



# National Transportation Safety Board

## Marine Accident Brief

### Contact of Liquid Petroleum Gas Carrier *Levant* with Mooring Dolphin

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<b>Accident type</b>	Contact	<b>No.</b> DCA20FM006
<b>Vessel name</b>	<i>Levant</i>	
<b>Location</b>	Petrogas Ferndale Wharf, about 5 miles west of Ferndale, Washington <sup>1</sup> 48°50.36' N, 122°43.26' W	
<b>Date</b>	December 15, 2019	
<b>Time</b>	0406 Pacific standard time (coordinated universal time – 8 hours)	
<b>Injuries</b>	None	
<b>Property damage</b>	\$8.25 million est.	
<b>Environmental damage</b>	None	
<b>Weather</b>	Visibility 7 miles, overcast, winds west-northwest at 15 knots, waves 2 feet, air temperature 45°F, water temperature 46°F, sunrise 0751	
<b>Waterway information</b>	Located in the Strait of Georgia, the Petrogas Ferndale Wharf's depth alongside at mean lower low water is about 36 feet, height of tide 2.9 feet, and mean range of tide 5.9 feet.	

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On December 15, 2019, about 0406 local time, the liquefied petroleum gas carrier *Levant* was shifting 0.7 miles from its anchorage to the Petrogas Ferndale Wharf in Ferndale, Washington, when it struck the wharf's south mooring dolphin. The mooring dolphin and catwalk connecting it to the wharf were destroyed, and the *Levant's* forward ballast tank was penetrated and flooded. There were no injuries to the vessel's crew or persons on the wharf. There was no release of pollutants or the ship's liquified cargo of propane and butane. Damage to the vessel was estimated at \$1.5 million. Damage to the south mooring dolphin and adjoining catwalk was estimated at \$6.75 million.



Postaccident photo of the *Levant* at anchor.

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<sup>1</sup> All miles in this report are nautical miles (1.15 statute miles).

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Area of accident where the *Levant* struck the Petrogas Ferndale Wharf, as indicated by the red triangle. (Background source: Google Maps)

### Background

The 741-foot-long, 120-foot-wide liquefied petroleum gas carrier *Levant* had a single right-hand-turning propeller and single rudder. The vessel was double-hulled, meaning its cargo tanks were within an inner watertight hull separated by tanks or other spaces from its outer hull. (Double-hull construction is intended to minimize the chances of cargo loss to the environment by providing protection from side or bottom damage.) The *Levant* was not fitted with a bow thruster. It was owned by Avance Gas LTD and operated by Exmar Ship Management NV.

The *Levant* first moored at the Petrogas Ferndale Wharf after arriving in ballast from Ulsan, Korea, just before midnight on December 10, 2019, and docked with its starboard side to the wharf to load a full cargo of liquefied propane and butane. The Petrogas Wharf was capable of receipt and shipment of liquefied petroleum gas. The heading alongside the pier was 343 degrees. At the north and south ends of the wharf, connected by steel-framed catwalks and in line with the face of the wharf, were mooring dolphins. A mooring dolphin is a separate platform, column, or set of pilings that is typically installed at each end of a pier or wharf to provide additional mooring points for vessels. About 5,000 feet of pipeline ran from the land-based terminal to the loading arm on the wharf.

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The Petrogas Wharf with a tanker of similar size to the *Levant* docking starboard side to the wharf. (Source: Petrogas, LLC)

### Accident Events

On December 14, after loading for about 3 days, the master of the *Levant* halted loading operations due to the increase in the vessel's draft, which resulted in a decrease in the under-keel clearance. With the ebbing tide, he was concerned about maintaining a safe under-keel clearance and decided it was necessary to take the ship off the wharf to deeper water to anchor, and then return to the wharf when the tide was high enough to complete loading operations. For the shift to the anchorage, a Puget Sound state-licensed pilot was required per Washington State regulations.

The Puget Sound pilot arrived on the bridge of the *Levant* at 1924, and he and the ship's master began a master/pilot exchange. The exchange included the draft of the ship, the planned maneuver and the use of assist tugs, the location and depth at the anchorage, and how much anchor to be used. They agreed that after the *Levant* was anchored, the pilot would remain on board and rest in the designated pilot cabin until the early morning shift back to the Petrogas Wharf. The *Levant* shifted off the wharf and at 2050 anchored about 0.7 miles southwest of the Petrogas Wharf with its port anchor and 5 shots of chain.

Before leaving the bridge for his cabin, the pilot informed the master that there would be enough water depth at the pier at 0415 the next morning (December 15). The master said that he informed the line handlers at the dock to be ready to receive the first line from the ship at 0415. In his cabin on board, the pilot recalled turning off the light to go to sleep at 2225, and he noted he was able to fall asleep quickly. The master departed the bridge after determining the anchor was holding, leaving the fourth officer in charge of the watch. He went to sleep about 2200 and woke up about 0230 on the morning of December 15.

