Report on the investigation of the collision between

the passenger vessel

Van Gogh

and the tanker

Spetses

Gibraltar Bay - 26 September 2004

Government of Gibraltar
Department of Shipping
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NOTE

This report is not written with liability in mind and is not intended to be used for the purpose of litigation. It endeavours to identify and analyse the relevant safety issues pertaining to the accident, and to make recommendations aimed at preventing similar accidents in the future.

CONTENTS

GLOSSARY OF ABBREVIATIONS, ACRYNOMS AND TERMS

ARPA	-	Automatic Radar Plotting Aid
cable	-	one tenth of a nautical mile
CPA	-	Closest Point of Approach
(D)GPS	-	(Differential) Global Positioning System
DNV	-	Det Norske Veritas
GMDSS	-	Global Maritime Distress & Safety System
GOC	-	General Operators Certificate
IMO	-	International Maritime Orgnisation
ISM	-	International Safety Management (Code)
kW	-	kilowatt
m	-	metre
MCA	-	Maritime and Coastguard Agency
MF	-	Medium Frequency
MGN	-	Marine Guidance Note
RYA	-	Royal Yachting Association
TCPA	-	Time to Closet Point of Approach
UK	-	United Kingdom
UTC	-	Universal Co-ordinated Time
VDR	-	Voyage Data Recorder
VHF	-	Very High Frequency
VLCC	-	Very Large Crude Carrier
VTS	-	Vessel Traffic Service

SYNOPSIS

At 1240 (UTC + 2) on 26 September 2004, the passenger vessel *Van Gogh* and the fully laden tanker *Spetses* collided in Gibraltar Bay in poor visibility. The Gibraltar Department of Shipping was immediately informed and an investigation started on that day.

Van Gogh, recently departed from Gibraltar port, was outbound for the port of Tangier. *Spetses,* had rounded Europa Point and was inbound for Algeciras oil refinery.

The bridge team on *Van Gogh* assumed incorrectly that the target of *Spetses,* which was clearly visible on their radar, was a vessel at anchor and failed to determine if a risk of collision existed. Since leaving the berth her speed was gradually increased to 14 knots despite the visibility. The bridge team on *Spetses* did detect, by radar, the target of *Van Gogh* but failed to appreciate her gradual increase in speed which had a profound effect on the information they had obtained by ARPA radar, which indicated a passing distance of 3 cables.

At a range of 100-150m, to the surprise of the bridge teams, both vessels became visible to one another. The master on *Van Gogh* ordered hard port helm, and full astern on both engines. The master on *Spetses* also ordered full astern on both engines. However, their actions failed to prevent a collision. *Van Gogh's* bow struck the starboard side of *Spetses.*

As a result of the collision *Van Gogh* sustained substantial bow and forward starboard side shell plate damage. *Spetses* sustained shell plate damage amidships on her starboard side. Fortunately there were no reported injuries on either vessel.

Several factors contributed to the accident including:

- The unsafe speed of *Van Gogh.*
- The failure of *Van Gogh's* bridge team to keep a proper lookout.
- The bridge team of both *Van Gogh* and *Spetses* failure to keep a proper radar lookout as the vessels approached each other, and both making decisions on scanty radar information.
- *Van Gogh* not sounding the appropriate signal in restricted visibility.
- The perceived acceptance by *Spetses's* bridge team of a 3 cable passing distance in thick fog.
- The influence of commercial pressure on the master of *Van Gogh*.
- The lack of an effective, independent VTS facility at Gibraltar Port.
- The lack of an effective measure in Gibraltar Bay to ensure traffic separation.

Appropriate recommendations have been made to those concerned which can be found at the end of this report.

SECTION 1 – FACTUAL INFORMATION

1.1 PARTICULARS OF *VAN GOGH* / *SPETSES* AND ACCIDENT

Vessel Details

Name	:	*Van Gogh* (IMO No. 7359400)
Registered owner	:	Maritiem & Leasing Ltd, Freeport, Bahamas
Operator	:	Club Cruise, Veenendaal, Netherlands
Port of registry	:	Kingstown
Flag	:	St Vincent and the Grenadines
Type	:	Passenger ship
Built	:	1975, Turku, Finland
Classification society	:	Det Norske Veritas
Construction	:	Steel
Gross Tonnage	:	15,402
Engine power and type	:	26480 kW 2x Pielstick Wartsilla Deisels
Other relevant info	:	Twin shaft

Accident details

Injuries	:	None reported
Damage	:	Substantial bow and forward starboard side shell plate damage.
Location of Accident	:	36°07.63 N 005°23.49 W (Gibraltar Bay)
Date and Time	:	1240 (UTC + 2) on 26 September 2004

Vessel Details

Name	:	*Spetses* (IMO No. 9107710)
Registered owner	:	Pitioussa Special Marine, Athens Greece.
Operator	:	Minerva Marine, Athens, Greece.
Port of registry	:	Pireaus
Flag	:	Greece
Type	:	Oil Tanker
Built	:	1996
Classification society	:	American Bureau of Shipping
Construction	:	Steel
Gross Tonnage	:	80,637
Engine power and type	:	Unknown
Service Speed	:	Unknown
Other relevant info	:	None

Accident details

Injuries	:	None reported.
Damage	:	Starboard side, amidships, shell plate damage

1.2 BACKGROUND

1.2.1 Van Gogh

Van Gogh, built in 1975 and operating as a cruise vessel was converted from a ro-ro passenger vessel. During this conversion her watertight ramp was removed and the shell "clam type" bow doors welded to form part of the shell plating.

