



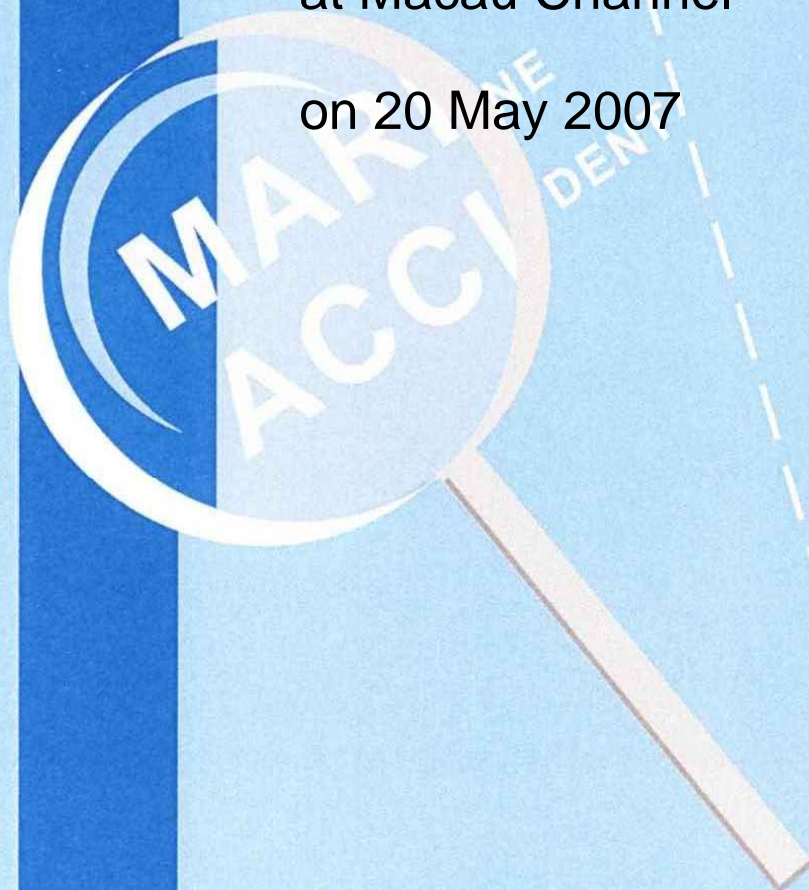
Report of Investigation  
into the Groundings of the  
Hong Kong Registered  
High- Speed Craft

*Universal Mk 2008 &*

*Universal Mk 2010*

at Macau Channel

on 20 May 2007





## **Purpose of Investigation**

This incident is investigated, and published in accordance with the IMO Code for the Investigation of Marine Casualties and Incidents promulgated under IMO Assembly Resolution A.849(20). The purpose of this investigation conducted by the Marine Accident Investigation and Shipping Security Policy Branch (MAISSPB) of Marine Department is to determine the circumstances and the causes of the incident with the aim of improving the safety of life at sea and avoiding similar incident in future.

The conclusions drawn in this report aim to identify the different factors contributing to the incident. They are not intended to apportion blame or liability towards any particular organization or individual except so far as necessary to achieve the said purpose.

The MAISSPB has no involvement in any prosecution or disciplinary action that may be taken by the Marine Department resulting from this incident.

## Table of Contents

	Page
1 Summary	1
2 Description of the Vessel	2
3 Sources of Evidence	4
4 Outline of Events	5
5 Analysis of Evidence	8
6 Conclusions	13
7 Recommendations	14
8 Submissions	14

## Summary

- 1.1 At about 1144 on 20 May 2007, the Hong Kong registered high speed craft *Universal Mk 2008* with 131 passengers on board ran aground at approximate position 22°11.01'N, 113°34.60'E near light beacon no. DN2 on the north breakwater of Macau Channel. The vessel had just departed from Macau and was bound for Hong Kong. About one minute later i.e. 1145, another Hong Kong registered high speed craft *Universal Mk 2010* with 243 passengers on board ran aground nearby at approximate position 22°10.86'N, 113°34.82'E at the end of the north breakwater of Macau Channel. The vessel departed from Hong Kong and had just entered the Macau Channel. The weather was cloudy and squally. The visibility was poor with heavy showers. There was no casualty and oil pollution resulting from the groundings. *Universal Mk 2008* sustained damages with water ingress into port fore peak tank and port and starboard T-foil tanks while *Universal Mk 2010* sustained damages with water ingress into No. 2 and No. 4 void compartments on the port side and No. 5 void compartment (engine room) on the starboard side.
  
