



National Transportation Safety Board

Washington, D.C. 20594

November 17, 2008

Factual Report of Operational/Other Factors

Accident No.: DCA08FM002

Vessel: Bahamas Registered Motor Tankship *Axel Spirit* 819 feet (249.85 meters) long, 143 feet (43.79 meters) wide, gross tons 62,929, O.N. 9000098; IMO No. 9282041, steel double hull construction, built in 2004

Accident Type: Allision with Ambrose Light tower, Entrance to New York Harbor

Location: Entrance to New York Harbor, New York

Date: November 3, 2007

Time: 0143 Local ¹

Owner: Axel Spirit, L.L.C.

Operator: Teekay Shipping Ltd., Bahamas

Property Damage: Ship \$1.5 million;
Ambrose Light tower: \$10 million for a replacement tower

Complement: 22

Injuries: None

Synopsis

On November 3, 2007, about 0143 local time, the 819-foot, Bahamas Registered, tankship *Axel Spirit*, carrying a cargo of 441,000 barrels of crude oil, allided with the Ambrose Light Tower at the entrance to New York Harbor. The *Axel Spirit* sustained a 60-foot long crease in the hull on its starboard side above the waterline and damage near the turn of the bilge. All three legs and the central column of Ambrose Light Tower were damaged causing the tower to lean. Preliminary reports by the Coast Guard indicate that the tower was damaged beyond repair and that construction of a new tower was estimated to cost approximately \$10 million,

¹¹ All times are Eastern Standard Time based on the 24-hour clock. The time is based on the time on the VDR (0142:05) and the delayed log entry made by the second officer pursuant to instructions from the master that such an entry be made.

The vessel had departed its anchorage about 4 miles northeast of Ambrose Light and was en route to the pilot boarding position one mile west of the light. The master planned to pass south of the light and then alter course to the northwest to head for the pilot boarding location. At the time, the master was conning the vessel on courses ranging from approximately 230° to 220°, and because the vessel was early for the 0200 arrival, the master was varying the vessel's speed from stop to dead slow ahead to consume time so as to arrive at the pilot boarding location at exactly 0200. The second officer was plotting the vessel's positions based on radar ranges and bearings to the Ambrose Light.

Three of the fixes had the same bearing indicating that the vessel was setting toward Ambrose light. The second officer claimed that he informed the master of the vessel's position by reporting bearings and ranges to Ambrose light. The lookout, who was in the wheelhouse, stated that he was concerned about the vessel's progress toward the light and had reported the bearing of the light on two occasions and that he heard the second officer relay his reports to the master. At 0141:46, the master ordered the course changed from 225° to 220°. Moments before the collision the master ordered the rudder to starboard 10°, but quickly changed the order to port 10°. At 0143 the vessel's starboard side allided with the Ambrose Light tower.

Events Before The Accident

On October 27, 2007, the 819 feet long Bahamian Tankship *M/V Axel Spirit* (Figure 1 Photo of vessel) completed loading a cargo of 441,000 bbls of Maya crude oil at the Petroleos Mexicanos (PeMex) oil complex at Cayo Arcas, Mexico in the Gulf of Campeche, and then got underway for the Chevron Refinery at Perth Amboy, New Jersey. The vessel proceeded northeast through the Straits of Florida and continued north along the United States east coast



Figure 1. Photo of *Axel Spirit*

toward New York. Due to the vessel's arrival draft and draft constraints at the intended berth, the vessel's arrival at the Chevron refinery was planned around the local high water periods which occurred at 1444 on November 2, with the following period of high water occurring at 0327 on November 3, 2007. Because of unfavorable sea conditions in the later part of the voyage, the vessel's estimated time of arrival (ETA) was delayed from 1200 to 1700 on November 2, 2007. Because of the expected delay, the vessel's agent scheduled the pilot and assist tugs for an arrival time at the refinery to coincide with or near the high water period at 0327 on November 3, 2007. The agent informed the master by telex messages about the revised arrangements for the pilot and berthing.

About 1345 on November 2, 2007, the *Axel Spirit* arrived at the Precautionary Area at the entrance to New York Harbor. The master of the *Axel Spirit* had been in contacted the pilot boat² about an hour and a half prior to arrival, and the watch officer (mate) on the pilot boat had informed the master that the pilot boarding time had been delayed to 0200³ on November 3, 2007, and he advised the master to anchor the vessel 2 to 5 miles northeast of Ambrose Light and await further information on the pilot boarding time. Specially, the mate on the pilot boat promised to call two hours before the boarding time to confirm the final time. The master selected an anchorage location about 4 miles northeast of Ambrose Light, which was clear of any submarine cables⁴.

While en route to the anchorage, the second officer used radar bearings and ranges to Ambrose Light to plot the vessel's progress and to assist the master in navigating the vessel to the anchorage location selected by the master. The vessel anchored about 1445. (See Figure 2. Chart showing vessel's anchorage position in relation to Ambrose Light and fixes showing vessel's track to allision with the light.)

An anchor watch was set and the master left night orders for the watch officers⁵ on the bridge to monitor the vessel's position and to maintain a listening watch on the

² The pilot boat remains underway in a designated pilot are and transfers pilots by launch to and from arriving and departing ships. Pilots are from the New York Sandy Hook Pilots Association and the New Jersey Sandy Hook Pilots Association. Both pilot association members, licensed by the States of New York and New Jersey, respectively, are assigned from a single rotation system. Also docking masters take charge of the vessel during docking and undocking, and issue all helm and engine orders to the vessel and by radio to the assisting tugboats. The docking masters who docked ships in New Jersey were members of the Metro Pilots of New Jersey and are licensed by the State of New Jersey. Docking masters pilot vessels moving between berths throughout New York Harbor.

