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Re: NTSB No. DCA22FM001, Proposed Findings, Probable Causes, and Safety Recommendations of V.Ships Greece Ltd.

Dear Ms. West,

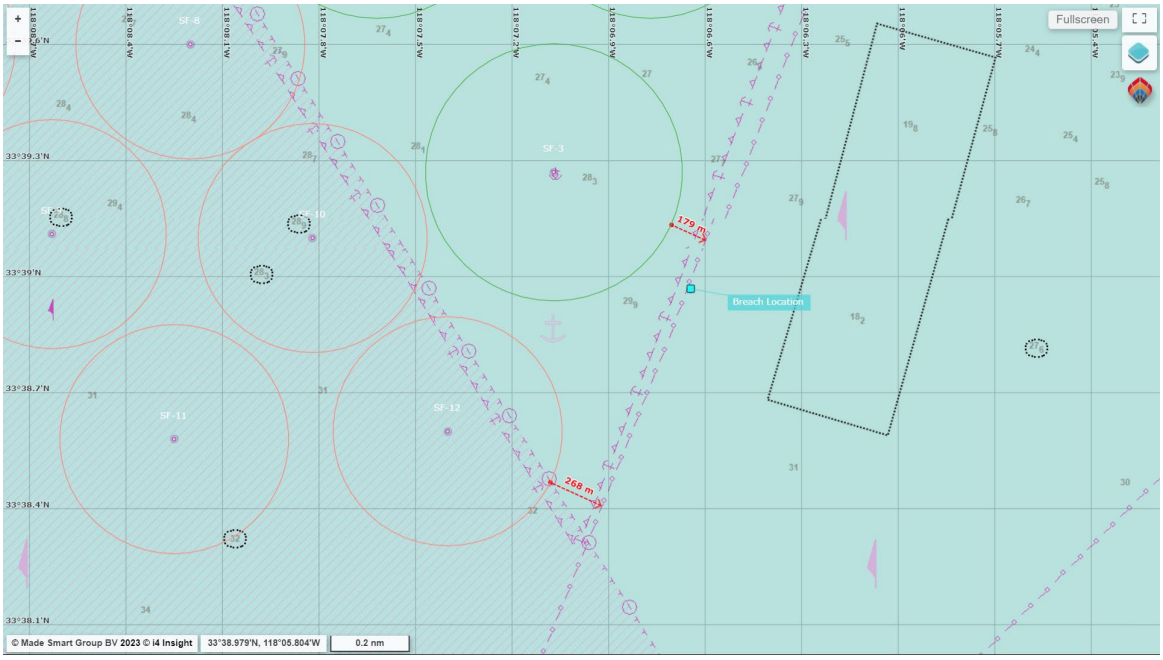
V.Ships Greece Ltd. ("V.Ships") thanks the National Transportation Safety Board ("NTSB") for the opportunity to submit proposed findings, probable causes, and recommendations to the NTSB relating to its investigation of the San Pedro Bay Pipeline ("Pipeline") leak (the "Oil Spill").

I. Proposed Findings

A. The BEIJING did not contact the Pipeline at the breach point.

AIS data showing GPS coordinates of the BEIJING, together with scour marks reflected on the seabed floor in bathymetric surveys, make clear that the BEIJING's anchor did not make contact with the Pipeline where it later cracked.[1] The closest likely contact between the BEIJING's anchor and the Pipeline was located approximately at 33°38'46.76"N, 118° 6'45.77"W.[2] The point at which the likely BEIJING anchor scour marks intersect with the Pipeline at this northernmost likely contact point —*i.e.*, the one closest to the breach point—is between 1,184 feet and 1,297 feet away from where the Pipeline ultimately leaked.[3] As shown in the figure below,[4] the BEIJING's anchorage, SF-12, abutted the Pipeline—but not at the breach point. During the course of extensive litigation that arose out of the Oil Spill, no party ever contended that the BEIJING contacted the Pipeline at the breach point.

[1] These facts are set forth in greater detail in the enclosed Declaration of Steve J. Cunningham ("Cunningham Decl.") at ¶¶ 13-18.
[2] *Id*. at ¶ 15.
[3] *Id*.
[4] *Id*. at ¶ 13.



B. The DANIT contacted the Pipeline at the breach point, causing denting and a gouge.

The DANIT's anchor likely struck the Pipeline at either 06:09 (if the DANIT had four shackles of chain in the water) or at 06:10 (if the DANIT had seven shackles of chain in the water).[5] The DANIT's anchor then dragged south along the Pipeline to the location of the subsequent crack, while the DANIT continued with its engine astern.[6] The DANIT's astern movement then caused the anchor to start pulling the Pipeline to the east at around 06:09:30 and to continue pulling the Pipeline east until around 06:11:14, at which point the DANIT's anchor pulled the location containing the breach point.[7] This sequence of events is consistent with the significant deformation and gouging visible in the subsea imaging of the leak site undertaken

[5] Cunningham Decl. at ¶¶ 12, 30.
[6] *Id*. at ¶¶ 12, 30-34.
[7] *Id*.

after the Oil Spill.[8] The most severe deformation—and the greatest changes in radius—corresponded with the pipe sections abutting the section of which the NTSB took possession.[9]

C. The dented and gouged area where the DANIT contacted the Pipeline was subjected to cyclic loading caused by pumping oil, which caused the gouge to extend and cause the Oil Spill.