- 1.2 The investigation revealed that the accident was caused by the failure of both Masters to closely monitor the vessel's positions in squally weather conditions. The Masters should have reduced the speed appropriate to the prevailing visibility situation when navigating in a narrow channel.

## 2. Description of the Vessels

### 2.1 *Universal Mk 2008* (宇航二〇〇八)

Call Sign	:	VRVL8
Port of Registry	:	Hong Kong
IMO No.	:	9139220
Type	:	High Speed Passenger Craft
Length	:	47.5 m
Breadth	:	11.8 m
Moulded Depth	:	4.8 m
Gross Tonnage	:	609
Year of Built	:	1997
Engine	:	2 x TARUS 60 Solar Gas Turbine
Engine Power	:	2 x 5,250 kW
Service speed	:	42 knots
Maximum no. of passengers	:	333
No. of crew permitted	:	15

2.1.1 *Universal Mk 2008* is an aluminum alloy high speed passenger craft. It was built with 2 sets of water jet propulsion unit cruising at a maximum speed of 42 knots.

2.1.2 The vessel is equipped with navigational equipment consisting of two radars, two sets of VHF DSC radiotelephone, GPS, AIS, electronic chart, gyro and magnetic compass.



Figure 1 – Photograph of *Universal Mk 2008*

## 2.2 *Universal Mk 2010 (宇航二〇一〇)*

Call Sign	:	VRBJ3
Port of Registry	:	Hong Kong
IMO No.	:	9182538
Type	:	High Speed Passenger Craft
Length	:	47.5 m
Breadth	:	11.7 m
Depth	:	4.8 m
Gross Tonnage	:	575
Year of Built	:	1997
Engine	:	2 x TARUS 60 Solar Gas Turbine
Engine Power	:	2 x 5,149 kW
Service speed	:	42 knots
Maximum no. of passengers	:	328
No. of crew permitted	:	15

2.1.1 *Universal Mk 2010* is an aluminum alloy high speed passenger craft. It was built with 2 sets of water jet propulsion unit cruising at a maximum speed of 42 knots.

2.1.2 The vessel is equipped with navigational equipment consisting of two radars, two sets of VHF DSC radiotelephone, GPS, AIS, electronic chart, gyro and magnetic compass.



Figure 2 – Photograph of *Universal Mk 2010*

**3. Sources of Evidence**

3.1 Masters, Chief Officers and Chief Engineers of *Universal Mk 2008* and *Universal Mk 2010*;

3.2 Macau Maritime Administration; and

3.3 Shun Tak – China Travel Ship Management Limited.

## 4. Outline of Events

### 4.1 Account of *Universal Mk 2008*

- 4.1.1 At about 1135 on 20 May 2007, the High Speed Craft (HSC) *Universal Mk 2008* departed from Macau to Hong Kong with 131 passengers and 10 crew members on board. The journey would take about one hour at a normal cruising speed of 42 knots. The weather was rainy with a visibility of about 0.5 nautical mile (n.m.). The radar range was set to 0.5 n.m.. Four crew members consisted of the Master, Chief Officer, Chief Engineer and a deck cadet were on the bridge. The Master who was in command was steering the vessel using the control levers. The Chief Officer was seated on the port side of the Master keeping a visual lookout and radar watch. The Chief Engineer was seated behind the Master and Chief Officer monitoring the machinery console. The deck cadet was seated next to the Chief Engineer performing a lookout duty.
- 4.1.2 At about 1136, a tug STDM 39 was observed proceeding outbound and the Master instructed the Chief Engineer to request permission from Macau VTS to overtake the tug. At 1138, permission was granted by Macau VTS to overtake the tug. *Universal Mk 2008* made radio (VHF) contact with STDM 39 which confirmed that *Universal Mk 2008* could overtake on her port side.
- 4.1.3 At about 1142, the Master increased the speed of the vessel to overtake the tug quickly in order to keep clear of the inbound *Universal Mk 2010* which had reported entry into Macau Channel. When *Universal Mk 2008* approached the tug's port quarter, she experienced rainsquall and visibility rapidly deteriorated to almost zero. The Master slowed down the engine instantly and altered course to port from 125°T to 110°T to keep clear of STDM 39.
- 4.1.4 At about 1143, when the Master observed a black line (later known as Northern Breakwater) on the port bow, he put both engines on full astern in order to stop the vessel. At 1144, the vessel went aground in the vicinity of Northern Breakwater Light Beacon DN2. At 1145 the Master reported the grounding to the Macau VTS. There was no injury from the grounding.
- 4.1.5 From 1146 to 1158, all tanks were inspected and it was found that both T-foil tanks had been flooded. Master requested tug assistance from Macau VTS to re-float the vessel but no tug was available. From 1159 to 1203, the Master attempted to re-float the vessel by using both main engines to go astern but