Van Gogh was fitted with standard navigational equipment which included two radars, one 3cm (X -band) with ARPA capability and one 10cm (S-band), DGPS, magnetic and gyro compasses, auto-pilot, echo sounder, and MF and VHF radios.

Van Gogh's destination after leaving Gibraltar was Tangier.

1.2.2 Spetses

Spetses, built in 1996 was a worldwide trading VLCC operated by Greek owners. Of double hull construction, her bridge superstructure, accommodation and engine room were situated aft with her main cargo tanks situated forward.

Spetses was also fitted with similar standard navigational equipment that again included two radars, one with ARPA capability.

Spetses last port of call was Side Kerir where she had loaded a cargo of 140,000 tons of crude for discharge at the Algeciras refinery.

1.3 NAVIGATIONAL CREWS

1.3.1 Van Gogh

At the time of the accident the navigational crew on board *Van Gogh* consisted of the master, staff captain and 2nd officer. All were experienced seaman and were the holders of appropriate Russian certificates of competency endorsed by the St Vincent and Grenadines administration. In addition to the navigational crew there was also a helmsman on duty.

Following the accident, alcohol and drug testing were carried out on the *Van Gogh's* bridge crew. Negative results on the navigating were revealed. However, the helmsman tested positive for traces of cannabis. However, it is unlikely it had any bearing on the accident.

1.4.2 Spetses

On board *Spetses,* the navigational crew consisted of the master and the 2nd officer. Both were holders of appropriate certificates of competency issued by the Greek administration. In addition to the navigating crew a lookout and helmsman were on duty.

Both navigational crews were well rested before the incident having acquired at the least the minimum hours of rest in accordance with the appropriate regulations.

1.4 ENVIRONMENTAL CONDITIONS

At the time of the accident the weather conditions were a variable wind, force 2-3, with slight seas. The visibility was poor to very poor in areas of dense fog. The tide was flooding in a northerly direction at a rate of approximately 1-1.5 knots.

1.5 NARRATIVE OF EVENTS (ALL TIMES UTC + 2, ALL COURSES TRUE)

At 1220 on 26 September 2004 *Van Gogh* departed her berth at the Western Arm of the North Mole in Gibraltar harbour. On the bridge was the master, staff captain, 2nd officer, an AB who had the helm and a Gibraltar pilot.

At approximately the same time, the VLCC *Spetses,* in a position 1.3 miles west south west of Europa Point was inbound for Algeciras (CEPSA) pilot boarding point. Her course was 335º (T) and her speed was 5.4 knots. On the bridge were the master, 2nd officer, a helmsman and a lookout. *Spetses* was sounding her fog signal in accordance with the Collision Regulations and both her radars, one with ARPA capability, were operational, one set to a range of 6-mile, the other 3-mile. Both sets were north-up display, relative motion.

At 1228, after manoeuvring *Van Gogh* from her berth, a course of 210º (T) was set towards Punta Carnero and half manoeuvring speed selected. The density of traffic in Gibraltar Bay was heavy with several vessels either at anchor or in the process of anchoring. Despite poor visibility and the density of traffic no fog signal was sounded. Both radars were in operation and manned by members of the bridge team. The 3cm radar was set to the 1.5-mile range, north-up display, ground based and relative motion. The configuration of the 10cm radar is unknown, as it was not recorded on the ships VDR. Two targets had been acquired by ARPA, which were vessels at anchor. Both had safe CPA's.

It was the intention of the pilot to pass another vessel to the north, *Vemabaltic* that was at anchor, and head out of the anchorage. The pilot then requested a speed of 4 knots for disembarking as the pilot launch was on its way towards *Van Gogh* having disembarked a colleague on the vessel *Cala Palma,* for anchoring.

The pilot disembarked at 1229. Before leaving it was reported that he informed the bridge team that there was no traffic movement in the outer part of Gibraltar Bay.

Once the pilot had left the bridge the 2nd officer, as a matter of course, contacted Algeciras VTS who in turn informed him that there was a tanker in the middle of the bay on its way north towards Algeciras and two further

vessels were making slow speed off Europa Point. The 2nd officer was requested to stand-by on channel 16 and 74. The time was 1231.

Speed on board *Van Gogh* was again increased to half manoeuvring speed. On the 3cm radar the echo of a large target was clearly visible bearing 10º relative to the port bow at a range of 1.5 miles. The radar display was momentarily shifted from a range of 3 miles to .75 mile and back again, but no attempt was made on the 3cm radar to acquire the target by ARPA.

