Marine Safety Investigation Unit

Transport Malta

SAFETY INVESTIGATION REPORT

201512/038 REPORT NO.: 22/2016 December 2016

This safety investigation has been conducted with the assistance and cooperation of the Ship Investigation Department of the Maritime and Port Authority of Singapore and the Marine Department SAR of Hong Kong, China.

MV *SHIBUMI*
Collision with MV *Sam Wolf*
In the Singapore Straits' TSS
23 December 2015

SUMMARY

On 23 December 2015, the bulk carriers *Shibumi* and *Sam Wolf* collided in the Eastbound Deep Water Route of Singapore Straits TSS. At the time of the collision, the weather was fine with visibility of up to eight nautical miles. The collision occurred shortly after *Shibumi* had passed Buffalo Rock Buoy and altered course to starboard in accordance with her documented voyage plan. *Sam Wolf*, which was on passage in the West-bound traffic lane, altered course to port and entered the Eastbound traffic lane.

The safety investigation concluded that the immediate cause of the accident was ineffective radio watch and communication between the two vessels.

On the basis of the actions already taken by TMS Dry Ltd., the MSIU has not issued any safety recommendations.

MV *Shibumi*

FACTUAL INFORMATION

Vessels

The Maltese registered *Shibumi* is a 91373 gt, dry-bulk carrier, owned by Kingswood Marine S.A., Marshal Islands and managed by TMS Dry Ltd. of Greece. The vessel was built by Shanghai Waigaoqiao Shipbuilding Co. Ltd, China in 2010, and is classed by American Bureau of Shipping. The vessel has a length overall of 292.0 m and an extreme breadth of 45.1 m. *Shibumi* has a summer deadweight of 178,090 tonnes.

Propulsive power is provided by a 6-cylinder MAN B&W 6S70MC, two-stroke, single acting, producing 16,860 kW. This drives a fixed pitch propeller at 91 rpm to give a service speed of about 14.0 knots.

The Hong Kong registered motor vessel *Sam Wolf* is a 31760 gt, dry bulk carrier, owned by Sam Wolf Inc. and managed by Shipping Asset Management SAM of Switzerland. The vessel was built by STX Offshore and Shipbuilding Co. Ltd., South Korea, in 2012 and is classed with Bureau Veritas. *Sam Wolf* has a length overall of 190.0 m, a beam of 32.3 m and a summer deadweight of 57,200 tonnes.

Propulsive power is provided by a 6-cylinder MAN B&W 6S60MC-C, two-stroke, single acting, producing 9,480 kW at 127 rpm. This drives a fixed pitch propeller to give a service speed of about 14.50 knots.

Crew members on *Shibumi*

At the time of the accident, *Shibumi* was manned by 21 crew members. The master and chief engineer were Greek nationals. The remaining officers and the ratings were from the Philippines. The working language on board was English. The crew compliment was in accordance with the Minimum Safe Manning Document issued by the flag State Administration.

Environmental conditions

The weather in the vicinity of Buffalo Rock, TSS Singapore Strait, was fine and clear. The visibility was eight nautical miles. The wind was light and the sea was calm. The air temperature was 22° C.

Narrative[1]

Shibumi sailed from Port Cartier, Canada, on 04 November 2015, loaded with 151,699 tonnes of iron ore. She was bound for Pohang, South Korea, *en route* Singapore for bunkers.

During the early hours of 23 December 2015, *Shibumi* was transiting the Singapore Straits TSS. She had an even keel and a draft of 16.50 m. The vessel was scheduled to arrive at the Eastern pilot boarding ground (PBG) 'B' at 0530. Traffic information concerning her transit through the Eastbound Deep Water Route was being broadcast by the Singapore VTIS.

At 0400, the second mate handed the navigation watch over to the chief mate but remained on the bridge to assist the bridge team. The master had the con and an AB was at the helm. At 0418, *Shibumi* was set on course 037° (T) for the next waypoint, Northwest of Buffalo Rock Buoy (Figure 1).

The navigation system on board indicated a tidal height of 1.20 m at Raffles Lighthouse. A surface current in the direction of 264° was flowing at 0.30 nm. *Shibumi* was making good a course over the ground of 034.8° and speed over the ground of 9.70 knots.