was unsuccessful. At 1204, starboard main engine had an auto shut down and failed to be re-started.

- 4.1.6 At 1208, a rescue tug arrived at the scene and attempted to re-float *Universal Mk 2008* but was unsuccessful. At 1236 two more rescue tugs arrived to assist the re-float of *Universal Mk 2008*. At 1248 the vessel was re-floated and towed to Macau Ferry Terminal. At 1327, the vessel was secured to First Ferry Pontoon No. 21 where all passengers were disembarked and unhurt.

## **4.2 Account of *Universal Mk 2010***

- 4.2.1 At about 1050 on 20 May 2007, the High Speed Craft (HSC) *Universal Mk 2010* departed from Hong Kong to Macau with 243 passengers and 10 crew members on board. The journey would take about one hour at a normal cruising speed of 42 knots. Four crew members consisted of the Master, Chief Officer, Chief Engineer and a chief officer trainee were on the bridge. After passing Green Island, the Chief Officer was steering the vessel using the control levers. The Master was seated on the starboard side of the Chief Officer keeping a visual lookout and radar watches. The Chief Engineer was seated behind the Master and Chief Officer monitoring the machinery console.
- 4.2.2 At about 1140, the Master took over the control of the vessel from the Chief Officer and steered the vessel. At 1141, the vessel passed Macau sea buoy and the visibility was substantially decreased due to rain squall. Targets on radar were badly obscured by heavy rain clutters. The vessel was put on a course of 305°T to line up with the Macau Channel.
- 4.2.3 At about 1144, when observing that the silhouette of a crossing vessel (later known as grounded vessel *Universal Mk 2008*) bore fine on the starboard bow, the Master stopped and reversed the engines. At 1145, the vessel did not respond to the command and noise was heard from ship's bottom. The Master attempted to put the engines astern with ship's power but was unsuccessful. Both engines had an auto shut down and unable to be re-started.
- 4.2.4 At about 1146, the vessel was found aground in the vicinity of Northern Breakwater Light Beacon DN1. The Master reported the grounding to Macau VTS and requested tug assistance. Chief Engineer was instructed to assess the damage and it was found that no. 2 port, 4 port and 5 starboard void compartments were damaged.

4.2.5 At 1150, all passengers were asked to don lifejackets as a safety precaution. At 1152 a rescue tug arrived and made fast to the vessel. At 1220, the vessel was re-floated with tug assistance. At 1224, the vessel was towed by two rescue tugs to Macau Ferry Terminal. At 1308, vessel was secured alongside to Macau Ferry Terminal No. 1 Berth where all passengers were disembarked and unhurt.

### **4.3 Account of STD M 39**

4.3.1 At about 1136 on 20 May 2007, STD M 39 departed from Macau Ferry Terminal in Macau and proceeded towards Macau Channel. At 1139, STD M 39 received a request from *Universal Mk 2008* to overtake her. Agreement by STD M 39 and approval by the Macau VTS were granted. It was raining and the visibility was about 0.5 n.m.

4.3.2 After passing under the bridge, STD M 39 navigated along the starboard side of the Macau Channel on a course between 125°T to 130°T with a speed of about 8 to 9 knots. After passing the BF light buoy, the rain became much heavier and the visibility was reduced to about 0.2 n.m.

4.3.3 When *Universal Mk 2008* had overtaken STD M 39 and was about 150 metres ahead of the latter vessel, STD M 39 gave a warning to *Universal Mk 2008* on the VHF that *Universal Mk 2008* was heading towards the north breakwater. There was no response from *Universal Mk 2008* which had later run aground near light beacon DN 2 on the north breakwater.

