



UNITED STATES COAST GUARD

**THE REPORT OF INVESTIGATION
INTO THE
TANK VESSEL GENESIS RIVER (IMO 9791224)
COLLISION WITH TOWING VESSEL VOYAGER (O.N.
563475) IN THE HOUSTON SHIP CHANNEL ON MAY
10, 2019**



U.S. Department of
Homeland Security

United States
Coast Guard



Commandant
United States Coast Guard

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16732/IIA#6682103
02 May 2022

**THE TANK VESSEL GENESIS RIVER COLLISION WITH THE TOWING VESSEL
VOYAGER IN THE HOUSTON SHIP CHANNEL ON MAY 10, 2019**

ACTION BY THE COMMANDANT

The record and the report of the investigation convened for the subject casualty have been reviewed. The record and the report, including the findings of fact, analysis, and conclusions are approved. The investigation's safety recommendations have been reviewed by the convening authority and are referred to Sector Houston-Galveston for action. This marine casualty investigation is closed.


J. D. NEUBAUER
Captain, U.S. Coast Guard
Acting Director of Inspections and Compliance



16732

MAY 13 2019

MEMORANDUM

From: P.F. Thomas, RADM
CGD Eight (d)

To: Mr. [REDACTED]
Lead Investigating Officer

Subj: FORMAL MARINE CASUALTY INVESTIGATION CONCERNING COLLISION
BETWEEN M/T GENESIS RIVER AND ITV VOYAGER

1. Pursuant to the authority contained in Title 46, United States Code (U.S.C.), Section 6301 and the regulations promulgated thereunder, you are to convene a formal investigation for the collision between the M/T GENESIS RIVER and the ITV VOYAGER in the Houston Ship Channel on May 10, 2019. In conducting your investigation, you shall follow, as closely as possible, to the policy guidance and operational procedures for the Coast Guard Marine Investigations Program, as found in the Marine Safety Manual, Volume V, COMDTINST M16000.1A.
2. Due to the scope and complexity of the investigation, I have assigned the following persons to assist you with your investigation. For purposes of this investigation, the below persons are all designated as investigating officers as defined under 46 C.F.R. § 4.03-30, and therefore, shall enjoy the powers outlined in 46 C.F.R. § 4.07-5.:
 - LCDR [REDACTED], Technical Advisor (Assistant Marine Inspector)
 - LT [REDACTED] Assistant Investigating Officer
3. Upon completion of the investigation, you will issue a report to me with the collected evidence, the established facts, and conclusions and recommendations. Conclusions and recommendations concerning commendatory actions or misconduct that would warrant further inquiry shall be referred to me, by separate correspondence for consideration and action as appropriate. A daily summary of significant events shall be transmitted to me via CGD Eight (dp) while the investigation is in formal session.
4. You will complete and submit your investigative report to me within 210 days of the convening date. If this deadline cannot be met, you shall submit a written explanation for the delay and notice of the expected completion date. You are highly encouraged to submit any interim recommendations intended to prevent similar casualties, if appropriate, at any point in your investigation.
5. As lead investigating officer, you will preside over any public hearing. LCDR [REDACTED] Investigations National Center of Expertise, will serve as your legal advisor, and may assist you and your team as you may direct. Additionally, a Recorder will be identified at a later date for assistance conducting the formal hearing. Further, at your discretion, you may utilize the services of Coast Guard and other Government-employed subject matter experts.

FORMAL MARINE CASUALTY INVESTIGATION
CONCERNING COLLISION BETWEEN M/T GENESIS RIVER
AND ITV VOYAGER

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6. The National Transportation Safety Board (NTSB) is also charged with the responsibility of determining the cause or probable cause of this casualty by the Independent Safety Board Act of 1974 (49 U.S.C. § 1901, et. seq.) and may designate a representative to participate in this investigation. The NTSB representative may make recommendations regarding the scope of the inquiry, may identify and examine witnesses, and/or submit or request additional evidence.

7. CGD Eight will furnish such funding and technical assistance as may be required by the Investigation when deemed appropriate and within the requirements for the scope of the investigation. Your point of contact for funding and technical assistance is LCDR [REDACTED] CGD Eight (dp).

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**TANK VESSEL GENESIS RIVER (IMO 9791224) COLLISION WITH TOWING
VESSEL VOYAGER (O.N. 563475) IN THE HOUSTON SHIP CHANNEL ON
MAY 10, 2019**

**ENDORSEMENT BY THE COMMANDER,
EIGHTH COAST GUARD DISTRICT**

After careful review, I approve the record and the report of investigation, including the findings of fact, analysis, conclusions, and recommendations. My comments and endorsements are noted below. I recommend this marine casualty investigation be closed.

COMMENTS ON THE REPORT

1. It is fortunate that no mariners were injured or lost as a result of the collision between the GENESIS RIVER and the VOYAGER's barges. The investigation, report and recommendations contain invaluable information which can be used to address the preventable chain of events that resulted in a catastrophic collision, and to prevent similar incidents from occurring in the future.
2. While a preventable chain of events contributed to this marine casualty, the most significant factor in this collision was human error. To begin with, the vessel's safety management system directed the use of the ship's ECIDS and ARPA to aid in navigating areas of high traffic density or navigational hazards, but the Pilot directed the crew to silence the alarms, and the Captain did not override that command. As a result, the equipment was secured, which eliminated an important navigation intervention. Additionally, at the time of the casualty the Pilot on the GENESIS RIVER chose to operate the vessel at full navigation speed, not holding any reserve speed to help with maneuvering. Lastly, available waterway survey information showed that the depth of water along the VOYAGER's path in the barge lane was shallower than the GENESIS RIVER's draft, yet neither the GENESIS RIVER's Pilot nor the VOYAGER's Mate used this data to assist with collision avoidance.
3. Coast Guard Vessel Traffic Services provide a safety net for vessels navigating our waterways. While there is no evidence to definitively suggest watch standers could have intervened in time to change the outcome of this incident, the Coast Guard is committed to providing vessel traffic services to the best of our abilities in order to prevent these types of collisions from occurring in the future. This report provides an important reminder to regularly evaluate whether any changes are necessary in critical areas, such as the Houston Ship Channel.

ENDORSEMENT ON RECOMMENDATIONS

Safety Recommendation 1: It is recommended the Sector Houston-Galveston Captain of the Port and VTS Director, consider establishing a working group with the Houston Pilot's Association and Lone Star Harbor Safety Committee to determine the value of implementing specific VTS measures in the Bayport Flare area, with a focus on vessel operational restrictions including, but not limited to, speed restrictions, adequate separation between vessels, and one-way traffic for vessels of a specific length, width, draft, and tonnage.

Endorsement: I concur with this recommendation. When any area sees a trend of vessel conflicts or accidents, it is important to seek out the input of port and waterway stakeholders, as they play a major role in the safety of the waterways. Before establishing a working group, I recommend the Captain of the Port and VTS Director request an analysis of incidents that have occurred in the Bayport Flare area from Commandant (CG-INV 2). A report may assist with identifying which vessel types could benefit from the specific VTS measures listed above to mitigate the risks when operating in the Bayport Flare area. This recommendation has been referred to the Captain of the Port, Sector Houston-Galveston, for review and action, as appropriate.

Safety Recommendation 2: It is recommended the Sector Houston-Galveston Captain of the Port and VTS Director analyze the precautionary areas listed in 33 CFR Table 161.35(b) to determine whether any currently listed areas should be removed to eliminate a redundancy to existing VTS authorities. Additionally, the VTS Director should consider establishing detailed operating procedures for watch-standers in areas of specific concern in lieu of blanket precautionary areas.

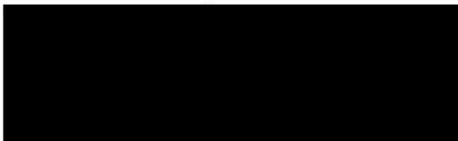
Endorsement: I partially concur with this recommendation. If a specific location, whether part of a precautionary zone or not, has an identified risk factor that could impact a vessel's ability to maneuver, or impact navigation safety, action by the VTS may be desirable as a risk mitigator. Detailed operating procedures for VTS watch-standers can help ensure they understand the actions and consistently apply them. In lieu of eliminating precautionary zones, specific VTS measures, such as those listed in Safety Recommendation 1, may best address the Bayport Flare area and any other location identified as benefitting from additional measures to improve navigation safety. The formation of the working group and any analysis done as part of Recommendation 1 may also inform potential operating procedures that may mitigate identified risk. This recommendation has been referred to the Captain of the Port, Sector Houston-Galveston, for review and action, as appropriate.

Administrative Recommendation 1: It is recommended the Sector Houston-Galveston Captain of the Port formally recognize the crew of the ITV PROVIDER for their post-casualty assistance to the crew of the ITV VOYAGER.

Endorsement: I concur with this recommendation. The crewmembers aboard the towing vessel PROVIDER demonstrated exceptional perseverance, courage and compassion during the response to this incident. As such, this recommendation has been referred to the Captain of the Port, Sector Houston-Galveston, for review and action, as appropriate.

Administrative Recommendation 2: It is recommended the Sector Houston-Galveston Captain of the Port initiate an investigation into the alleged offenses listed in 6.2 and take any necessary and appropriate enforcement actions.