[1] Unless otherwise stated, all times are ship's time (UTC +8).

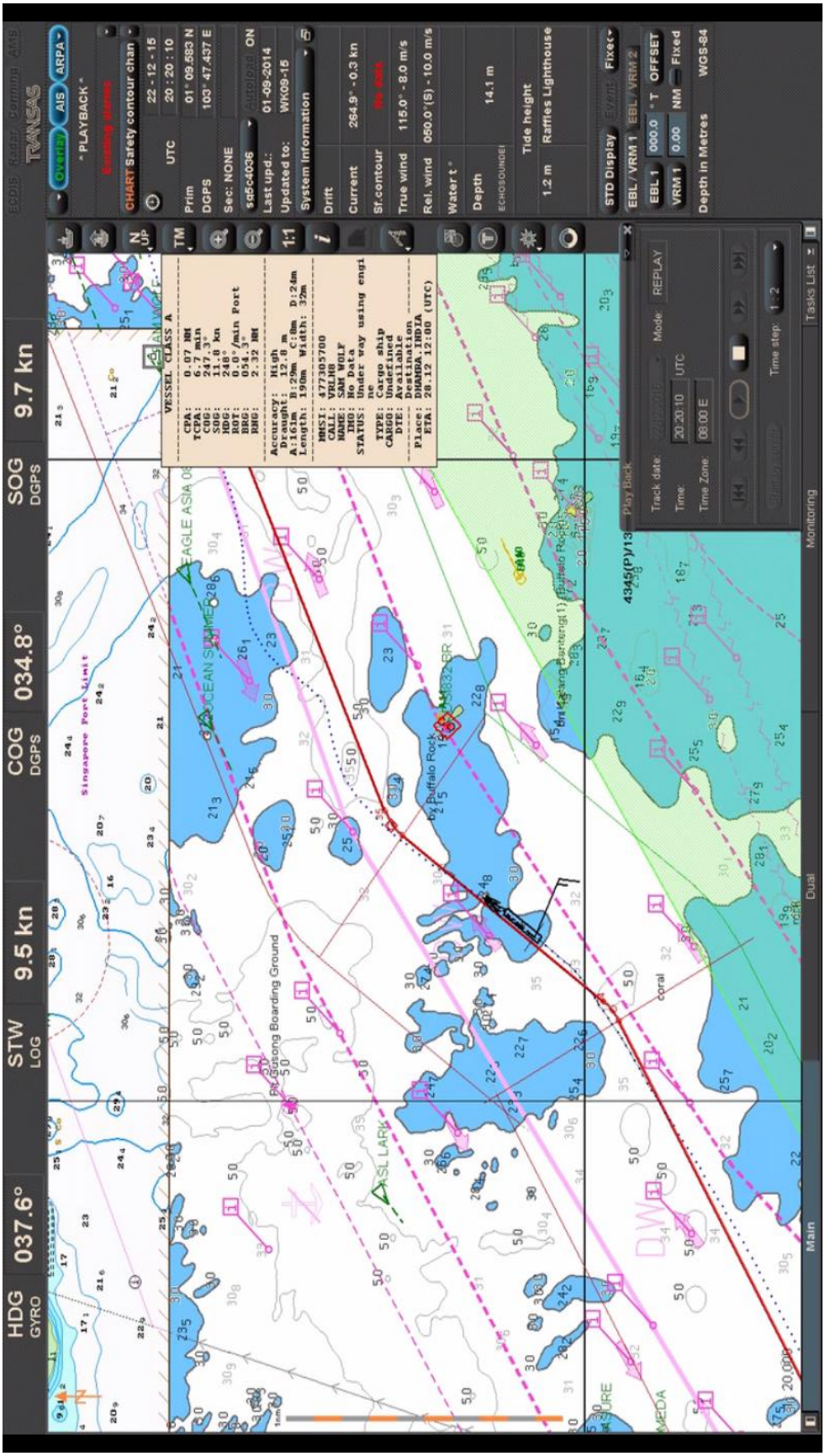

Figure 1: ECDIS image at 0420 showing CPA and TCPA of *Sam Wolf*

Sam Wolf, which was two points on *Shibumi*'s starboard bow, was bearing 054.3° and range 2.33 nm. Bound for a port in India, she was steering 248° in the Westbound traffic lane. Her speed over ground was 11.8 knots.