## **5. Analysis of Evidence**

Although there is no direct relationship between the two grounding incidents, the two cases are incorporated into one investigation report because both incidents occurred at almost the same location and time and the vessels are same type of vessels.

### **5.1 Certification and Experience of Personnel**

5.1.1 The masters of both vessels hold a valid Certificate of Competency as Master for vessels plying within the river trade area and a valid type rating certificate as a master on FBM 45M TRICAT vessels. The Master of *Universal Mk 2008* has been working on board HSC (High-speed craft) plying Hong Kong and Macau as Chief Officer for about 6 years and has been a Master for about 1.5 years. The Master of *Universal Mk 2010* has been working on board HSC (High-speed craft) plying Hong Kong and Macau as Chief Officer for about 26 years and has been a Master for about 5 years.

5.1.2 The Chief Officer of *Universal Mk 2008* holds a valid Certificate of Competency as Master for vessels plying within the river trade area and the Chief Officer of *Universal Mk 2010* holds a valid Certificate of Competency as Chief Mate for vessels plying within the river trade area. Both the chief officers hold a valid type rating certificate as a chief officer on FBM 45M TRICAT vessels and have been working on board HSC plying Hong Kong and Macau as Chief Officer for about 7 years.

5.1.3 It was considered that the operating personnel of both vessels were properly certificated with appropriate experiences.

### **5.2 Certification of the vessels in collision**

5.2.1 The statutory trading certificates of both vessels were valid and issued by the Marine Department of the Hong Kong Special Administrative Region.

### **5.3 Weather and Visibility**

5.3.1 According to the Macau Observatory, the weather on 20 May 2007 was cloudy, squally with showers.

5.3.2 Thunderstorm warning was issued by the Macau Observatory at 0810 on 20 May 2007 and the warning was cancelled at 1245 on the same day.

### **5.4 Working conditions of radars**

5.4.1 The working performance of all the radars was checked after the accident. It was found that all the radars were working properly.

### **5.5 Actions taken by *Universal Mk 2008***

5.5.1 According to the record of the VTS system of Macau Maritime Administration, after departing Macau Ferry Terminal in Macau at 1135 and passing under the Ponte da Amizade bridge at about 1141, *Universal Mk 2008* was initially steaming along the Macau Channel on a course of 123°T with a speed of about 19 knots (Figure 3). The speed was later reduced to 9 knots and then increased to 34 knots at 1143 until the time of grounding.

5.5.2 At 1141, *Universal Mk 2008* altered course from 123°T to starboard to 138°T and then to port to 117°T at 1142 until the vessel struck the breakwater at 1143.

#### Lookout and Watchkeeping

5.5.3 Both the Master and Chief Officer were keeping a visual and radar lookout on the bridge. They could observe STDM 39 visually before overtaking the tug. However, the visibility deteriorated suddenly during the period of overtaking by *Universal Mk 2008* due to heavy showers. In this connection, they could not observe the tug STDM 39 and breakwater visually and on the radars. Although the vessel was installed with both a X-band (3-cm) radar and a S-band (10-cm) radar, the targets on both radars were obscured by rain clutter. It is suspected that the radars had not been tuned properly before sailing.

### Speed of vessel

- 5.5.4 Although the Master claimed that the vessel was crash-stopped to arrest the headway at 1143, the VTS system of Macau Maritime Administration recorded that *Universal Mk 2008* had attained a speed of about 34 knots and there was no reduction of speed just before hitting the breakwater at 1144. Under a raining situation, the visibility is inversely proportional to the speed of the vessel i.e. the visibility will be improved when the speed of vessel is reduced due to the reason that the number of raindrops falling on the window will be less when the speed of the vessel is reduced. As *STDM 39* travelled at a much slower speed of about 10 knots, the Master of the tug could observe the breakwater visually and he warned *Universal Mk 2008* on the VHF that the latter vessel was heading towards the breakwater.