Endorsement: I concur with this recommendation. This recommendation has been referred to the Captain of the Port, Sector Houston-Galveston, for review and action, as appropriate.



R.V. TIMME
Rear Admiral, U.S. Coast Guard
Commander, Eighth Coast Guard District

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**TANK VESSEL GENESIS RIVER (IMO 9791224) COLLISION WITH TOWING
VESSEL VOYAGER (O.N. 563475) IN THE HOUSTON SHIP CHANNEL ON
MAY 10, 2019**

EXECUTIVE SUMAMRY

On May 10, 2019, at approximately 1516 local time, the tankship GENESIS RIVER collided with the tank barges KIRBY 30015T and the MMI3041, pushed in an abreast configuration by the towing vessel VOYAGER, near the Houston Ship Channel (HSC) light No. 72, in Houston, Texas.

The GENESIS RIVER was down-bound in the HSC executing a maneuver to port after passing another deep draft vessel near the Bayport Flare when the vessel veered across the channel into the path of the up-bound towing vessel VOYAGER and its two barges. The VOYAGER's Mate turned to port at the direction of the GENESIS RIVER's Pilot to avoid the down-bound GENESIS RIVER while the GENESIS RIVER turned back to starboard, to right the swing of the ship and avoid exiting the channel. The maneuvers by both vessels were insufficient to avoid the collision and the GENESIS RIVER struck starboard amidships of the barge KIRBY 30015T.

The collision caused extensive structural damage to the starboard barge KIRBY 30015T and breached the #2 port and starboard wing tanks. As a result of the breached tanks, approximately 10,000 barrels of reformate was discharged into Galveston Bay, a navigable water of the United States. The port barge, MMI3041, capsized during the collision. The towing vessel VOYAGER did not sustain any structural damage from the collision, but its screws became entangled with parted face wires, shutting down the engines. The GENESIS RIVER sustained minor damage to the forward hold. The HSC was closed to traffic while the barges were salvaged, and cleanup of the discharge was initiated. The HSC was reopened three days later for traffic. KIRBY 30015T and MMI3041 suffered extensive damage, and both barges were considered a total loss.

The causal factors contributing to this incident were determined to be 1) the speed of the GENESIS RIVER, 2) the complacency of the VOYAGER's Mate, 3) GENESIS RIVER Pilot's lack of awareness of the GENESIS RIVER's maneuvering ability, 4) the VOYAGER Mate's and GENESIS RIVER Pilot's lack of awareness of the bottom conditions near Bayport Flare and their unwavering focus on a singular action.



16732
October 13, 2020

**TANK VESSEL GENESIS RIVER (IMO 9791224) COLLISION WITH TOWING
VESSEL VOYAGER (O.N. 563475) IN THE HOUSTON SHIP CHANNEL ON MAY 10,
2019**

INVESTIGATING OFFICER'S REPORT

1. Preliminary Statement

1.1. This investigation along with the submission of this report were conducted in accordance with Title 46, Code of Federal Regulations, Part 4, and under the authority of Title 46, United States Code, Chapter 63.

1.2. On May 10, 2019, Commander, Eighth Coast Guard District initiated this formal investigation which was joined by the National Transportation Safety Board (NTSB). The investigation panel consisted of Mr. [REDACTED] as the lead investigator (LIO) for the Coast Guard. He was assisted by Lieutenant Commander [REDACTED] as the Technical Advisor, Lieutenant Commander [REDACTED] as Legal Advisor, Lieutenant [REDACTED] as Assistant Investigator, and Lieutenant [REDACTED] as Recorder.

1.3. The LIO presided over a public hearing held on September 16, 2019 to September 20, 2019 at the Galveston County Courthouse in Galveston, Texas. During the public hearing, 11 witnesses were called.

1.4. First-class Pilot [REDACTED] (hereafter referred to as Pilot 1), First-class Pilot [REDACTED] (hereafter referred to as Pilot 2), two pilots aboard the BW OAK, and representatives of the following: K-Line Energy Ship Management Co, Ltd., Kirby Inland Marine, LP, LOC Group, Houston Port Authority, and Houston Pilot Association, were designated as parties-in-interest in this investigation in accordance with 46 CFR §4.03-10.

1.5. All times listed in this report are approximate and are in Central Standard Time using a 24-hour format. The Incident Investigation Activity Number for this investigation is 6682103.

2. Vessels Involved in the Incident



Figure 1. Stock photo of tank ship GENESIS RIVER underway. (Unknown Date/Source)

Vessel Name:	GENESIS RIVER
Vessel Identification Number:	IMO 9791224
Flag:	Panama
Vessel Class/Type/Sub-Type	Tank Vessel/Liquified Propane Gas Carrier
Build Year:	2018
Gross Tons:	46,794
Length:	754 feet
Beam/Width	122 feet
Draft/Depth	36.8 feet (with load at time of incident)
Main/Primary Propulsion: (Configuration/System Type, Ahead Horsepower)	Kawasaki MAN B&W 7S60ME-C8.2, Direct-drive diesel, 17,567 horsepower (13,100 kilowatts)
Owner	FPG Shipholding Panama 47 S.A. Paseo Del Mar and Pacific Avenues, Costa Del Este, MMG Tower, 23 rd floor Panama City, Republic of Panama
Operator	“K”-Line Energy Ship Management Co. LTD 1-1 Uchisaiwaicho 2-Chome, Chiyoda-Ku Tokyo, Japan



Figure 2. Stock photo of towing vessel VOYAGER underway. (Unknown Date/Source)

Vessel Name:	VOYAGER
Vessel Identification Number:	563475
Flag:	United States
Vessel Class/Type/Sub-Type	Towing Vessel
Build Year:	1975
Gross Tons:	155
Length:	68.9 feet
Beam/Width	26 feet
Draft/Depth	9.3 feet
Main/Primary Propulsion: (Configuration/System Type, Ahead Horsepower)	Cummins K38-M Tier 2 Diesel Engines; 1700 total HP
Owner	Kirby Inland Marine 55 Waugh Dr, Suite 1000 Houston, TX 77007
Operator	Kirby Inland Marine 55 Waugh Dr, Suite 1000 Houston, TX 77007

Vessel Name:	MMI 3041
Vessel Identification Number:	1145645
Flag:	United States
Vessel Class/Type/Sub-Type	Tank Barge
Build Year:	2003
Gross Tons:	1619
Length:	297.5 feet
Beam/Width	54 feet
Draft/Depth	10.0 feet (loaded draft)

Main/Primary Propulsion: (Configuration/System Type, Ahead Horsepower)	N/A
Owner	Kirby Inland Marine 55 Waugh Dr, Suite 1000 Houston, TX 77007
Operator	Kirby Inland Marine 55 Waugh Dr, Suite 1000 Houston, TX 77007

Vessel Name:	KIRBY 30015T
Vessel Identification Number:	1045801
Flag:	United States
Vessel Class/Type/Sub-Type	Tank Barge
Build Year:	1996
Gross Tons:	1619
Length:	297.5 feet
Beam/Width	54 feet
Draft/Depth	10.0 feet (loaded draft)
Main/Primary Propulsion: (Configuration/System Type, Ahead Horsepower)	N/A
Owner	Kirby Inland Marine 55 Waugh Dr, Suite 1000 Houston, TX 77007
Operator	Kirby Inland Marine 55 Waugh Dr, Suite 1000 Houston, TX 77007

3. Record of Deceased, Missing, and Injured

3.1. There were no deceased, missing, or injured persons as a result of this casualty.

4. Findings of Fact

4.1. The Incident:

4.1.1. On May 10, 2019, prior to getting underway, the GENESIS RIVER was loaded with liquefied propane gas with a displacement of 69,249 long tons (70,360 metric tons) and a 36.8-foot draft at the bow and stern. The GENESIS RIVER did not experience any propulsion, steering, or other mechanical issues during the transit down the HSC. On May 10, 2019, the GENESIS RIVER had a compliment of 14 officers and 14 crewmembers.

4.1.2. On May 10, 2019, the VOYAGER was pushing ahead two tank barges, the KIRBY 30015T (O.N. 1045801) and MMI3041 (O.N. 1145645). The VOYAGER had its regular compliment of a Master, Mate, and 02 deckhands.

4.1.3. On May 10, 2019, the barges were made up to the VOYAGER with towing wire in an abreast configuration. The barge KIRBY 30015T was fully loaded with 26,023 barrels of reformat, and the barge MMI304 was fully loaded with 25,392 barrels of reformat. Both barges had a draft of 10 feet.

4.1.4. On May 10, 2019, the GENESIS RIVER was scheduled to depart the Targa Resources Galena Park Terminal in Houston, Texas at 1200 for an outbound transit to sea. All pre-underway checks and steering system checks were conducted in accordance with 33 Code of Federal Regulations (CFR) 164.25 between 1045 and 1200. Houston Pilots were not on board during these tests.

4.1.5. At 1148 hours, Pilot 1 and Pilot 2 (Houston Pilots¹), boarded the GENESIS RIVER².

4.1.6. Upon boarding the vessel, the pilots were escorted to the ship's bridge. Pilot 1 reviewed a pilot card provided by the crew while Pilot 2 installed the portable pilot unit (PPU) which would be used by both pilots while at the conn³.

