



Danish Maritime Accident
Investigation Board

MARINE ACCIDENT REPORT

March 2013



VEGA SAGITTARIUS
Grounding on 16 August 2012

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Front page: VEGA SAGITTARIUS
Source: Danish police

The marine accident report is available from the webpage of the Danish Maritime Accident Investigation Board www.dmaib.com.

The Danish Maritime Accident Investigation Board

The Danish Maritime Accident Investigation Board is an independent unit under the Ministry of Business and Growth that carries out investigations with a view to preventing accidents and promoting initiatives that will enhance safety at sea.

The Danish Maritime Accident Investigation Board is an impartial unit which is, organizationally and legally, independent of other parties.

Purpose

The purpose of the Danish Maritime Accident Investigation Board is to investigate maritime accidents and to make recommendations for improving safety, and it forms part of a collaboration with similar investigation bodies in other countries. The Danish Maritime Accident Investigation Board investigates maritime accidents and accidents to seafarers on Danish and Greenlandic merchant and fishing ships as well as accidents on foreign merchant ships in Danish and Greenlandic waters.

The investigations of the Danish Maritime Accident Investigation Board procure information about the actual circumstances of accidents and clarify the sequence of events and reasons leading to these accidents.

The investigations are carried out separate from the criminal investigation. The criminal and/or liability aspects of accidents are not considered.

Marine accident reports and summary reports

The Danish Maritime Accident Investigation Board investigates about 140 accidents annually. In case of very serious accidents, such as deaths and losses, or in case of other special circumstances, either a marine accident report or a summary report is published depending on the extent and complexity of the accident.

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1. SUMMARY

On the morning of 16 August 2012, the container ship VEGA SAGITTARIUS departed from the port of Nuuk, Greenland, heading for Aasiaat in the north-western part of Greenland.

Approximately one hour after departure, the watch keeping officer changed course in order to avoid drifting ice ahead and shortly after, the ship ran aground on a submerged rock by the entrance to Godthåbsfjorden.

After extensive salvage work the ship was refloated on 29 August 2012 at 0532 and safely brought alongside in Nuuk.

The Danish Maritime Accident Investigation Board has made recommendations to the operator of the ship and to the charterer of the ship.

2. FACTUAL INFORMATION

2.1 Photo of the ship



Figure 1: VEGA SAGITTARIUS
Source: Karina Kleist

2.2 Ship particulars

Name of vessel:	VEGA SAGITTARIUS
Type of vessel:	Container ship (fully cellular)
Nationality/flag:	Liberia
Port of registry:	Monrovia
IMO number:	9491616
Call sign:	A8RK2
DOC company:	VEGA-Reederei Friedrich Dauber
IMO company no. (DOC):	0301909
Year built:	2012
Shipyard/yard number:	Yangfan Group Co Ltd – Zhoushan ZJ/2096
Classification society:	Germanischer Lloyd
Length overall:	139.170 m

Breadth overall:	22.60 m
Gross tonnage:	9,750 ts
Deadweight:	11,811 ts
Draught max.:	8.80 m
Engine rating:	9,600 kW
Service speed:	18.10 kts
Hull material:	Steel
Hull design:	Single hull, FS ice class II

2.3 Voyage particulars

Port of departure:	Nuuk, Greenland
Port of call:	Aasiaat, Greenland
Type of voyage:	Merchant shipping, international
Cargo information:	General cargo in containers
Manning:	17
Pilot on board:	No
Number of passengers:	0

2.4 Weather data

Wind – direction and speed:	South 2-3 m/s
Wave height:	0.0-0.5 m
Visibility:	Good
Light/dark:	Light
Current:	Unknown

2.5 Marine casualty or incident information

Type of marine casualty/incident:	Grounding
IMO classification:	Serious
Date, time:	16 August 2012, 0821 LT
Location:	Saelskaeret, Greenland
Position:	64°04.12 N 052°09.16 W
Ship's operation, voyage segment:	Departure
Place on board:	Over side
Human factor data:	Yes
Consequences:	Damage to hull

2.6 Shore authority involvement and emergency response

Involved parties:	Greenland Police authority, Nuuk Fire Department
Resources used:	Police vessel, various fishing and passenger vessels
Speed of response:	Approximately one hour
Actions taken:	Crew except officers evacuated from ship

2.7 The ship's crew

Master:	Had 18 years' experience at sea. Had been with the company since 2008 and master since 2009.
Chief officer:	Had 16 years' experience at sea. Had been with the company since 2008 as chief officer.
3 rd officer:	Had been at sea since 2011. First ship as officer.
Able seaman:	Had 6 years experience at sea as and one year with the company.
Local competent seafarer: (ice pilot/super cargo)	Been at sea since 1995 and been sailing in Greenlandic waters for 8 years. Last 4 years in merchant fleet. Second trip as local competent seafarer.