The pilot woke up at 0322 and was on the bridge at 0338, where he was greeted by the master. Three minutes after, upon agreement from the pilot, the master ordered the commencement of heaving the port anchor. The master recalled the pilot saying they would approach the Petrogas Wharf at a 65-degree heading and then turn the vessel to line up with (or come alongside) the wharf. During the time of the anchor heaving, the pilot explained to the master there would be a

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tug fast on the stern and a tug on the port bow, “same as before.” There was no further discussion between the master and pilot about the shift back to the Petrogas Wharf prior to getting under way. Manning the bridge of the *Levant* was the pilot, who was conning; the master, in overall command; the second officer, on watch as officer of the watch (OOW); and a helmsman. In addition to his duties as OOW, the second officer was tasked by the master to respond to any engine telegraph orders at the main console on the bridge.

At 0350, the pilot informed Puget Sound vessel traffic service (VTS) that the *Levant* would shift from the anchorage to the Petrogas Wharf, and that they would be alongside in about 45 minutes. At 0352 the chief officer reported the anchor was up, and, following that, the master told him that he could leave the bow and the fourth officer would remain for the mooring operation. The master needed the chief officer at the ship’s cargo manifold to ensure the vessel was properly aligned to receive a shore connection. Over the radio, the master instructed the fourth officer to prepare the mooring lines for the docking. The pilot issued his first helm and propulsion orders of dead slow ahead and starboard 30 degrees rudder at 0354, while the vessel was on a gyro heading of 058 degrees.<sup>2</sup>

Assisting with the shift back to the Petrogas Wharf were two tractor tugs: the *Lindsay Foss* (7,600 horsepower [hp]) and the *Garth Foss* (8,000 hp). At 0355, the *Lindsay Foss* was secured with one line through the centerline chock on the stern of the *Levant*. At 0356, the pilot ordered slow ahead, and following that, the pilot informed the master that the current was setting to the north-northwest along the shoreline at a velocity he calculated at 1.2 knots. At 0358, the *Garth Foss* was secured with a line on the port bow of the *Levant*.

At 0401, on an ordered course of 065 degrees and speed of 4.3 knots over the ground, the pilot ordered dead slow ahead. For about the next 2 minutes a conversation about non-navigational, non-operational matters took place between the master and pilot. At 0403, with a heading of 066 degrees and a speed of 4.5 knots, the pilot ordered the rudder hard to port. The pilot recalled that, about this point, “something didn’t feel right,” so he briskly walked from inside the bridge out to the starboard bridge wing. At that time, the *Levant*’s bow was less than two ship lengths from the south mooring dolphin of the Petrogas Wharf, and the ship’s electronic chart display and information system (ECDIS) recorded the wind from the west at 15 knots. A few seconds after the hard-to-port helm order, the operator of the *Garth Foss* called the pilot on the *Levant* asking him for orders, to which the pilot replied to stand by.

At 0405, at a speed of 4.5 knots, the pilot ordered stop engine. From the starboard bridge wing, the pilot could see the wharf but not the south mooring dolphin as he expected. He requested from the master the distance of the vessel’s bow to the wharf. The master radioed the fourth officer, who was located on the bow, to get the distance from the wharf. Seconds later, the pilot radioed the *Lindsey Foss* with an order to pull straight back.