³ The pilot boarding times are determined by the agent for the vessel. The agent makes arrangements for the vessel's arrival in port, including the berth assignment, line handlers, tugs, pilot, docking master and for loading or discharge of cargo. The agent must consider availability of berths and tidal stage to ensure a safe berth that is adequate for the vessel's draft at arrival and at departure. Because different agents establish boarding times for their vessels independently, it is possible for two vessels to have the same pilot boarding time, and in such cases the watch officer on the pilot boat normally chooses to send a pilot to the vessel closest to the pilot boarding location.

⁴ This is not a designated anchorage but vessels awaiting a pilot regularly anchor in the area.

⁵ The vessel carried two third officers who along with the second officer stood the navigation watches. One third officer stood the 8 to 12 watches, the other stood the 4 to 8 watches, and the second officer stood the 12 to 4 watches. The chief officer worked days and during cargo operations.

Channel 8 VHF/FM radio used by the pilot boat. The master's night orders for the evening watch contained instructions to call him at 2350 and to be prepared to commence heaving in the anchor at 2400.

The Accident Narrative

At 2300, the third officer on the 2000 to 2400 watch gave a one-hour notice to the engine room. Between 2300 and 2320, the third officer tested all bridge equipment including the telegraph, communications and steering, and synchronized all clocks. All equipment, except the main engine, had been tested and found in satisfactory working order. About 2345, the mate on the pilot boat informed the *Axel Spirit* that the pilot boarding time would be at 0200, and that the pilot boarding location would be one mile west of Ambrose Light. Shortly before 2400, the second officer arrived on the bridge to assume the deck watch. At this time the navigation watch comprised the second officer and an ordinary seaman at the helm.

The master arrived on the bridge about 2400 and instructed the third officer, who had stood the 2000 to 2400 watch to take the able seaman assigned to his watch, and go forward to the bow and start heaving in the anchor. The master stated that the wind was out of the northeast at about 22 knots and gusting to 35 knots, and that the vessel was heading about 065°. The recent passage of Hurricane NOEL⁶ had produced strong winds and swell from the northeast. The master thought the wind and sea conditions might require more time for heaving up the anchor and he had elected to start heaving up the anchor earlier than normal.

At 0015, the anchor detail commenced heaving in the anchor. At 0042 the anchor was aweigh. Heaving in the anchor had gone smoothly and the vessel was then ahead of schedule. Once the anchor was aweigh, the master tested the main engine ahead and astern, and the engine tested satisfactory. The master, then, put the engine to slow ahead and ordered the helmsman to come right to a course of 230°. At that time the Ambrose Light was bearing 235°. The master announced to the second officer that the 230° course looked like a good course the pass south of Ambrose Light. The master never informed the second officer how far off that he wished to pass Ambrose Light. At 0052, after the vessel was steadied on course 230°, Ambrose Light was bearing 235°, about 3.5 miles away. About this time the master reduced speed to dead slow. See Figure 2.

The master did not require the second officer to prepare a passage plan or to plot an intended trackline on the chart from the anchorage, past Ambrose Light, and thence to the pilot boarding location one mile west of the light, nor did he plot any intended

⁶ Hurricane Noel had been downgraded to a tropical storm and was about 300 miles southeast of Ambrose Light.

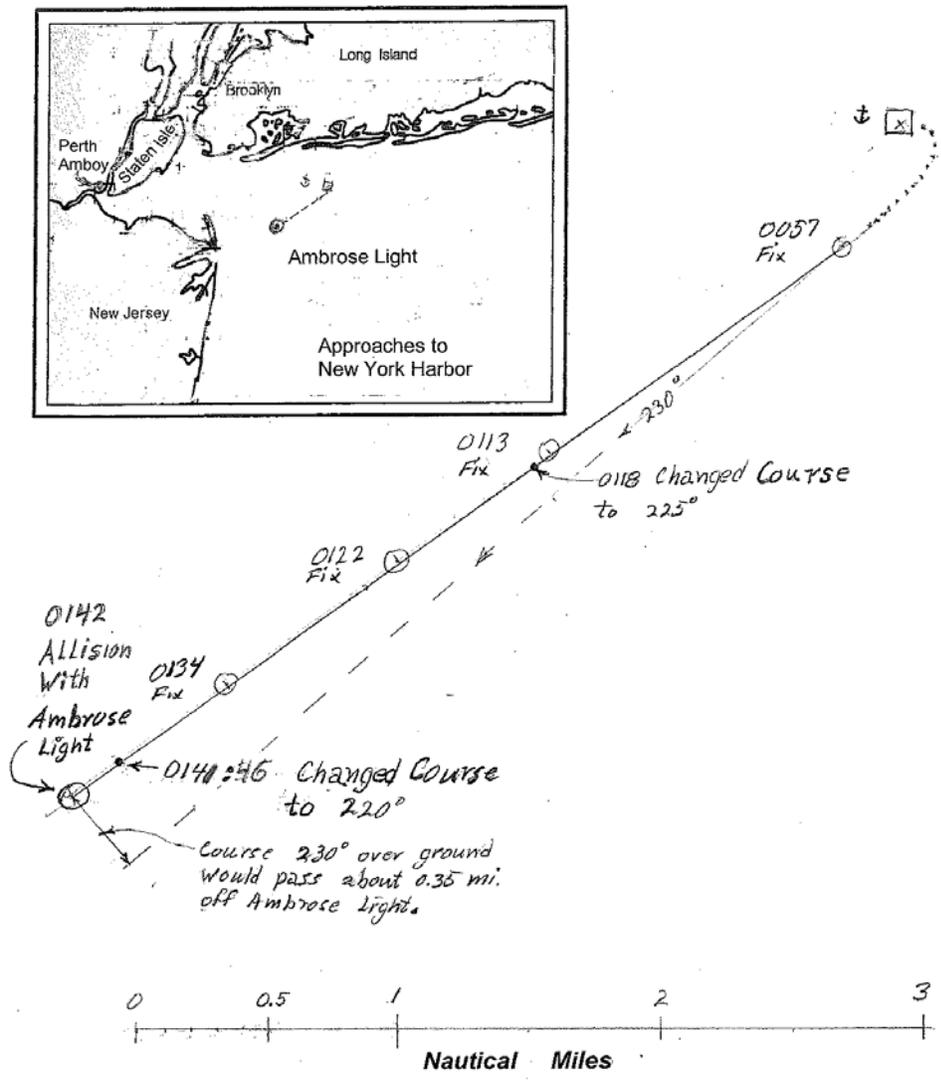


Figure 2. Vessel track to the allision showing fixes plotted by the second officer and locations of course changes.