On reaching Buffalo Rock Buoy at 0424, *Shibumi* initiated a starboard turn for her next planned course 067° (T). At about the same time, *Sam Wolf*, which was less than a mile from *Shibumi*, altered her course to port and headed across the path of *Shibumi* in the Eastbound traffic lane (Figure 2).

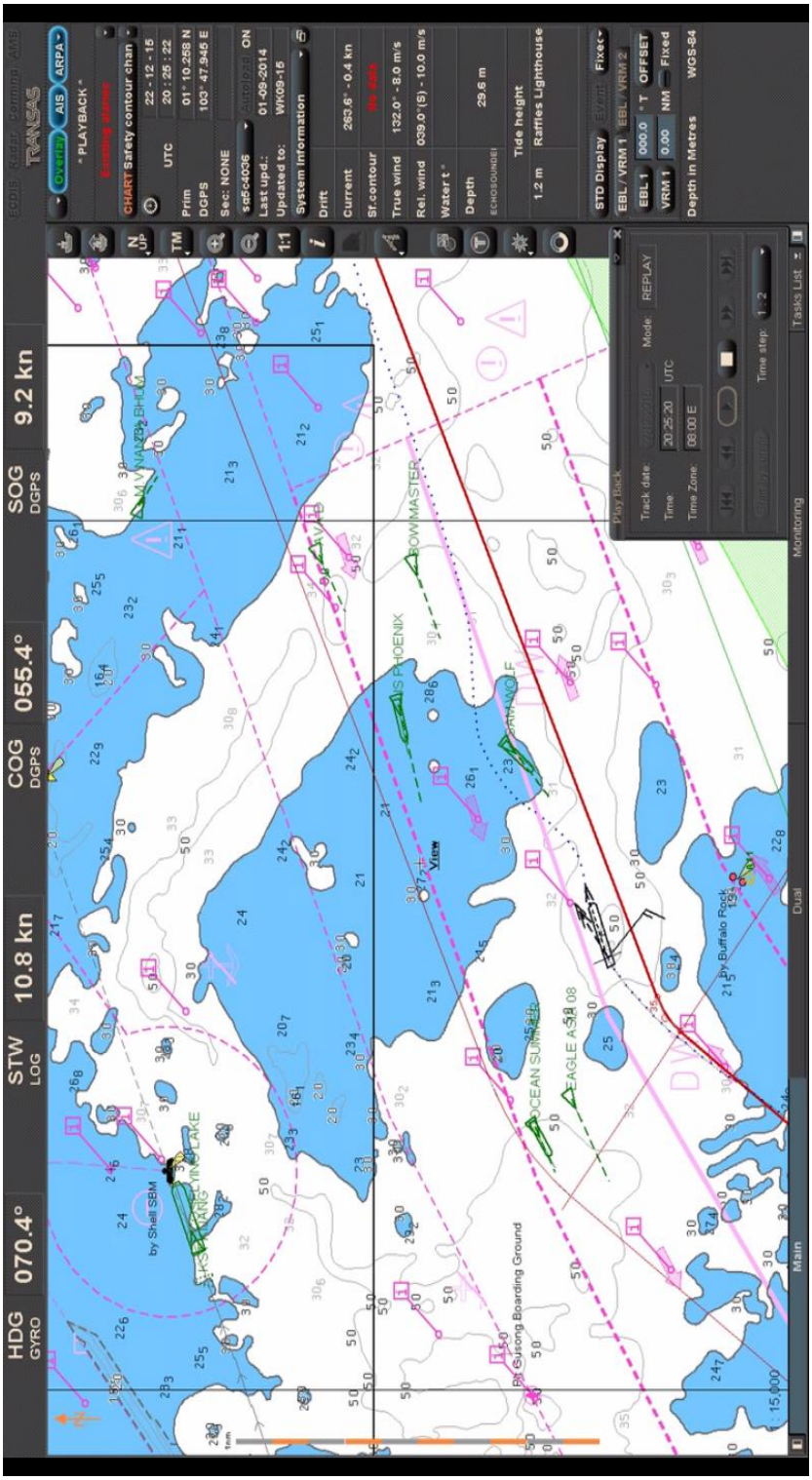

Figure 2: ECDIS image at 0425 - *Sam Wolf* crossing TSS separation line

Shibumi's master called *Sam Wolf* by VHF radio, however, there was no response. Singapore VTIS responded advising *Sam Wolf* to keep clear and navigate within the Westbound traffic lane. *Sam Wolf*, however, was observed maintaining her course to port and at 0425 crossed the TSS separation line (Figure 2). By then, both vessels were very close and a collision was imminent.