The appearance and circumstances of the longitudinal crack suggest fatigue as the most likely cracking mechanism.[10] Dents result in abnormal stresses in the pipe wall as the internal pressure tries to push the dent out.[11] Relative to round, undented pipe, deformed pipe is therefore much more susceptible to fatigue.[12] Moreover, the mechanical damage and gouge coincide with an additional stress concentration—the longitudinal seam weld.[13] The progressive characteristics of fatigue are consistent with the time that elapsed between the impact damage and the Oil Spill.[14] In addition, a recent fatigue crack, oriented in the same direction as the leak, was observed in a girth weld just north of the leak site, as shown below.[15] The crack was approximately 31 feet north of the NTSB cut and was in the same manufactured joint of pipe.[16] This crack exhibited signs of recent fatigue cracking that initiated from a much older, dormant, heavily oxidized crack that formed around the time the Pipeline was originally constructed.[17] The presence of the fatigue crack further suggests the Pipeline was subject to fatigue (cyclic) loading.[18]

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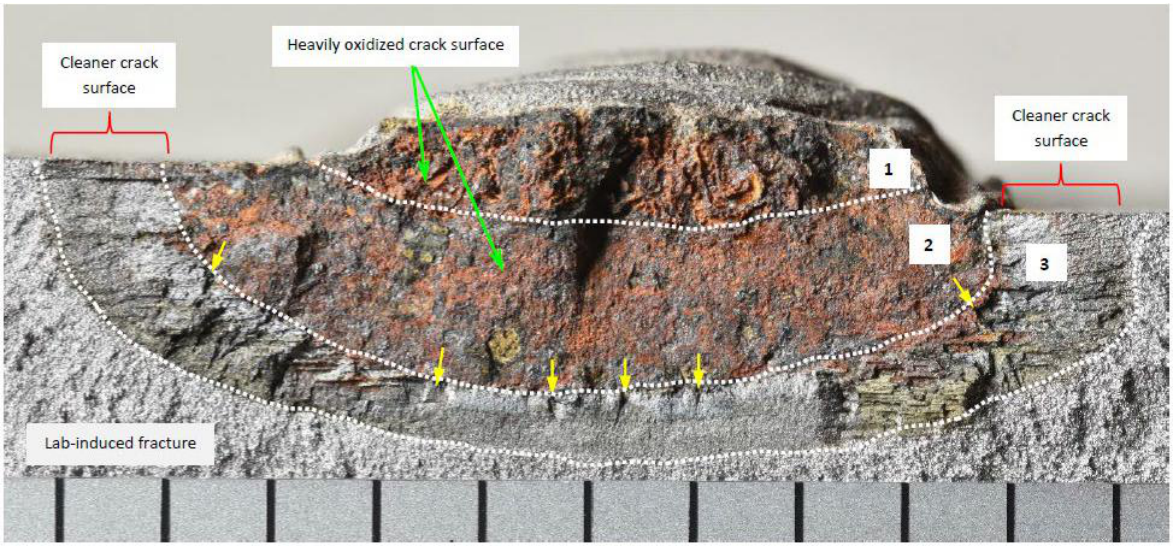
[8] Declaration of Kimberly O. Flesner ("Flesner Decl.") (enclosed) at ¶ 69.
[9] *Id*. at ¶ 80.
[10] *Id*. at ¶ 75.
[11] *Id*. at ¶ 76.
[12] *Id*.
[13] *Id*. at ¶ 77.
[14] *Id*. at ¶ 78.
[15] *Id*. at ¶¶ 42, 79.
[16] *Id*. at ¶ 80.
[17] *Id*. at ¶ 37.
[18] *Id*. at ¶ 80.