trackline on the chart himself. The master conned the vessel at a position near the center of the bridge. The engine order telegraph was just to the master's right, and he personally operated the engine order telegraph⁷. The ECDIS⁸ was just to the right of telegraph and clearly visible to master, and the master had used it to observe the movement of the passenger vessel Norwegian Spirit and had become aware that the vessel, although over 10 miles to the east, was traveling at about 20 – 23 knots toward Ambrose Light. The 10-centimeter radar was just right of the ECDIS and also clearly visible to the master. The master recalled that the RACON on Ambrose Light was showing on the radar. (See Figure 3 Photo showing Layout of Navigation Bridge.) Also, the master had an unobstructed view of Ambrose Light from his location. The master described the visibility as good and he described Ambrose Light as a very sharp [bright] light. The master complained that lights on shore at Sandy Hook interfered with his observation of Ambrose Light and that they were very confusing. (The second officer also said that the lights on shore interfered with seeing Ambrose Light.) The master noticed that the second officer was taking radar bearings and ranges on Ambrose Light and plotting fixes on a navigation chart at the chart table just to the left of the 3-centimeter radar, about 10 feet from where the master was standing. (The second officer stated that he was obtaining the radar bearings and ranges to Ambrose Light for his chart plotting from the 10-centimeter radar near the master.) Throughout the approach to Ambrose Light, the master never looked at the chart to examine the fixes plotted by the second officer, nor did he determine any bearing or ranges to Ambrose Light on the radar, nor did either the master or second officer make use of the ARPA function on the radar to determine the CPA to Ambrose Light or utilize the parallel indexing feature to ensure the vessel was on a trackline that would pass clear of the light.

The master was concerned about arriving at the pilot boarding location a mile west of Ambrose Light at exactly 0200. The pilot boarding area was about 4.5 miles away from the 0057 fix and the vessel was ahead of schedule, causing the master to proceed at dead slow and to stop the engine on two occasions to consume time. The master stated that the following swells caused the vessel to yaw 5° to 6° from the desired course when the engine was stopped. In both instances the vessel's heading changed to the left while the vessel was stopped. The master stated that the helmsman maintained the vessel on course when power was applied to the vessel. The first stopping of the main engine occurred about 0103 and lasted until about 0114, when the master put the engine back to dead slow ahead.

About 0112, the mate on the pilot boat called on channel 8⁹ and asked the master which side of Ambrose Light did he intend to pass and the master responded

⁷ The vessel's main engine was in bridge-control and speed of the engine was directly controlled from the bridge by operating the telegraph.

⁸ Electronic Chart Display Information System shows a navigation chart of the area and may have the radar presentation superimposed on the chart.

⁹ A pilot working channel. Not recorded by the Vessel Traffic Service

that the *Axel Spirit* would pass south of the light. The master's plan was to pass south of Ambrose Light and then alter course to a northwesterly heading to reach the pilot



Fig 3 Layout of the Navigation Bridge.

boarding location one mile west of Ambrose Light. Upon being informed that the *Axel Spirit* would pass south of Ambrose Light, the mate on the pilot boat informed the master that a pilot would board his vessel first because his vessel was closer to the pilot boarding area, and that the passenger vessel Norwegian Spirit, which was still a few miles east of Ambrose Light would receive a pilot second. The mate also asked if the master planned to stay ahead of the Norwegian Spirit and the master stated he would do so. The mate on the pilot boat then requested the master to contact the Norwegian Spirit, and inform that vessel of his intentions. The master, who had been observing the approach of the Norwegian Spirit on the ECDIS, contacted the Norwegian Spirit on Channel 8 and informed its navigation watch officer that *Axel Spirit* would pass south of Ambrose Light. He did not inform the Norwegian Spirit that the pilot would board his vessel first, a fact possibly known by the Norwegian Spirit that was also using Channel 8 to communicate with the pilot boat. The Norwegian Spirit acknowledged the message.

At 0113 , the second officer plotted a radar fix that showed Ambrose Light bearing 235°, 2.2 miles away. At 0118:20, the master ordered the course changed to 225° because he recognized that the vessel would pass too close to Ambrose Light. At

this time the vessel was about 2 miles from Ambrose Light. About 0120, the master stopped the engine a second time and about 0124 the master put the engine back to dead slow ahead. At 0122, the second officer plotted another radar fix that showed Ambrose Light still bearing 235° at a distance of 1.6 miles and at 0134, he plotted a third fix showing Ambrose Light still bearing 235° at a distance of 0.7 miles. No reporting of the three fixes, showing no change in bearing, or any recommendations by the second officer are head on the VDR.

At 0138, the master asked the second officer “what speed do we need for being [at pilot boarding location] at two o’clock? The second officer answered 4.5 and the Master replied 4.5, yes that is what we are making.

About 0141, the lookout made a report to the second officer but the report was not recorded. However, immediately afterwards, the second officer informed the master that the vessel was very close to Ambrose Light. The master answered “huh” and the second officer repeated the report. The second officer then answered “this one, this light on the starboard side” and the master asked: Ambrose? At 0141:33, the look out reported that we are very close sir, and the master asks: Ambrose? A brief discussion ensued between the master and the second officer, apparently about which light was being reported. And at 0141:46, the master ordered the course changed to 220°. At this time the distance to Ambrose Light was about 0.7 miles.

At 0142 the mate on the pilot boat called the *Axel Spirit* and spoke with the master about procedures and maneuvers for rendezvousing with the pilot launch and boarding the pilot. At 0142:38, when the radio call was completed, the master asked the second officer “where is he?” apparently referring either to the Ambrose Light or the pilot boat. At 0142:42, the second officer replied, “starboard, flashing there. See.”