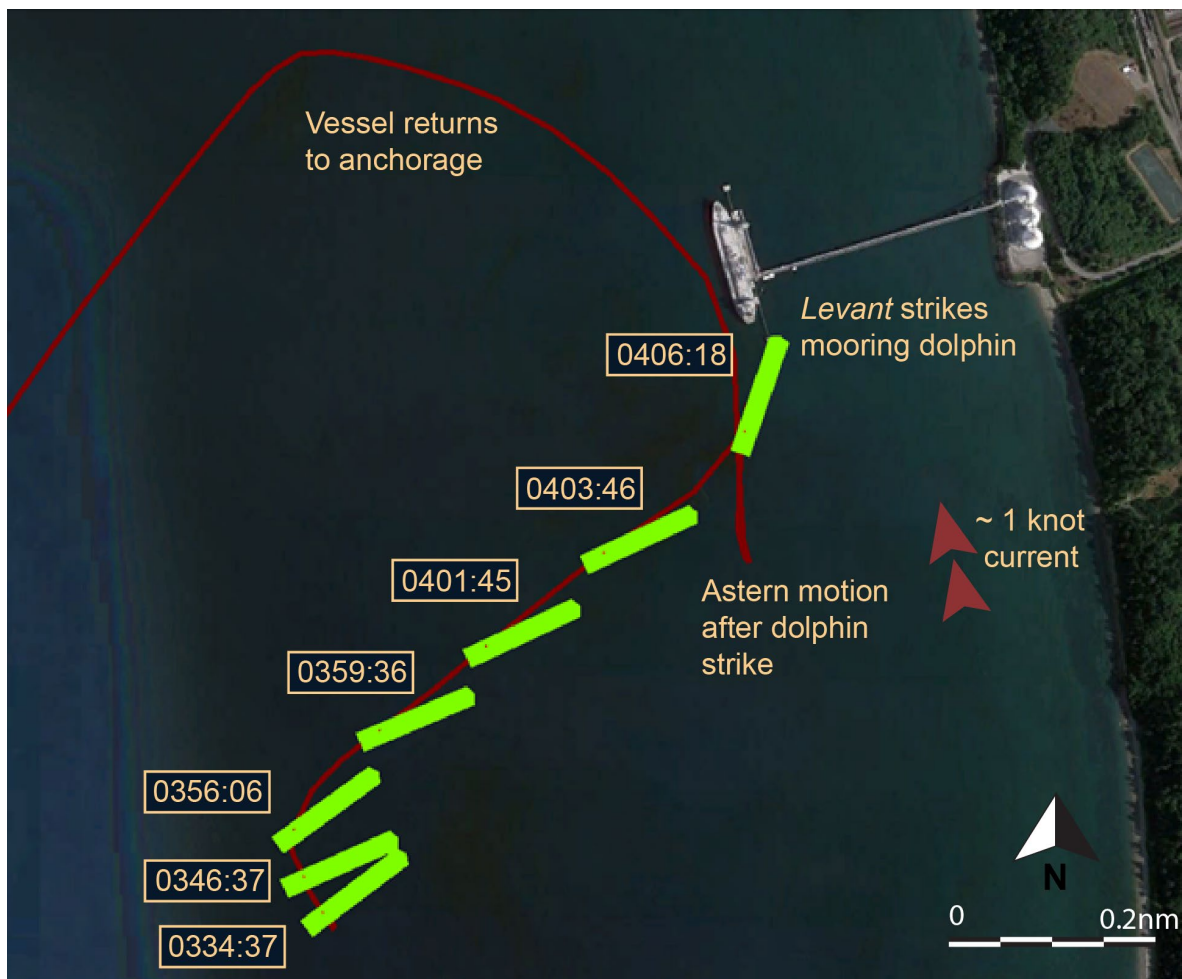
On the bow, the mooring crew was preparing the mooring lines when a seaman alerted the bosun of the proximity to the Petrogas Wharf, who in turn alerted the fourth officer. The fourth officer said he saw the ship approaching the wharf “very fast,” and both he and the bosun went to

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<sup>2</sup> According to the main engine speed revolutions per minute (rpm) table in the pilot card, in a loaded condition, dead slow ahead was 34 rpm on the main engine, which produced 5.4 knots of speed (6.2 knots in ballast). Slow ahead was 48 rpm, which produced 7.8 knots in a loaded condition (8.1 knots in ballast).

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a position where they could see the wharf and south mooring dolphin. The fourth officer radioed the master that there was a 40-meter distance to the mooring dolphin, and the master relayed this distance to the pilot. After hearing this distance, the pilot ordered dead slow astern propulsion. The pilot asked for the distance to the wharf again, and he heard 10 meters as the reply over the radio. At 0406, the bosun announced over the radio the distance from the wharf was 5 meters before both he and the fourth officer moved further aft for personal safety. At that time, the heading of the *Levant* was 024 degrees with a speed of 4.3 knots, about 41 degrees off the dock alignment heading of 343 degrees.



The *Levant's* positions as it moved from the anchorage to the Petrogas Wharf, based on automatic identification system (AIS) data. Vessel scale approximate; vessel at pier was not present at the time of the accident. (Background source: Google Earth)