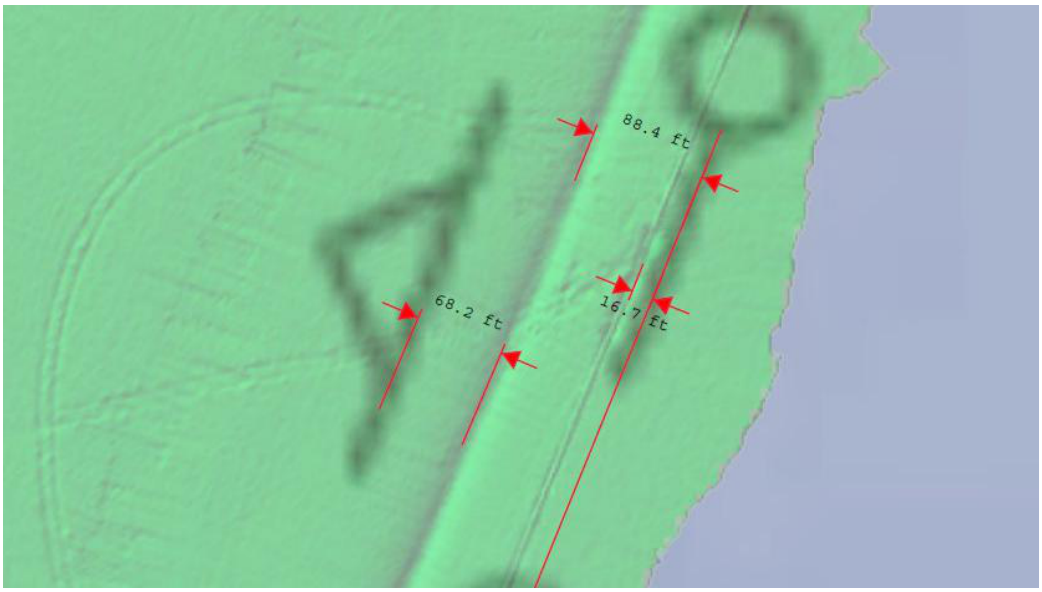


D. Although Amplify is responsible for supplying accurate information about the location of its Pipeline, the Pipeline was mis-charted and shown to be farther away from anchorage SF-12 than it really was.

On January 25, 2021, the Pipeline's location as displayed on National Oceanic and Atmospheric Administration ("NOAA") charts was wrong.[19] These charts are prepared based on location information provided by the Pipeline's owner,[20] which here is Amplify. The Pipeline's actual location—both before and after its displacement in January 2021—was west of, and closer to the anchorage than, the Pipeline's charted location in the section where the BEIJING is likely to have contacted the Pipeline.[21] According to bathymetric survey data, and as reflected in the image below,[22] the Pipeline was charted between approximately 88.4 feet and 95.9 feet east of its actual location in the areas in which the BEIJING's anchor likely contacted

[19] Cunningham Decl. at ¶ 21.
[20] *See* NOAA's Role in Charting Pipelines & Current Datasets, https://cdmcs.org/wp-content/uploads/2019/03/NOAAs-Role-in-Charting-Pipelines-Current-Datasets-Lance-Roddy.pdf.
[21] Cunningham Decl. at ¶ 12.
[22] *Id*. at ¶ 21.

it.[23] The Pipeline's final displaced position near the points at which the BEIJING's anchor likely contacted it was between 16.7 feet and 32.8 feet west of the Pipeline's charted location.[24]



There is no dispute that the bathymetric surveys conducted after the Oil Spill by both the BEIJING's experts and Amplify demonstrate that the chart displayed on the BEIJING's navigational display showed the Pipeline was nearly 100 feet further from the vessel than it really was.[25]

E. The BEIJING's anchor never reached the charted location of the Pipeline.

The BEIJING's anchor never would have contacted the Pipeline had it been located where it was charted. The BEIJING's anchor left scour marks on the seabed that have been recorded by bathymetric surveys conducted after the Oil Spill.[26] As illustrated by the image below, those scour marks do not reach, and instead are all closer to the anchorage area than, the charted location of the Pipeline.[27] The fact that the BEIJING's anchor did not cross the Pipeline's charted location demonstrates that the BEIJING's Captain reasonably believed that the

[23] *Id*. at ¶ 22.
[24] *Id*. at ¶ 23.
[25] *See id.* at ¶ 21.
[26] *Id*. at ¶¶ 13-18.
[27] *Id*. at ¶¶ 20-24.

Beijing's anchor did not contact the Pipeline. While the hull of the BEIJING crossed over, the scour marks that are likely attributable to the BEIJING's anchor dragging do not extend to the charted location of the Pipeline. Were the Pipeline in its charted location, the BEIJING's anchor accordingly would not have contacted it.

F. The likely contact between the BEIJING's anchor and the Pipeline had no effect on the Pipeline at the breach point.

The BEIJING's closest likely contact to the breach point was over 1,100 feet away from it and any such contact could not have caused the Oil Spill.[28] This is confirmed by analyses performed across three dimensions that show that the BEIJING's likely anchor contacts (1) had no mechanical or metallurgical effect on the Pipeline at the breach point; (2) did not

[28] *Id*. at ¶¶ 15-18.

displace the Pipeline at the breach point or alter the internal pressure of the Pipeline at the breach point; and (3) added no stress or strain at the breach point.[29]

First, the results of extensive testing and analysis—which are explained in detail in the enclosed Flesner Declaration—made clear that the BEIJING's likely anchor contacts with the Pipeline had no mechanical or metallurgical effect at the breach point. Fatigue in dented pipe is well known to be a localized phenomenon.[30] It is therefore unsurprising that significant lengths of round, undented pipe were present between the closest likely BEIJING contact and the breach point—points separated by over 1,100 feet, as set forth above.[31] Moreover, longitudinal tension test results from the pipe segments removed from the sea floor confirm that any effects of deformation on the Pipeline's mechanical properties were isolated to the dented areas and did not affect the properties in adjacent round pipe, including any round pipe between any BEIJING contact point and the breach point.[32]