At 0142:49, the helmsman reported steady on 220°. The master recognized that the vessel was then very close to Ambrose Light and at 0143 he ordered the rudder to starboard 10°, but immediately ordered “no port ten”. Seconds later, the master increased speed to slow ahead, which he later said was give the more effect to the rudder, but then he immediately reduced speed back to dead slow.

At 0143:14 the starboard side of the *Axel Spirit* struck the Ambrose Light tower, causing extensive damage to structure and causing the rotating beacon to stop rotating. At this time, the sound of two impacts are heard on the VDR. At 0143:23, a third impact is heard and at this time, the master ordered the rudder to starboard 10°; and at 0143:42 he ordered starboard 20°, and at 0144:06 he ordered hard starboard. At 0144:23, the master is heard to say “we touched” (See Figures 4 and 5, Photos of Ambrose light)

Various accounts of the incident from each of the bridge team members described the close encounter with the tower. The second officer said he felt a vibration.

The lookout and helmsman stated they saw a very bright light pass down the starboard side. The master stated that he hoped that the vessel had not actually touched the light.

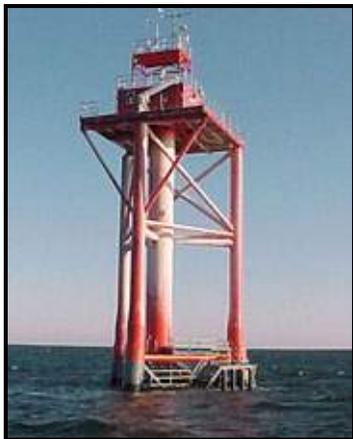


Fig 4. Ambrose Light (Prior to Allision)¹⁰



Fig 5. Ambrose Light (Post Allision)¹¹

The master stated that he believed the vessel was proceeding “nicely” toward Ambrose and that he was 100 percent sure that he vessel would pass clear of Ambrose Light. He stated that the second officer, the navigation officer, had been taking bearings and ranges from the radar and plotting them on a chart. He stated that he expected the second officer to inform him if there was any problem. He also stated that Ambrose Light had been on the starboard bow continuously. The master stated that he did not personally take bearings using the radar, because the second officer the navigation officer was on the bridge taking bearings and ranges and plotting them on the chart. The master complained that the second officer had not given any indication of a problem until just before the allision.

During his interviews the master stated that he hoped that the vessel had not touched. He stated that he knew no cargo had been lost and the hull was intact, because of instruments in the ballast tanks would have alarmed in either case. He did not require any sounding of tanks of any other examination of the vessel for damage, because he was certain that the hull and cargo tanks were intact.

The master did not push the button on the VDR to preserve the previous 12 hours of recorded information in the VDR to prevent the data from being recorded over. He did not make any report to the Coast Guard or his company at the time about the accident. Nor did he consider that the Ambrose Light may have been extinguished. (Pushing the VDR button by a petty officer of the Coast guard boarding team preserved 12 hours of data, starting about 8 minutes after the anchor was aweigh, thus including most of the vessel’s progress from its anchorage area to the allision, and continuing to about 1648, long after the vessel was moored.)

¹⁰ Picture by Ashbury & Park Press, www.app.com, date unknown.

¹¹ Picture by U. S. Coast Guard, Sector New York, November 4, 2007.

Second Officer -- Three of the positions plotted on the chart by the second officer showed the vessel setting toward Ambrose Light on a steady bearing of 235°, as follows:

- 0113 - Ambrose Light bearing 235°, range 2.2 miles
- 0122 - Ambrose Light bearing 235°, range 1.6 miles
- 0134 - Ambrose Light bearing 235°, range 0.7 miles

See Figure 2 for the location of the three fixes.

The second officer stated that he reported the bearings and ranges to Ambrose Light to keep the master informed. The second officer stated that he did not state that the bearing to Ambrose Light was steady or advise the master specifically that the vessel was drifting toward Ambrose Light. Nor did he recommend any course change to pass clear of the light. The second officer stated that the master had requested a CPA on the approaching Norwegian Spirit and that he reported one of the fixes on Ambrose light along with his report of the CPA to the master. The master recalled that early in the approach to Ambrose Light, he had requested a CPA on the Norwegian Spirit and that the second officer had provided it, but he did not recall hearing any ranges or bearings to Ambrose Light.

Lookout -- About 0115, after the anchor was secured, the able seaman reported to the bridge to assume the lookout watch. He stated that he used binoculars to look around and saw the pilot boat to the right of a bright flashing light that he thought was a lighthouse. At 0120, the VDR indicates that the lookout made a report to the second officer. The lookout stated that soon after arriving on the bridge he reported a contact (possibly the pilot boat) bearing to the right of a flashing light. The lookout stated that he asked the second officer if the flashing light was a lighthouse and the second officer said that it was¹².

The lookout stated that he was very concerned because the vessel was moving toward the lighthouse and that he made two reports to the second officer that it appeared that the vessel was getting close to the lighthouse. The lookout stated that he heard the second officer relay his observations to the master. He stated that he became very concerned about how close the vessel was coming to the light.

He stated that he observed the light to pass close aboard on the starboard side but did not hear any noise to indicate the vessel made contact with the light.

The helmsman recalled the lookout making two reports to the second officer that the vessel was getting close to Ambrose Light and that the second officer relayed the

¹² The lookout spoke clearly but little of his reporting is heard on the VRD, and very little is heard from the 2nd officer. No reporting by the second officer to the Master concerning the ranges and bearings to Ambrose Light is heard on the VDR,

reports to the master. The helmsman also stated that he did not hear anything when Ambrose Light passed down the starboard side

The chief engineer, who later in the day learned that the vessel had struck Ambrose Light, recalled a noise about the time of the collision while he was in the engine room. He had attributed the noise to a speed change or waves. He stated that he had heard similar noises before; hence, he did not see any need to call the bridge. When he learned that the vessel had struck Ambrose Light he asked two members of the engine room staff in the engine room at the time if they heard anything unusual and that they said they did not.