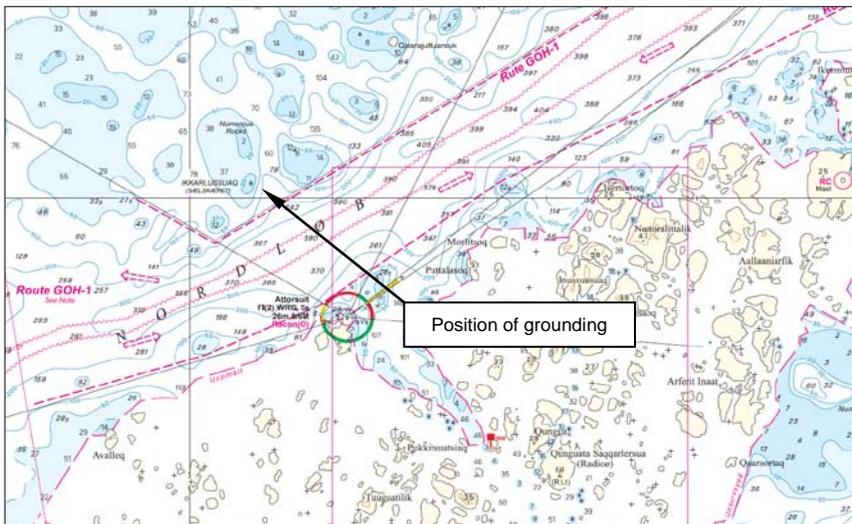


Figure 2: Location of the accident
Source: Map from Danish Geodata Agency

3. NARRATIVE

3.1 Background

VEGA SAGITTARIUS and VEGA STOCKHOLM had been hired on a charter with Royal Arctic Line. The vessels were to trade between the port of Aalborg, Denmark, and several ports along the west coast of Greenland. All of the crew members of VEGA SAGITTARIUS signed on in Singapore on 1 July 2012 and departed for Aalborg, Denmark. None of the crew members had served on this particular vessel before, but the officers had been with other ships within the company. The master had been on the sister vessels and was therefore familiar with the ship.

The charterer had appointed a local competent seafarer¹ to assist the crew with navigation in the Greenlandic waters. Furthermore, he had the task of assisting and training the crew, particularly the chief officer, in the charterer's cargo planning systems. In the correspondence between the charterer and the owners he was referred to as an ice pilot and/or super cargo. Among the crew members he was primarily referred to as the super cargo.

The local competent seafarer will in the following be referred to as the super cargo because the crew members addressed him as the super cargo.

VEGA STOCKHOLM had been on a round trip and was alongside in Aalborg, Denmark, when VEGA SAGITTARIUS arrived in Aalborg. The local competent seafarer had been on the round trip and signed off VEGA STOCKHOLM and signed on VEGA SAGITTARIUS.

The ice search light, sea charts and passage planning were brought on board VEGA SAGITTARIUS to be used for the oncoming sea voyage.

The crew on VEGA SAGITTARIUS had some concerns about the voyage because they did not have any experience navigating in remote arctic areas with risk factors such as ice and extreme cold weather conditions. An information package made by the Danish Maritime Authority, informing about the special conditions of navigation in Greenlandic waters, had been provided by the charterer. This package created concerns and raised a considerable amount of questions that the local competent seafarer could assist in answering.

During the voyage to the first port Nuuk, the local competent seafarer mainly informed the master about the special circumstances regarding navigation in Greenlandic waters. The chief officer was mainly informed about the charterer's requirements on cargo operations.

The master of VEGA SAGITTARIUS insisted that the arrival in Nuuk was planned to be in daylight due to his inexperience navigating in Greenland.

VEGA SAGITTARIUS's arrival in Nuuk on 13 August 2012 went as planned without any incidents.

3.2 The grounding

VEGA SAGITTARIUS completed the cargo operations in the late afternoon of 15 August 2012 at 1835. It was decided to depart the next morning so that the transit out of Nuuk could take place in daylight.

On 16 August 2012 at 0712 LT, VEGA SAGITTARIUS departed from the port of Nuuk according to schedule, heading for Aasiaat, Greenland. At departure, the draught was observed to be 5.78 m forward and 6.70 m aft.