## **5.6 Actions taken by *Universal Mk 2010***

- 5.6.1 According to the record of the VTS system of Macau Maritime Administration, after passing the Macau Light Buoy No. 1 at 1142 on her starboard side, *Universal Mk 2010* altered course to starboard to 304°T with a speed of about 40 knots (Figure 3).
- 5.6.2 At 1143, *Universal Mk 2010* altered course to starboard and the course was on 310°T when striking the breakwater at 1145. The Master was probably confused and in doubt whether his vessel was in the proper inbound lane of the channel when he saw the silhouette of the grounded *Universal Mk 2008* ahead. Therefore, he altered course to starboard trying to pull the vessel to his supposed proper lane of the channel. The speed was reduced at 1143 and it was 19 knots when hitting the breakwater.

### Lookout and Watchkeeping

- 5.6.3 Both the Master and Chief Officer were keeping a visual and radar lookout on the bridge but due to heavy showers, they only observed the silhouette of the grounded *Universal Mk 2008* visually at 1144. The vessel was installed with two X-band (3-cm) radars and the targets on both radars were obscured by rain clutter. The X-band radar uses a wavelength of 3 cm. Radiation on this wavelength does not penetrate as good as S-band (3cm) through rain showers and causes more sea echoes.

### Speed of vessel

- 5.6.4 Although the Master claimed that the engine was substantially reduced at 1141 when the visibility deteriorated due to squally weather, the VTS system of Macau Maritime Administration recorded that *Universal Mk 2010* still had a speed of about 40 knots and the speed started to reduce at about 1143. As visibility will improve with reduction of speed of the vessel, the grounded *Universal Mk 2008* and breakwater could have been observed visually had *Universal Mk 2010* reduced her speed substantially when the visibility deteriorated at 1141.

## **5.7 Movement of Tug STDM 39 and other traffic**

- 5.7.1 Tug STDM 39 sailed along the starboard side of the outbound lane of Macau Channel on an initial course of about 130°T and 142°T later with an average speed of about 10 knots. Its movement should not have caused any concern to *Universal Mk 2008* and *Universal Mk 2010*.
- 5.7.2 There was no other traffic in the area when the groundings took place.



## **5.8 Fatigue and alcohol impairment**

- 5.8.1 There was no evidence to suggest that alcohol or drugs were taken by any of the officers involved in the groundings.
- 5.8.2 The groundings took place in daylight and the duty roster of the officers indicated that they should have sufficiently rested at night. Therefore fatigue was not an issue in this accident.

## **6. Conclusions**

- 6.1 At about 1144 on 20 May 2007, the Hong Kong registered high speed craft *Universal Mk 2008* ran aground at a position 22°10.89'N, 113°34.73'E near light beacon no. DN2 on the north breakwater of Macau Channel. About one minute later i.e. 1145, another Hong Kong registered high speed craft *Universal Mk 2010* ran aground nearby at a position 22°10.93'N, 113°34.87'E at the end of the north breakwater of Macau Channel. There was no casualty and oil pollution resulting from the groundings.
- 6.2 At the time of the accident, the weather was cloudy and squally and the visibility was poor in heavy showers.
- 6.3 *Universal Mk 2008* sustained damages on port fore peak tank and port and starboard T-foil tanks while *Universal Mk 2010* sustained damages on No. 2 and No. 4 void compartments on the port side and No. 5 void compartment (engine room) on the starboard side. There was no oil pollution and no casualty reported.
- 6.4 The accident was caused by the failure of both Masters to closely monitor the vessel's positions in squally weather conditions. The Masters should have reduced the speed of the vessel appropriate to the visibility situation to allow more time to ascertain the vessel's position when navigating in a narrow channel.

## **7. Recommendations**

- 7.1 A copy of the report should be sent to the Macau Maritime Administration for their information.
- 7.2 A copy of the report should be sent to the owners and Masters of *Universal Mk 2008* and *Universal Mk 2010* drawing their attention of the findings. The Masters should be urged to closely monitor the vessel's position in restricted visibility and vessels should be slowed down to allow more time to assess the situation. The Masters will be reminded to tune the radars properly before departing from berths.

## **8. Submissions**

- 8.1 In the event that the conduct of any person or organization is commented in an accident investigation report, it is the policy of the Marine Department to send a copy of the draft report to that person or organization for their comments.
- 8.2 The relevant parts of the final draft of the report were sent to the following:  
  
Master of *Universal Mk 2008*  
Master of *Universal Mk 2010*
- 8.3 No submissions were received from the Masters of *Universal Mk 2008* and *Universal Mk 2010*.