4.1.7. Pilot 2 instructed the bridge crew to silence all alarms on the vessel's Automatic Plotting Radar Aid (ARPA)⁴. He stated to the Captain of the vessel that due to the close proximity the GENESIS RIVER would have to inbound vessels, the closest point of approach (CPA) alarms would be incessant and cause unnecessary distraction. To silence the alarms, the GENESIS RIVER crew secured the vessel's electronic charting data information system (ECDIS) because they were unable to turn off the ARPA alarms independently. The GENESIS RIVER's Captain instructed the 4th Officer to monitor the vessel's position by visually spotting landmarks and aids to navigation, and to monitor the vessel's position on the pilot's laptop (PPU).

4.1.8. Pilot 1 and Pilot 2 claim they were unaware that silencing the alarms would require the radar and ECDIS to be placed on standby, thus not showing any information, and the GENESIS RIVER's Captain did not relay the information to the pilots.

4.1.9. The GENESIS RIVER's safety management system (SMS) required the ECDIS and ARPA to remain energized during transits near navigational hazards or high traffic density.

4.1.10. At 1220, after concluding pre-departure checks, the GENESIS RIVER got underway from the Targa Terminal with the assistance of two tugboats with Pilot 1 at the conn. The 4th Officer was the Officer of the Watch.

4.1.11. Pilot 1 instructed the helmsman to refrain from announcing when the helm or engine answered the given command from the conn to reduce unnecessary noise. At

¹ In accordance with the Houston Pilots Working Rules, Including Navigation Safety Guidelines for the Houston Ship Channel, two Pilots were required for the outbound transit of the GENESIS RIVER due to the breadth of the vessel.

² There was no seniority system between the Pilots. The Pilots acted independently of one another while at the conn of the vessel.

³ The Pilot card was a three-page document that provided dimensional, draft, and maneuvering data specific to the GENESIS RIVER for the Pilots to review prior to and during conning evolutions.

⁴ The decision to silence alarms is not a standard for all Houston-Galveston Pilot, but an individual decision made by each pilot.

1245, Pilot 2 departed the bridge to go to the pilot room directly aft of the bridge. At the same time, the 2nd Officer relieved the 4th Officer as the Officer of the Watch.

4.1.12. When the 2nd Officer questioned why the ECDIS and ARPA were secured, the Captain informed him of Pilot 1's request to silence the alarms and instructed him to monitor the vessel's position visually.

4.1.13. At 1300, the Chief Officer relieved the Captain as the Senior Officer on the bridge. The Captain indicated to the Chief Officer that he would return to the bridge at 1500.

4.1.14. Shortly after assuming the conn, Pilot 1 noted the vessel's sluggish response to rudder and engine commands. While conning the GENESIS RIVER north of Morgan's Point, Pilot 1 used varying combinations of engine speeds (between dead slow and half ahead) and rudder commands (between 20 and 30-degrees rudder) to maintain the appropriate course and speed.

4.1.15. At 1411 hours, the GENESIS RIVER met the 580-foot STOLT INSPIRATION port-to-port without incident. Pilot 1 later noted that each time he met another deep-draft vessel while conning the GENESIS RIVER, he could quicken the ship's rate of turn by increasing the engine speed thereby forcing more water over the rudder.

4.1.16. At 1440 hours, when the GENESIS RIVER was in the HSC near Morgan's Point, Pilot 2 returned to the bridge.

4.1.17. After taking time to listen to the bridge-bridge radio communications and observing Pilot 1 meet the inbound 600-foot tanker MARVEL port-to-port, Pilot 2 relieved the conn at 1444 hours.

4.1.18. Upon relieving the conn, Pilot 2 issued the order "steady." The helmsman repeated the command only once, which was consistent with the order previously given by Pilot 1 to refrain from announcing when the rudder or engine answered the command.

4.1.19. Near the same time, after Pilot 2 relieved the conn, Pilot 1 informed Pilot 2 that the GENESIS RIVER handled poorly. He also provided information to Pilot 2 about vessel traffic conditions that should be expected.

4.1.20. Pilot 1 remained on the bridge during which time the pilots discussed the handling characteristics of the GENESIS RIVER and similar vessels. During the conversation, Pilot 2 stated, "Yeah, I've sweated a couple of times not knowing if the vessel would check-up after meetin' a wide-body there."

4.1.21. At 1448 hours, the GENESIS RIVER cleared Morgan's Point and entered Galveston Bay on a straight section of the HSC of about 5 miles (8 kilometers) in length. Pilot 2 asked the bridge team if the ship had a 10-minute standby to which the engine could increase. The 2nd Officer replied in the affirmative and asked Pilot 2 if he would like to increase speed immediately. Pilot 2 answered, "Yes, that would be great." At that

time, the 2nd Officer increased the ship's engine to Nav. Full which is also referred to as sea speed. The ship's engine began a gradual increase from 60 revolutions per minute (rpm).

4.1.22. At 1450 hours, the GENESIS RIVER met the inbound 473-foot (144 meter) tanker CRIMSON RAY port-to-port without incident. At 1459 hours, the GENESIS RIVER met the inbound 440-foot (134 meter) tanker NORDIC AKI port-to-port without incident.

4.1.23. At 1500 hours, Pilot 1 departed the bridge and an ordinary seaman (OS), in training to qualify as a helmsman, requested and received permission from the 2nd Officer to relieve the helm under the supervision of an able seaman (AB).

4.1.24. Pilot 2 and the BW OAK Pilot anticipated that the meeting of their vessels would occur near the southern portion of the Bayport Flare⁵. The base course for the HSC immediately north of the Bayport Flare is 161.7° True (T) according to the National Oceanic and Atmospheric Administration (NOAA) Chart 11327.

4.1.25. As the GENESIS RIVER neared the Bayport Flare, the ship's engine reached a speed of approximately 72 rpm and the ship's speed over ground was approximately 12 knots.

4.1.26. At 1509:23 hours as Pilot 2 prepared to meet the BW OAK, he ordered the GENESIS RIVER's course 2° to starboard from 161° T to 163° T. At 1509:54 hours, Pilot 2 ordered a course of 165° T (2° to starboard), and the ship steadied on the course at 1510:12 hours. The helmsman used varying degrees of rudder between 25 degrees port and 25 degrees starboard to maintain course.

4.1.27. The pilot aboard the BW OAK altered course to starboard to meet the GENESIS RIVER. At 1511:12 hours, the GENESIS RIVER's heading was 166° T and the rudder was 19 degrees to port. Pilot 2 ordered a course of 164°T (1° to port from previous ordered course).

4.1.28. Between 1511:12 and 1511:22 hours, the GENESIS RIVER's helmsman first used 19 degrees of port rudder then 14 degrees of starboard rudder to maintain the ordered course.

4.1.29. Between 1511:29 and 1511:45 hours, Pilot 2 and the pilot aboard the BW OAK had a conversation over VHF-CH 13 about a house burning down in Houston while the vessels were passing just above the Bayport Flare. All pilot commands were appropriate to the circumstances. The helmsman's responses to the rudder commands were also appropriate. The GENESIS RIVER and the BW OAK passed without incident.

4.1.30. As the stern of the GENESIS RIVER cleared the stern of the BW OAK, Pilot 2 ordered starboard 20 degrees, followed by amidships and then hard starboard to bring the ship's head to the main channel.

⁵ Bayport Flare is located in the easternmost portion of the Bayport Channel and a portion of the Houston Ship Channel that extends from marker 75/76 northward to markers 77/78.

4.1.31. At 1512:51 hours, Pilot 2 contacted the towing vessel VOYAGER saying “That ship lookin; at you, tryin' to check this thing up. Keep an eye on me” as the GENESIS RIVER would not respond to the starboard rudder command.

4.1.32. Pilot 2 told the 2nd Officer to “(profanity) give me more rpms”, at which the 2nd Officer responded “yes,yes,yes”.

4.1.33. Pilot 2 radioed the VOYAGER again stating, “she's not checking up VOYAGER”. The VOYAGER’s Mate responded with “what do you need me to do Captain?” and Pilot 2 told the VOYAGER “go to the greens” (opposite side of the channel).

4.1.34. At 1513:27 hours, Pilot 2 asked the 2nd Officer to “gimme everything you got man”. The 2nd Officer responded, “yes sir – yes sir we are going to full”.

4.1.35. Pilot 2 told the 2nd Officer “get that other pilot up here – (profanity) – get that other pilot up here”.

4.1.36. At 1513:54 hours, Pilot 2 told the VOYAGER “you need to go straight to the greens – take a ninety to the greens cause I'm going to go your way again probably”.

4.1.37. The VOYAGER’s Mate responded he is heading to the greens and steered to the right descending bank of the Houston Ship Channel (green side). The VOYAGER's speed slowed by approximately 2 mph as the towing vessel attempted to turn towards the greens.

4.1.38. At 1514:02 hours, Pilot 2 ordered amidships rudder, and a second later orders hard port. The helmsman responds one second later “hard port”. Pilot 2 continues to make several rudder commands in an attempt to slow the port swing of the GENESIS RIVER.

4.1.39. Pilot 2 began yelling out “(profanity) that rudder's slow” and asking the 2nd Officer “have you got both (steering) pumps on?” to which the 2nd Officer responded, “yeah already”.

4.1.40. Pilot 2 called the VOYAGER saying “(profanity) man – go VOYAGER go – go go go” to which the VOYAGER’s Mate responded, “I'm hooked up – hard over there bubba (engine full and far rudder/everything I can give you)”.