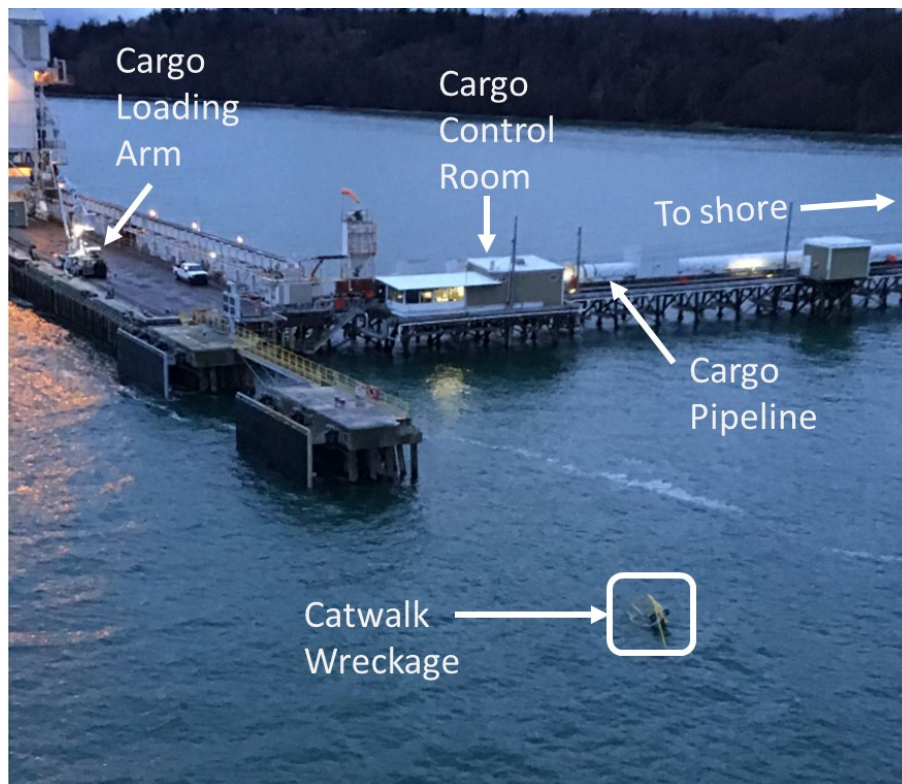
On the Petrogas Wharf, four operators at the cargo control room, standing by to resume loading operations on the *Levant*, saw the ship approach. One operator described the vessel's approach as "extremely fast." At 0406, the *Levant* struck the south mooring dolphin, and, a few seconds later, the pilot ordered full astern and both tugs to pull full away. Upon seeing the ship hit the south mooring dolphin, the operators and line handlers ran down the causeway to the shore. Witnesses on the wharf described seeing that the first point of contact was the portside bow section of the *Levant* hitting the southeast side of the south mooring dolphin, which was knocked down along with the catwalk connecting it to the wharf. There were no sound signals from the *Levant* to

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alert anyone on the wharf of danger prior to it striking the south mooring dolphin. The lead operator stated the pipeline leading from the shore to the wharf loading arms was charged with propane (a normal procedure for cooling down the piping before cargo operations could commence) and that after making it to the shore, he closed the shore valve for the pipeline to the wharf as a precaution in case the ship hit the piping.

The *Levant* continued to slow but still made headway after striking the mooring dolphin until 0408, when it came to a brief stop before beginning to make sternway from the ship being in full astern propulsion with the tugs pulling full back. The pilot radioed the dock coordinator to ask if the *Levant* could still come alongside, but at 0415, the dock coordinator informed the pilot that the south mooring dolphin had been knocked over and the wharf was unusable. The *Levant's* voyage data recorder captured the pilot's reaction at 0417 as he said to the master, "I had no information. And I'm the one who was not paying attention to how close we were to the pier." After reporting the accident, and in consultation with Puget Sound VTS, the pilot conned the *Levant* to a location about 1.5 miles from the Petrogas Wharf, where the *Levant* dropped anchor at 0706.

After the contact with the mooring dolphin, the *Levant* crew discovered that an empty forward ballast tank was taking on water. A subsequent damage assessment found four hull breaches below the waterline in the *Levant's* number one port ballast tank, and a crease approximately 40-60 inches long on the port bow. The estimated cost to repair the damage to the vessel was \$1.5 million. The south mooring dolphin and adjoining catwalk at the Petrogas Wharf were completely destroyed; the estimated replacement cost was \$6.75 million.



Postaccident photo of the Petrogas Wharf on the morning of December 15 with the catwalk and south mooring dolphin missing. (Source: US Coast Guard, annotated by NTSB)

### Additional Information

There were no known deficiencies or reported problems with the *Levant's* navigational equipment, steering gear, propulsion control or machinery.

The catwalk to the south mooring dolphin had floodlighting, and on the south mooring dolphin, there were two yellow all-around aid-to-navigation lights (one direct-powered and one battery-powered with a solar charging panel). According to the lead operator working on the wharf the morning of the accident, there was ongoing construction on the wharf's boathouse, which required power be disconnected to the floodlights that illuminated the catwalk to the south mooring dolphin. Petrogas stated that the direct-powered aid-to-navigation light was on the same circuit as the catwalk floodlights, but the backup battery powered aid-to-navigation light was operational. No planned maintenance records were available for the aid-to-navigation lights. During the past pre-arrival dock inspection carried out on December 9, prior to the *Levant's* arrival, there were no discrepancies reported with the aid-to-navigation lights on the checklist. During the *Levant's* original arrival on December 10 (also at night), neither the pilot nor master reported issues with the aid-to-navigation lights. None of the persons interviewed by investigators could recall if a yellow aid-to-navigation light on the south mooring dolphin was flashing. A low-resolution closed-circuit video of the *Levant* approaching the Petrogas Wharf did not show any flashing lights in the vicinity of the south mooring dolphin.

