

U.S. Department of
Homeland Security

United States
Coast Guard



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16732

APR 28 2005

**FORMAL INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE
ALLISION BETWEEN THE BARGE TOW OF THE M/V BROWN WATER V AND
THE QUEEN ISABELLA CAUSEWAY BRIDGE ON SEPTEMBER 15, 2001, IN PORT
ISABEL, TEXAS, RESULTING IN MULTIPLE LOSS OF LIFE**

ACTION BY THE COMMANDANT

The record and the report of the Formal Investigation convened to investigate the subject casualty have been reviewed. The record and the report, including the findings of fact, analysis, conclusions, and recommendations are approved subject to the following comments.

COMMENT ON ANALYSIS

Pages 23-24: The current was a factor in this casualty but not a contributing cause. Although an exact current speed was not available for the time of the casualty, it was "running hard." Scientific evidence indicates that the current speed had equaled or surpassed that of the morning of September 15 on three occasions in the previous six months. Mariners on the witness stand testified to the methods they used to gauge the tide and current in the "S" curve prior to entering the bend before the Queen Isabella Causeway Bridge. The current was foreseeable by a prudent mariner, and the casualty was not inevitable. "An accident is said to be "inevitable" not merely when caused by...(an)...Act of God, but also when all precautions reasonably to be required have been taken, and the accident has occurred notwithstanding." Decision of the Vice Commandant on Appeal, United States Coast Guard, 2217, Michael Hugh Quinn.

Comment: We disagree with the investigator's statement that the current was not a contributing cause. A contributing cause is a condition, action, or event that, when present, increases the likelihood of an accident, but that by itself does not cause the accident. Witness statements and evidence cited in sections 13 through 16 of the Findings of Fact consistently identify the currents at the approach to the causeway as a condition that persons operating towing vessels need to be aware of and account for properly. In addition, the final paragraph of the analysis concludes that, "While this casualty was caused by the failure to set up properly, mechanical failures such as a loss of steering or loss of power could result in a similar catastrophe anytime the current is running hard and despite the degree of care exercised by the vessel's operator." In other words, the existence of the cross current increases the likelihood of an accident by making the transit less forgiving of human error or mechanical failures. Therefore, we believe that the condition of the current at the time of the casualty was a contributing cause.

COMMENTS ON CONCLUSIONS

Conclusion 3: The *Brown Water V* was capable of handling the tow as configured and the configuration did not contribute to the casualty.

Comment: There is insufficient evidence to conclude that the configuration of the tow of the *Brown Water V* did not contribute to the casualty. On the contrary, there are conditions identified in the report that raise concern about the tow configuration and its appropriateness for the transit. Among these are the deeper drafts and heavier loads of the two forward barges compared to the aft barges, especially when combined with the overall length of the tow resulting from the single-file configuration. The cross current most likely affected the lead barges first, pushing them to port. Additionally, the tow configuration placed the heavier, deeper draft lead barges well forward of the tow boat, which could increase the difficulty of maintaining control of the tow.

Conclusion 4: The *Brown Water V* had sufficient horsepower to safely navigate through the Long Island Swing Bridge and the Queen Isabella Causeway Bridge if suitable precautions had been undertaken prior to entering the bend.

Comment: The only direct evidence provided on this issue were statements by its captain, Rocky Wilson, and the operator at the time of the casualty, David D. Fowler, that the horsepower and characteristics of the *Brown Water V* were adequate to handle the tow. However, Captain Fowler also described how his efforts to stop the swing of the tow and then to stop the forward movement of the tow were unsuccessful. He also indicated that he did not have enough control with the horsepower available to make it through the turn once the current began acting on the tow. Additionally, as noted by the Eighth District Commander, in other situations where horsepower limitations have been developed, the *BROWN WATER V* would have been considered underpowered. That said, we understand this conclusion to state that a competent captain, experienced with navigating this tug and tow configuration in similar current conditions, could have safely navigated through the bridge. That is not to say, however, that the Eighth District Commander should not examine the issue of horsepower limitations for towing vessels in this area in light of this casualty to improve navigation safety.

COMMENTS ON THE APPARENT CAUSE

Apparent Cause: The apparent cause of this casualty was Captain David D. Fowler's failure to exercise reasonable care according to the standards of the ordinary practice of good seamanship.

There were no contributing causes to this casualty.

Comment: We do not agree that there were no contributing causes to this casualty. See the previous comment on the analysis. We believe that the condition of the current at the time of the casualty was a contributing cause.

ACTION ON RECOMMENDATIONS

Recommendation 1: Due to the proximity of the Queen Isabella Causeway Bridge to a bend and a crosscurrent, I recommend that the Eighth Coast Guard District distribute this report to area agencies and entities for review and possible bridge protection action. (Perhaps along the lines of the protection provided for Florida's Sunshine Skyway Bridge over Tampa Bay following the 1980 bridge allision resulting in multiple loss of life.)