4.1.41. The PROVIDER (tow ½ mile behind the VOYAGER) called the GENESIS RIVER. Pilot 2 told the PROVIDER “you need to keep an eye on me too man”.

4.1.42. At 1514:39 hours, Pilot 2 said “I don't think this is gonna work (here/either)” and ordered hard port rudder. The helmsman responded with hard port rudder, but the Pilot 2 again repeated “hard port – (profanity) hard to port”. The helmsman responded again with hard port.

4.1.43. Pilot 2 called VOYAGER to say “I’m gonna probably hit ya – uh – sound your general alarm there Voy – uh – just get everyone up”.

4.1.44. Pilot 2 ordered amidships rudder followed 1 second later with hard port rudder command. The helmsman responded appropriately to both rudder commands.

4.1.45. At 1515.10 hours, the PROVIDER called to ask if the GENESIS RIVER “lost steering or something”. Pilot 2 told the PROVIDER “no just keep an eye on me”.

4.1.46. Pilot 2 called the VOYAGER to “wake everybody up on that – uh – VOYAGER”.

4.1.47. Pilot 2 ordered amidships rudder to which the helmsman responded appropriately. The VOYAGER’s Mate responded to Pilot 2’s last radio transmission “you got it brother – we got ‘em, appreciate it”.

4.1.48. Pilot 2 later radioed the VOYAGER once more warning, “I’m gonna be swingin’ your way real soon – soon she’s comin’ your way – you (gotta/guys) push on it”. The VOYAGER’s Mate responded, “it’s all she got - it’s all she got”.

4.1.49. At 1515:23 hours, the 2nd Officer attempted to break in saying “go – go to the port – go to the port”. But Pilot 2 ordered amidships rudder, followed immediately by hard starboard rudder.

4.1.50. At 1515:29 hours, Pilot 2 radioed the VOYAGER “you got it hard over there VOYAGER you’re gonna have to uh – you’re gonna have to just – uh – work with me we’re gonna have – uh – we’re gonna collide – (profanity)”. The VOYAGER’s Mate responded “roger – roger roger”.

4.1.51. At 1515:33 hours, the 2nd Officer attempted to advise Pilot 2 saying “hard port sir hard port”.

4.1.52. At 1515:41 Pilot 2 ordered to stop engines, then about 3 seconds later ordered full astern but immediately followed with “just stop the engines” and then said “(this is/looking) bad”.

4.1.53. At 1516 hours, the tank ship GENESIS RIVER collided with the starboard side amidships of the barge KIRBY 30015T in the tow of the towing vessel VOYAGER. The collision caused a breach in the # 2 port and starboard cargo tanks of KIRBY 30015T, nearly splitting the barge in half.

4.1.54. The breach of the KIRBY 30015T’s #2 port and starboard cargo tanks caused 10,000 barrels (420,000 gallons) of reformat to be released into Galveston Bay, a navigable waterway of the United States. The collision also caused the barge MMI3041, breasted to the port side of the KIRBY 30015T, to suffer damage and capsized.

4.1.55. All members of the bridge team of the GENESIS RIVER, including Pilot 2, and the Mate of the ITV VOYAGER, were determined to be directly involved in a serious

marine casualty and were subjected to post casualty chemical testing in accordance with 46 CFR Subpart 4.06. All test results were [REDACTED] for both drugs and alcohol.

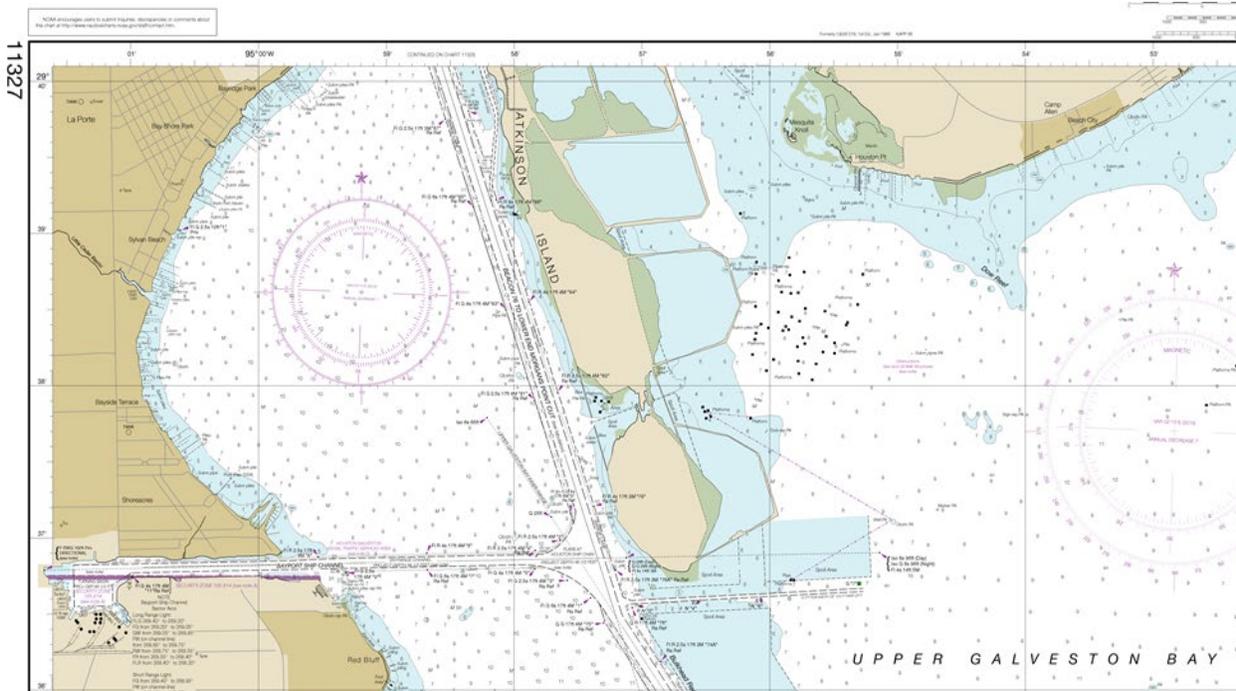


Figure 3. A section of Chart 11327-Houston Ship Channel. (Unknown Date/USACE)

4.2 Additional/Supporting Information:

4.2.1. The Houston Ship Channel is approximately 55 miles long from turning basin to the Galveston Sea Buoy.



Figure 4. USACE Bayport Channel depiction. (Unknown Date/USACE)

4.2.2. The Bayport Channel extends from the Bayport turning basin to the Houston Ship Channel. The easternmost portion of the Bayport Channel and a portion of the Houston Ship Channel that extends from marker 75/76 northward to markers 77/78, is known as the Bayport Flare.

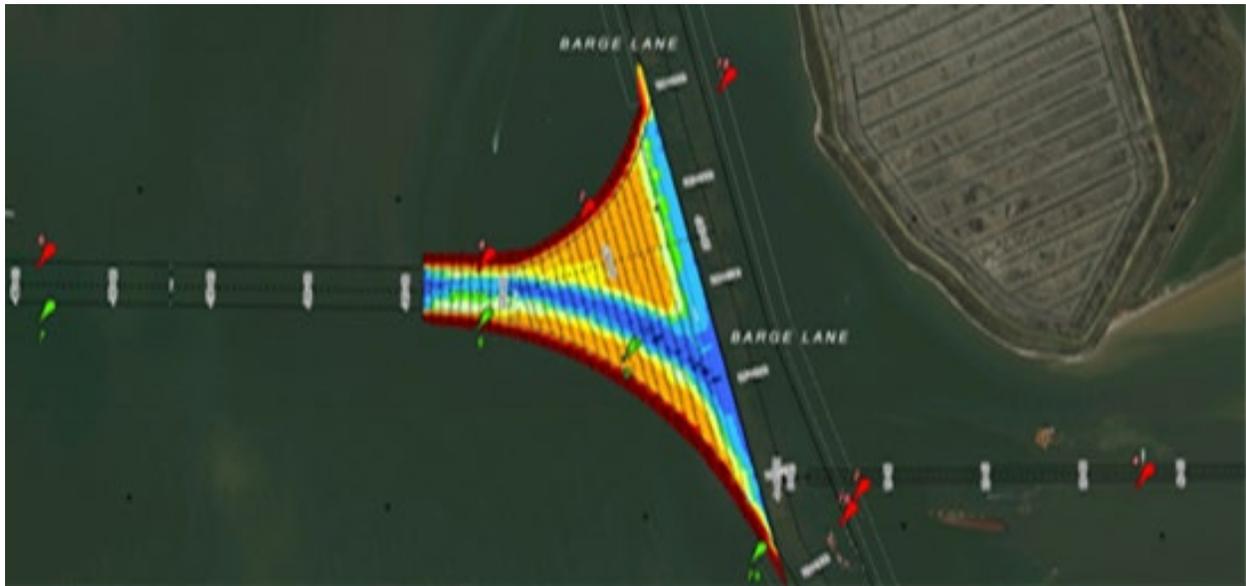


Figure 5. USACE Survey of Bayport Flare. (February 2020/USACE)

4.2.3. In 2018, U.S. Army Corps of Engineers (USACE) initiated a project to ease the slope of the flare to assist vessels entering Bayport Channel. The Bayport Flare was dredged in 2017 after Hurricane Harvey.