Second, the BEIJING's likely contacts did not laterally displace the Pipeline, or affect the pressure in the Pipeline, at the breach point.[33] This conclusion derives from an investigation of the behavior of the Pipeline that resulted from the likely BEIJING and DANIT anchor strikes. That investigation was guided by a particular focus on the Pipeline's global movement across the sea floor as the likely anchor contacts exerted force on the Pipeline.[34] The results of the investigation are set forth in detail in the enclosed Declaration of Rune Iversen.[35]

Third, the BEIJING's likely anchor contacts did not increase the stress or strain on the Pipeline at the breach point.[36] Assuming that only the DANIT contacted the Pipeline, the Pipeline would have been subject to the same amount of stress and strain that caused the crack.[37]

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[29] Flesner Decl. at ¶ 80; Declaration of Rune Iversen ("Iversen Decl.") (enclosed) at ¶ 86.
[30] Flesner Decl. at ¶ 76.
[31] *Id*. at ¶ 3-4.
[32] *Id*.
[33] Iversen Decl. at ¶ 86.
[34] *Id*. at ¶ 3.
[35] *Id*. at ¶¶ 70-85.
[36] *Id*. at ¶ 86.
[37] *Id*.

Calculating the force required to displace the Pipeline as it was in January 2021 reveals that it would have taken roughly 150 kips from the DANIT's anchor to displace the Pipeline to the extent it did.[38] Running this scenario both with (Case 1b) and without (Case 2) accounting for the BEIJING having first contacted the Pipeline yielded the results displayed in the below table.[39] The plastic strain at the breach point—which is the permanent deformation that caused the gouge to become a crack—would have been higher if only the DANIT's anchor contacted the Pipeline.[40] Any contacts by the BEIJING therefore did not impose stress or strain that contributed to the Oil Spill.[41]

Case	von Mises (VME) Stress (before anchor release)	von Mises (VME) Stress (after anchor release)	Plastic Strain
Case 1b	54.2	53.1 ksi	1.473×10^{-2}
Case 2	54.4	53.1 ksi	1.610×10^{-2}

G. NOAA charts 18746 and 18749, which chart the Pipeline, contain no specific warning regarding Amplify's Pipeline, and do not indicate that the Pipeline is unburied.

The language on the NOAA charts for San Pedro Bay did not state that the Amplify Pipeline was unburied or an active oil pipeline. Instead, the chart merely included generic pipeline language, noting that some pipelines may not be buried.[42]

H. The BEIJING acted consistently with most of other vessels in deciding to remain at anchor when the harbor was initially beset by severe weather on January 24, 2021.

[38] *Id*. at ¶ 82.
[39] *Id*. at ¶¶ 82-85.
[40] *Id*. at ¶ 86.
[41] *Id*.
[42] NOAA Chart 18746, 18749.

As of January 24, 2021, there were approximately 50 vessels at anchor in the ports of Long Beach and Los Angeles. That evening, weather reports predicted high winds and rough seas for January 25. Neither the Coast Guard nor VTS instructed any ship to leave its assigned anchorage, and the vast majority of ships did not leave before the storm—of the roughly 50 ships at anchor, prior to the storm, only three departed to drift and await their return to the anchorages or port. When, at approximately 3:54 a.m., the BEIJING crew detected the first signs that it was dragging anchor, and the BEIJING's Captain ordered the deck crew to the forward mooring station to prepare to heave the anchor.[43] The BEIJING promptly started heaving anchor and reported its dragging to VTS, making it one of the first vessels to attempt to do so.[44]

I. The BEIJING did not encroach on the DANIT's anchorage circle.

The AIS data confirms that the BEIJING never encroached on the DANIT's anchorage circle, and the BEIJING never limited the DANIT's ability to return its own anchorage.[45]

J. The BEIJING abided by all VTS instruction and procedures while in San Pedro Bay.

First, the BEIJING was at anchor in the anchorage assigned by VTS to the BEIJING.[46] Beyond the breakwater in the San Pedro Bay, in the Coast Guard/Marine Exchange Vessel Traffic Service's ("VTS") Area of Responsibility, a vessel cannot select its own anchorage, or anchor, without the permission of the VTS. In accordance with the rules governing the use of the port, vessels must be assigned a specific anchorage. After being assigned an anchorage, a vessel is authorized by the VTS to drop anchor when it is within an acceptable position to do so relative to its assigned anchorage.[47] Upon its arrival in the San Pedro Bay on January 23, 2021, the VTS assigned the BEIJING to the SF-12 contingency

[43] Captain Solovyov Statement of Facts.
[44] *See id*.
[45] Cunningham Decl. at ¶¶ 12, 25-29
[46] Captain Solovyov Statement of Facts.
[47] https://mxsocal.org/assets/pdf/hsp/lalb-hsp-combined-220629.pdf.

anchorage.[48] The VTS did so despite knowing the proximity of the anchorage SF-12 to the charted Pipeline. Consistent with industry custom and practice, the BEIJING anchored at SF-12, as instructed by the VTS, the Coast Guard's representative.