Commander, Eighth Coast Guard District Endorsement: Recommend that G-MOA provide the Federal Highway Administration with a copy of the investigation case report. CGD8(m) will provide a copy of the investigation report (w/o enclosures) to the Eighth Coast Guard District Office of Bridges for information purposes. Upon closure of the case by Commandant, MSO Corpus Christi shall provide the State of Texas, Department of Transportation, the Division Administrator for the State of Texas, and the appropriate Army Corps of Engineers District Office with a copy of this report (w/o enclosures) for information purposes.

Action: We concur with this recommendation as endorsed. Copies of this report will be distributed to the agencies and organizations identified in the recommendation and the Eighth District Commander's endorsement for their review and action, as appropriate. In addition, we will encourage them to consider the use of Risk-Based Decision Making (RBDM) processes, which we believe would be useful in identifying and implementing protective measures intended to prevent similar casualties in the future. Interested organizations and agencies may contact the Office of Design and Engineering Standards, Commandant (G-MSE), 2100 Second Street, SW, Washington, DC, 20593, for information and assistance in the use of RBDM processes.

Commander, Eighth Coast Guard District, Recommendation 1: It should be noted that the regulatory proposal on "Fire-Suppression Systems and Voyage Planning for Towing Vessels" outlined in the Notice of Proposed Rulemaking, October 6, 1997 (62FR 52057) contained requirements for voyage planning analysis that are directly connected to this particular case. The proposed regulations required that companies should have documented policies and procedures in place to address decision-making criteria related to risk and route analysis of voyages including equipment size, suitability, and special equipment needs. All towing vessels would have been required to complete a voyage plan that included minimum requirements. The following proposed regulations may have prevented the casualty:

- a. navigation charts for the intended route, applicable extracts from publications including Coast Pilot, Coast Guard Light List, and Coast Guard Local Notice to Mariners for the area;
- b. applicable current and forecasted weather conditions for the duration of the voyage including visibility, wind, and sea state;
- c. extracts from tide and tidal current tables;
- d. intended speed and estimated time of arrival at the anticipated waypoints; and
- e. Master's standing orders for closest points of approach, special conditions, and critical maneuvers.

Unfortunately the proposed rule was modified by the April 29, 2003 Interim Rule contained in Federal Register (68FR22604) to require voyage planning for only those towing vessels operating in unprotected waters, beyond the baseline of the territorial sea. In light of this accident, we recommend that Commandant reconsider applying the Voyage Planning requirements to all towing vessel voyages.

Action: We concur with the intent of this recommendation. There is a need to heighten the towing vessel industry's awareness of the inherent dangers of transits through bridges and the need for those that direct and control towing vessels to be especially aware of and prepared for the conditions they will encounter when transiting through bridges. We believe accomplishing this will improve their ability to safely direct their tows through bridges and reduce the likelihood of allisions. In addition, we agree that removing the current exemption and requiring all towing vessels to comply with the voyage planning requirements found at 33 CFR 164.80 is one option that would serve to address that need. However, doing so would also result in the application of other unwanted and unnecessary requirements to those towing vessels currently exempt under the current regulations. As an alternative, we will: 1) include specific guidance on bridge transits in a Navigation and Vessel Inspection Circular (NVIC) to provide clarification for the requirements for planning and documenting a voyage outlined in 33 CFR 164.80 and a voyage risk management tool including human and organizational factors; 2) publish "lesson's learned" describing the dangers inherent in transiting through bridges and the need to be prepared; 3) propose an amendment to the regulations at 33 CFR 164.78, "Navigation Underway: Towing Vessels," that specifically addresses the need for the owner, master, or operator of each vessel towing to ensure that each person directing and controlling the movement of the vessel is specifically aware of and prepared for the conditions around bridges they will be transiting through; and 4) forward a proposal to the American Waterways Operators (AWO) that they consider including procedures and guidance regarding preparation for transits through bridges in their Responsible Carrier Program (RCP).

Commander, Eighth District, Recommendation 2: Contained in that October 6, 1997 NPRM were enhanced anchoring standards for barges. These proposed anchoring standards were eventually incorporated into regulation, specifically 46 CFR 32.15-15 and 33 CFR 155.230. The application of these standards is limited in scope, and does not include towboat and barge operations on the inland rivers systems or the Gulf Intracoastal Waterway (GIWW). Taking into account the circumstances of this case, we submit that anchoring systems may be a viable method to prevent recurrence of a similar accident. Accordingly, we recommend that Commandant put forward the topic to the Towing Safety Advisory Committee (TSAC) for consideration of establishing a subcommittee to determine the practicality, feasibility, and accident prevention capability of anchoring systems aboard barges and/or towboats in the inland rivers systems and the GIWW. In addition, we recommend that Commandant consult with the American Waterways Operators (AWO) to gain their perspective and independent judgment on the issue.