**Safety Management System (SMS).** Exmar Ship Management, the *Levant's* managing company, had policies in place for "sailing under pilotage" as part of its SMS, which held the master ultimately responsible for the safety of the ship and required him/her to take over from the pilot in case there is doubt of the pilot's judgement. The policy held the OOW accountable for the safe navigation of the ship and required the OOW to assist the master and monitor the ship's progress as per the passage plan, and keep the master informed of any deviations from the planned track or speed.

One of the staples of good bridge resource management (BRM) is the master/pilot exchange, which is required at the start of pilot transits. Exmar's "sailing under pilotage" policy required that a master/pilot exchange be carried out to trade information between parties regarding the ship's characteristics, local and transit information, and all necessary information to make sure the passage can be carried out safely. The policy also required that the ship's speed and position, as well as dynamic forces affecting the ship, be always monitored.

When asked about the master/pilot exchange, the pilot stated that he likes the exchange to be continuous throughout the transit. He said that he and the master did not discuss the plan to shift the *Levant* back to the wharf. The pilot stated he did not set any expectations of the bridge team, did not ask for any information that he would have used, and that he does not rely on the bridge team. He said that he planned on being on the bridge about 30 minutes before getting under way but was surprised that the anchor was aweigh so fast.

**Docking.** The pilot explained to investigators that his intended approach to the wharf was to make an easterly course from the anchorage toward the wharf and come up to his "typical speed" of "3 to 4, maybe a little bit more knots" in order to "get her to come around with the steerage especially, and then reduce the speed as necessary," further using the tug on the bow to hold the bow of the *Levant* from coming too far away from the wharf. The pilot said his intent was to turn

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the *Levant* “a couple of ship lengths off” the wharf to a position to come alongside. He reported that the main apron of the wharf was well lit and that he was using that as his gauge for distance; he had no visual deck obstructions from his vantage point on the bridge. The pilot stated that he was not using a portable pilot unit because he did not have it with him and that he referenced the *Levant*’s ECDIS and radar for the shift from the anchorage to the wharf.<sup>3</sup>

The master was seated at the starboard radar from the time the *Levant* got under way from the anchorage until the pilot moved to the starboard bridge wing. Although the docking maneuver had different tide and current conditions than the undocking maneuver the day before, the master stated he believed the previous day’s master/pilot exchange was adequate for the shift back to the wharf, considering it was the same pilot who remained on board. The master said that he did not have any concerns related to the pilot’s actions in the shift from the anchorage to the wharf, and he felt confident with the pilot and did not notice any problems in advance of the contact with the south mooring dolphin. The master recalled the speed getting up to about 4 knots and expected the pilot needed that speed to make the turn to port to align the ship with the wharf.

The OOW said that he was continuously monitoring the distance to the wharf and, as delegated by the master, he was tasked to follow through with any telegraph orders given by the master or advised by the pilot. He described the shift to the wharf as being an easy approach and maneuver and was aware of the pilot’s intended approach course, but he expected the pilot to use the tugs to help turn the ship toward the wharf.

The dock coordinator, who had been waiting with three other operators on the wharf to begin the cargo loading operation, stated the *Levant* was approaching the wharf “much quicker” than he had ever seen, and it was “coming in pretty hot.” According to one of the operators on the wharf who witnessed the approach, he had never seen a ship approach at that angle to the wharf before, noting that the *Levant* was “facing the wrong direction.” Ships normally come in “facing the north, pushing to east.”

**Other Recent Dockings.** For the *Levant*’s approach to the Petrogas Wharf on December 10, with a different pilot, the approach angle was about 25 degrees to the wharf with a speed of 2-3 knots. Once the bow of the ship was abeam the south mooring dolphin, tugs pushed the ship toward the wharf. The fourth officer commented that on the last approach to the Petrogas Wharf, he was also located on the bow, and the approach went “very slowly.”