Second, consistent with direction from the VTS, the BEIJING's engine was on immediate standby in advance of the heavy weather on January 24, 2021.[49] The BEIJING's main engine was ready to be started on short notice (within 15 minutes), and the BEIJING in fact responded immediately when conditions became severe.[50] The VTS watchstander who gave the instruction to commercial vessels to have their propulsion plants on immediate standby testified that he believed the advisory meant the vessels should "be able to be maneuvered on very short notice", "within 20 or 30 minutes", and thus the BEIJING's 15-minute readiness complied with this directive.[51] When the BEIJING's windlass motor failed, it began to maneuver with the main engine,[52] which it did successfully to avoid its anchor ever reaching the Pipeline's charted location (as described above, the pipeline was mischarted).

Third, the BEIJING complied with obligations to report to the VTS. Specifically, the BEIJING reported both of its relevant conditions—namely, that its anchor was dragging and that it suffered a windlass failure. At 3:54 a.m., the BEIJING's Second Officer observed the vessel was dragging anchor.[53] Captain Solovyov was notified and, only two minutes later, arrived at the bridge and took command.[54] The BEIJING notified VTS at 4:04 a.m. that it was dragging anchor. Although not required, the BEIJING also notified VTS of the failure of its windlass motor.

[48] Captain Solovyov Statement of Facts.
[49] Captain Solovyov Statement of Facts.
[50] *Id*.
[51] Martin Dep. 199:13–200:2 (enclosed).
[52] Captain Solovyov Statement of Facts.
[53] *Id*.
[54] *Id*.

K. VTS assigned the BEIJING to SF-12 but, following changes made after the Oil Spill, VTS no longer assigns vessels to anchorages that close to the Pipeline.

After the heavy weather event of January 25, 2021 and the eventual Oil Spill, the VTS discontinued anchorage SF-12—the anchorage to which BEIJING was assigned on January 25—due to the anchorage's proximity to the Pipeline. The VTS also increased the distances between anchorages and between anchorages and the Pipeline. In 2022, the Marine Exchange undertook an anchorage restructuring proposal and presented it to local stakeholders at the Harbor Safety Committee.

L. The VTS had the ability to track the BEIJING's proximity to the Pipeline on January 25, but it did not contact the BEIJING regarding the Pipeline.

The VTS uses a Kongsberg/Norcontrol C-Scope VTS System to track the movement and location of vessels within its Area of Responsibility.[55] Throughout its time at the anchorage in January 2021, the BEIJING reported conditions onboard via the VHF radio, and its position by way of the AIS system. Specifically on January 25, 2021, the BEIJING promptly reported to the VTS the fact that it was dragging anchor and that it intended to get underway and heave when its anchor was dragging. The BEIJING also reported its deviation from that plan when the burned out windlass motor delayed its operations. At all relevant times that morning, the BEIJING consistently communicated with VTS, which was tracking the vessel's movements and location.

At no time on January 25, 2021 did the VTS contact the BEIJING to warn it of a possible interaction with the Pipeline or that its position posed any threat to the Pipeline, despite the fact that the VTS was tracking the vessel's movements. Nor did the VTS provide any instructions to the BEIJING or require it to take any additional steps in response to reported anchor dragging and vessel conditions, including the inoperability of the anchor windlass motor.

[55] Harbor Safety Plan for the Ports of Los Angeles and Long Beach (Dated 06/30/2022), https://mxsocal.org/assets/pdf/hsp/lalb-hsp-combined-220629.pdf, at VIII – 2-3.

The officers and operators of the BEIJING, as VTS users, could reasonably expect that if the BEIJING's movements posed an imminent threat to the Pipeline or the environment, the VTS would notify them of that risk.

M. The BEIJING was manned by a competent Master and crew with the requisite experience, training and credentials for their positions.

V.Ships abides by detailed crewing procedures to maintain fully vetted, certified and experienced crews.

Beginning with the crew, on January 25, 2021, the BEIJING's crew complied fully with the manning requirements of the International Safety Management Code. It held a Document of Compliance issued by the Republic of Malta[56] and was crewed with competent and qualified seafarers in accordance with the Vessel's Safe Manning Certificate.[57] In fact, the BEIJING was more than adequately staffed on January 25, 2021—it was manned with a crew of 22 credentialed mariners, seven more than the number of mariners required by the Vessel's Safe Manning Certificate.[58] The increased manning would provide for additional maintenance to be carried out throughout the voyage while enabling the vessel to maintain adequate watches and ensure work-rest requirements were satisfied.

In the 14 months preceding January 25, 2021, the BEIJING underwent 14 different audits that demonstrated no serious instances of non-compliance and observations indicating the company and crew were meeting the International Safety Management Code requirements.[59] Moreover the crew had also undergone dozens of mandatory and auxiliary

[56] V.SHIPS310911 (enclosed).
[57] V.SHIPS096209 (enclosed).
[58] *See id*.
[59] Three external audits were completed by Lloyd's Register: CAPE019389; CAPE038679; CAPE039549. One internal ISM audit was completed by a V.Group auditor: V.SHIPS229372. Five internal navigation audits were completed: V.SHIPS232301; CAPE121788; V.SHIPS310922; CAPE043445; V.SHIPS251383. Three internal mooring and anchoring audits were completed: CAPE043851; CAPE121794; CAPE043972. One external Flag State inspection was conducted in Vancouver, Canada: CAPE106031. One external Port State Control inspection was conducted in Singapore: V.SHIPS229533. Less than three months after

trainings,[60] consistent with the heightened standard imposed by V.Ships' own crew training matrix. And the deck officers and Bosun all satisfactorily completed a course in safe anchoring.[61]

The Captain was likewise certified, experienced and trained. Captain Solovyov was duly certified and had significant seagoing experience—garnered over the course of 25 years—as both a Master and Chief Officer.[62] He was certified in accordance with Standards of Training, Certification and Watchkeeping ("STCW")[63] and had an endorsement from the Vessel's flag state (Malta) confirming his compliance with the applicable provisions of the STCW Code[64].