Action: We concur with this recommendation. While the control measures, including the requirement for an operable anchoring system, prescribed for certain tank barges in 33 CFR 155.230(b) are primarily intended to reduce the likelihood of a tank barge grounding and spilling its cargo, we agree that those same measures may also be useful in reducing the likelihood of

bridge allisions. The Commandant brought forward the topic to the TSAC for consideration of establishing a subcommittee to determine the practicality, feasibility, and accident prevention capability of anchoring systems aboard barges and/or towboats in the inland rivers systems and the GIWW. TSAC conducted the study and concluded that the idea of remotely operating anchoring systems is unfeasible because: 1) no remote operating systems currently exist or are manufactured, and; 2) no such remote operating systems are being researched or are in the development stage. Additionally, remotely operated anchoring systems can be detrimental to safety due to the hazards of accidental operation. American Waterways Operators (AWO), as members of TSAC, participated fully in the study.

Commander, Eighth District, Recommendation 3: We also believe that early warning systems on vehicular bridges may be viable methods to prevent future motorist fatalities. Approaching vehicular traffic could be warned of a "bridge out" situation by flashing signs or lights, triggered by a system of devices positioned across the bridge that detects a collapsed bridge situation. The system could be based on a variety of mechanisms including vibration sensors, infrared sensors, video recognition, inclinometers, metal wiring, etc. The Texas Department of Transportation is currently beta testing an early warning collapse detection system for the Queen Isabella Causeway Bridge. Their system is based on signal-dependent fiber optic cable that runs the length of the bridge. When the signal is broken (i.e. a collapsed/fallen bridge span), alarms such as flashing lights, beacons, and message board warnings, are illuminated to warn motorists. In addition, bridge gate arms are activated to block approaches in both directions, and phone messages are automatically sent to emergency services such as the local Coast Guard. Phone conversations with the research department at TxDOT suggest that this technology is not available as an off-the-shelf item; rather it is a first of its kind system designed by TxDOT. Once TxDOT completes the beta testing and the system is fully functional, TxDOT plans to share the system design and technology with any state or federal DOT entity interested in improving safety on bridges. TxDOT conducted extensive international research before they developed their system. It appears that there are not many bridge collapse early warning systems installed across the nation. Because of the life saving potential for such systems, we believe it is the Coast Guard's duty to bring this issue to the attention of appropriate entities within the federal government. Accordingly, we recommend that Commandant engage the Department of Transportation, specifically the National Highway Traffic Safety Administration (NHTSA) and the Federal Highway Administration (FHWA). We believe that federal incentives may be a way to entice State DOTs to install these devices on their vulnerable bridges.

Action: We concur with this recommendation. We will forward copies of this report to the National Highway Traffic Safety Administration and the Federal Highway Administration for their consideration and action, as appropriate.



W. D. RABE
By direction

U.S. Department of
Homeland Security

United States
Coast Guard



Commander
Eighth Coast Guard District
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16732
05 DEC 03

From: D. F. Ryan
CGD8 (m)

A handwritten signature in black ink, appearing to read "D. F. Ryan", written over a horizontal line.

To: Commandant (G-MOA)

Subj: ONE-PERSON FORMAL INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE ALLISION BETWEEN THE BARGE TOW OF THE M/V BROWN WATER V AND THE QUEEN ISABELLA CAUSEWAY BRIDGE, ON SEPTEMBER 15, 2001, IN PORT ISABEL, TEXAS, RESULTING IN MULTIPLE LOSS OF LIFE AND PROPERTY

Ref: (a) Title 46, United States Code Annotated (USC), Chapter 63
(b) Title 46, Code of Federal Regulations (CFR), Subpart 4.07

1. Pursuant to references (a) & (b), the Commander, Eighth Coast Guard District convened a one-person formal investigation into the subject casualty. The investigation final report and the electronic MISLE activity (#1482244) report are forwarded to you for final review and approval, with our recommendation that the investigation be officially closed. This office concurs with the findings, opinions, and recommendations of the investigation final report, with the exception of the items listed below. In addition, enclosed is the endorsement memorandum from the Commanding Officer of Marine Safety Corpus Christi.
2. The Eighth Coast Guard District Marine Safety Division concurs with the four recommendations of the formal investigation report with the following comments.
 - a. Recommendation #1: Recommend that G-MOA provide the Federal Highway Administration with a copy of the investigation case report. CGD8 (m) will provide a copy of the investigation report (w/o enclosures) to the Eighth Coast Guard District Office of Bridges for information purposes. Upon closure of the case by Commandant, MSO Corpus Christi shall provide the State of Texas, Department of Transportation, the Division Administrator for the State of Texas, and the appropriate Army Corps of Engineers District Office with a copy of this report (w/o enclosures) for information purposes.
 - b. Recommendation #2: MSO Corpus Christi shall initiate an enforcement investigation regarding the positive drug test result of deckhand J.W. Blocker and take appropriate action.
 - c. Recommendation #3: We concur. Accordingly, MSO Corpus Christi conducted an enforcement investigation to review the conduct and actions of Captain Fowler. The results of their investigation and communication with Captain Fowler led to the voluntary surrender of his Coast Guard license to MSO Corpus Christi on November 8, 2003.