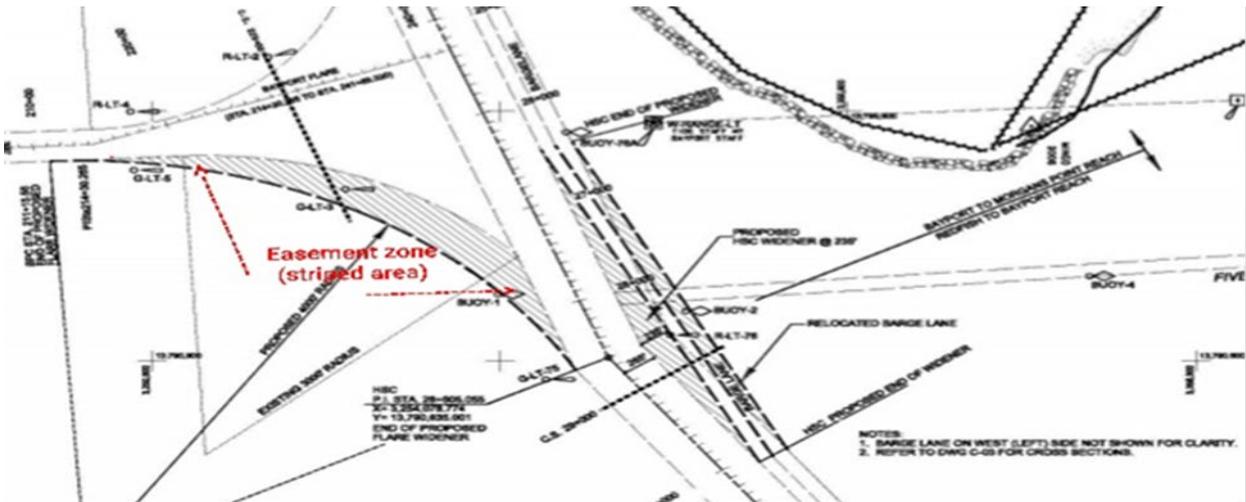


Figure 6. Diagrams of Bayport Channel easement. (Unknown Date/USACE)

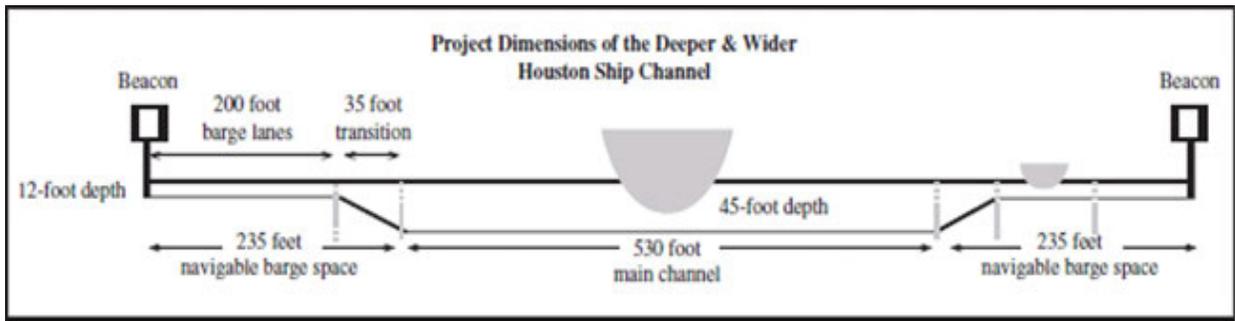


Figure 7. Houston Ship Channel cross section. (Unknown Date/USACE)

4.2.4. The Houston Ship Channel consists of a 530-foot main ship channel dredge to a depth of 45 feet. On either side of the channel, there is a 35-foot transition from a depth of 45 feet, sloping up and out to the barge lanes. Barge lanes extend out another 200 feet with a depth of 12 feet.

4.2.5. Surveys of the HSC were conducted in January 2019 (annotated by the red line in the *Figure 8*), and included the entire channel depth and the barge lanes. In April of 2019, an additional survey was conducted (annotated by the blue line in *Figure 8*), but did not include a survey of the barge lane. Dredging of the Bayport Flare was scheduled for November 2019.

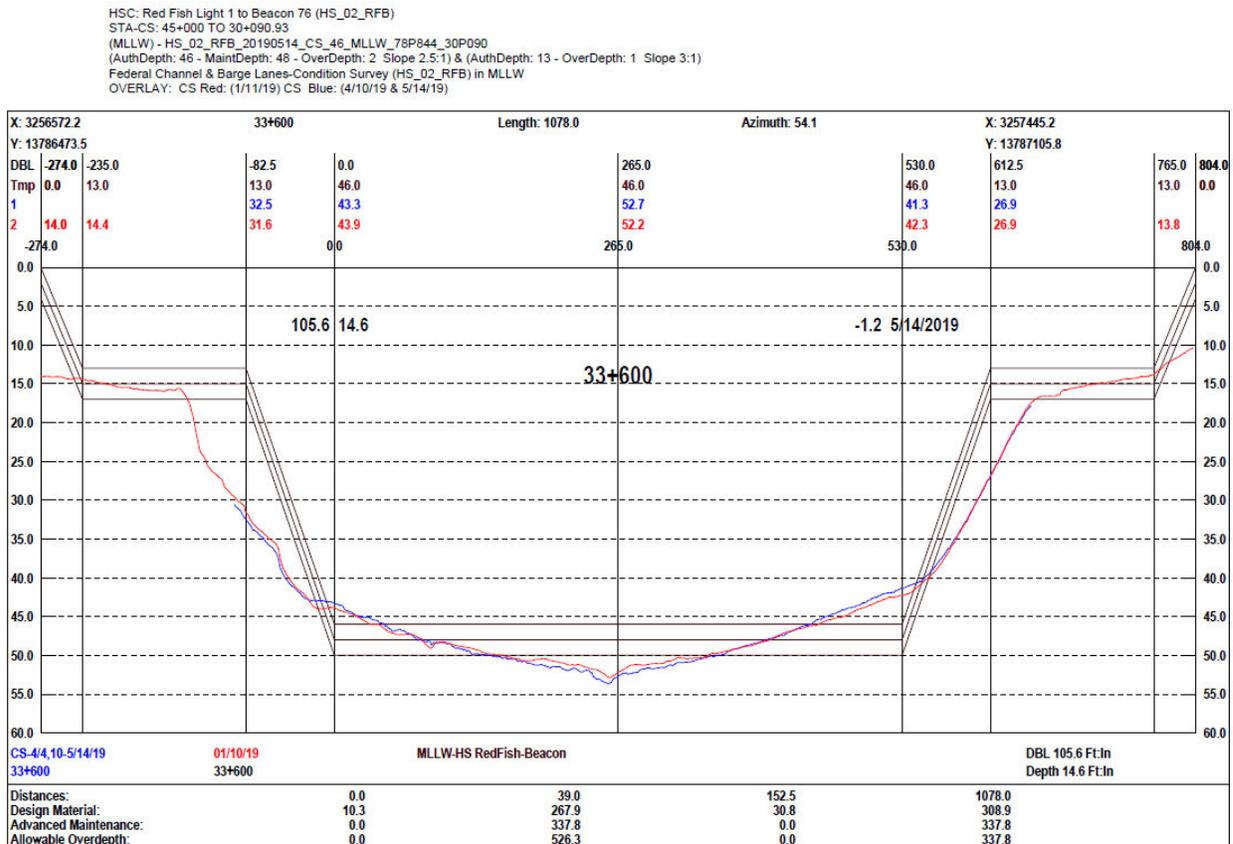


Figure 8. USACE Houston Ship Channel survey results. Cross section 33+600 correlates to Light No. 74. The left side of the diagram is the “green buoy” side of the channel. The GENESIS RIVER was travelling outbound on the “green” side of the channel. The right side of the diagram is the “red” side of the channel. The VOYAGER was travelling inbound on the “red” side of the channel.

4.2.5.1. The January 2019 survey showed that near HSC MM 18.8, at Light No. 74, the outside half of the barge lane on the “green” side of the channel was 14.4 feet deep and the outside half of the barge lane on the “red” side was 13.8 feet deep. This area was not surveyed after the incident occurred.

4.2.5.2. The survey in April 2019, just prior to the incident, showed the main channel depth to be 52.2 feet. The 35 foot transition from the main channel up to the barge lane showed 42.3 feet at the toe of the slope, up to 26.9 feet at the inside edge of the 200 foot wide barge lane. A survey was completed after the incident and these numbers were not significantly different.

4.2.6. The Vessel Traffic Service (VTS) Houston-Galveston is a U.S. Coast Guard facility that provides mariners with information to safely navigate the waterway. VTS regulations and responsibilities are outlined in 33 Code of Federal Regulations (CFR) Part 161.

4.2.7. Regulations in 33 CFR 161 state that a VTS may issue directions to control the movement of vessels in order to minimize the risk of collision between vessels, or damage to property or the environment. No direction of vessel movement was issued to either vessel prior to the collision, but the vessels were given routine vessel movement and traffic information prior to the vessels’ transit.