N. The BEIJING, including its windlass motor, was well-maintained and in good working order when the BEIJING left for Long Beach.

As set forth above, the BEIJING's departure from port was delayed by the failure of its portside windlass motor. The motor failed because it was subjected to high loads when the crew attempted to heave the anchor while the BEIJING was dragging anchor in stormy weather and potentially before the main engine was online to relieve load from the anchor chain. The windlass was regularly inspected and maintained according to the manufacturer's manual by both crew and V.Ships shoreside personnel and was in good working order until January 25, when it failed due to an overload.

January 2021 incident, another external Port State Control inspection was conducted by the United States in Oakland: CAPE031156. The United States found zero deficiencies. These documents are all enclosed.

[60] V.Ships would be happy to provide individual training records for each crewmember upon request.

[61] V.SHIPS231072 at 73 (Captain Solovyov, on February 15, 2013); V.SHIPS231057 at 58 (Chief Officer Vasiutin, on August 22, 2013); V.SHIPS231025 at 26 (Second Officer Ledesma, on November 4, 2020); V.SHIPS231030 at 31 (Third Officer Austria, on April 6, 2020, and August 27, 2020); V.SHIPS299654 (Bosun Solleza, on May 29, 2013). These documents are all enclosed.

[62] V.SHIPS231072 (enclosed).

[63] V.SHIPS012591 (enclosed).

[64] CAPE123575 (enclosed).

In their interviews with the Coast Guard, the crew who had been onboard the Beijing on January 25, 2021, indicated that the windlass had never presented a problem before.[65] A September 2020 email between V.Ships and the BEIJING shows that the port side windlass motor was used in August 2020 without incident, and was inspected in September 2020 and found to have no issues.[66] The Beijing's maintenance records show that the crew conducted a "megger test" to test the windlass motor's insulation in December 2020 and inspected the motor on January 11, 2021, two weeks before the incident. Both tests showed the windlass motor was functioning well prior to January 25, 2021.[67]

O. On October 1, 2021, a crack in the Pipeline released oil into the San Pedro Bay and discharged an estimated 25,000 gallons of oil over the course of 14 hours.

The Pipeline ruptured at approximately 4:05 p.m. on October 1, 2021, causing oil to leak from the Pipeline from 4:05 p.m. until 6:04 a.m.[68] This caused approximately 588 barrels of crude oil to spill into the San Pedro Bay, or about 25,000 gallons.[69]

P. As of January 2021, the Pipeline was operated in a manner inconsistent with its permits.

In 1979, the U.S. Army Corps of Engineers issued a Department of the Army permit allowing Shell, Amplify's predecessor, to install the Pipeline. The permit required that part of the Pipeline be buried near the shore, but allowed portions of the Pipeline to remain unburied on the condition that "the pipeline shall be placed at least five hundred yards outside of the anchorage area that is seaward of the Long Beach Breakwater and described as Anchorage F."[70] This condition was imposed because the Pipeline was located in an area of heavy marine

[65] Khadzhyoglo Interview at 34; Ledesma Interview at 18–19; Yakubov Interview at 31.
[66] *See* September 9, 2020, email from Beijing to George Ioannou.
[67] Megger Test Spreadsheet; Windlass Maintenance History.
[68] Federal Plea Agreement at 24–29.
[69] *Id*. at 29.
[70] *See* U.S. Department of the Army Permit at AMPLIFY-00549715–17.

traffic (even more than 40 years ago). This location made the Pipeline "vulnerable to damage from anchoring, particularly by large ships, . . . [making it] important that the anchorage area be separated from the pipeline".[71] In January 2021, the distance from the nearest edge of the anchorage to the Pipeline was only 56.2 yards – placing the Pipeline approximately 90% closer to the anchorage area than its permit allowed.[72] Additionally, the Pipeline's Right of Way permit states that the permittee "agrees to maintain the pipeline to be compatible with fishing and shipping."[73] Given its proximity to anchorages, the Pipeline was operated in a manner that was inconsistent with fishing and shipping activity in the San Pedro Bay, in violation of its permit.

Despite operating the Pipeline in violation of its permits, Amplify did not take any additional steps to mitigate the risk of anchor strikes created by the proximity of anchorages to the Pipeline. We have not seen any evidence that Amplify utilized publicly available AIS data to monitor vessel traffic near its Pipeline or that Amplify purchased other anchor strike protection monitoring systems available to pipeline operators. Nor have we seen evidence that Amplify took alternative potential mitigative measures, such as increased inspections, to address this heightened risk.