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- d. Recommendation #4: The Eighth District Marine Safety Division will consult with the Eighth District Legal Division to determine whether the actions of David D. Fowler warrant referral to the U.S. Attorney's Office for criminal action.
3. Unquestionably, the Eighth Coast Guard District Marine Safety Division agrees with the investigating officer's opinion that Captain Fowler's negligence was the root cause of this casualty. Clearly, Captain Fowler did not give due regard to the apparent dangers of navigating under the prevailing conditions posed by a high tide and strong currents. Captain Fowler was responsible to gather information and familiarize himself with the tide and current conditions, and the charted channel limits, prior to transiting the "S" curve area of the GIWW, and the navigation channel under the Queen Isabella Causeway Bridge.
 4. However, the Eighth Coast Guard District Marine Safety Division disagrees with the investigating officer's and the experts' opinions that the strong currents, high tide, and horsepower limitations of the M/V Brown Water V weren't contributing factors to the cause of the accident.
 - a. Although Captain Fowler's negligence was the apparent cause, the strong currents and their influence on the tow's misalignment cannot be ignored. The four barges in the tow were fully loaded and in a single-file configuration. This is important to note because a barge's maneuverability is greatly influenced by the water current's effect upon the underwater profile of a barge. The effects are linear: a large underwater profile will be affected more by current than a small underwater profile; a strong current will affect the underwater profile more than a weak current. This is analogous to the affect of wind upon an empty barge with a large sail area, and the subsequent influence on the barge's maneuverability. In addition, a strong current on the stern of a towboat will diminish its maneuverability; the vessel's forward movement through the water must be at a speed necessary to overcome the following current across its rudders. The experts agreed that there was a "hard running" channel current on the stern of the vessel, and a strong cross current running towards the northwest that affected the vessel once it passed the unprotected part of the channel. The formal investigation case analysis stated that two separate, strong currents affected the tow. During Captain Fowler's initial Coast Guard interviews immediately following the accident, he stated that the tug and tow were set far toward the outside of the last turn, causing the tug's stern to touch bottom. Taking all of these factors into account, the Eighth Coast Guard District believes that the towboat's ability to maneuver and align its barges may have been diminished by the effects of the strong currents.

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- b. A NOAA representative testified that tide was 2.19 feet above Mean Lower Low Tide at the time of the casualty, and made the point that the tide had reached or exceeded that level only three other times during the past six months. NOAA attributed the unusually high tide to Tropical Storm Gabrielle. As the Commanding Officer of MSO Corpus Christi correctly pointed out in his case endorsement, the lead barge most likely would have grounded prior to hitting the bridge if the tide would not have been so high. We agree with that theory, and conclude that the high tide was a contributing factor to the incident.
 - c. Lastly, we can only speculate whether or not the tug & tow could have stopped if the M/V Brown Water V had additional horsepower. Again, we believe it's important to note that the tow was four loaded barges in single-file configuration with a box barge butted up against the bow of the M/V Brown Water V. Accordingly, the large flat, squared off underwater profile of the box barge would hinder the effectiveness of reverse propulsion by impeding the astern prop wash of the tug. The expert testimony in the investigation alluded to this issue. More horsepower aboard the M/V Brown Water V may have allowed Captain Fowler to recover the tow's set-up, or allow him to intentionally ground the tow or stop completely before impacting with the bridge. The horsepower limitation issue is not new to the maritime industry or the Coast Guard. The Coast Guard in some cases has established horsepower requirements for regulated navigation areas when water levels reach a certain gauge reading. For example: The regulated navigation area in Berwick Bay, Louisiana, is activated when the river gauge reads 3.0 feet or above. Thus, towing vessels transiting downbound at nighttime are required to have 600 HP or a horsepower that is three times the length of the tow, including the towboat (whichever is greater). If this requirement were applied in this case, the M/V Brownwater V would need to be at least 2,553 HP (3 x 851 ft). The Inland River Crisis Action Plan (IRCAP), developed by the industry group "Waterways Management Committee," delineates several trigger points for horsepower on various rivers. In general, their high water advisory recommendation delineates 240 HP per barge on the Lower Mississippi River and on the Upper Mississippi River (below mile 185). If this requirement were applied to this case, the M/V Brownwater V would need to be at least 1,060 HP (240 HP x 4). A 1998 Eighth Coast Guard District Quality Action Team including industry experts reviewed the effects of strong currents on Western River fleeing operations. Their report on "downstreaming" concluded that 1,350 HP is the minimum level necessary for safe fleeing operations with strong currents on the stern of a tug.
5. It should be noted that the regulatory proposal on "Fire-Suppression Systems and Voyage Planning for Towing Vessels" outlined in the Notice of Proposed Rulemaking, October 6, 1997 (62FR 52057) contained requirements for voyage planning analysis that are directly connected to

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this particular case. The proposed regulations required that companies should have documented policies and procedures in place to address decision-making criteria related to risk and route analysis of voyages including equipment size, suitability, and special equipment needs. All towing vessels would have been required to complete a voyage plan that included minimum requirements. The following proposed regulations may have prevented the casualty:

- a. navigation charts for the intended route, applicable extracts from publications including Coast Pilot, Coast Guard Light List, and Coast Guard Local Notice to Mariners for the area;
- b. applicable current and forecasted weather conditions for the duration of the voyage including visibility, wind, and sea state;
- c. extracts from tide and tidal current tables;
- d. intended speed and estimated time of arrival at the anticipated waypoints; and
- e. Master's standing orders for closest points of approach, special conditions, and critical maneuvers.