¹ See section 3.7.2.

There was a moderate southerly wind, a slight sea and good visibility.

On the bridge during departure were the master, the chief officer, the able seaman (AB) and the super cargo, who had stayed on board during the port stay, assisting the crew with the planning of the loading and discharging operations. During departure, there were conversations about the presence of ice in the approaches to the port and how to navigate around it, but it was expected and did not cause any immediate concerns among the crew members on the bridge because they relied on the experience of the super cargo.

The master and super cargo were communicating in the port side of the bridge about the navigation and how to proceed in order to avoid ice growlers in the immediate vicinity. The chief officer was standing by the starboard side conning station. He did not participate in the conversation and could not hear what they were talking about.

Shortly after departure at 0742, the sea passage started and the engine load was set at approximately 70%, which gave a speed over the ground of approximately 16-17 knots. The steering was changed from manual steering by the helmsman to auto steering. The setting of the course was from then on ordered by the officer of the watch. The button setting the course on the auto steering was operated by the helmsman. Shortly after the 3rd officer came to the bridge and observed the navigation; he was standby because his watch usually started at 0800. By this time the vessel was a bit south of the planned course line due to the presence of ice on the planned track.

Shortly after departure and while transiting along the recommended route, the 2nd officer came to the bridge from the forward mooring station. The 2nd officer was told to send a report to GREEN-POS²/Coastal Control and the chief officer was told to send a stevedore damage report afterwards.

At 0750, the master gave the watch to the chief officer. There was no immediate concerns regarding the navigation and there was a calm and relaxed atmosphere on the bridge. The ship was steering southwest course 240° which was changed to 247° to avoid ice on the planned track.

At 0753, a GPS position was plotted on the paper chart by the 3rd officer by order of the chief officer. This was the last position plotted on the paper chart by the officer(s) on watch. The ship was by this time south of the course line.

At 0805, the 2nd officer has finished reporting and the INMARSAT B became available so the chief officer started to send the stevedore damage report. The master was still on the bridge and again held the watch. The super cargo was walking around on the bridge.

At 0810, the master had a stomach problem and asked the chief officer if it would be all right if he went to his cabin. Approximately at this time, the master and the other crew members on the bridge observed ice bergs drifting in a southerly direction west of the Attorsuit (Racon O), see figure 2 above.

When the master had left the bridge, the super cargo, the 3rd officer, the AB and the chief officer were on the bridge. The chief officer noticed an ice berg dead ahead and ordered the helmsman to turn to starboard. As the auto steering was activated, the helmsman used the knob to alter the course. Because the chief officer did not give a specific course, he turned the heading to approximately 250. He looked at the 3rd officer standing by the radar in the port side to get confirmation that it was sufficient. He acknowledged this. Meanwhile, the super cargo had left the bridge to go down to the mess room for breakfast.

At 0819, the master met the super cargo in the stairway on his way back to the bridge. As he entered the bridge, he noticed a rock approximately four points to the starboard side of the ship. He

² Mandatory reporting system for ships travelling in the Greenland EEZ (IMO SN/Circ.221 of 29 May 2002 and Danish order no. 170 of 17 March 2003).

asked the chief officer and the 3rd officer about the rock, plotted the ship's position in the paper chart by means of the GPS and ordered the chief officer: "no more to the starboard".

However, the other crew members did not observe any rock, but some ice bergs in the same direction. Shortly after, the crew members felt some strong vibrations and the ship started to heel to port and the propeller pitch was set to zero. Initially, the crew thought the ship had run into an ice berg, but when the super cargo came to the bridge shortly after, he informed the crew members that the ship had run aground.

At 0821, immediately after the grounding, the crew sent a distress message by VHF DSC and a verbal message on VHF channel 16. The super cargo also called ashore to inform the company and the authorities about the situation.

When the initial confusion had subsided, the crew started assessing the damages suffered by the vessel. The master ordered the 3rd officer to prepare the life-saving equipment. He went on deck and took the lashings off the rescue boat and life rafts and the embarkation ladder was lowered to the water.

The chief officer went to the deck office and pumped ballast from the port side tanks. Soundings were taken of the water depth around the ship. All tanks and other spaces were sounded and it was established that there was no water ingress. During rounds on the ship, deformed frames and bulkheads were observed on the forward part of the ship.

At approximately 1130, the situation was stabilized. It had been established that there was no water ingress, the ballast water had been pumped out, the crew had made a visual check of the ship and the life-saving equipment was ready for use. The authorities had been informed and SAR operations had been initiated.