Events following the accident

The vessel proceeded to the pilot boarding location and boarded a pilot at 0200. The master stated that he had instructed the crew not to mention the accident and no one did so. The pilot later confirmed that nothing was said about any accident and that the master and he had a routine master pilot exchange of information. He stated that the master appeared to be alert and acted normally. He stated that the transit to the berth at Perth Amboy, which involved picking up a docking master at 0410, went smoothly. The pilot described the vessel as handling very well. The pilot did not learn that the vessel had struck Ambrose Light until later in the afternoon when another pilot called his home and informed him.

The vessel was secured port side to at its berth at the Chevron facility at Perth Amboy, NY at 0606 and the pilots departed at 0612. The facility representatives boarded the vessel about 0615 to confer with the ship about the discharge of the cargo. The agent for the vessel boarded the vessel at 0618 to confer with the master. The agent stated that the master appeared to be a "bit stressed" but he recognized that the master had been up all night. He stated that the master appeared to be well organized and provided the needed ship's papers expeditiously. The agent stated that there was no mention of any accident and that when he departed the vessel about 0642 he felt that the ship was going to be one of his easier assignments. He stated it was just starting to get light at the time he departed the vessel.

At 0630, the vessel commenced discharging cargo to the Chevron Refinery.

The master stated that he called the chief officer and asked him to have the gangway positioned out over the starboard side (but not lowered) so they could look over the side when it became light enough to see if there was damage. Then, about 0730 the master and chief officer inspected the side of the vessel from the gangway and observed a long inset in the hull estimated about 60 feet long. The master then called First Alert, a company that is contracted by Teekay to receive calls from vessels at all times and then inform key members of the vessel's operating company (Teekay); and then the master spoke with the duty watch at Teekay and informed the company that

Axel Spirit had allided with Ambrose Light. Then, about 0850, the master phoned the agent and requested the agent to notify the Coast Guard that the *Axel Spirit* had struck Ambrose Light. At 0852, the agent called and informed the Coast Guard that the *Axel Spirit* had allided with Ambrose Light, and learned that the Coast Guard already knew that the light had been struck.

Coast Guard investigators boarded the vessel at 1230 and a Coast Guard Investigator pushed the VDR button to preserve most of the data pertaining to the accident. The Coast Guard investigators examined the vessels machinery, propulsion, steering, and navigational equipment. All systems were determined to be operating satisfactorily. An examination of the vessel's records was conducted and revealed that the vessel had successfully completed an intermediate survey by DNV on March 22, 2007, and that the required safety certificates issued on behalf of the Commonwealth of the Bahamas were onboard the vessel and were properly endorsed. Also, the vessel had completed a tank vessel examination on April 26, 2007, in which no discrepancies were identified and was issued a valid *Certificate of Compliance* issued by the U.S. Coast Guard, Sector Northern New England.¹³

Coast Guard investigators entered the double hull void in way of the damage and found that internal framing had suffered significant damage.

About 1500 the vessel stopped cargo transfer operations on instructions from the Coast Guard.

Some time after the accident, the master instructed the second officer to make a delayed entry in the logbook that the vessel may have struck Ambrose Light. The second officer made the entry and assigned the time (0140) when he had felt a vibration as Ambrose Light passed close aboard, down the starboard side. The master at some time following the accident informed the second officer that the company had asked if the voyage plan had been modified to include the transit from the anchorage to the pilot boarding location. The second officer then drew a course line on the chart to pass south of Ambrose Light and then a second course line to the pilot boarding location. Then the second officer made a change to the voyage plan to reflect the travel from the anchorage to the pilot boarding location.

Damage to the Vessel

The damage was confined to starboard ballast tanks 4 and 5, and consisted of distorted and tripped side longitudinal and transverse framing in each tank. The hull was not penetrated but there was significant indents in the hull between transverse frames at the turn of the bilge, and there was an inset running fore and aft for about 60 feet in way of the two ballast tanks.

¹³ *Certificate of Compliance*, US Coast Guard Sector Northern New England, dated April 26, 2007.

Damage to Ambrose Light

Ambrose Light tower was heavily damaged and was considered beyond repair. Rather than reconstruct a replacement tower or install a large navigation buoy, the Coast Guard decided not to replace the navigation aid. (See Waterway Information section for further discussion relating to Ambrose Light, extending Ambrose Channel, and reconfiguring the pilot area.)

Personnel Information

Master --The master, age 60, had started going to sea in 1963 as a member of the deck department on oceangoing ships on the Norwegian coast. After three and a half years he attended a Norwegian navigation school, and after completing a one-year course, acquired a officers licenses. After a few years of experience as second officer the company offered him a temporary assignment as chief officer, which required a waiver to allow him to take the position while holding a second officer license. He acquired a chief officer licenses and continued sailing as chief officer. In 1982 he completed the master's course at a Norwegian Navigation school and acquired a master's license. In 1987 Teekay bought the Norwegian company that the was working for and he has been employed by Teekay since that time. In 1993 he became master and has served as master since that date. He had served as master of the *Kiowa Spirit* during an eight year period. He had served as master of the *Axel Spirit* for five months in 2007, and had then gone on a 4-monthe vacation. He had just returned to the ship about a week before the accident. The master had renewed his Norwegian license in 2005. His last physical exam was on October 12, 2007 and he was found fit for duty. He had taken all of the STCW courses including Bridge Resource Management.