Unfortunately the proposed rule was modified by the April 29, 2003 Interim Rule contained in Federal Register (68FR22604) to require voyage planning for only those towing vessels operating in unprotected waters, beyond the baseline of the territorial sea. In light of this accident, we recommend that Commandant reconsider applying the Voyage Planning requirements to all towing vessel voyages.

6. Also contained in that October 6, 1997 NPRM were enhanced anchoring standards for barges. These proposed anchoring standards were eventually incorporated into regulation, specifically 46 CFR 32.15-15 and 33 CFR 155.230. The application of these standards is limited in scope, and does not include towboat and barge operations on the inland rivers systems or the Gulf Intracoastal Waterway (GIWW). Taking into account the circumstances of this case, we submit that anchoring systems may be a viable method to prevent recurrence of a similar accident. Accordingly, we recommend that Commandant put forward the topic to the Towing Safety Advisory Committee (TSAC) for consideration of establishing a subcommittee to determine the practicality, feasibility, and accident prevention capability of anchoring systems aboard barges and/or towboats in the inland rivers systems and the GIWW. In addition, we recommend that Commandant consult with the American Waterways Operators (AWO) to gain their perspective and independent judgment on the issue.

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7. Lastly, we also believe that early warning systems on vehicular bridges may be viable methods to prevent future motorist fatalities. Approaching vehicular traffic could be warned of a "bridge out" situation by flashing signs or lights, triggered by a system of devices positioned across the bridge that detects a collapsed bridge situation. The system could be based on a variety of mechanisms including vibration sensors, infrared sensors, video recognition, inclinometers, metal wiring, etc. The Texas Department of Transportation is currently beta testing an early warning collapse detection system for the Queen Isabella Causeway Bridge. Their system is based on signal-dependent fiber optic cable that runs the length of the bridge. When the signal is broken (i.e. a collapsed/fallen bridge span), alarms such as flashing lights, beacons, and message board warnings, are illuminated to warn motorists. In addition, bridge gate arms are activated to block approaches in both directions, and phone messages are automatically sent to emergency services such as the local Coast Guard. Phone conversations with the research department at TxDOT suggest that this technology is not available as an off-the-shelf item; rather it is a first of its kind system designed by TxDOT. Once TxDOT completes the beta testing and the system is fully functional, TxDOT plans to share the system design and technology with any state or federal DOT entity interested in improving safety on bridges. TxDOT conducted extensive international research before they developed their system. It appears that there are not many bridge collapse early warning systems installed across the nation. Because of the life saving potential for such systems, we believe it is the Coast Guard's duty to bring this issue to the attention of appropriate entities within the federal government. Accordingly, we recommend that Commandant engage the Department of Transportation, specifically the National Highway Traffic Safety Administration (NHTSA) and the Federal Highway Administration (FHWA). We believe that federal incentives may be a way to entice State DOTs to install these devices on their vulnerable bridges.

#

Encl: (1) Formal Investigation Report by Mr. James Wilson
(2) MSO Corpus Christi memorandum 16732 of 14 October 2003

Copy: MSO Corpus Christi w/o enclosures
Mr. James Wilson w/o enclosures

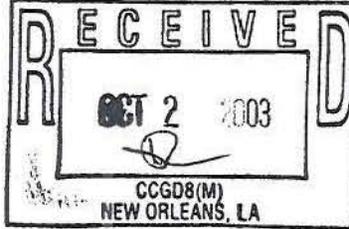
U.S. Department of
Homeland Security

United States
Coast Guard



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16732
14 October 2003

MEMORANDUM

From: WILLIAM J. WAGNER III 
COGARD MSO Corpus Christi TX

To: Commander, Eighth Coast Guard District (m)

Subj: INVESTIGATION OF QUEEN ISABELLA CAUSEWAY COLLAPSE

REF: (a) CG Marine Safety Manual, Volume V, Investigations, COMDTINST M16000.10
(b) Investigation Report into the Circumstances Surrounding the Allision Between the Barge Tow of the M/V BROWN WATER V and the Queen Isabella Causeway Bridge, Texas, on 15 September 2001, Resulting in Multiple Loss of Life.

1. After an extensive review of both the evidence gathered in this investigation and the investigative report issued by Mr. James Wilson, the Hearing Officer designated by the District Commander to conduct the formal investigation, I have concluded that the findings of Mr. Wilson's report are generally in keeping with those of the Marine Safety Office Corpus Christi. However, I disagree with the Hearing Officer's conclusions on Horsepower and Current & Tide.
2. Horsepower – It is my opinion that the adequacy of the horsepower of the M/V BROWN WATER V was questionable in safely handling a tow of this size and configuration under the conditions encountered on the morning of September 15, 2001. The M/V BROWN WATER V was powered by two 12V 71 Detroit Diesel engines rated at 400 horsepower per engine with a six to one gear ration. The BROWN WATER V was pushing ahead four-loaded barges configured single file encompassing a length of 851 feet and 2945 gross tons. The tug was not able to move the bow of the tow to starboard nor was it able to stop the tow in the current encountered.
3. Current & Tide – It is my opinion that current and tide were contributing factors. The current and tide were abnormally strong and high as reflected in the testimony of various witnesses including that of the NOAA expert. Had the tide not been as high as it was, the lead barge most likely would have grounded prior to hitting the bridge.
4. I have noted the expert mariner's remedial recommendations as outlined in the report and I am evaluating the feasibility of implementing them. However, these recommendations will require the coordination and agreement of local, state, and federal agencies.