At noon, the police arrived alongside.

3.3 Navigation and watch keeping on VEGA SAGITTARIUS

The bridge watch on VEGA SAGITTARIUS was divided between the chief officer, the 2nd officer and the 3rd officer in accordance with a regular watch schedule of four hours on watch and eight hours off. Three ABs were assigned as lookouts.

The change of the watch was made by a verbal handover and there was no formalized way of stating that the watch was taken over, such as the signing of a document.

Usually one AB was on duty on the bridge during departure and arrival. Among other tasks he was assigned the helmsman. On VEGA SAGITTARIUS, the helmsman usually used manual steering, but as a helmsman he was also adjusting the auto steering while underway in, for example narrow waters. The course was ordered by the officer of the watch and then the helmsman adjusted the course on the auto steering.

The 2nd officer made the passage planning that was subsequently approved by the master. All navigational equipment was maintained by the 2nd officer and he was therefore also the user most experienced in setting up the various control functions and limits within the various equipment items such as GPS, electronic chart system (ECS) and echo sounder. In the passage planning, there was no description of parallel indexing or other use of terrestrial navigation methods. There was no tradition on the vessel for planning terrestrial navigation, and the passage plan from the sister vessel's previous voyage did not have it either except from some parallel indexing in the chart used for the approaches to Aasiaat.

On the voyage from Singapore to Aalborg, the officers on the bridge had a meeting about the general circumstances regarding the watch keeping – a bridge discipline meeting. The change of a watch or how to organise the work on the bridge during arrival and departure was not discussed. The topic of changing the watch was not discussed during the meeting. The ship did not have any change-of-watch checklist or specific arrangements for changing the navigational watch.

Below in figure 3 is a picture of the bridge and the conning stations. The one that was typically used was the one by the chair. The chart table was placed behind the conning station at the exit to the stairway. While plotting positions on the chart, there is a limited view out of the bridge front end windows.

The echo sounder is mounted on the bulkhead above the chart table. The alarm settings on the echo sounder were not used by some crew members as it was considered impracticable since the water depth would often vary during arrival and departure and resetting and continuously changing the alarm limits would increase the work load with little added value.