The master on *Shibumi* ordered the wheel hard over to port to minimise the impact of the collision. At 0426/50s *Shibumi*'s starboard bow scraped *Sam Wolf*'s starboard quarter. The collision occurred in position 01° 10.32´ N 103° 48.14´ E, in the Eastbound Deep Water Route of TSS Singapore Straits (Figure 3).

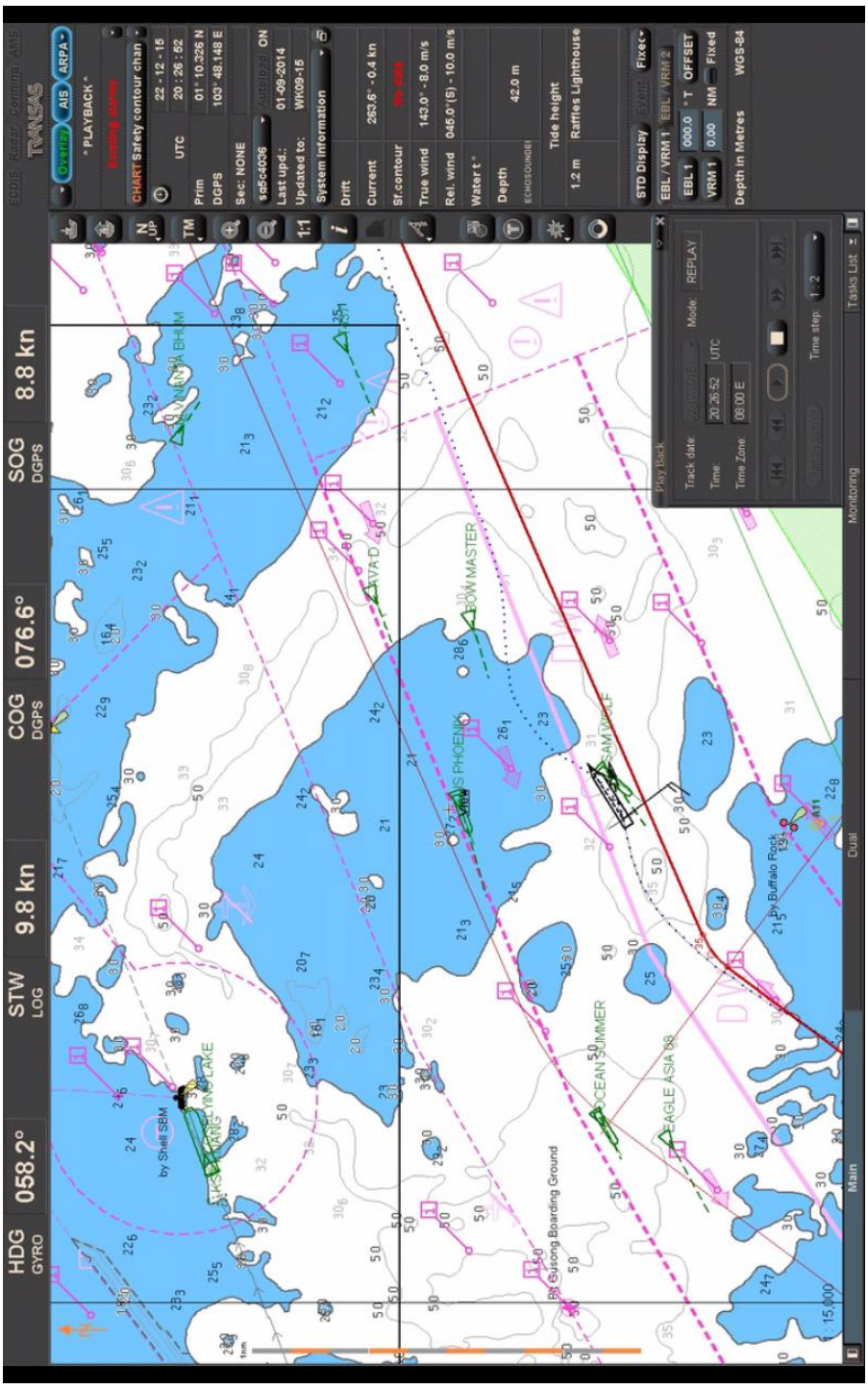

Figure 3: ECDIS image at 0426/50s, showing position of collision

Structural damages
A damage survey report, compiled by the attending Class surveyor on board *Shibumi* referred to a number of indentations on the vessel's starboard bow shell plating, deformed frames, brackets and stiffeners in way of bosun store, topside tank no. 1, void space and starboard bulwark. All structural damages were above the waterline

Records of the structural damages sustained by *Sam Wolf* were not received by the MSIU.

Events following the collision
The master on board *Shibumi* reported the collision to Singapore VTIS. The vessel was instructed to drop anchor off Singapore port limits. Crew members inspected the area, verifying that that was no water ingress. Meanwhile, *Sam Wolf* had re-joined the Westbound traffic lane and resumed her voyage. Following the collision, no communication was exchanged between *Sam Wolf* and *Shibumi*.

ANALYSIS

Aim
The purpose of a marine safety investigation is to determine the circumstances and safety factors of the accident as a basis for making recommendations, and to prevent further marine casualties or incidents from occurring in the future.

Cooperation
During the course of this safety investigation, the MSIU received all the necessary assistance and cooperation from the Ship Investigation Department of the Maritime and Port Authority of Singapore and the Marine Department SAR of Hong Kong, China.

However, several requests for information to the managers of *Sam Wolf* remained unanswered. Therefore, neither the factual nor the analysis part of this safety investigation report is being considered comprehensive enough to provide a detailed understanding of the accident dynamics.

Fatigue