On board *Spetses,* speed was reduced to 4.5 knots. The master acquired the target of vessel departing Gibraltar harbour, but while waiting for the ARPA to compute, the curser jumped from that target to another stationery target. He then repositioned the cursor on the first target and after approximately one minute interpreted the following information: Course 210º, range 8 cables, speed 9 knots, CPA 3.0 cables to starboard. Course and speed were maintained.

At 1234, on board Van Gogh the 3cm radar was again shifted from the 3 miles to .75mile range. Still no attempt was made to plot the large target on the port bow.

At 1235 Algeciras VTS, in reply to a call from another vessel entering the bay, call sign *OUOW 2,* informed them that *Van Gogh* had recently departed Gibraltar bound for Tangier and *Spetses* was making slow speed to the north for the Mono buoy.

By 1236 *Van Gogh's* speed had increased to 12 knots.

By 1239 *Van Gogh's* speed had increased further to 14 knots.

At a range of approximately 100-150m, to the surprise of the bridge teams, both vessels became visible to one another. At that point, Algeciras VTS called out a warning to both vessels that a collision was imminent. The master on *Van Gogh* ordered hard port helm, and full astern on both engines. The master on *Spetses* also ordered full astern on both engines. However, their actions failed to prevent a collision. *Van Gogh's* bow struck the starboard side of *Spetses.* The time was 1240.

Immediately following the collision instructions were given on both vessels to close all watertight doors and to sound round. After initial damage assessments, *Spetses* informed Algeciras VTS and began making her way to the pilot boarding point. *Van Gogh* called Gibraltar Port control informing them of the situation and requested a pilot. She then began making her way back to port.

No emergency signal was sounded on board *Van Gogh* and no announcement was made to the passengers, consequently, in the confusion passengers began donning lifejackets. It wasn't until some 10 minutes later that an announcement was made to the passengers with instructions that it wasn't necessary to don lifejackets.

As a result of the collision *Van Gogh* sustained substantial bow and forward starboard side shell plate damage. *Spetses* sustained shell plate damage amidships on her starboard side. Fortunately there were no reported injuries on either vessel.

At 1340 *Van Gogh* arrived back alongside the Western Arm of the North Mole in Gibraltar Harbour. Some time later *Spetses* arrived at the Mono discharge buoy off Algeciras refinery.

At no time, from *Van Gogh* letting go and during the time leading up to the incident was there any involvement from Gibraltar port control. Two port operatives were on duty monitoring VHF radio channels 12 and 16. However, the port control radar was not being monitored.

1.6 GIBRALTAR (PORT)

1.6.1 Port

The port of Gibraltar receives in excess of 550 ship calls per year. Port operations are under the control of the Captain of the Port who is ultimately responsible for its safe operation, conservancy, pilotage and security.

In addition to ship calls at the port, 5354 vessels anchored in Gibraltar waters last year, mainly for bunkering purposes.

1.6.2 Pilots

Pilotage in the port of Gibraltar is undertaken by Gibraltar Pilots Limited, a private company independent of the port authority. It employs 7 experienced full time pilots who work on a roster basis. The company and its employees have a good working relationship with the port authority.

Normally after boarding vessels alongside, pilots disembark very soon after unberthing, once both master and pilot are satisfied with the situation. In this instance, the pilot left *Van Gogh* as soon as a course was set for the Strait of Gibraltar. It is understood for pilots to remain on board any longer than the time taken for the unberthing operation would incur an additional cost.

1.6.3 Port Control

Gibraltar Port Control incorporates VHF radio coverage on both Channels 16 and 12. It also incorporates radar coverage of Gibraltar Bay and beyond to a distance of approximately 20 miles. However, the coverage is somewhat depended on that provided by the MOD Windmill Hill Signal Station, with Gibraltar VTS radar acting as a slave to it. Consequently, problems have arisen regarding reliability. In addition, Windmill Hill operators have control over the data being displayed on the Gibraltar port control radar display. On occasions, this arrangement has caused problems in relation to erasing useful information such as vessels tracks.

Gibraltar Port Control is manned 24 hours a day, 7 days a week, on a rotational basis by a minimum of two port lookout operatives. The majority of operatives are holders of RYA navigational certificates and are GMDSS (GOC) qualified. However, none hold recognised sea-going certificates of competency neither are they qualified VTS operators, in accordance with the V 103 standard.

The role of the port lookout operatives does not involve radar monitoring or intervention in navigational situations.

1.7 GIBRALTAR BAY

In addition to the traffic using Gibraltar Port and its anchorages, a further 1400 vessels transit Gibraltar Bay annually. This figure includes port calls to Algeciras and its refinery, mainly by large container vessels and tankers respectively. There is also a high volume of HSC crossings from Algeciras and Gibraltar to the ports of Ceuta and Tangier.

It is not uncommon for vessels bound to and from the port of Algeciras and its refinery, when entering Gibraltar Bay from the east, to round Europa point at relatively closes ranges on a north-westerly course in order to save on steaming time, as opposed to travelling further west and approaching on a more northerly course.

Invariably, vessels adopting this approach transit close to Gibraltar anchorages and risk coming into conflict, not only with vessels at anchor, but additionally with vessels departing Gibraltar Port as was highlighted in this incident.