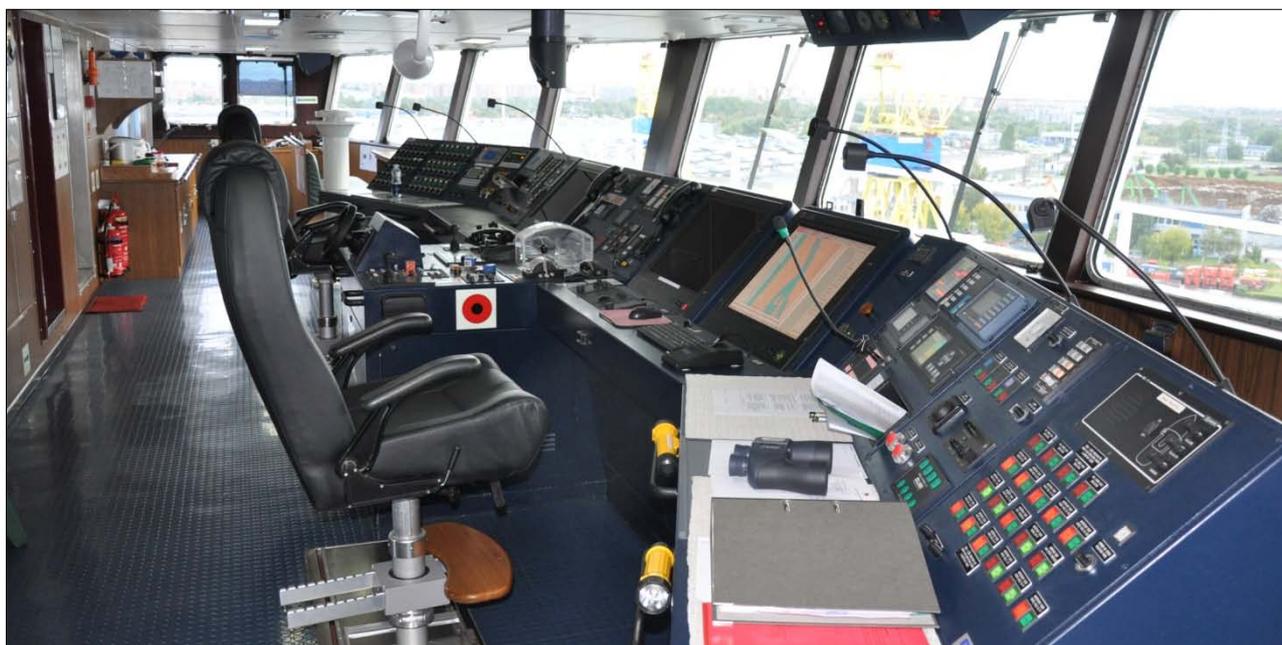


Figure 3: View of the bridge from the starboard side
Source: DMAIB

The navigational officers relied on the ECS for navigation purposes. The passage plan was made in the ECS and then transferred to the radar. The route was not programmed in either of the GPSs. There was one GPS on the front end bridge consol and one by the chart table. Usually, the position was established by GPS and plotted on the chart. This was done as a matter of habit and for documentation purposes – real time navigation was usually carried out on the ECS because experience had shown that this was an effective way of navigating.

No ARCS³ or digital charts were available on board for the area of Nuuk or other areas in Greenland. The ARCS charts for Greenland are available only in the scale 1:10 mill which was not suitable for navigation in the approaches to Nuuk. Therefore, no approved chart was available on the ECS. On figure 4 below is a picture of the information available to the navigator on the ECS.

³ Admiralty Raster Chart Service.



Figure 4: Picture of display on ECS
Source: Danish police

The paper chart used during the time of the accident was chart 1331 from the Danish Geodata Agency as seen in figure 5 below. The arrow points towards a symbol in the chart that indicates that there is a rock which covers and uncovers depending on the tide. This was the position of the grounding. There was no buoyage indicating the low water depth.

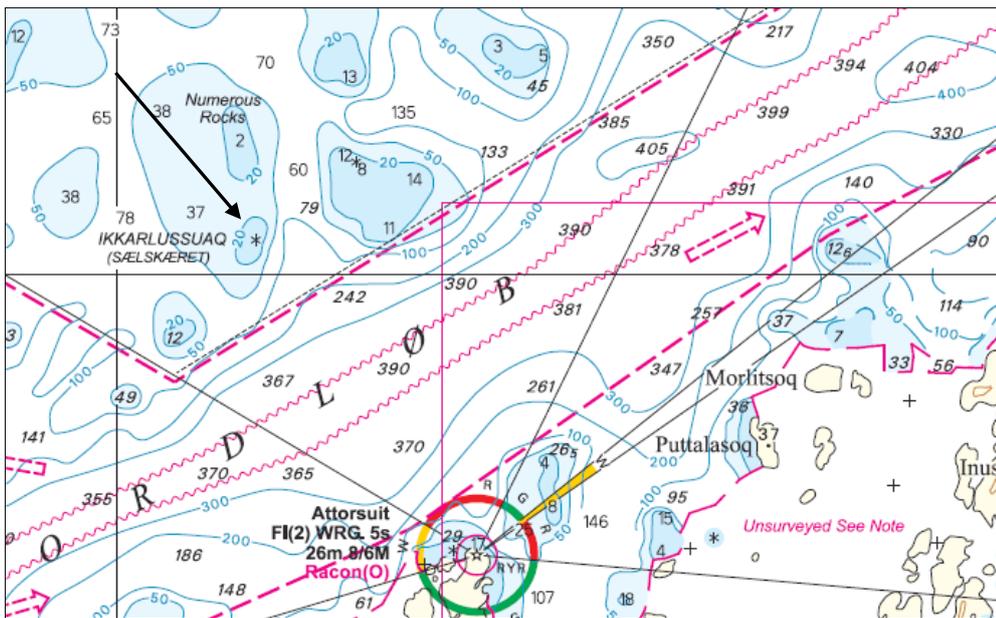


Figure 5: Picture of Sælskæret from chart 1331
Source: DMAIB

Two categories of navigational charts cover Greenlandic waters: Paper charts and electronic navigational charts (ENC). The charts are made by the Danish Geodata Agency. There is an ENC covering the area of the grounding (DK3 – 1310), but it is not in a scale that would make it suitable for navigation close to shore and was not ordered before the arrival in Greenlandic waters.

The ENC charts covering the area of Nuuk (area of chart 1331) had not been released at the time of the accident. They have since been published on 25 January 2013.

Information regarding the specific challenges in navigating Greenlandic waters was delivered by the owners and the charterer. This information was generally about the precautions to be taken with regard to the inaccuracy of the charts, reporting to GREENPOS, and the DMI Ice Service as included in the information package from the Danish Maritime Authority.