Although *Shibumi*'s master had been on the bridge since midnight, his daily rest periods of 12 hours and the minimum 77 hours rest in the preceding seven days were in compliance with the STCW Convention requirements. The rest/work record of the chief mate, second mate and AB were also found in accordance with the requirements. Moreover, the safety investigation did not identify behavioural patterns which would suggest the influence of fatigue.

Fatigue was therefore not considered to be a contributing factor on *Shibumi*.

With respect to *Sam Wolf*, the MSIU did not have access to records of 'Hours of Work and Rest' of the bridge team and therefore was unable to determine whether these were within the time frames stipulated in international requirements.

Drug and alcohol test
Evidence submitted to the MSIU shows that almost immediately after the collision, *Shibumi*'s master carried out an alcohol test to all the bridge team members, *i.e.* the master, chief mate, second mate, AB and crew members who were on duty in the engine-room.

The MSIU is unaware whether similar tests were carried out on *Sam Wolf*.

Interpretation of the events leading to the collision
Key navigational information taken from Singapore VTIS data and *Shibumi*'s ECDIS is shown in Table 1.

Table 1: Key navigational information

Local Time	Shibumi			Sam Wolf					Observations
	Heading	SOG	COG	SOG	Range	Bearing	CPA	TCPA	
hh mm ss	°	Knot	°	Knot	nm	°	nm	minute	
04 16 16	059.1	10.2	249.3	11.6	3.69	056.3	0.45	10.1	Shibumi on charted course 061°(T)
04 18 00	052.1	10.0							Shibumi altered course from 061°(T) to 037°(T)
04 19 44	038.8	9.7	247	11.8	2.47	054.3	0.01	7.1	
04 20 10	037.6	9.7	247.3	11.8	2.32	054.3	0.07	6.7	
04 24 00									Shibumi altered course for 067°(T) Sam Wolf changing course to port
04 25 00	070.4	9.2							Sam Wolf crossing TSS separation line into the east-bound traffic lane
04 26 50	058.2	8.8							Collision in east-bound Deep Water Route, position 01° 10.325´ N 103° 48.143´ E

Between 0418 and 0424, *Shibumi* was on a charted course of 037° (T). On *Shibumi*'s ECDIS display, the course 037° appears oblique to the direction of traffic flow. The passing distance (or CPA) to *Sam Wolf* which, on the previous course of 061° was 0.45 nm, had now been reduced to between 0.01 nm and 0.07 nm, with a TCPA of seven minutes[2] (Figure 2).