1.8 VTS

The IMO's resolution A.578 (14) defines Vessel Traffic Services (VTS) as:

Any service implemented by a competent authority designed to improve safety and efficiency of vessel traffic and the protection of the environment. The service shall have the capability to interact with marine traffic and to respond to traffic situations developing in the VTS area.

The following are extracts from the IMO resolution A.857 (20) Guidelines for VTS:

.9.1 An information service is a service to ensure that essential information becomes available in time for on-board navigational decision making.

.9.2 A navigational assistance service is a service to assist on-board navigational decision-making and to monitor its effects.

.9.3 A traffic organisation service is a service to prevent the

development of dangerous maritime traffic situations and to provide for safe and efficient movement of vessel traffic within the VTS area.

2.1 The purpose of VTS is to improve the safety and efficiency of navigation, safety of life at sea and the protection of the marine environment and/or the adjacent shore area, worksites and offshore installations from possible adverse effects of maritime traffic.

2.1.2 The type and level of service or services rendered could differ between both types of VTS; in a port or harbour VTS a navigational assistance service and/or a traffic organisation service is usually provided for, while in coastal VTS usually only an information service is rendered.

2.3.4 When the VTS is authorised to issue instructions to vessels, these instructions should be result-orientated only, leaving the details of the execution, such as course to be steered or engine manoeuvres to be executed, to the master or pilot on board the vessel. Care should be taken that VTS operations do not encroach upon the master's responsibility for safe navigation or disturb the traditional relationship between master and pilot.

As suggested in 2.1.2. above, there are two types of VTS: port/harbour and coastal. Both can be found throughout the world. The former is a service provided for ships entering and leaving the confines of a port and/or transiting within harbour limits. The latter is concerned with traffic passing through an area outside harbour limits.

A difference between a coastal VTS and a port/harbour VTS is in the amount of control of shipping a port/harbour VTS can have. For example, the former can direct a ship to leave an anchorage at a certain time, to slow her speed, or to enter a certain channel.

1.9 VTS OPERATOR TRAINING

As a comparative standard to the industry advice contained in UK-MGN 239, entitled Vessel Traffic Services (VTS) and Port Information, responsibilities of the UK Competent Authority, Statutory Harbour Authorities and VTS Authorities, VTS operators in the UK should be trained to the IALA V103 standard. In Gibraltar, there is at present no standard set for VTS operator training.

The IALA V103 standard requires operators to be competent in the following areas: language, traffic management, equipment, nautical knowledge, communication co-ordination, VHF radio, personal attributes and emergency situations.

1.10 PORT MARINE SAFETY CODE

Again for comparative standards, the Port Marine Safety Code which was introduced in the UK in March 2000, required a national standard for all aspects of port marine safety. It aim was to improve safety for those who work in ports, their ships, passengers and cargoes, and the environment.

Those aims were undertaken by the following measures: assessment of risks, consideration of a means of reducing risk, control and management over ship movements, standards of qualification and training, management of identified hazards and risks, monitoring and auditing of policies and standards and planning for emergency.

In implementing these measures the well developed principles of formal risk assessment and safety management systems were adopted which entailed the identification and analysis of risks, the assessment and acceptability of risks and consideration of risk reducing measures using the As Low As Reasonably Practicable principle.

Since its introduction, safety in UK ports and their waters of jurisdiction has been enhanced.

1.11 COLLISON REGULATIONS

The International Regulations for Preventing Collisions at Sea, Rule 2, Responsibility, states:

1.10.1 Rule 5
Rule 5, Look-out states:

> *Every vessel shall at all times maintain a proper lookout 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.*

1.10.2 Rule 6
Rule 6, Safe Speed states:

> *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 the visibility;*
>
> *(ii) the traffic density;*

(iii) the maneuverability 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 light or from back scatter of her own lights;

(v) the state of the wind, sea and current, and the proximity of navigational hazards;

(vi) the draught in relation to the 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 aids used to determine the range of vessels or other objects in the vicinity.

1.10.3 Rule 7
Risk of Collision states:

(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.

1.10.4 Rule 19
Rule 19, Conduct of Vessels in Restricted Visibility, states:

(a) This Rule applies to vessels not in sight of one another when navigating in or near an area of restricted visibility.

(b) Every vessel shall proceed at a safe speed adapted to the prevailing circumstances and conditions of restricted visibility. A power-driven vessel shall have her engines ready for immediate manoeuvre.

(c) Every vessel shall have due regard to the prevailing circumstances and conditions of restricted visibility when complying with the Rules of section 1 of this part.

(d) A vessel which detects by radar alone the presence of another vessel shall determine if a close-quarters situation is developing and/or risk of collision exists. If so, she shall take avoiding action in ample time, provided that when such action consists of an alteration of course, so far as possible the following shall be avoided:

(i) an alteration of course to port for a vessel forward of the beam, other than for a vessel being overtaken;

(ii) an alteration of course towards a vessel abeam or abaft the beam.