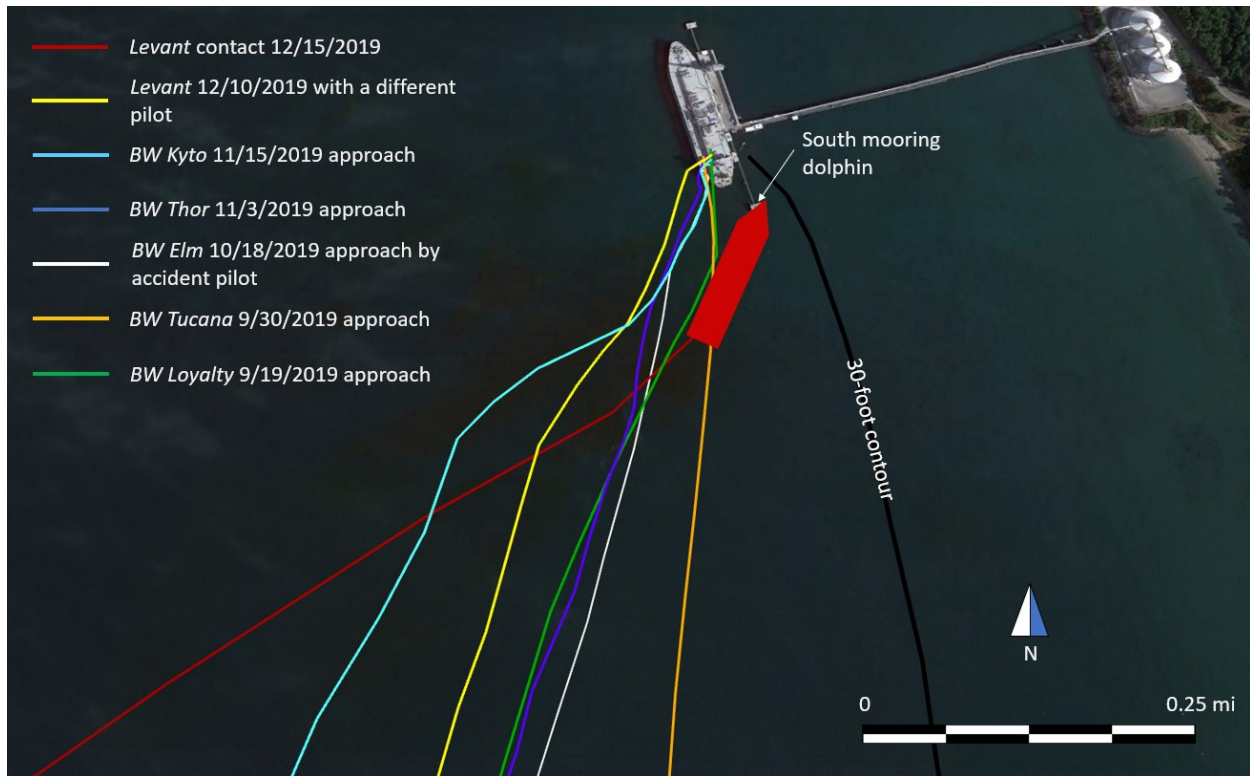
A sample of similar size liquefied petroleum gas carrier approaches to the Petrogas Wharf in the 90 days before the accident, including the accident pilot’s last docking of a similar size tanker at the Petrogas Wharf on October 18, 2019, was examined. All six approaches, including the *Levant*’s December 10 approach, were at a shallower angle than the accident docking. Additionally, all other approaches had less than 3 knots approach speed within 0.25 miles of the south mooring dolphin.

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<sup>3</sup> A portable pilot unit is a compact laptop or tablet device with electronic navigation and charting software that pilots use for navigation (in addition to the vessel’s own navigation equipment).



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AIS tracks of all liquid petroleum gas carrier approaches to the Petrogas Wharf from September 19 to December 15, 2019. Included is the initial approach of the *Levant* to the wharf on December 10 (yellow line), and the accident pilot's last approach to the wharf on October 18 (white line). *Levant* scale approximate; vessel at pier was not present at the time of either approach. (Background source: Google Earth)

**Personnel.** The *Levant* master had sailed as master since 2010 and had been employed with Exmar since 2016 as master. During his time at Exmar, he had sailed as master on the *Levant* in past contracts as well as on sister vessels. He held a valid unlimited master's credential endorsed by the flag of Marshall Islands. He told investigators that his first time at the Petrogas Wharf was when the ship docked there on December 10.

The pilot was a member of the Puget Sound Pilot's Association and had been working as a pilot in full capacity for vessels of unlimited tonnage since 2000. He held a US Coast Guard-issued merchant mariner master's inland credential with no limitations. He was issued a license through the State of Washington for all pilotage in Puget Sound and all interconnected waterways.

All *Levant* crewmembers were tested for alcohol, with negative results. The *Levant* crewmembers involved in the maneuver were tested for drugs with negative results. The accident pilot was tested for alcohol and drugs with negative results. The operators and crew of the tugs were tested for alcohol, all with negative results.