[2] The CPA and TCPA are the functions of planned tracks and combined speeds of the two vessels.

Moreover, the direction and aspect of *Shibumi* appeared to be crossing the TSS and which had (very likely) influenced the decisions made by *Sam Wolf*'s OOW. Less than a mile and closing on a steady bearing, *Sam Wolf* altered her course to port without warning or querying the intention of *Shibumi*; apparently in an attempt avoid colliding with *Shibumi*.

Indeed, the master of *Sam Wolf* acknowledged that his OOW had altered course to port because *Shibumi* was crossing the traffic lane. Furthermore, he stated that midway in her crossing of the traffic separation scheme, *Shibumi* changed her course to starboard[3].

Unaware of the developments on board *Sam Wolf*, *Shibumi* altered her course to starboard to keep with her voyage plan within the Deep Water Route, which coincided with *Sam Wolf*'s manoeuvre. *Shibumi*'s VHF radio calls were not answered and Singapore VTIS advice to *Sam Wolf* to keep clear of *Shibumi* and maintain transit in the Westbound lane was not followed up.

Whilst the manoeuvre by *Sam Wolf* may be interpreted as a manoeuvre in accordance with COLREGs rule 17(a)(ii)[4], the alteration of course to port may have created further confusion as it was not in accordance with rule 17(c)[5].

[3] It appears that the master and the OOW were not aware of the traffic information broadcasts by Singapore VTS, advising *Shibumi*'s transit in the East-bound traffic lane.

[4] In accordance with COLREGs Rule 17(a)(ii), a stand-on vessel may take action by her manoeuvre alone to avoid a collision as soon it becomes apparent that the give-way vessel is not taking any action.

[5] COLREGs Rule 17(c) states that
A power-driven vessel which takes action in a crossing situation in accordance with subparagraph (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.

The MSIU is not aware whether *Sam Wolf* was constrained to reduce or stop engine or alter course to starboard.

Use of VHF radio in collision avoidance

The navigation SMS procedures on *Shibumi* did not specifically address the use of VHF radio, other than to record ship-to-ship communication whenever the VHF radio was used for anti-collision purposes.

At sea, although the VHF radio is often used to either clarify a vessel's movements or intentions, its use for collision avoidance is generally discouraged as it may, *inter alia*, distract the OOW from his duties on the bridge[6].

The MSIU is of the opinion that in this case, the VHF radio could have been used at an early stage to clarify uncertainty and ensure a uniform mental model of the circumstances rather than at a later stage of the dynamic process.

Sound signals

The COLREGs require vessels in sight of one another and manoeuvring to sound signals by whistle. A vessel which is in doubt of whether action is being taken by the other to avoid collision should sound at least five short and rapid blasts, which may be supplemented by a light signal. The MSIU did not have evidence which suggested that *Sam Wolf* used sound signals as prescribed in Rule 34 of the COLREGs.

Assistance following the collision

Following the collision, *Shibumi* dropped her anchor in a safe anchorage as requested by Singapore VTS. *Sam Wolf* continued with her voyage at a reduced speed, without requesting any assistance.

Communication

As indicated elsewhere in this safety investigation report, communication between the two vessels (whether by VHF radio or some other means), was lacking. Communication, which is a vehicle for information exchange, is a core activity for decision-making and other related activities, such as situation awareness. The main issue, which was critical in the way the accident evolved, was the lack of communication leading to no information sharing and lack of common understanding of the prevailing context.

The two OOWs (and not even with the intervention of the VTIS), did not manage to communicate their respective mental models – the sharing of situation awareness. The materialisation of this accident was a clear indication that the context did not allow the OOWs to assess the state and adjust the performance before the matter was impossible to control.

Lack of communication had a much broader effect on the coordination of the event. Coordination, which depends on (efficient) communication between persons (the OOWs in this case) who have to control a dynamic system, had been compromised.

Timely communication (and coordination) was crucial because similar to other complex situations, it is not always possible to control the situation by means of prepared plans and regulations alone.