(e) Except where it has been determined that a risk of collision does not exist, every vessel which hears apparently forward of her beam the fog signal of another vessel, or which cannot avoid a close-quarters situation with another vessel forward of her beam, shall reduce her speed to the minimum at which she can be kept on her course. She shall if necessary take all her way off and in any event navigate with extreme caution until risk of collision is over.

1.12 NAVIGATION IN FOG

Sound advice concerning navigation in fog is contained in a UK *Marine Guidance Note MGN 202 (M&F),* published by the UK MCA and entitled *Navigation in Fog,* which states, in part:

The Maritime and Coastguard Agency (MCA) is concerned that a number of casualties to ships have resulted from serious disregard for the basic principles of good seamanship and prudent navigation in bad

> *visibility. Sensible use of radar and other aids to navigation greatly assists the conduct of ships in fog, but these aids have not reduced the need to comply fully with the Collision Regulations: to proceed at a safe speed, pay special attention to good watch-keeping, and navigate with proper caution.*

It gives a brief outline of three casualties in fog, then states:

> *None of the casualties described led to loss of life, but clearly this was only due to good fortune. In all cases those responsible for the ship's navigation sacrificed seamen for expediency. They failed to recognize the limitations of aids to navigation; or to follow the requirements of the Collision Regulations and the advice of Marine Notices. It is worth stressing that the ships involved were all well-equipped vessels in the charge of men with sound qualifications; it was not skill or experience that was lacking, but the proper seamanlike approach to the situation. Whatever the pressure on masters to make a quick passage or to meet the wishes of owners, operators, charters or port operators, it does not justify ships and those on board them being put unnecessarily at risk.*

The document also stresses the responsibilities of owners; it is the duty of the company to take all reasonable steps to ensure that the ship is operated in a safe manner. In this regard, it states:

> *The company must have established and implemented an effective Safety Management System which includes procedures to ensure safe operation of ships as well as reporting accidents and non-conformities.*

1.12 CONVERSION -*VAN GOGH*

It is understood, although not confirmed, when *Van Gogh* was operated as a ro-ro passenger vessel fitted with both bow and stern doors she was classed with the Russian Register of Shipping. While under the supervision of that Classification Society, during her conversion to a cruise liner, the bow "clam type" doors were welded permanently closed and the watertight bow ramp was removed in its entirety.

The method used to close the clam doors was welding of a metal strip approximately 300mm wide around the outside circumference of the doors. This was some additional stiffening internally, but the internal framing was not continued across the section between the door and main hull structure.

Following the accident, repairs to the bow of *Van Gogh*, under the supervision of DNV, entailed redesigning in line with a conventional bow structure, which included appropriate material thickness and scantlings.

SECTION 2 - ANALYSIS

2.1 AIM

The purpose of the analysis is to determine the contributory causes and circumstances of the accident as a basis for making recommendations to prevent similar accidents occurring in the future.

2.2 GENERAL

Fortunately, there were no injuries as a result of this accident even though the damage to both vessels was substantial. However, the potential for a more serious accident was evident.

2.3 ACTIONS TAKEN BY *VAN GOGH*

2.3.1 Safe speed

It is appreciated that the criteria for determining a safe speed, is open for debate and, no doubt, can be interpreted in many different ways. However, a prudent approach, especially in an area such as Gibraltar Bay in restricted visibility, could be to travel at no greater a speed than that in relation to the visibility and stopping distance of the vessel, having regard to the additional factors listed in Rule 6(a) of the International Regulations for Preventing Collisions at Sea.

However, the practicality of following the above criterion in conditions of severely restricted visibility is questionable (eg the need to maintain steerage in conditions of zero visibility). Additionally, the commercial viability of shipping would be in danger of being undermined if the criterion was strictly applied, particularly in areas prone to restricted visibility.

Nevertheless, it could be assumed that *Van Gogh's* speed at the time of the collision cannot be considered a safe speed in accordance with Rule 6 and 19(b) of the Collision Regulations. However, she was fitted with operational radar, which enabled the bridge team to detect other vessels beyond the visible range. A speed, greater than that in relation to the visibility and stopping distance of the vessel, can only be guaranteed a safe speed if there is an assured detection of all vessels at sufficient range so as to be able to avoid a collision in accordance with the Collision Regulations. Such assurance relies on those additional factors listed in Rule 6(b), as well as the time required for detection, reaction and implementation of evasive action in the prevailing circumstances with an adequate safety margin to cater for the unexpected, and the heightened potential for damage to the vessel and injury to her crew and passengers in the event of an accident.

A N Cockcroft and J N F Laeijer in their publication *A Guide to the Collision*

Avoidance Rules state:

> *The word 'safe' is intended to be used in a relative sense. Every vessel is required to proceed at a speed which could reasonably be considered in the particular circumstances. If a ship is involved in a collision it does not necessarily follow that she was initially proceeding at an unsafe speed. In clear visibility, collisions can generally be attributed to bad look out, or to wrongful action subsequent to detection, rather than to a high initial speed.*

They also state:

> *in restricted visibility a vessel making proper use of radar will normally be justified in going at a higher speed than that which would be acceptable for a vessel which does not have the equipment but not usually at the speed which would be considered safe for good visibility.*

Given the density of traffic and visibility in Gibraltar Bay at the time of the incident it is considered that *Van Gogh* was traveling at an unsafe speed.