The master stated that he was normally in good health and did not take any prescription medicine. He wore glasses for reading. However, he had contracted food poisoning shortly after returning on board, which he attributed to fish caught by the crew. He stated that he had been ill with diarrhea and some vomiting, which lasted for four days. During this period he was able to regularly visit the bridge and conduct ship business, but the frequent diarrhea and vomiting had sometimes limited sleep to periods of as little as two hours. He stated that he normally needed about 8 hours sleep. He stated at the time of the accident he had been over the diarrhea and vomiting for two days, but still did not feel fully recovered as his stomach was not yet completely normal and he still felt a little bit tired. The master stated he took charcoal bills,¹⁴ which he obtained from the stock of medical supplies carried by the vessel to treat the food

¹⁴ WHO #18, Charcoal, activated for use in poisoning and over dosages. Usual dosage: 120ml. By mouth. Repeat if patient vomits. "Obtain medical Advice"

poisoning. Also he added “muscelex”, a breakfast cereal, to his diet to ensure an intake of fiber and he took liquids to avoid dehydration. The master stated that he had talked to the Teekay manager of cargo during his illness and had informed him of his illness. Otherwise he had not notified management, which was a company requirement if he was disabled, nor had he sought any medical advice from shore.

(The chief engineer had caught two nearly identical fish during the evening of October 26, 2007, while the ship was loading cargo at Cayo Arcas. The Chief engineer had gutted the two fish and placed them in the sink in the galley about 2100. The next morning he offered one of the fish to the master, who accepted the offer. Sometime about 1030, the chief engineer spoke to the cook about preparing the fish for the master and himself. At this time he learned that the cook had eaten one of the fish, so the chief engineer instructed the cook to prepare the remaining fish for the master, and the master had the fish for lunch. The next day the chief engineer was on the bridge attending to an electrical problem and at this time the master mentioned that he had been ill all evening. The cook had not been affected by the fish, and no other crewmembers experienced any food poisoning. The vessel’s hospital log indicates that the master received a charcoal medication on October 28, 2007.)

Prior to going on the bridge at midnight, the master had slept from 2130 until 2345. He stated that he considered himself fit to pilot the ship to pick up the pilot and to take the ship into port. He did not believe his prior illness was a factor in the accident.

The second officer stated that the master looked and acted fine at the time the vessel weighed anchor and proceeded into port. The lookout and helmsman also said the master seemed normal. The mate on the pilot boat stated that the master’s voice on the radio sounded clear and confident. The mate also stated that he had asked the master to notify the *Norwegian Spirit* of his intentions and that the master had done so right away. The pilot who came onboard at 0200, stated that the master seemed fine and that they had a normal master/pilot conference.

Second Officer - The second officer, age 42, stated that he had been going to sea for about twenty years, and that about 5 years ago he had entered an apprentice program to become an officer. He stated that he acquired his first officer license in 2002 and that he had served as second officer for about two years including some 4 contracts ranging from 4 to 5 months in duration, equating to about 16 months of service as second officer. He had taken the required STCW courses including Bridge Resource Management. He stated that he stood the 12 to 4 watches, routinely slept from 0500 to 1100, and that he normally worked about 2 additional hours following the afternoon watch. When he felt the need, he occasionally took a one-or-two-hour nap in the evening before going on watch at midnight. He stated that he felt good and rested when he went on watch at midnight prior to the accident.

Waterway Information

Three traffic lane systems lead to the entrance to New York Harbor:

1. Nantucket to Ambrose/Ambrose to Nantucket (running generally east/west).
2. Hudson Canyon to Ambrose/ Ambrose to Hudson Canyon (running generally northwest/southeast).
3. Barnegat to Ambrose/Ambrose to Barnegat (running generally north/south).

(See Figure 6 Section of NOAA chart 12326,) The three lanes lead to and from a 14-mile diameter circular precautionary area. Ambrose Light was a prominent a navigation aid near¹⁵ the center of the precautionary area. A triangular shaped pilot area lead west and west-northwest form Ambrose Light. The entrance to Ambrose Channel leading into New York Harbor was located 4.9 miles west-northwest (300°) of Ambrose Light. The entrance to Sandy Hook Channel leading into Perth Amboy and Arthur Kill was about 6 miles west of Ambrose Light. Ships awaiting entrance to New York Harbor or the Perth Amboy/ Arthur Kill area frequently anchor 2 to 5 miles northeast of Ambrose Light or remain underway. The area, which is not a recognized anchorage, may have up to ten ships anchored at a time. Many submarine cables traverse the area; however, the Sandy Hook Pilots state that no damage to the cables has ever been reported.

Ambrose Light – A lightship formerly marked the entrance to New York and most major US ports. On June 24, 1960, during heavy fog, the relief lightship was struck by the merchant ship Green Bay. The light ship sank but its 9-man crew was rescued safely. This accident led to the construction of a Texas tower in 1996 to replace the light ship. The tower was manned by 6 Coast Guardsmen. On October 5, 1996, the tower was struck by the tanker Aegeo. The damage to the tower caused the Coast Guard to demolish the tower and construct an unmanned structure, which was completed on November 12, 1999. The latest tower was struck by the Maltese bulker *Kouros V* in January 2001. The allision of the *Axel Spirit* on November 3, 2007, was the second time the structure has been struck.

Following the *Axel Spirit* collision with the Ambrose Light tower, Coast Guard Sector New York, held discussions with waterway users and stake holders regarding the need for a replacement tower and other potential changes to the configuration of Ambrose Channel. Based on the infomation acquired in these discussions, the Coast Guard decided not to rebuild Ambrose Light, as a new tower was not deemed necessary for navigation. However, the discussions resulted in a consensus that a seaward extension of Ambrose Channel was needed and that the pilot boarding area should be shifted to a location immediately southeast of the new entrance to Ambrose Channel. The scheme for the extension of Ambrose Channel, including new navigation aids, and the configuration of the new pilot area was developed by the Coast Guard jointly in consultations with the NOAA and the Sandy Hook Pilots.

¹⁵ Ambrose Light was mounted on a fixed tower structure having three legs and a central column, was 76 feet high and visible for 18 miles and had a light characteristic of flashing every 5 seconds. The light hosted a fog horn and a RACON returning a dash and two dots on the vessel's radar scope. The light was displaced approxiofficerly 1.7 miles east south east of the center of the precautionary area.

Following removal of the remnants of Ambrose Tower, installation of additional navigation aids, and some dredging, the new channel and pilot area were available for navigation in late October 2008.