Subj: INVESTIGATION OF QUEEN ISABELLA CAUSEWAY COLLAPSE

16732

14 Oct 2003

5. I am in agreement with Recommendations one and three. I plan on taking no civil penalty action towards the deckhand, J. W. Blocker, as Brown Water Marine no longer employs him in accordance with 49 CFR 40.23. It is also my intention to press forward with Suspension and Revocation Proceedings against Captain Fowler.

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U.S. COAST GUARD
ONE-PERSON FORMAL BOARD OF INVESTIGATION
Mr. James Wilson

Investigative Report

ALLISON INVOLVING THE M/V BROWNWATER V AND THE
QUEEN ISABELLA CAUSEWAY BRIDGE

September 15, 2001
Gulf Intracoastal Waterway
Port Isabel, TX

USCG MISLE Case Number 1482244

INVESTIGATION REPORT INTO THE CIRCUMSTANCES SURROUNDING THE ALLISION
BETWEEN THE BARGE TOW OF THE M/V *BROWN WATER V* AND THE QUEEN ISABELLA
CAUSEWAY BRIDGE, TEXAS, ON 15 SEPTEMBER 2001, RESULTING IN MULTIPLE LOSS
OF LIFE

(Due to the pictures & charts, this investigation is best viewed in color.)

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Summary

At or near 2110 on Friday, September 14, 2001, the M/V *Brown Water V* departed Brownsville, Texas, under the control of Captain Rocky Lee Wilson. The *Brown Water V* was pushing four loaded hopper barges ahead of it, lined up in a straight line, single-file. At 2400 Captain David D. Fowler took the helm. The vessel successfully cleared the Long Island Swing Bridge at 0145 on September 15, and at 0200 allided almost head-on with the Queen Isabella Causeway Bridge approximately 375 feet west of the channel. The Queen Isabella Causeway Bridge connects Port Isabel with South Padre Island. The allision caused two 80-foot sections of the bridge to collapse. Following the collapse, nine vehicles entered the water through the missing bridge sections, resulting in eight deaths and three injuries.



The bridge with two sections collapsed

There was some damage to the alliding barge but no flooding.



Damage to barge

The coupling connecting the lead barge to the second barge was either snapped by the allision or snapped following the allision due to the current pushing the vessel and tow to the west of the allision point.



*Vessel and barge configuration following the allision,
lead barge decoupled*

Later that day, during the search and rescue operation, a third 80-foot section of the bridge collapsed but caused no injuries or deaths.



The bridge with three sections collapsed

Introduction to the Findings of Fact

The casualty happened during the darkness of the early morning hours. Everyone on the vessel except Captain Fowler was asleep. It was determined that Captain Fowler was the best, if not the only, source of information about the events leading up to the allision. Captain Fowler took the Fifth Amendment during the formal hearing. Because of this lack of testimony, it was necessary to rely on what he said about the casualty during his pre-hearing contacts with Coast Guard Investigators.

The first contact was on the morning of the casualty by Chief Warrant Officer (CWO) Alan Grodecki, supervisor of the Coast Guard Marine Safety Satellite Office in Brownsville. CWO Grodecki had a tape recorder operating during his initial casualty response. The tape recorder picked up some of Captain Fowler's comments concerning the incident.

On September 17, Lieutenant (LT) Robert Helton, the Senior Investigating Officer at Marine Safety Office Corpus Christi, and CWO Grodecki, supervisor of the Coast Guard Marine Safety Satellite Office in Brownsville interviewed Captain Fowler. That interview was taped. Captain Fowler also provided a written statement on the 17th.

Besides the expertise necessary -- channel experts, aids to navigation experts, etc. -- it was determined that assistance in the form of an experienced towing vessel operator knowledgeable of the casualty area would be needed to interpret the events discussed by Captain Fowler on the tape recordings and written statement to compare them with the other information available. With the assistance of the Eighth District Marine Safety Division, the Marine Safety Office in Corpus Christi, and with the recommendation of Raymond Butler, Executive Director of the Gulf Intracoastal Canal Association, Captain Alton Chadwick was identified. Captain Chadwick agreed to review all the initial evidence, study the two tape recordings of Captain Fowler and his written statement, attend the full hearing, advise the Coast Guard during the hearing, and act as an expert witness if called to the stand. Captain Chadwick was subsequently qualified and accepted as an expert witness by the Coast Guard at the formal hearing. (While other witnesses generally may testify only as to that which they have perceived, because of their specialized knowledge or experience, "expert" witnesses are allowed to give testimony in the form of an opinion or conclusion.)