2.3.2 Lookout / risk of collision

The master's decision to travel at an unsafe speed is considered not to be the only issue in this accident, although it is considered a contributory factor. Traveling at a lesser speed would have allowed additional time for the bridge team to more fully assess the situation. However, a full assessment including accurate radar plotting was dependent on whether the bridge team considered the target of *Spetses*, which was one of many on the radar display, believe it a threat. It is considered they did not.

The target of *Spetses* was detected by radar on board *Van Gogh*. However, the bridge team failed to make a full appraisal of the situation with the available means they had at their disposal. They were thus, in contravention of Rule 5 of the collision regulations by failing to keep a proper lookout. Had the target of *Spetses* been acquired by ARPA radar, the information it would have provided would have shown that both vessels were on or near a collision course. With this information, necessary avoiding action could have been taken to prevent the collision.

It is more than likely that the bridge team failed to plot the target of *Spetses* because they incorrectly assumed *Spetses* to be a vessel at anchor with no risk of collision. However, by not determining if such a situation did exist, failing to make proper use of the radar and making assumptions based on scanty radar information they also contravened Rule 7(a), 7(b), 7(c) and Rule 19(d) of the collision regulations. This assumption was probably based on two factors, firstly the reported remarks by the pilot that there was no traffic movement in the outer part of Gibraltar Bay, and secondly, the slow speed of *Spetses* making it difficult for the bridge team to distinguish visually on the radar display between it and those vessels at anchor, especially as the radar

was being operated in ground mode, the incorrect mode for collision avoidance.

However, Algeciras VTS did inform them that *Spetses* was inbound, and later the same information was broadcast to another vessel.

2.3.3 Sound signals

In addition to *Van Gogh* being in contravention of Rule 5, Rule 7(b), 7(c) and Rule 19(d) of the Collision Regulations, by not sounding the appropriate signal in restricted visibility she also contravened Rule 34(d). Had the appropriate signal been sounded it may have aided the bridge team on board *Spetses* to enable them to have a fuller appreciation of the situation.

2.3.4 Action after the collision

After the collision passengers were not kept sufficiently informed as to what was happening. No announcement was made which led to uncertainty and confusion and is the reason why passengers indiscriminately began donning lifejackets. The common factor in such accidents is that those on the bridge are very often heavily occupied in handling post-accident events. In such circumstances, it is necessary to prioritise what is required, and it may be that keeping the passengers informed is not necessarily considered to be of the highest priority at the time.

It is also possible that those on the bridge might themselves be suffering from various states of shock. In addition, post-accident stress can result in those on the bridge temporarily losing their concept of the passage of time. What they believe is an interval of only 1 or 2 minutes may in fact be 5 to 10 minutes. It is not, therefore, a case that those on the bridge are unaware of the need to inform people of what is happening.

The person best placed to make the initial calm and authoritative broadcast is very often someone not directly involved in handling the accident or its immediate aftermath. The potential difficulty with this, however, is that such a person may not be fully familiar with all the necessary facts to enable him/her to make such an announcement. It would mean that those on the bridge would have to divert precious time to brief someone. Nonetheless, management should give thought to how this requirement can be met.

Providing regular and accurate information in an authoritative and calm manner is among the most important of all requirements in any passenger-carrying vessel involved in an emergency. The need is extremely well known but, as this accident demonstrates, it is often overlooked. The difficulties are recognised, especially when the communication channels are likely to be clogged. It does, however, need to be addressed by management.

2.4 ACTION BY *SPETSES*

A crucial factor in *Spetses* bridge team's assumption that *Van Gogh* would pass clear was their belief that the information obtained from ARPA, especially in relation to CPA, and TCPA would remain constant. However *Van Gogh's* progressive increase in speed would have had a profound effect on both the CPA and TCPA. So what may initially have been a CPA of 3 cables began rapidly decreasing to the point that the CPA became zero. The only way the bridge team could have been aware of this was by continually monitoring the radar. It's obvious they did not, hence their surprise when *Van Gogh* began looming out of the fog at a distance where a collision was unavoidable. Consequently, *Spetses* also contravened Rule 19(d), Rule 7(b) and Rule 7(c) of the collision regulations.

Another factor was the bridge teams over-confidence in the accuracy of the Information provided by ARPA. Several factors reduce the accuracy of relative velocity or triangular calculations carried out by automatic radar plotting equipment. ARPA requires adequate time to produce accurate information suitable for assessing collision risk and assessing appropriate action to be taken; it also requires time to detect any alteration in course and speed. Consequently, with Van Gogh continually increasing speed over a short period of time there was considerable scope for inaccuracy in the information displayed on ARPA.

