-operation with the Korean Register of Shipping as classification society should check why no AIS signal could be received from the vessel and that they eliminate this inadequacy.

7.3 Voyage planning

The BSU recommends that the operator of MSC ILONA specify in its voyage planning procedure how the available information important for safe passage of the vessel are to be entered clearly in all appropriate charts and that it should be constantly available for the Nautical Officer of the watch.

8 Sources

- Investigations of the Korean Maritime Safety Tribunal (KMST)
- Written declarations/comments by the
  - Commands of the vessels and the
  - Vessel operators
- Questioning of witnesses on the spot by the BSU
- Vessel data from the Federal Maritime and Hydrographic Agency (BSH)
- Official weather expertise by Germany's National Meteorological Service (DWD)
- Radar records by the Vessel Traffic Services Hong Kong (MarDep Hong Kong)
- Photo of the vessel MS HYUNDAI ADVANCE – Photo Hasenpusch

9 Annex

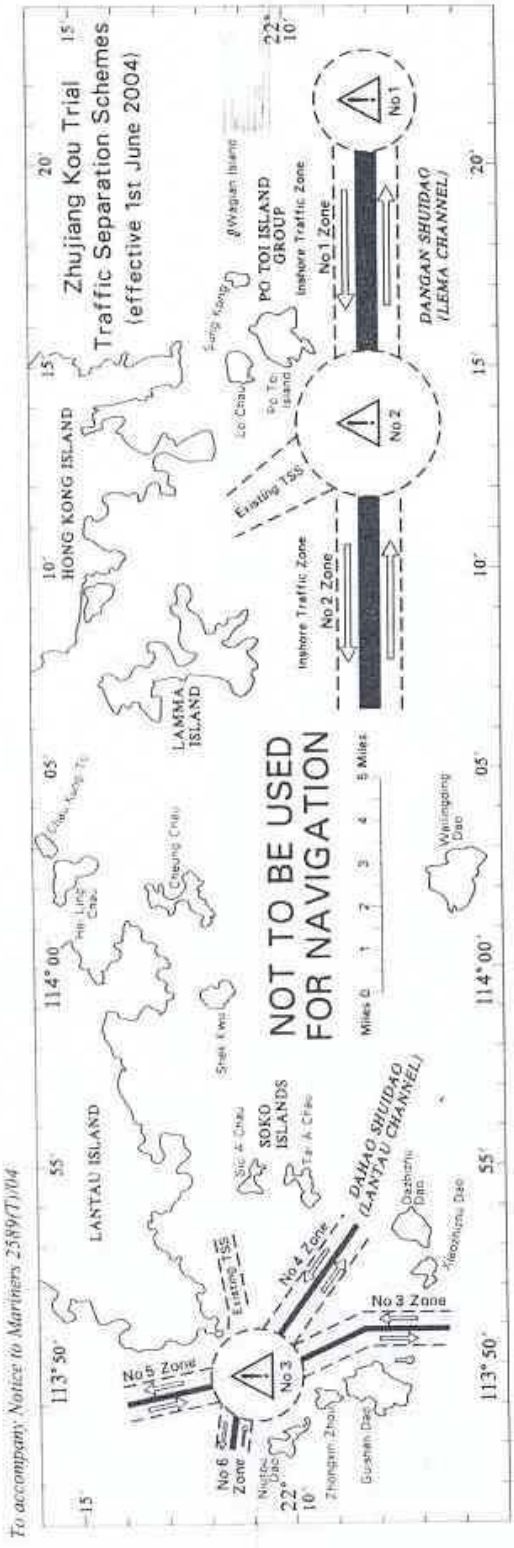
NtM 2589(T)/04

II

2589(T)/04 CHINA - South Coast - Zhujiang Kou - Dangan Shuidao (Lema Channel) and Dahao Shuidao (Lantau Channel) - Traffic separation schemes. Precautionary areas.

Source: Hong Kong Marine Department Notice 32/04

1. Mariners are advised that from 1st June 2004 the following Traffic Separation Schemes have been established by the Maritime Safety Agency of China in Zhujiang Kou for a trial period of 12 months. The schemes are shown in the accompanying diagram.



To accompany Notice to Mariners 2589(T)/04