Before its departure from Aalborg, the sister vessel gave its charts and route planning to the ship. Beyond this, no specific information was given about any precautions relating to the navigation.

The super cargo communicated primarily directly with the master. On a more informal basis, there was communication between the super cargo and the rest of the crew and in this context the chief officer had understood that a minimum of 500 metres should be kept between the ship and any ice berg. The primary communication between the chief officer and the super cargo was related to cargo planning.

There had been high tide in the port of Nuuk approximately one hour before the grounding. The rock on which the ship grounded was submerged at the time of the grounding and was therefore not noticed as the ship deviated from the planned track. The view from the bridge gave the immediate impression that the ship was in open waters/deep sea.

3.4 Assistance

At 0825, a mayday from VEGA SAGITTARIUS was received by the police in Nuuk via the coastal radio station Aasiaat Radio. Several vessels were underway to the site of the grounding. The police vessel SISAK arrived at 0908.

The police coordinated with the charterer who was in contact with the vessel. The police arrived on board at 1129 and took an alcohol test of the chief officer and the master, both of whom tested negative.

At 1146, the vessel started to move and vibrate. Fearing that VEGA SAGITTARIUS was at risk of capsizing, it was decided to evacuate nine of the crewmembers to the vessels SISAK and TULLUGAQ. Later two of the crew members were brought back on board so that the vessel had a minimum level of manning should an emergency arise.

Flotation devices were positioned in the immediate vicinity of the vessel to contain any leakage of oil. Devices to be positioned at a greater distance were ordered, but were cancelled at a later stage. When it had been established that the oil tanks were intact, it was determined that there was no danger of extensive pollution.

No leakage of oil or cargo was detected at any time during the grounding.

During the afternoon, the risk of the VEGA SAGITTARIUS capsizing was evaluated. The police authority, the master of VEGA SAGITTARIUS and the crew on the vessels nearby concluded that the risk would increase as time passed because low tide would occur at approximately 1315. It was estimated that the forward part of the vessel would be above the water at this point in time.

At 1347, it was established that the vessel was on the ground amidships and on each side on the forward part of the vessel, see figure 3 below.



Figure 3: VEGA SAGITTARIUS
Source: Danish police

At 1352, as the time for low tide had passed and it was established that the weather conditions would stay favourable, the authorities considered it unlikely that the vessel would capsize.

Any attempt to pull the vessel off the ground should be taken upon the owner's initiative and would not be done the same day. Therefore, the shore emergency response was cancelled and the crew members were brought back to the vessel.

At 1605, the last vessel departed from the area.

3.5 Consequences

On 17 August at 1900, a salvage team arrived at Nuuk and went to the ship for assessment of the situation. The crew on the ship advised that the forepeak tank and ballast tanks on port and starboard side forward were breached. During night and the following day inspections and damage calculations were carried out by the salvage team.

During the 19 August, a continued deterioration of the hull of the ship was noted, specifically on the forward wing tanks and cargo hold as well as minor water ingress in the tunnel duct keel. A lightering craft was contracted and 70 metric tons bunker oil was transferred from the bunker tank forward to the aft bunker tank to minimize the risk of oil pollution.

In the morning of 20 August, a diving survey confirmed that the ship was grounded on multiple rock pinnacles.

On 22 August, a salvage plan was presented that involved lightering the ship by discharging the cargo, redistribute or discharge bunkers, discharge ballast and refloat the ship with the assistance of tugs.

On 28 August, discharging was completed, a towing plan was agreed upon and a towing connection was established.

At 0532 on 29 August, after spring tide, a tug pulled and refloated the VEGA SAGITTARIUS. The ship was subsequently towed into deeper water and another tug was connected.

At 1245 on 29 August, VEGA SAGITTARIUS was safely moored at the pier in Nuuk.

3.6 Search and Rescue operations (SAR) in Greenlandic waters

Greenland is an autonomous country within the Kingdom of Denmark, but the police in Greenland is governed by the Danish Ministry of Justice.

SAR operations in Greenlandic waters are formally the responsibility of the Ministry of Business and Growth (the Danish Maritime Authority) and the Ministry of Justice (the Danish Police). At an operational level, SAR operations are carried out by the Joint Arctic Command and the Danish police.

The Greenland police authority is responsible for SAR operations within the area where ordinary police work is carried out. This would ordinarily be within three nautical miles from the shore and in populated areas or where every-day traffic occurs. At their disposal are helicopters from Air Greenland, police vessels and smaller private vessels hired for a specific task. Dependent on the scale and complexity of the accident, the Joint Arctic Command can upon request assist the police or take over the SAR operation.