The pilot told investigators he felt rested at the time they were engaged in the *Levant's* shift from the anchorage to the Petrogas Wharf. He said he had a good night's rest on the night of December 13. On December 14, knowing that he would be dispatched to a ship that evening, he had a 45-minute nap at noon. He received his dispatch orders the same day at 1400 to be on the

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*Levant* for a 2000 maneuver that evening, and he departed his home to meet the ship just before 1500 for the estimated 3-hour commute (by car and ferry) to the Petrogas Wharf.

The *Levant* master stated he had a normal working day on December 14. He slept after lunch for about 2 hours that day before starting work at 1500. His work/rest records showed that the night before the accident (December 13), the master slept about 7 to 7.5 hours. He said he went to sleep about 2200 on the night of December 14 and was awake about 4.5 hours later, and back on the bridge about 0315.

## Analysis

There was no evidence of deficiencies with the ship's navigational equipment, steering gear, or propulsion system being causal to the accident. There was also no evidence of bridge team error in any response to helm or propulsion orders given by the pilot, or any error in responding to orders given by the pilot to the assist tugs. There were no time pressures or language barriers that prevented effective communication between the pilot and bridge team. Postaccident alcohol and drug tests for the pilot and crew yielded negative results.

The *Levant* was anchored only 0.7 miles from the closest point (the south mooring dolphin) of the Petrogas Wharf. Unlike a passage where a vessel gets under way and proceeds to sea or picks up a pilot for passage to a dock, the *Levant* was shifting only a short distance back to a wharf where it had been just hours earlier using the same pilot and tugs. While a shift to and from a wharf may be shorter than a longer distance passage, there should be no difference to the overall planning of the approach speed and angle to the wharf.

There was not an effective exchange of information between the pilot and bridge team prior to getting under way regarding the pilot's plan to bring the *Levant* to the Petrogas Wharf. The master and pilot conducted a master/pilot exchange before the *Levant* got under way from the Petrogas Wharf to the anchorage on the evening of December 14; however, that exchange was for an undocking maneuver, and the accident occurred during a docking evolution. Because the pilot remained with the vessel, the master determined the exchange to be adequate for the short shift back to the wharf the next morning. Exmar's navigation policy, however, did not specify any conditions—including short distance transits such as shifting between an anchorage and wharf—exempting the master/pilot exchange requirements. While certain conditions of the December 14 master/pilot exchange, such as the ship's characteristics, had not changed since the pilot last departed the bridge, variables such as wind, current, and tidal conditions were different for the docking.

The *Levant* approached the Petrogas Wharf at too steep of an angle, at an excessive speed for the proximity to the wharf. After getting under way, the pilot ordered a heading of 065 degrees, toward the shoreline at an angle of about 80 degrees to the Petrogas Wharf (343 degrees) to account for the current. The pilot, who said he did not typically rely on the bridge team, only explained to the master his reason for the approach heading he chose. The vessel's speed increased to about 4.5 knots before the pilot ordered the rudder hard to port to bring the ship in line with the wharf. This order came too late, less than 3 minutes before the contact and when the *Levant* was less than two ship lengths from the wharf. By comparison, past approaches to the Petrogas Wharf were at a slower speed and a shallower angle (about 25 degrees). Additionally, Petrogas Wharf operators familiar with seeing vessels approach the wharf explained that the *Levant* had an unusual approach

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angle and faster-than-normal speed. With two high-powered tractor tugs available and no time pressures, the option to approach the Petrogas Wharf at a slower speed was available.

While both the master and OOW thought they understood the pilot's intended approach and use of tugs and speed, it was based on their assumptions rather than a communicated plan. There was no shared mental model between the pilot and bridge team, which in turn diminished the bridge team's capacity to monitor the passage and alert or challenge the pilot should any deviations from the plan occur. Additionally, both the pilot and master were likely distracted by a non-pertinent conversation about 3 minutes before the contact. While the pilot and master engaged in the non-pertinent conversation, they likely missed opportunities to detect the vessel's speed and movement toward the mooring dolphin and the point at which the pilot intended to turn to the wharf. After the conversation ended, the pilot issued a hard-to-port helm order at less than two ship lengths to the south mooring dolphin before going to the starboard bridge wing, thinking something did not look right. By the time the pilot issued the hard-to-port rudder order and requested the distance to the mooring dolphin, it was too late to take preventive measures to avoid contact because of the ship's speed of more than 4 knots. In this circumstance, a condition of complacency likely existed with the pilot and bridge team because of the short distance back to the wharf. The vigilance of a pilot and bridge team should be increased, not decreased, with a ship's proximity to dangers and obstructions.