4.2.7.1. While authority exists for the VTS to direct vessel movements to avoid collision, the VTS Houston-Galveston Director said he “would not have the situational awareness to direct movement of vessels with density patterns of multiple vessels with differing speeds, thus taking a “hands off” approach to allow mariners to work the situation out between themselves.”⁶

4.2.8. VTS Houston-Galveston is responsible for fourteen precautionary areas throughout their zone, as listed in table (b) of 33CFR161.35. This includes the Bayport Channel and Redfish Bar areas.

4.2.9. A precautionary area is defined as a routing measure comprising an area within defined limits where vessels must navigate with particular caution and within which the direction of traffic may be recommended.

4.2.10. VTS Houston-Galveston did not have specific measures to control the direction, speed, or passage of any vessels in the Bayport Channel precautionary area, to include the Bayport Flare, at the time of the incident.

5. **Analysis and Opinions**

5.1. *Failure to Follow Company SMS.* Upon arrival aboard the GENESIS RIVER, Pilot 2 directed the Captain to secure all alarms on the vessel’s ARPA, stating that it is an unnecessary irritant. The Captain acquiesced to Pilot 1 and ordered the alarms silenced, then ordered the 2nd Officer to keep the position of the vessel through visual means and observation of the Pilot’s Raven display (PPU). The only way to secure the vessel’s

⁶ [REDACTED] Tr. Pg. 13 lines 14-23; pg. 14 lines 1-21

navigation alarms (ARPA/ECDIS) was to place the radar on standby. This was directly contradictory to the K-Line Safety Management System requirements that the alarms remain on at all times. Had the Captain explained the company policy and the ramifications of silencing the alarms, Pilot 2 may have reconsidered his request. If Pilot 2 had both the ARPA and the ECDIS at his disposal when making decisions for how to avoid the collision, he may have taken a different course of action and the collision may not have occurred.

5.2. Failure to Maintain Safe Speed. During the hearing, there was extensive discussion about whether the GENESIS RIVER was travelling at safe speed. Both pilots felt that the speed of the GENESIS RIVER was not unsafe and pointed out that the vessel had better maneuverability with more water over the smaller rudders on the vessel. The Captain of the GENESIS RIVER did not contradict the pilots, stating that he did not feel the speed was unsafe. The Captain later clarified his statement, saying “nearing banks or wherever there is a turn which is a steep turn” the vessel should proceed at “slow speed”. When asked at what speed this would be, the Captain responded “half ahead⁷.” Early maneuvering efforts by Pilot 1 do not agree with the sentiments stated by the pilots. In fact, the actions of Pilot 1 indicate that it is prudent to use a speed that is below full navigation to assist in turning the vessel. Pilot 1 used varying speeds and rudder angles to transit the upper portion of the HSC. While Pilot 1 used slower speeds in the upper HSC due to bends in the channel and terminals along the shoreline, he was able to increase speed temporarily to full, below Lynchburg, TX, until they approached the barge terminal. Then he reduced speed while passing the terminal. Later, the GENESIS RIVER met the STOLTZ INSPIRATION at 1411 and Pilot 1 acknowledged he used hard starboard which was not sufficient, and had to use an “engine kick” to bring the GENESIS RIVER back around⁸. Pilot 1, while passing the 600-foot-long inbound tanker MARVEL, used the engine kick once more to stop the turn of the GENESIS RIVER. At the time, Pilot 2 was in the pilothouse, observing and preparing to relieve Pilot 1. Both incidents are clearly indicative of the value of having reserve speed to assist the GENESIS RIVER’s rudders in controlling the swing of the vessel. If Pilot 2 had the ability to use an engine kick after passing the BW OAK, this incident may have been avoided.

Pilot 2 was on the bridge to observe at least one maneuver on the GENESIS RIVER and stated that he “sweated a couple times not knowing they were going to check-up after meeting a wide-body there” and continued to have a 5 minute conversation with Pilot 1 on the issues with these types of vessels⁹. Pilot 2 perceived problems associated with the small rudders common to Japanese built vessels, and Pilot 1 told him that the ship was “handling poorly”. As such, Pilot 2’s decision to increase the vessel speed to “nav full” without holding reserve engine rpms is contra-indicated. Both pilots felt, whether substantiated or not, the vessel handled poorly, and knew that the vessel was assisted in at least two situations with the help of an engine kick. Pilot 2 was aware that he was meeting another up bound vessel on his transit and experienced a tense situation with previous vessels of the same parameters. When he finalized the passing arrangement, he knew that there would be a continual turn to port to steady on the channel below Bayport cut. By maintaining the full navigation speed of the GENESIS RIVER, Pilot 2 eliminated a source of control that additional RPMs would have provided. The speed of the GENESIS RIVER is therefore considered unsafe and excessive for the conditions, in violation of 33 CFR 83.06 Safe Speed

⁷ [REDACTED] Tr. pg. 38, lines 3-13

⁸ [REDACTED] Tr. pg. 4, lines 14-17

⁹ VDR Tr. @ 1050:58.9 – 1955:53

(Rule 6, Inland Navigation Rules). The rule states that a vessel shall at all times proceed at a safe speed so that she can take proper and effective action to avoid collision and be stopped within in a distance appropriate to the prevailing circumstances and conditions, something the GENESIS RIVER was unable to do. Violation of the Safe Speed rule triggers the Pennsylvania Rule¹⁰, in which Pilot 2 would have to prove that his violation of Rule 6 did not contribute to the casualty. The panel's opinion is the violation of the rule did in fact contribute to the casualty as discussed throughout this section.

To determine the forces acting on the vessel at the speed indicated, the U.S. Coast Guard commissioned an independent hydrodynamics and path stability study to be conducted by Dr. [REDACTED], Professor of the Ocean Engineering department at Texas A&M University. The study was commissioned to determine whether the channel environment, the physical attributes of the ship, including speed and rudder control, and the actions of Pilot 2 relative to the forces affecting his transit, were potentially contributory to the collision. While this incident report will not conduct a point by point examination of Dr. [REDACTED] study, the study is included as an exhibit.

One observation of the study was that a “prudent ship handler will navigate in close quarters at the slowest safe speed. Then, if required to increase speed he will gain control, rather than risk losing it if required to slow down.”¹¹ Pilot 1 proved this observation in the way he handled the GENESIS RIVER during his portion of the transit. Pilot 2, having reached a straight-away in the channel, increased to sea speed. When approaching the agreed upon passing with the BW OAK, just prior to the bend in the HSC, Pilot 2 did not consider himself to be in a tight quarters situation and maintained his high speed. By travelling at sea speed when meeting the BW OAK, Pilot 2 eliminated the ability to increase his speed to safely maneuver past the vessel and continue the transit down the lower channel. In effect, Pilot 2 was not travelling at a safe speed for the conditions he faced.

The study concluded that the vessel, including the steering system and rudders, operated as designed and performed satisfactorily within design parameters. The study also concluded that the GENESIS RIVER's speed was too fast for the sequence of events the vessel encountered. The GENESIS RIVER passed the bow of the BW OAK, cleared the stern, dropped into the void created, and simultaneously exited the Bayport Flare while having to turn to port due to the bend in the channel. This sequence of events did not allow enough time for the GENESIS RIVER to respond accordingly in the distance remaining to the opposite side (red) side of the channel. The narrowness of the channel, combined with the sequence of events faced by Pilot 2 due to the speed of the GENESIS RIVER, contributed greatly to the casualty¹².

5.3. Ineffective Communication. During the hearing, Pilot 2's relationship with the helmsman, bridge crew, the GENESIS RIVER's Captain, and the Mate of the towing vessel VOYAGER was discussed. The pilots requested that all alarms be silenced because they were a distraction while operating in close quarters or in high traffic density areas. The pilots

¹⁰ The Pennsylvania Rule signifies a maritime rule set forth by the U.S. Supreme Court in 1874. According to the Rule, if a ship is in violation of any applicable statute at the time of an injury or collision, such violation is deemed to be a contributory cause to the injury or collision.

¹¹ [REDACTED] Pg. 5-6

¹² [REDACTED] Pg. 20-2

were not aware that it would require placing the radar and ECDIS on standby¹³. This secured the ECDIS displays, removing a primary navigation tool that would have been used by the 2nd Mate to identify any issues regarding vessel position, closest point of approach, contacts, etc. and alert the pilots. The pilots stated that they rely more on their PPUs and visuals to determine their position but had expected the ECDIS display to be on, contrary to the interview testimony of the 2nd Officer who stated repeatedly that Pilot 2 was aware the displays were off. The Captain of the vessel also did not explain that securing the alarms meant placing the units on standby, violating K-Line safety management policy requiring the navigation displays to be on. The lack of communication, especially between Pilot 2 and the crew, is highlighted as the incident began to unfold.

Pilot 2 stated that he was unaware that the OS took over the helm. However, the OS was under the constant supervision of the AB and had two years of experience steering vessels. Pilot 2 did not have any issues with the helmsman's steering or response as the GENESIS RIVER approached and passed the BW OAK. The only indication Pilot 2 gave that he had issues with the helm responses was long after the accident occurred when he stated the helmsman was completing each command prior to executing the next command. Pilot 2 was giving rapid-fire steering commands to the helm during this time and Pilot 2 believed that the helmsman was "cycling" the rudder, (i.e. allowing the rudder to complete the last command before going to the next rudder command). A review of the vessel data recorder logs does not support Pilot 2's belief.