The Danish Maritime Authority is responsible for SAR operations outside the ordinary operational area of the police. The Joint Arctic Command carries out SAR operations on behalf of the maritime administration.

3.7 Navigation in Greenlandic waters

3.7.1 Regulation

Navigation in Greenlandic waters is mainly regulated by the act on safety at sea⁴ and the order on technical regulation on safety of navigation in Greenland territorial waters⁵. The latter contains regulations on, for example, description of areas to be avoided, reporting and equipment. Section 5 of the regulation outlines the requirements on the navigator's qualifications and states in the first paragraph: "*Ships shall have at least one navigator available on board with the necessary local knowledge of the waters to be navigated*". This navigator is commonly referred to as a qualified navigator, local competent person or ice pilot.

The Danish Maritime Authority has prepared an information package⁶ for vessels bound for Greenlandic waters. The package contains information on regulations, SAR and special precautions for navigation in Greenlandic waters.

3.7.2 Qualified navigator – local competent person

Shipping companies chartering their cargo ships for service in Greenlandic waters do not usually have crews possessing the necessary qualifications as stipulated in the regulation. The same applies to cruise ships operating in these areas.

In order to meet the regulatory requirements, the shipping companies hire local competent persons on a temporary basis who have gained their experience from a Greenlandic shipping company

⁴ Consolidated act no. 903 of 12 July 2007.

⁵ Order no. 417 of 28 May 2009.

⁶ <http://www.dma.dk/Ships/Sider/Greenlandwaters.aspx>

and/or the Admiral Danish Fleet. Their services are typically provided via shipping agents in Greenland. Some of them still work for the local shipping company, but offer their services to other shipping companies on a part time basis.

In Danish, the local competent person is referred to as a “kendt mand”, which translates into: “a person with local knowledge” or “local competent person”. Therein lies not that the person is a pilot in the traditional meaning of the concept, for example a deep sea pilot or harbour pilot, but rather that the person is a navigator with local knowledge of reefs and shoals and experience navigating in ice who offers advice to on-board navigators. The person does not meet the requirements for regular pilots as set out in IMO Resolution A.960⁷.

Besides assisting the on-board navigational crew, the local competent person also acts as an agent representing the ship/company and as a super cargo on chartered ships. The extent to which local competent persons assist with other tasks depends on whether it is a cruise ship or a cargo ship.

In the correspondence between the charterer and VEGA SAGITTARIUS, the qualified navigator was referred to as the ice pilot.

4. ANALYSIS

4.1 Bridge management

Between the start of the sea passage at 0742 and until the grounding at 0821, there were two, three or four navigational officers, one helmsman (AB) and the super cargo on the bridge. Each of the crew members were on the bridge to carry out specific tasks. The master had the watch, two officers were about to report, one officer was waiting for taking over the watch, the super cargo was standby for assisting in the navigation and the AB was helmsman.

The navigational watch changed four times between the master and the chief officer within a time frame of approximately 40 minutes. At one point in time, the chief officer was in doubt whether he was on watch because it was after 0800 which was when the 3rd officer usually held the watch. The 3rd officer did not acknowledge having had the watch at any time before the grounding.

When the master left the bridge at 0810, the chief officer was still reporting, but as he was the most senior officer on the bridge, he accepted to navigate even if it was after 0800 and the 3rd officer was on the watch according to the watch schedule.

The fact that the watch changed several times within a short time frame without any formal hand-over, made it more difficult for the navigator to plan and assess the medium or long-term navigational situation. That is, there was not sufficient time to create an effective mental model of the navigational situation on which decisions were to be made.

When the 3rd officer had plotted the position previously, he made not made a remark about any immediate danger. That gave the chief officer the impression that nothing unusual was noticeable on the paper chart. As the watch progressed, there was little communication between the crew members on the bridge. The situation seemed normal.

The super cargo had communicated with the master, but any information given was not shared with the chief officer. During the short period of time from the end of the sea passage to the

⁷ Recommendations on training and certification and operational procedures for maritime pilots other than deep-sea pilots.

grounding, there was not a common understanding among the crew members on the bridge of how the navigation should proceed.

It was not considered how to integrate the super cargo into the bridge team and his role became unclear. Him being on board as a super cargo became his predominant role towards the chief officer. Towards the master and the rest of the bridge officers, he was a navigational adviser. There was a common understanding that he was not a “regular” pilot, but what that entailed was not understood by the crew members, especially because he was referred to as an super cargo and performed some of the duties of a regular pilot.