When the bridge team on board *Spetses* first detected *Van Gogh* by radar they were content with a CPA of 3 cables to starboard. They did not consider this to be close quarters situation. This is borne out by the fact that no avoiding action was considered necessary at that time as course and speed were maintained. Notwithstanding the fact that *Spetses* was a large fully laden vessel, somewhat restricted in her manoeuvrability and proceeding at an appropriate speed in the prevailing conditions, it is considered there was still time available to take avoiding action. Such action could have been to take all the way of the vessel in accordance with Rule 19(e) by stopping and reversing engines. This course of action would have prevented the collision, but was not taken.

It is unknown why the bridge team did not consider 3 cables as a close quarters situation, especially in thick fog. The fact that no action was taken in accordance with Rule 19(d) and Rule 19(e) supports this. In effect, they were using their clear visibility criterion for determining a close quarters situation and /or risk of collision. They did not recognize the need for an increased CPA in restricted visibility. Had they determined it to be a close quarters situation appropriate action could have been taken.

This raises the issue of what constitutes a close quarters situation.

A N Cockcroft and J N F Laeijer state: *The distance at which a close quarters situation first applies has not been defined in miles, and is not likely to be, as it will depend upon a number of factors. The 1972 Conference (IMO Revision of the Collision Regulations) considered the possibility of specifying the distance at which it would begin to apply but after lengthy discussions it was decided that this distance could not be quantified.*

On the other hand, the Seafarers' International Research Centre (SIRC) in a paper dealing with near miss encounters in the Dover Strait (Belcher P (2002) *"Overtaking in the Dover Strait, an analysis of near miss encounters"*) states: *from a review of literature on ships' domains (Fuji and Tanka, 1971, Goodwin, 1977, Coldwell, 1983, Zhao, et al., 1993) it has been found that the domain required for a ship in congested waters can be approximated to a circular space with a radius of 8 cables. It also states: it might be argued that a criterion of a minimum passing distance of 8 cables is too stringent a measure for such a busy area. However, a passing distance of 3 cables or less, is on anyone's measure, a very dangerous occurrence that could lead to a collision with only a very slight change in circumstances.*

In this case, where the vessel was transiting in thick fog, in an area of high traffic density, the bridge teams perceived acceptance of such a small passing distance was inappropriate.

2.5 COMMERCIAL PRESSURE

Commercial pressure more than likely influenced the master of *Van Gogh* in his decision to proceed at 14 knots in such conditions. It is considered that vessels with tight schedules, as is the case with the many passenger vessels, rarely reduce speed regardless of the visibility.

The dangers of travelling at potentially unsafe speeds, in areas of high traffic density and restricted visibility, are self-evident, as has been highlighted in this case.

Therefore it is essential that the operators of *Van Gogh* have, if not already in place, an effective safety management system, in accordance with ISM, with clear operating procedures in relation to safe speeds, especially in restricted visibility where overriding concern is not commercial pressure.

2.6 GIBRALTAR PORT

2.6.1 Port Control

Apart from monitoring VHF radio channels 12 and 16, Gibraltar port control operatives had no involvement in the incident even though the accident occurred in their jurisdiction. Whilst recognising that Gibraltar port control may not be a fully functioning VTS facility, the purpose of any port control should be as a minimum to provide a navigational assistance service to assist on-board navigational decision-making and to monitor its effects.

It is appreciated that Algeciras VTS was monitoring the situation and did advise both vessels of each other’s movements. However, possibly due to the volume of traffic being monitored by them in Gibraltar Bay, their intervention came too late.

Had Gibraltar port control radar been monitored on a continual basis by qualified personnel, in addition to the monitoring being carried out by Algeciras VTS, the developing situation might have been detected early enough and timely information given, which might have prevented the collision.

However, having said that, the IMO resolution on the role of VTS is careful not to advise operators to give specific navigational advice to masters and officers. This reflects the concerns in many VTS operations, operators are reluctant to issue navigational instructions, for fear of litigation should an incident occur. Nevertheless, considering all the above issues, there is a case for Gibraltar Port Authority having a detailed port control policy with greater emphasis on a navigational assistance service. In addition to this, further operator training in the form of the prescribed V103 standard is advised.

Given the volume and profile of shipping calling at Gibraltar Port, and its anchorages, it is considered essential that a reliable independent VTS facility, manned by qualified staff become operational as soon as practicably possible.

In assessing the risks associated with shipping in Gibraltar port and its jurisdiction it is further advised that a code of practice in line with, or similar to, the UK Port Marine Safety Code is adopted.

2.6.2 Pilotage

In addition to the measures already discussed there is also an argument that had the pilot remained on board *Van Gogh* until she was clear of traffic this would have aided her safe passage, especially given the conditions of visibility at the time.

Being familiar with the area, Algeciras VTS procedures, the limitations of Gibraltar port control, and anticipated traffic movements within Gibraltar Bay, the pilot probably would have been able to gain a much clearer picture of the situation, advising the bridge team accordingly, not least of all in relation to speed in such a busy shipping area.

However, it is appreciated that having a pilot on board is no guarantee that accidents will be avoided. Nevertheless, it is an additional prudent safety measure.

The assessment of whether pilots should remain onboard vessels for longer periods than is currently the norm, under what conditions and type of vessels this should apply to, could be addressed in a port marine safety code.