Two of the Parties-in-Interest also provided expert witnesses at the hearing. Brown Water Marine provided Captain Ronald Yates, towing vessel operator and marine consultant. The State of Texas provided a forensic marine engineer, Captain Richard Silloway. Captain Stephen (Mike) Wike of Hollywood Marine was present as a spectator but was used by the Coast Guard based on Captain Chadwick's personal knowledge of Captain Wike's towing experience and familiarity with the casualty area. All three were subsequently qualified and accepted as expert witnesses by the Coast Guard at the formal hearing.

The hearing was organized in such a manner as to bring out all the necessary facts to determine what happened and why it happened, so the Coast Guard could determine the cause of the casualty. It was also hoped that if Captain Alton Chadwick could compare all the available facts with the events leading up to the allision, as stated in Captain Fowler's communications, he would be able to assist the Coast Guard in its causal determination. In the end, the four expert witnesses formed a unanimous opinion concerning the casualty. The Coast Guard Investigating Officer agrees with this opinion.

All testimony at the hearing was given under oath.

As a result of the investigation, several recommendations were developed and are included at the end of this report. This report is written to be included in the U.S. Coast Guard's Marine Information for Safety and Law Enforcement (MISLE) system. As a result, the endorsement and action on the recommendations will only be found in MISLE. In order to obtain a copy of this report the public should submit a request under the Freedom of Information Act to: Commandant (G-CIM-2), 2100 2nd Street, SW, Washington, D.C. 20593-0001, Attn: FOIA.

Findings of Fact

01. Record of Dead and Injured

01.1 All the dead and the injured were occupants of the automobiles that plunged from the bridge.

<i>Deceased</i>	<i>Age</i>	<i>Home Address</i>	<i>Next of Kin</i>
Harris, Robert Victor	46	[REDACTED]	[REDACTED], Wife
Hinojosa, Gasper Saenz	52	[REDACTED]	[REDACTED], Wife
Leavell, Robin Faye	29	[REDACTED]	[REDACTED], Mother [REDACTED], Father
Martinez Jr., Hector	32	[REDACTED]	[REDACTED], Sr., Father [REDACTED], Mother
Mireles, Julio Cesar	22	[REDACTED]	[REDACTED], Father [REDACTED], Mother
Rivas, Stvan Francisco	22	[REDACTED]	[REDACTED], Father [REDACTED], Mother
Welch, Barry R.	53	[REDACTED]	[REDACTED], Minor Son [REDACTED], Father
Welch, Chealsa Louise	23	[REDACTED]	[REDACTED], Minor Son [REDACTED], Father

<i>Injured</i>	<i>Age</i>	<i>Home Address</i>
Goza, Brigitte Marie	[REDACTED]	[REDACTED]
Mata, Rene Francisco	[REDACTED]	[REDACTED]
Morales, Gustavo Adolfo	[REDACTED]	[REDACTED]

02. Parties-in-Interest

02.1 Designated Parties-in-Interest

Brown Water Marine	As owner/operator of the M/V <i>Brown Water V</i>
Captain David Fowler	As wheelman of the <i>Brown Water V</i> at the time of the casualty
The State of Texas	As owner of the Queen Isabella Causeway Bridge
Cameron County, Texas	As the entity responsible for the maintenance of the Queen Isabella Causeway Bridge highway lighting system and navigation lighting system
Town of South Padre Island, Texas	As the operator of the street lighting on the island side of the Queen Isabella Causeway Bridge
City of Port Isabel, Texas	As the operator of the street lighting on the mainland side of the Queen Isabella Causeway Bridge

02.2 It was subsequently determined that the State of Texas was the entity responsible for the maintenance of the Queen Isabella Causeway Bridge navigation lighting system. As Texas was already a Party-in-Interest, it was not designated again.

02.3 During the hearing, it was determined the highway illumination lighting used by vehicular traffic crossing the bridge was not an aid to vessel navigation and was irrelevant to the investigation. When the hearing was reopened on November 5, because the causeway highway illumination lighting was eliminated as an issue, Cameron County, the City of Port Isabel, and the Town of South Padre Island were no longer designated as Parties-in-Interest.

02.4 Neither the injured nor the next-of-kin of the dead persons were designated as Parties-in-Interest.

03. The M/V *Brown Water V's* Crew

03.1 Each Brown Water tugboat has three licensed officers permanently assigned. Only two licensed officers are onboard at any one time. Brown Water Marine classifies the licensed person with overall responsibility for the vessel and working with Brown Water Marine Services as the Captain. The second-in-command is designated the Relief Captain. Each vessel also has a Pilot assigned. The Pilot assumes the second-in-command responsibilities when either the Captain or Relief Captain is not on the vessel. On September 15, the Captain, Rocky Lee Wilson, and the Relief Captain, David D. Fowler, were on the vessel.