The super cargo’s decision to leave the bridge was based on a subjective evaluation of the navigation ahead. He did not consider the waters difficult to navigate and the presence of ice did not present any immediate danger to the navigation of the ship. The fact that the bridge officers had navigated this area before without any concern influenced his decision to leave the bridge.

However, what is considered unproblematic for a navigator with experience navigating Greenlandic waters is not necessarily unproblematic for an inexperienced navigator. However, there was no communication between the super cargo and the officer of the watch before the super cargo left the bridge.

The regulation does not mention the concept of a local competent person, but requires the ship to have a navigator with the necessary local knowledge. That regulatory requirement has been fulfilled by having a navigator on board who is not a pilot, but who in some ways acts as one and is by some referred to as an ice pilot and/or super cargo. There is no systematic approach to this concept and how the super cargo interacts with the bridge team. The challenges in introducing such a concept to the bridge team has not been formally considered by the parties involved.

4.2 Navigation

Navigation in Greenlandic waters is challenging for navigators who are used to navigate more southerly waters. The challenges lie not only in the technical circumstances, such as limited updated surveys and charts or a lack of bouyage, but also in general navigation in narrow passages without a pilot, in adverse weather conditions and in the presence of ice.

Before departing Aalborg, the ship had received information about navigation in Greenland. The above-mentioned circumstances and challenges had created concern among the crew members. Mainly because the arctic area was outside the normal trading area and the crew had no expertise sailing in remote arctic areas. The concern was primarily related to the presence of ice growlers and ice bergs.

The only information available to the officer of the watch about the danger ahead was the symbol in the paper chart (see figure 5) on the chart table approximately four meters behind him. He did not continuously consult the paper chart before starting the starboard turn because previously the ECS had proven an effective way of navigating. However, on this day there was no approved ECS chart available and the chart on the ECS did not contain any information about navigational dangers.

In the absence of positioning by means of terrestrial navigation (e.g. parallel index), there was no warning that the ship was outside the recommended track. Therefore the bridge team did not realize that the ship was heading towards a rock.

The immediate concern of the officer of the watch became drifting ice from the north, and without the super cargo to consult and a safety distance of 500 metres to take into account, the officer of the watch ordered the ship to be turned to starboard. As the three crew members looked out the bridge front end windows, they had the impression that the ship was in open waters and deep sea.

No buoyage was observed indicating shallow waters. With a speed of 16-17 knots and a distance of approximately 150 metres from the 100 metre depth contour line to the shallow area, any setting on the echo sounder would not have been capable of giving sufficient warning to prevent the grounding.

The fact that the crew on the bridge thought that the ship had hit an ice berg until the super cargo told them otherwise indicates that the presence of the rock was not acknowledged and that the primary concern was the presence of ice.

5. CONCLUSIONS

VEGA SAGITTARIUS grounded in daylight with clear weather, calm sea and no traffic. On the bridge were two navigators and one helmsman who were in a situation that appeared to be normal. However, though the situation seemed normal to the bridge team, the margin for the accidental events to appear had been narrowed considerably before the grounding.

The different tasks of the members of the bridge team had been loosely defined. Furthermore, the way in which the change of the watch was carried out caused a loss of information about the forthcoming navigation and about the precautions to be taken.

The presence of drifting ice bergs presented an uncommon concern to the bridge crew and, in the absence of the super cargo, the watch keeping officer reacted in an instinctive manner. He decided to turn the vessel on the basis of the information available on the ECS and the view from the bridge window. The lookout and the other officer on the bridge were also unaware that the manoeuvre would make the ship head towards shallow waters.

The super cargo was not sufficiently integrated in the bridge organisation and, therefore, his experience navigating these waters with ice bergs and shallow water areas was not fully utilized. The lack of a systematic approach to the concept of a local competent person has contributed to this condition.

The information that the ship had received about the special precautions for navigating in Greenlandic waters was not effectively implemented on board, particularly with reference to the reliance on GPS and the use of ECS.

6. SAFETY RECOMMENDATIONS

The Danish Maritime Accident Investigation Board recommends that VEGA Reederei GmbH & Co. KG together with their external ISM auditors evaluates the implementation of the bridge team resource management onboard their fleet.

The Danish Maritime Accident Investigation Board recommends that Royal Arctic Line in the ongoing evaluation of the super cargo / local competent person concept further develops the guidelines for how the local competent person functions as super cargo and as a person who gives navigational advice.