The master is ultimately responsible for the safety of the ship, which gives him the obligation to question and, if necessary, take over from the pilot in case he is in doubt of the pilot's judgment. In the time leading up to the contact, the master did not notice any problems with the vessel's approach angle to the wharf or the speed of the ship in relation to the mooring dolphin and wharf. Neither the master nor the OOW questioned or challenged the pilot as the ship got closer to the wharf. The master became concerned only after the pilot noticed that something was not right, moved to the bridge wing, and requested the distance to the pier.

Due to ongoing electrical work on the wharf, the south mooring dolphin and catwalk were not illuminated by floodlights and the direct-powered aid-to-navigation light on the south mooring dolphin was not operational. Petrogas stated the backup navigation light was operational during its most recent check about 5 days before the accident; however, witnesses could not recall whether they saw a flashing light, and poor-resolution video did not indicate any flashing light on the south mooring dolphin. The floodlights on the catwalk and aid-to-navigation light on the south mooring dolphin would have provided additional reference points, but the remainder of the wharf was well lit. The pilot stated he was judging his distance to the apron of the wharf by visual reference. Visual cues and depth perception can be affected by darkness because the eye does not have adequate reference points with which to measure. As such, use of visual reference, at night, as a sole means for judging the distance to an object (such as a wheel over point) would have been inaccurate.

Regardless of his visual acuity, there was no evidence of the pilot using any distance-measuring functions of the radar or functions of the ECDIS to determine his distance to the wharf, or of his using the bridge team to keep him informed of distances to objects. By the pilot's own admission, he was not paying attention to the vessel's position in relation to the dangers a short distance ahead and had no expectation of the master or the bridge team to provide him any information. Good BRM encompasses the use of all resources, human and technical, that are available to a bridge team to ensure the safe completion of a vessel's voyage. Regardless of the distance or duration of a transit, the BRM fundamentals of planning, communication, use of all

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available resources and information, monitoring, and management of distractions are essential to operations with a pilot on board a vessel. Had these fundamentals been effectively employed, there would have been clear communication and understanding of the pilot's intended plan, for which the bridge team could actively monitor and provide information. Had all available resources, such as the bridge team, radar, ECDIS and tugs been used during the shift of the *Levant* from the anchorage to the wharf, opportunities to detect the ship's position, wheel-over point, and speed in relation to the wharf and mooring dolphin may not have been missed, which would have allowed for an appropriate corrective response to avoid the danger.

### Probable Cause

The National Transportation Safety Board determines that the probable cause of the contact of the liquid petroleum gas carrier *Levant* with a mooring dolphin at the Petrogas Ferndale Wharf was the pilot's approach with excessive speed and at too steep an angle, resulting from the pilot's and bridge team's poor bridge resource management.

### Passage Planning for Short Transits

Regardless of the length of the transit or maneuver, the master/pilot exchange is a critical opportunity for a pilot and bridge team to establish and share necessary information (shared mental model) for the task ahead.

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### Vessel Particulars

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Vessel	<i>Levant</i>
Owner/operator	Avance Gas LTD/ Exmar Ship Management NV
Port of registry	Majuro, Marshall Islands
Flag	Marshall Islands
Type	Liquefied Petroleum Gas Tanker
Year built	2015
Official number (US)	None
IMO number	9686388
Classification society	Lloyds Register of Shipping
Construction	Steel
Length	741.5 ft (226.0 m)
Draft	34.1 ft (10.4 m)
Beam/width	120.1 ft (36.6 m)
Tonnage	46789 GRT
Engine power; manufacturer	1 x 16,628.7 hp (12,400 kW); 6S60ME-C8.2 Tier II Man B&W diesel engines
Persons on board	21

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**NTSB investigators worked closely with our counterparts from Coast Guard Sector Puget Sound, Washington, throughout this investigation.**

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For more details about this accident, visit [www.nts.gov](http://www.nts.gov) and search for NTSB accident ID DCA20FM006.

**Issued: January 19, 2021**

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The NTSB has authority to investigate and establish the probable cause of any major marine casualty or any marine casualty involving both public and nonpublic vessels under Title 49 *United States Code*, Section 1131(b)(1). This report is based on factual information either gathered by NTSB investigators or provided by the Coast Guard from its informal investigation of the accident.

The NTSB does not assign fault or blame for a marine casualty; rather, as specified by NTSB regulation, “[NTSB] investigations are fact-finding proceedings with no formal issues and no adverse parties . . . and are not conducted for the purpose of determining the rights or liabilities of any person.” Title 49 *Code of Federal Regulations*, Section 831.4.

Assignment of fault or legal liability is not relevant to the NTSB’s statutory mission to improve transportation safety by conducting investigations and issuing safety recommendations. In addition, statutory language prohibits the admission into evidence or use of any part of an NTSB report related to an accident in a civil action for damages resulting from a matter mentioned in the report. Title 49 *United States Code*, Section 1154(b).

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