Additional issues arose with Pilot 2's relationship with the crew. Pilot 1 stated that he has been countermanded by a captain of a ship he's piloted; and Pilot 2 testified that during his position as Chief Officer in pilotage waters he had no problem countermanding a pilot but never had the opportunity or need¹⁴. However, the scenario put forth by Pilot 1 of being countermanded showed that he believed his position and his orders are supreme over a ship's crew¹⁵. Similarly, Pilot 2 emphatically stated that crew input is desired and sometimes expected during a transit or in an emergency situation. In this incident, the 2nd Officer suggested twice to Pilot 2 to "go – go to port" and the second time "hard port sir hard port" when it appeared that the Pilot 2's actions were not going to be successful. Both times, Pilot 2 either did not hear or ignored the 2nd Officer. After the first time the 2nd Officer suggested to go to hard port, Pilot 2 directed rudder amidships and then hard starboard. Up to then, Pilot 2's varied rudder commands were consistent with his attempt to maintain an impossible course still directed at going astern of the VOYAGER. After the turn to hard starboard, Pilot 2 had resigned to the prospect of an imminent collision and ordered all stop, full astern, then all stop again¹⁶.

The investigation panel attempted to explore the idea of high powered and low powered distance cultures¹⁷ during Pilot 2's testimony, but Pilot 2 was not aware of the significance of the question.¹⁸ This perceived positional hierarchy was also explored with Captain [REDACTED] of the Seaman's Church Institute concerning the first-class pilot/towboat mate

¹³ [REDACTED] Tr. pg. 14, lines 18-20

¹⁴ [REDACTED] Tr. pg. 9, lines 1-11

¹⁵ [REDACTED] Tr. pg. 9, lines 1-15

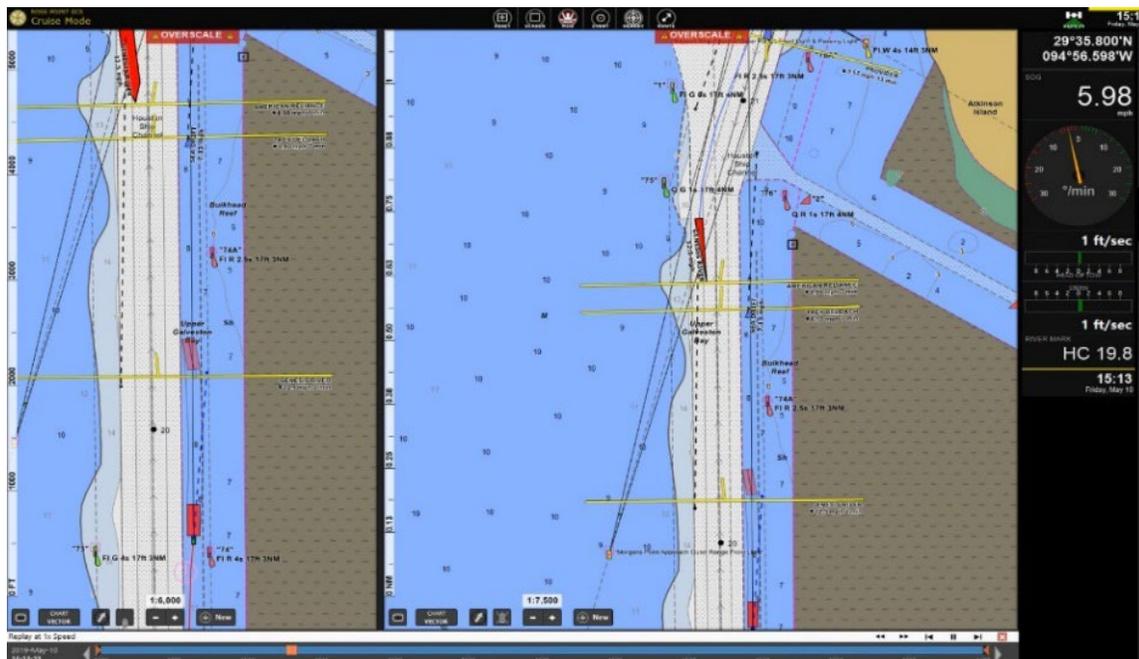
¹⁶ VDR Tr @ 2015:25.5 – 201:1546.6

¹⁷ Significant dimension in cross-cultural environments that unconsciously influences people's behavior and contributes to so-called "cultural norms", which are shaped by perceptions and acceptance of power inequality to a certain degree.

¹⁸ [REDACTED] Tr. pg. 6, lines 6-22

relationship in what he called a “challenge scenario.”¹⁹ In both relationships, the idea of positional authority superseded any perception of equality in the relationship, which affected the behavior of both Pilot 2 and the VOYAGER’s Mate. When the 2nd Officer believed that Pilot 2 had lost awareness of the situation and his voice indicated panic, the 2nd Officer attempted to assist, but Pilot 2 was not responsive to any suggestions in his single-minded focus to do what he, with his experience, thought was right. Pilot 2 never considered any other option but to go behind the VOYAGER, even when the 2nd Officer suggested an option that would most likely have resulted in grounding the ship but could have avoided a collision. Likewise, the VOYAGER’s Mate, when directed by Pilot 2 to “go to the greens”, immediately did so without question. The VOYAGER’s Mate stated that he had reduced his engines to clutch to review his options after the radio contact with Pilot 2, and that when Pilot 2 came back and told him to “go to the greens”, the direction only confirmed what he had decided.

There is no indication in VOYAGER’s Rose Point data to suggest any slowing of speed. The first major change of speed came when after directed by Pilot 2, the VOYAGER turned to port. There was no other suggestion that the VOYAGER’s Mate considered any other option. There wasn’t any slowdown of the vessel, any contact with the PROVIDER behind the VOYAGER, no alarm to the crew, nothing to show any options beyond what later, was directed by Pilot 2. This action reduced the tow’s speed from approximately 6 mph to 4 mph. The VOYAGER’s Mate also stated that it would take two tow lengths for the VOYAGER to come to a crash stop.²⁰ But when the GENESIS RIVER was swinging starboard, the VOYAGER did not make any attempts to avoid collision at this juncture but continued to maintain speed, as per the last direction of Pilot 2 to “go VOYAGER go. Go go



go”. The VOYAGER’s Mate abdicated control of his situation to Pilot 2.

Figure 9. VOYAGER Rose Point screenshot just prior to making a turn for the green side. Note the lack of reduction in speed. GENESIS RIVER was continually swinging to the red side. VOYAGER speed will reduce by 1/3 as the tow turns to port. Distance between vessels is a little over ½ mile.

¹⁹ [REDACTED] Tr. pg. 23, lines 13-23; pg. 24 lines 1-7

²⁰ [REDACTED] Tr. pg. 24, lines 6-7

The perception of positional hierarchy contributed to Pilot 2’s belief that his action was the only proper action, narrowing his focus to one action without consideration to other possibilities or suggestions. It also contributed to the reaction of the VOYAGER’s Mate to relinquish his role as a properly credentialed mate, and act as more of a helmsman responding to commands, rather than explore other options.

5.4 *Lack of Situational Awareness*

5.4.1. *Awareness of Channel Conditions.* The Bayport Flare area was last dredged in 2017 after increased shoaling caused by Hurricane Harvey. However, the opening to the Bayport Flare was modified in 2018 to ease the transition of the entrance to the Bayport Channel so that vessels entering the channel would not be subject to severe turns. The last surveys of the area were conducted in April 2019 and a contract was initiated to conduct dredging of the area in November 2019.²¹

During testimony, the USACE representative clearly stated that while the Bayport Flare shoals more frequently than other areas, it was not out of the norm, and is more prevalent in the “toes” or base of the channel transition to shallower depth. USACE channel scans are uploaded to the USACE website and available for download.²²

Pilot 2 stated that he was unaware of any shoaling in the lower Bayport bend area prior to and during the transit until after the accident, and Pilot 2 was never aware or saw the USACE website where the surveys were uploaded.^{23 24} He expected the vessel to respond to a 45-foot channel depth, but the channel in that location was 3-4 foot less. This was likely the result of shoaling. This shoaling had the potential to increase the likelihood of an increased bank cushion or cause a shallow grounding of the bow. There is no solid evidence the vessel grounded, but the vessel’s bow did suddenly shift to port as it transited this area and prevented Pilot 2 from steering hard starboard to bring the ships head to the main channel. Had Pilot 2 used the available surveys of areas he would be transiting, he may have been more aware of any issues that may impact his ability to navigate the GENESIS RIVER after passing the Bayport Flare. Additionally, he would have known the depth of the transition slope up to the barge lanes the VOYAGER was travelling in. Using this information, he may have recognized the likelihood of an impact within the barge lane was very unlikely and instead, requested the VOYAGER stay as far starboard in the barge lane as possible.