The New York Vessel Traffic Service (VTS) is operated by Coast Guard Sector New York from a base at Fort Wadsworth on Staten Island. Control by the VTS starts at the entrance to Ambrose Channel and at the entrance to Sandy Hook Channel. The VTS does not have complete radar coverage of the precautionary area, but can track ships based on their AIS signal.

Pilotage – The Sandy Hook Pilots of New York and Sandy Hook Pilots of New Jersey jointly provide pilotage into New York and New Jersey. A pilot boat operated by the Sandy Hook Pilots is maintained underway in the pilot area at all times. Large pilot launches transport pilots between the pilot boat and the arriving and departing vessels. For safety, the pilots normally specify a specific boarding location, a course that provides a lee, and speed of about 8 knots. The lee and speed enables the pilot launch, to approach a vessel at a slight angle and match the motion of the vessel being boarded. The pilot's state there was no requirement for which direction to pass Ambrose light, but that inbound vessels will likely pass south of Ambrose if picking up a pilot. Inbound vessels proceeding to an anchorage north east of Ambrose Light will likely pass east of the light.

Metrological Information

The weather at John F Kennedy International Airport (located 008°, 11 miles from Ambrose Light) at 0051 was cloudy skies; visibility was 10 miles; temperature was 33°F, winds were from 050° at 13 knots with gusts to 22 knots and wind velocity was decreasing.

The master estimated that the wind was 22 knots and gusting to 35 Knots from the northeast. The vessel's logbook listed the visibility at 12 miles, wind from the northeast at force 5 to 6 (12 to 21 and 22 to 27 knots). The logbook listed swells from the northeast at 2 meters high (about 6 feet) high. The VDR indicated a wind speed of 15 knots with gusts reaching 30 knots. The master stated that the current, was about one knot or less and was flowing in a westerly direction. See Figure 7 Current direction.

The mate on the pilot boat stated that the visibility was 12 miles, the wind was northeasterly at 25 to 35 knots, and there was easterly swell about 6 feet high.

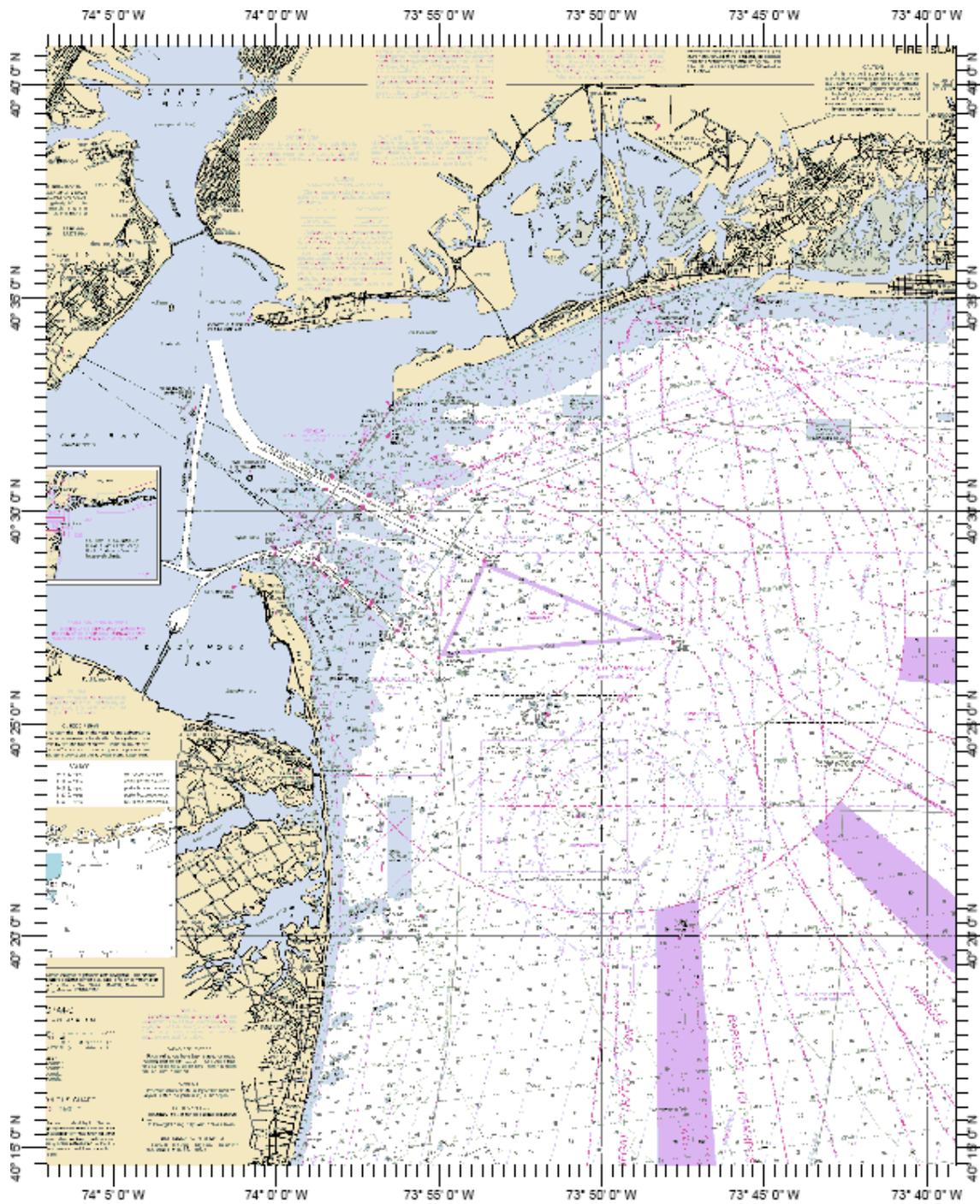


Chart Name: APPROACHES TO NEW YORK FIRE ISLAND LIGHT TO SEA GIRT
 Chart ID: 12326_1
 Top Left: 40° 40' 54" N 74° 7' 5" W
 Bottom Right: 40° 14' 36" N 73° 39' 5" W

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Figure 6. Section of NOAA Chart 12226. "Approaches to New York.." showing the circular precautionary area, Ambrose Light, the triangular pilot station, the beginning of Ambrose and Sandy Hook Channels, and part of the three traffic lanes leading to and from the precautionary area.