Q. Amplify did not adequately train its Beta Offshore employees on the leak detection system prior to the Oil Spill.

49 C.F.R. § 195.403 requires operators to establish and conduct a training program to instruct emergency response personnel to "recognize conditions that are likely to cause emergencies, predict the consequences of facility malfunctions or failures and hazardous liquids or carbon dioxide spills, and take appropriate corrective action." 49 C.F.R. § 195.446 requires each pipeline operator to "establish a controller training program and review the training program... An operator's program must provide for training each controller to carry out the roles

[71] *See* United States Geological Survey, EIR/EA Shell OCS Beta Unit Development Impact Assessment ("EIR/EA"), Vol. II (Dec. 1, 1978) (enclosed) at 195.
[72] United States Coast Guard Memorandum, Distances Between Areas of Interest in Oil Pipeline Leak Near Huntington Beach, CA, October 13, 2021 (enclosed).
[73] *See* U.S. Department of the Interior Right of Way Permit at AMPLIFY-00144284–86.

and responsibilities as defined by the operator... and must include the following elements: 1) Responding to abnormal operating conditions... 2) Use of a computerized system or non-computerized (tabletop) method for training controllers to recognize abnormal operating conditions; 3) Training controllers on their responsibilities for communication under the operator's response procedures; 4) Training that will provide a controller a working knowledge of the pipeline system..." Further, 30 C.F.R. § 250.1915 requires pipeline operators to "establish and implement a training program... Training must address areas such as operating procedures (§ 250.1913), safe work practices (§ 250.1914), emergency response and control measures (§ 250.1918)..." Amplify failed to provide its controllers with sufficient training on emergency response procedures and on responding to leak alarms on the leak detection system, violating these regulations.

We have seen no evidence that Amplify's control room operators received formal training or were adequately trained on the Pipeline's Atmos leak detection system or Beta's operating procedures. Atmos's corporate representative testified that Amplify's Beta employees had not received any training from Atmos for at least five years preceding the Oil Spill.[74] If Amplify's employees had received training from Atmos, they would have been taught not to use leak location when evaluating whether the Pipeline is leaking.[75] Amplify's employees testified to relying on leak location in responding to the leak alarms on October 1 and 2, 2021, indicating they were not sufficiently trained.[76] Additionally, we have not seen any evidence that Amplify's control room operators understood the Atmos leak detection system data available to them, such as the lambdas, to be able to adequately respond to leak alarms. If they had been properly trained, the operators would have understood that the Atmos system only alarms when it is 99% certain there is a leak.[77]

[74] *See* Kane Dep. Tr. 132:24-133:7 (enclosed).
[75] *Id*. at 200:17-201:6.
[76] *See, e.g.*, Armstrong NTSB Interview Tr. 10:22-11:3.
[77] *See* Kane Dep. Tr. 112:8-15; 144:2-15.

R. Amplify failed to adequately respond to leak detection system alarms on October 1 and 2, 2021.

Amplify failed to appropriately respond to and investigate seven separate leak detection system alarms on October 1 and 2, 2021.[78] Amplify's control room operators testified that their normal process of responding to leak detection alarms involved only shutting down the shipping pumps to let them settle before restarting the pumps in hopes that this reset would lead the leak detection system to clear.[79] This process assumes that the leak detection alarm is false to begin with, rather than acknowledging the fact that Atmos's leak detection system only triggers when the probability of a leak is 99% or greater. Additionally, Amplify's practice of responding to alarms was unsafe and inconsistent with API RP 1130, which states that "[t]he operational responses to a possible commodity release alarm need to consider these factors: a) All CPM alarms have a cause; b) CPM alarms will be probabilistic, and need to be assessed in light of the current sensitivity threshold; c) Prior instances of alarm causes can be a useful guide in alarm evaluation, but *every alarm should be evaluated individually and assumptions of previous causes not be readily made*." If Amplify had shut down the Pipeline and investigated whether the first leak detection alarm at 4:10 p.m. was a real alarm, such as by running a line ride, or looking at the historical pressure, flow and other data available on the Atmos system, instead of making assumptions based on previous alarms, it would have determined there was a leak in the Pipeline after the first leak alarm.

S. Amplify did not implement or follow adequate procedures for inspecting the Pipeline following an extreme weather event.

49 C.F.R. § 195.414 requires that "[f]ollowing an extreme weather event or natural disaster that has the likelihood of damage to infrastructure by the scouring or movement of the soil surrounding the pipeline, such as a named tropical storm or hurricane; a flood...or an

[78] *See* Federal Plea Agreement at 26–29.
[79] *See* Sanchez NTSB Interview Tr. 21:12-25 ("[U]sually we just shut down the shipping pumps, let them calm down, and then we turn them back on...").

earthquake in the area of the pipeline, an operator must inspect all potentially affected pipeline facilities to detect conditions that could adversely affect the safe operation of that pipeline" and "[t]he inspection... must commence within 72 hours after the cessation of the event..."