The VOYAGER’s Mate explained that the outside edge of the barge lane was rumored to have an old bulkhead running the length but did not verify if this obstruction was actually annotated on any chart. He admitted that this affected his decision to cross the channel instead of steering starboard to get to the further outer edge of the barge lane. He stated he was aware that the GENESIS RIVER’s draft was deeper than the depth of water he was in, but he and the Pilot onboard the GENESIS RIVER thought there would

21 [REDACTED] Tr. pg. 7, lines 1-12

22 [REDACTED] Tr. pg. 11

23 [REDACTED] Tr pg. 66, line 23 and pg. 67 lines 1-12

24 [REDACTED] Tr Pg. 60, lines 3-17

still be a collision.²⁵ Had the Mate recognized that the depth of the GENESIS RIVER, the depth on the transition slope of the channel, and the depth in the barge lane made it almost impossible for the vessels to collide within the barge lanes, he may have stayed in the barge lane, and this incident may not have occurred.

5.4.2. *Vessel Familiarity*. One of the continuing themes discussed by Pilot 2 and his representative was the idea of a slow rudder and slow helm response. As discussed in other portions of this report, it does not appear that either was an issue during the passing of the BW OAK or the rapid-fire commands given by Pilot 2. While the OS helmsman was in break-in status during his time on the helm, there was always a qualified AB standing by, and the OS had 3 years of experience training as a helmsman both on the GENESIS RIVER and his prior ship.²⁶

The second theme throughout Pilot 2's discussion at the hearing was the complaint of rudder size. While Pilot 2's perception was negative, conversations between the pilots show that they were both aware of the issues and options necessary to offset or correct any perceived problems. Additionally, Dr. [REDACTED] study indicated that the rudders were, and operated within design parameters. The same applied to Pilot 2's perception that the rudders were slow. Pilot 2's perception of the lack of rudder speed was highlighted by his immediate circumstances and panicked responses.

Lastly, Pilot 2 had an expectation that he would have additional engine speed should an emergency arise. Prior to the collision, Pilot 2 ordered additional RPMs which were relayed to the engine room by the 2nd Officer. It is unknown if the order was completed prior to the collision. It is also not known if the ship was capable of producing additional RPMs, or was able to produce it in the remaining time available. A pilot having the knowledge and expectation of additional engine rpms in an emergency is both beneficial and problematic. As shown in Dr. [REDACTED] study, vessels rely on water over the rudder for steering purposes. When the speed is maximum, the steering ability is also maximum with no margin for error. Prudent mariners understand and reserve engine rpms to assist in effective steering prior to emergency situations as did Pilot 1 in the upper channel. Pilot 2 did not reserve any engine rpms and could not get out of an emergency situation when it was needed to assist in steering the vessel. Relying solely on emergency procedures should not be the norm in any transit of a congested/semi-congested waterway.

5.5. *Vessel Traffic Service*. The Vessel Traffic Service is a U. S. Coast Guard service to mariners with the responsibility of providing safety information to mariners. The VTS has the authority to direct the movement of vessels as necessary to reduce the risk of collisions, damage to vessels, and protect lives and the environment. Testimony by the VTS Director show that he was well aware of VTS responsibility in his area of operations.

The VTS Director's testimony also clearly show that he is not in favor of precautionary zones and believes it is an antiquated holdover from previous years that is unnecessary, and potentially a distraction with the authorities already granted in VTS regulations, 33 CFR

²⁵ [REDACTED] interview Tr. pg. 42, lines 14-16; pg.63, lines 2-16; pg. 77, lines 1-11

²⁶ [REDACTED] interview Tr. pg. 12, lines 24-25; pg. 13, lines 1-6

161.11.²⁷ Moreover, he posited that the whole of the Houston Ship Channel is in effect a precautionary area. With that, his expectation is that all mariners would use the proper caution while transiting and VTS provides monitoring, guidance, and assistance as needed. He gave examples of when VTS would “direct” vessels, but they were mostly used in areas of high traffic congestion. Even so he admitted he would not have the situational awareness to direct movement of vessels with density patterns of multiple vessels with differing speeds, thus taking a “hands off” approach to allow mariners to work the situation out between themselves.²⁸ This position also extends to the Bayport Flare and precautionary area, with no directing or controlling of vessel movement, specifically wide-body, deep draft vessels. The only times control of the waterway was exercised was during dredging operations.

When the investigation team proposed that the VTS Director potentially create a regulated navigation area for Bayport Flare, he stated he was not in favor because he did not see any verbiage that it would add any value to the authorities he already possesses. However, prior collisions at or near this area, and the particular problems presented by the opening of the flare to the west, increased shoaling frequency around the flare entrance, turn of the HSC, and the inherent problems associated with two wide-body vessels passing in a narrow channel, indicate a need to consider establishing some vessel movement control.

Dr [REDACTED] evaluation is clear that excessive speed was a contributing factor. It is also clear that VTS maintains a hands-off posture to deep draft vessels transiting the Bayport Flare area unless there is a specific reason to initiate any control of vessel movement, including speed of the vessels, and rely on the pilots to determine their actions. While generally pilots do have a clearer knowledge of the conditions, as evidenced by the pilot’s discussions of increasing vessel distances and recovery distances,²⁹ this, and previous incidents demonstrate that it may not be the most prudent posture and other controls may be necessary.

5.6 *Other Involved Vessels.* There is no evidence that any actions by the pilots or crewmembers aboard the BW OAK or towing vessel PROVIDER contributed to the casualty.

6. Conclusions

6.1. Cause of the Casualty

6.1.1. The initiating event for this casualty occurred when the GENESIS RIVER passed the BW OAK, and Pilot 2 aboard the GENESIS RIVER attempted to maneuver to align his course down the lower HSC. Pilot 2, was unable to control the turn to port and the vessel continued to head to the red side of the channel where the towing vessel VOYAGER was upbound in the barge lane of the channel. The actions and conditions contributing to Pilot 2’s inability to correct course were:

- a) two wide-body vessels passing in a narrow channel;
- b) speed of the GENESIS RIVER as it approached and passed the BW OAK;
- c) Pilot 2’s lack of awareness of shoaling in the lower end of Bayport Flare; and

²⁷ [REDACTED] Tr. pg. 5, line 20-pg. 7, line 14

²⁸ [REDACTED] Tr. pg. 13 lines 14-23; pg. 14 lines 1-21

²⁹ VDR Tr. pg. 19. @ 1853:15.8

d) lack of communication between Pilot 2 and the bridge crew.

6.1.2. Despite the Pilot 2's efforts to control the GENESIS RIVER and steer behind the VOYAGER, the GENESIS RIVER ultimately collided with the starboard side of the KIRBY BARGE 30015T. The causal factors contributing to the collision were:

- a) Pilot 2's single-minded focus on only one option of going astern of the VOYAGER vice exploring all options;
- b) Pilot 2's loss of situational awareness, believing the helmsman wasn't responding properly and that the speed of rudder movement was slow;
- c) Pilot 2's direction to the VOYAGER's Mate to go to the opposite channel for a starboard to starboard passing;
- d) the VOYAGER mate's abdication of control of the situation and his actions to follow the orders from Pilot 2;
- e) the VOYAGER mate's failure to communicate with the vessel PROVIDER so a crash stop of the VOYAGER could have been attempted to avoid collision;
- f) the VOYAGER's Mate's failure to consider all options including bringing the vessel to all stop or conducting a crash stop.

6.2. Violations of Law by Credentialed Mariners

6.2.1. The actions described in paragraph 6.1.1 and 6.1.2 above represent potential acts of negligence by Pilot 2 while aboard the GENESIS RIVER.

6.2.2. The actions described in paragraph 6.1.2 above represent a potential act of negligence by the credentialed mariner (Mate) on watch aboard the VOYAGER.

6.3. Violations by Members of the Coast Guard - There were no violations by any members of the Coast Guard.

6.4. Violations Subjecting Parties to a Civil Penalty - There were no violations subjecting any parties to civil penalties.

6.5. Violations of Criminal Law -There were no violations of criminal law.

6.6. Need for New or Amended Laws/Regulations - See section 8.1 Safety Recommendations

7. **Actions Taken Since the Incident**

7.1. The Lone Star Harbor Safety Committee directed all pilots to avoid meeting or passing other wide body vessels while transiting the Bayport Flare.

7.2. The Houston Pilots Board issued a letter of caution to Pilot 2 for his actions during the transit of the Houston Ship Channel, which contributed to the collision.

8. Recommendations

8.1. Safety Recommendations

8.1.1. It is recommended the Sector Houston-Galveston Captain of the Port and VTS Director, consider establishing a working group with the Houston Pilot's Association and Lone Star Harbor Safety Committee to determine to value of implementing specific VTS measures in the Bayport Flare area, with a focus on vessel operational restrictions including, but not limited to, speed restrictions, adequate separation between vessels, and one-way traffic for vessels of a specific length, width, draft, and tonnage.

8.1.2. It is recommended the Sector Houston-Galveston Captain of the Port and VTS Director analyze the precautionary areas listed in 33 CFR Table 161.35(b) to determine whether any currently listed areas should be removed to eliminate a redundancy to existing VTS authorities. Additionally, the VTS Director should consider establishing detailed operating procedures for watch-standers in areas of specific concern in lieu of blanket precautionary areas.

8.2. Administrative Recommendations

8.2.1. It is recommended the Sector Houston-Galveston Captain of the Port formally recognize the crew of the ITV PROVIDER for their post-casualty assistance to the crew of the ITV VOYAGER.

8.2.2. It is recommended the Sector Houston-Galveston Captain of the Port initiate an investigation into the alleged offenses listed in 6.2 and take any necessary and appropriate enforcement actions.



GS13, U.S. Coast Guard
Lead Investigating Officer