[6] Guidance given in the Bridge Procedures Guide (Fifth Edition, 2016) published by the International Chamber of Shipping (ICS) states:

VHF radio should not be used for collision avoidance purposes. Valuable time can be wasted attempting to make contact since positive identification may be difficult and, once contact has been made, misunderstandings may arise.

CONCLUSIONS

1. The direction and aspect of *Shibumi* appeared to be crossing the TSS and had (very likely) influenced the decisions made by *Sam Wolf's* OOW;

2. In all probability, the OOW on *Sam Wolf* was not aware of the traffic information broadcasts by Singapore VTS, advising *Shibumi*'s transit in the Eastbound traffic lane;

3. Less than a mile and closing on a steady bearing, *Sam Wolf* altered her course to port without warning or querying the intention of *Shibumi*;

4. Unaware of the developments on board *Sam Wolf*, *Shibumi* altered her course to starboard to keep with her voyage plan within the Deep Water Route, but which coincided with *Sam Wolf*'s manoeuvre;

5. Singapore VTIS advice to *Sam Wolf* to keep clear of *Shibumi* and maintain transit in the Westbound lane was not followed up;

6. Whilst the manoeuvre by *Sam Wolf* may be interpreted as a manoeuvre in accordance with COLREGs rule 17(a)(ii), the alteration of course to port may have created further confusion as it was not in accordance with rule 17(c);

7. The VHF radio could have been used at an early stage to clarify uncertainty and ensure a uniform mental model of the circumstances rather than at a later stage of the dynamic process;

8. Lack of communication led to no information sharing and lack of common understanding of the prevailing context;

9. The two OOWs did not manage to communicate their respective mental models – the sharing of situation awareness;

10. Coordination, which depends on (efficient) communication between persons (the OOWs in this case) who have to control a dynamic system, had been compromised.

SAFETY ACTIONS TAKEN DURING THE COURSE OF THE SAFETY INVESTIGATION[7]

Following the accident, TMS Dry Ltd. has taken the following safety actions:

- Emphasised the need for the proper implementation of bridge resource management procedures on board and the need to be fully aware of the International Regulations for Preventing Collisions at Sea;
- Highlighted the importance of all bridge officers to be aware of the maneuvering characteristics of their vessel;
- Expressed caution that congested areas are extremely hazardous areas to navigate in, particularly with a large ship, and that masters should give careful consideration to the risks when so requested;
- Specified that it is important to appreciate that in such areas, ships are often too close to each other so as not to provide a reasonable margin of error;
- The importance of crew members to implement risk control measures in areas similar to Singapore where approaches involve a number of serious and fast changing conditions.

[7] **Safety actions should not create a presumption of blame and / or liability.**

SHIP PARTICULARS		
Vessel Name:	*Shibumi*	*Sam Wolf*
Flag:	Malta	Hong Kong
Classification Society:	ABS	BV
IMO Number:	9408085	9620176
Type:	Bulk Carrier	Bulk Carrier
Registered Owner:	Kingswood Marine S.A.	Sam Wolf Inc.
Managers:	TMS Bulkers Ltd.	Shipping Asset Management Ltd.
Construction:	Steel	Steel
Length Overall:	292.0 m	190.0 m
Registered Length:	283.04 m	Not Available
Gross Tonnage:	91373	31760
Minimum Safe Manning:	15	Not Available
Authorised Cargo:	Dry Bulk	Dry Bulk

VOYAGE PARTICULARS		
Port of Departure:	Port Cartier, Canada	Not Available
Port of Arrival:	Pohang, Republic of Korea	India (port unknown)
Type of Voyage:	International	International
Cargo Information:	Iron Ore	Not Available
Manning:	21	Not Available

MARINE OCCURRENCE INFORMATION		
Date and Time:	23 December 2015 at 0426 (LT)	
Classification of Occurrence:	Serious Marine Casualty	Serious Marine Casualty
Location of Occurrence:	TSS Singapore Strait off Buffalo Rock Buoy	
Place on Board	Bow area	Overside
Injuries / Fatalities:	None reported	
Damage / Environmental Impact:	None reported	
Ship Operation:	In passage	In passage
Voyage Segment:	Transit	Transit
External & Internal Environment:	The weather was clear with a visibility of eight nautical miles. The wind was East Northeast Force 3 and the sea was calm. The air temperature was 22 °C.	
Persons on board:	21	Not Available