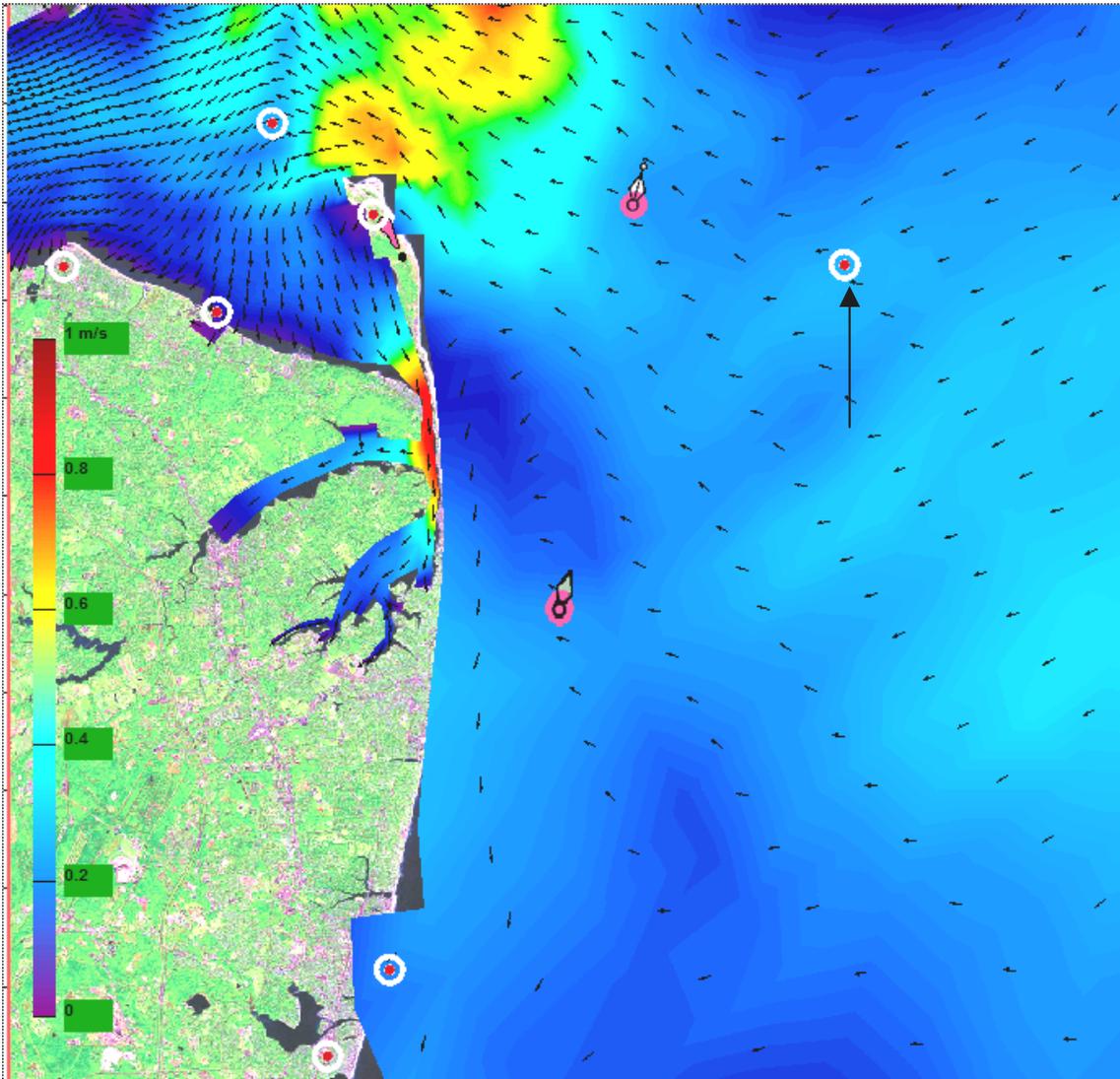


Figure 7. Surface Currents in meters per second (color coded) for November 3, 2007 at 0100 to 0200 EDT. The arrow shows the former location of the Ambrose Light. At that location the current was moving from east to west at about 0.2 to 0.4 meters per second (see the color bar on the left side of the image). From the Stevens Institute of Technology.¹⁶

¹⁶ Provided by: Salottolo NTSB AS-30,5/2/2008

Bridge Resource Management

Bridge Resource management (BRM) encompasses the procedures and practices used to facilitate an effective bridge team that makes optimum use of available equipment and personnel to ensure the safe navigation of the vessel. The concept of BRM is that those on the bridge constitute a team that works together and supports each other. Each member is obligated to report any condition that may affect safety, and senior personnel are required to be receptive to reports from subordinates. Good communications between team members, in this case primarily the master and second officer, and also the helmsman and lookout are a requirement for effective coordination of the team.

The second officer stated that he had been with the master for only two weeks and believed he had a good relation with the master. He stated that he spoke only English with the master and that when he reported information such as the bearings and ranges to Ambrose light that he made his reports face-to-face with the master. However, during his interviews with investigators the second officer, much of the time, spoke in very low, barely audible voice and he avoided eye contact. In response to questions about the set of the ship toward Ambrose Light, he responded consistently that his reports about the vessel's position consisted only of the bearings and ranges to Ambrose Light.

It was not possible to learn from the second officer when he plotted the course line on the chart from the anchorage to a point south of Ambrose Light; however, the master stated that the second officer had plotted the course line some time after the accident, when he learned that the Company had asked if the ship had modified the passage plan, a requirement of the safety management system. (Information on Safety Management System is found in Factual Report of Operational Factors by Larry Bowling.)

W. R. Woody
Investigator In Charge