2.7 GIBRALTAR BAY

Given the volume of traffic in Gibraltar Bay and the location of both the port of Gibraltar, Algeciras, and its refinery a case for vessel de-confliction exists. The decision by the master of *Spetses* to transit close to Europa Point to save on voyage time could be considered as a contributory cause to this accident.

Such a system preventing vessels, bound to and from Algeciras from the east, transiting close to Europa Point, and vessels bound to and from Gibraltar from the west transiting close to Punta Carnero, will reduce the potential for accidents similar to this one in the future.

The Government of Gibraltar, Its Port Authority, together with stakeholders, should consider taking forward the possibility of some form of separation scheme, which ensures de-confliction of traffic in Gibraltar Bay.

2.8 *VAN GOGH* – CONVERSION

Because the internal framing was not continued across the area between the door and the main hull structure, its strength relied purely on the welded closing strip. Consequently, when the bow came into contact with the hull of *Spetses* this area of weakness gave way, causing a greater degree of damage than would have happened with a conventional bow door.

The design of a ro-ro vessels bow area is that the ramp forms the main watertight boundary and the shell plating and doors, although not necessary watertight, keep the force of seas away from the ramp. It is therefore, of some concern that with the removal of the bow ramp, its designated watertight boundary; had the accident resulted in damage below the waterline, causing *Van Gogh* to trim by the head, seawater would have been able to flood on to the passenger deck, the ex car deck, and a similar situation as the *Herald of Free Enterprise* could have developed.

SECTION 3 – CONCLUSIONS

3.1 SAFETY ISSUES

The following are safety issues identified by the investigation. They are not listed in any order of priority.

1. The unsafe speed of *Van Gogh* [2.3]

2. The failure of *Van Gogh's* bridge team to keep a proper lookout in accordance with Rule 5 of the collision regulations. [2.3]

3. The operation of *Van Gogh's* radar in ground mode, the incorrect mode for collision avoidance. [2.3]

3. The bridge team of both *Van Gogh* and *Spetses* failure to keep a proper radar lookout as the vessels approached each other, and both making decisions on scanty radar information. [2.3] [2.4]

4. The failure of *Van Gogh's* bridge team to sound the appropriate signal in restricted visibility in accordance with Rule 34(d) of the collision regulations. [2.3]

5. The lack of a passenger announcement on board *Van Gogh*, which led to uncertainty amongst the passengers. [2.3]

6. The perceived acceptance by *Spetses's* bridge team of a 3 cable passing distance in thick fog. [2.4]

7. The influence of commercial pressure on the master of *Van Gogh.* [2.6]

8. The lack of an effective, independent VTS facility at Gibraltar port manned by qualified personnel. [2.7]

9. The decision reached by the pilot and master of *Van Gogh* for the pilot to leave the vessel when he did. [2.7]

10. The lack of an effective measure in Gibraltar Bay to ensure traffic separation. [2.8]

11. The decision by the master of *Spetses* to transit close to Europa Point. [2.8]

12. The conversion carried out on *Van Gogh* resulting in her being more susceptible to flooding than a conventional passenger vessel. [2.9]

SECTION 4 – RECOMMENDATIONS

The owners/operators of *Van Gogh* are recommended to:

1. Ensure adequate operating procedures are promulgated in its safety management system in accordance with ISM to ensure:

    - The avoidance of unsafe speeds in restricted visibility;
    - The avoidance of commercial pressure;
    - The proper use of radar in restricted visibility, and its limitations.
    - Timely advice, and follow up action, to passengers in cases of similar incidents of emergency.

The owners/operators of *Spetses* are recommended to:

1. Ensure adequate operating procedures are promulgated in its safety management system in accordance with ISM to ensure:

    - The avoidance of close quarters situations in restricted visibility.
    - The proper use of radar in restricted visibility, and its limitations.

The Gibraltar Port Authority is recommended to:

1. Implement, as soon as practicably possible, a reliable VTS facility, manned by qualified staff.

2. Consider the adoption of a port marine safety code, similar to that in the UK.

The Government of Gibraltar along with other stakeholders in Gibraltar Bay are recommended to:

1. Explore the possibility of some form of separation scheme in the Bay of Gibraltar which de-conflicts traffic.

The International Association of Classification Societies (IACS) is recommend to:

1. Promulgate to its members the importance of monitoring closely bow door conversions, similar to that of *Van Gogh,* to ensure their integrity in relation to strength.

SECTION 5 – SUBSEQUENT ACTIONS

1. Subsequent to the report, the Port of Gibraltar is to obtain a reliable VTS facility and implement a policy to train staff to use the VTS adequately.

   In addition, there have been preliminary discussions between officials of the Ports of Gibraltar and Algeciras to consider how best maritime traffic in the Bay of Gibraltar can be de-conflicted.

2. Det Norske Veritas (DNV), as a classification society, has reviewed all its RO/PAX passenger ferries with the aim of verifying if any of them have been converted to passenger ships by removing the bow ramp, by welding closed to the bow.

Government of Gibraltar
Department of Shipping
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