On January 25, 2021, there was a severe storm in the area of the Pipeline, which the Daily Breeze described as having "[w]ind gusts to 55 knots (63 mph) and 17-foot seas.[80] This storm was further complicated by the fact that the Los Angeles and Long Beach ports were "enduring one of the worst U.S. port bottlenecks in more than a decade", with the director of the Marine Exchange of Southern California stating "[w]e cannot recall a more complex situation with this many vessels and this bad a wind and sea condition, for such a sustained period of time".[81] There is no evidence that Amplify visually inspected the Pipeline after this severe storm, or even considered or evaluated whether it should conduct an inspection given the shipping congestion near its Pipeline.

II. Probable Causes

A. The DANIT's contact with the Pipeline caused a gouge and denting that, when subject to cyclic loading from oil being pumped through the Pipeline, caused the Oil Spill.

As discussed in Section I(B) above, the DANIT's anchor contacted the Pipeline on the morning of January 25, 2021. After this initial contact, the anchor then slid along the Pipeline until the DANIT's anchor reached the breach point, where the anchor started pulling the Pipeline to the east. This contact caused denting and a gouge at the location where the Pipeline ultimately ruptured. Amplify's continued operation of the Pipeline subjected this damaged section of pipe to cyclic loading and fatigue, causing the Oil Spill.

B. VTS assigned the DANIT to an anchorage close to the Pipeline.

[80] *See* Bloomberg & E. Ritchie, 17-foot waves force container ships at ports of LA and Long Beach to flee to safety, Daily Breeze (January 26, 2021), https://www.dailybreeze.com/2021/01/26/storm-forces-containerships-off-los-angeles-to-flee-to-safety/.
[81] *Id.*

As discussed in Section I(B) above, the VTS assigned the DANIT to anchorage SF-3, the easternmost edge of which was less than 600 feet away from the Pipeline.[82] Situating vessels this close to the Pipeline created unnecessary risk.

C. Amplify's operation of its Pipeline in violation of the Pipeline's permits resulted in the Pipeline being operated dangerously close to nearby anchorages. Had the Pipeline been kept a safe distance from the anchorages, as intended by its permits, it is unlikely that the vessels' anchors would have contacted the Pipeline.

As discussed in Section I(E) above, the BEIJING's anchor never reached the charted location of the Pipeline, which was about 100 feet further away from the anchorage location than where the Pipeline actually lay. If the Pipeline had been kept at least 500 yards away from the anchorage, as intended by its permit, instead of its actual distance of 56.2 yards, it is unlikely that the vessels' anchors would have contacted the Pipeline.

D. Amplify's negligent operation of its Pipeline prior to October 1, 2021 resulted in its failure to discover the damage to the Pipeline after an extreme weather event.

As discussed in Section I(S) above, there is no evidence that Amplify visually inspected the Pipeline after the January 25, 2021 severe storm. Had it done so, it could have discovered the damage to the Pipeline and taken actions to remedy the damage, which would have prevented the Oil Spill.

E. Amplify's negligent response to the leak alarms on October 1, 2021 caused the Oil Spill to increase dramatically in size. Had Amplify shut down its Pipeline after the first leak alarm at 16:10 on October 1, 2021, and adequately investigated the alarm, any oil spilled from the Pipeline would have been minimal.

[82] Cunningham Decl. at ¶ 13.

As discussed in Section I(R), Amplify failed to adequately respond to the leak detection system alarms on October 1 and 2, 2021. If Amplify had evaluated the first leak alarm at 4:10 p.m. correctly, either through the Atmos data readily available or by conducting an investigation of the alarm through a line ride, it would have discovered the Pipeline leak after this first alarm. Had it done so, it could have kept the Pipeline shut off, and only a minimal volume of oil would have spilled between the Pipeline rupture and the first leak alarm.

III. Recommendations

V.Ships proposes that the NTSB make the following recommendations:

A. There should be a distance of at least 500 yards between unburied sections of the Pipeline and anchorages, as required by the Pipeline's permit.

B. Amplify should regularly survey the Pipeline's location and ensure the Pipeline's surveyed location matches the Pipeline's charted location on NOAA charts.

C. Amplify should ensure the NOAA charts indicate the uncovered portions of the Pipeline.

D. Amplify should provide formal training on its leak detection system to relevant Beta Offshore employees, including on how to interpret leak data that is presented.

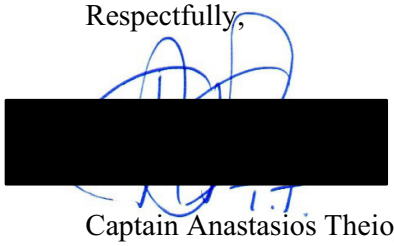
E. Amplify should provide annual formal training on its procedures, including Emergency Shutdown and Abnormal Operating Conditions procedures, to relevant Beta Offshore employees.

F. Amplify should revise its procedure on extreme weather events to require visual inspections of the Pipeline following a severe storm (based on a determined wind speed) or earthquake that is felt on its platforms.

IV. Conclusion

If any of the above requires clarification or additional information, please do not hesitate to contact us. We thank the NTSB for the opportunity to provide a fair and complete record of the Oil Spill.

Respectfully,



Captain Anastasios Theiopoulos

V.Ships Greece Ltd.