03.2 Crewmembers onboard the *Brown Water V* at the time of the casualty:

<i>Name</i>	<i>License/Certificate</i>	<i>Position</i>	<i>Age</i>	<i>Address</i>	<i>Location at time of allision</i>
Rocky Lee Wilson	██████ Issue #2 MMD ██████ ██████	Captain	██	████████████████████	Asleep Below
David D. Fowler	██████ Issue #3	Relief Captain	██	████████████████████	Wheelhouse
J.W. Blocker	None & None Required	Deckhand	██	████████████████████	Asleep Below
Levie Old	None & None Required	Deckhand	██	████████████████████	On Duty & Asleep In Wheelhouse
Ross L. Valigura	None & None Required	Deckhand	██	████████████████████	Asleep Below

03.3 All five members of the *Brown Water V's* crew gave statements and/or testimony indicating that at the time of the casualty Captain Fowler was at the wheel and the other crewmembers were asleep.

03.4 At the time of the allision, deckhand Levie Old was on duty but sleeping in the wheelhouse. Captain Fowler gave Old permission to sleep but wanted him near in case he needed him. Although the Brown Water Marine Safety Manual does not specifically discuss sleeping on watch, it does task the Captain on duty with the responsibility for the overall operation of the vessel, including the actions of the deckhands. The other three crewmembers were off duty.

04. Drug and Alcohol Testing

04.1 After the casualty, all members of the M/V *Brown Water V* crew were chemically tested for drug use. All tests were negative except for deckhand J.W. Blocker, whose test was reported positive for marijuana. Blocker holds no Coast Guard credentials so he is not subject to Suspension and Revocation remedial action for the use of dangerous drugs. Before Blocker can return to work aboard a vessel he must obtain a Medical Review Officer back-to-work letter.

04.2 Captain Fowler also passed an on-scene field sobriety test, an on-scene Intoximeter alcohol test, as well as a National Transportation Safety Board toxicology screen.

05. The M/V *Brown Water V* and Its Barges

05.1 The M/V *Brown Water V* is a U.S. Coast Guard documented uninspected towing vessel owned and operated by Brown Water Marine Services of Rockport, Texas. American Commercial Barge Lines of Jeffersonville, Indiana, owned the four loaded hopper barges.

05.2 The *Brown Water V* (D580422) is a steel hulled towing vessel built in 1977. At the time of the casualty two 12V 71 Detroit diesel 400 horsepower engines with a six-to-one gear ratio powered it.

05.3

The <i>Brown Water V</i> and Its Barge Configuration at the Time of Casualty				
BW 5	VLB 9173	VLB 9182	ACL 9933B	NM 315
D580422	D967622	D967631	D1084946	D953212
8' 4" Draft	8' 10" Draft	7' 3" Draft	9' 0" Draft	9' 3" Draft
49' Length	202' Length	202' Length	203' Length	195' Length
20' Breadth	35' 2" Breadth	35' 3" Breadth	35' 2" Breadth	35' Breadth
84 Gross Tons	Gross Tons	705 Gross Tons	764 Gross Tons	687 Gross Tons
	Load 1659.4 tons phosphates	Load 1222.10 tons steel	Load 1662.90 tons steel	Load 1482.55 tons steel
⇨	851' Total Length			⇨

05.4 At the time of the allision, the *Brown Water V* was pushing four loaded hopper barges ahead of it. The barges were lined up in a straight line, single-file (dubbed a strung-out configuration by area mariners). The head barge, NM 315, was a rake-end barge and the other three were squared-ended box barges.

05.5 Nautical Chart 11302 is the chart used during the hearing. For perspective when using the chart, the 851-foot length of the *Brown Water V* and its four barges is roughly the same as the charted distance between aids to navigation 147 and 149.

05.6 The barges were configured under the supervision of the *Brown Water V's* captain, Rocky Wilson. In his September 17 interview with the Coast Guard, Captain Fowler indicated the horsepower and characteristics of the *Brown Water V* were adequate to handle the tow. Captain Wilson testified the horsepower and characteristics of the *Brown Water V* were adequate to handle the tow.

05.7 Testimony from various witness at the hearing and from Captain Fowler's September 17 statement indicated loaded barges present less sail area for the wind but with more of the barge below the water surface, they are more affected by the current. With the barges loaded as heavily as they were, the current would affect the navigation, but the wind would not.

05.8 Coast Guard CWO Olmsted conducted a boarding of the M/V *Brown Water V* on September 15, 2001, and noted that the vessel had a copy of local chart, Nautical Chart 11302. Because of the difficulty Captain Wilson had in locating the chart, and the fact that the chart was tightly folded, it was CWO Olmsted's opinion that the chart hadn't been used recently.

05.9 During his boarding, CWO Olmstead also noted that there was a television set in the wheelhouse set to a local channel. CWO Alan Grodecki noted that prior to CWO Olmstead's boarding, people on the vessel were using the television to watch live post-casualty television coverage. The captain of the vessel, Rocky Wilson, testified that the television was never on during a transit. Deckhand Levie Old testified that when he went to sleep in the wheelhouse while Captain Fowler had the helm, the TV was not on and when he awoke immediately after the allision, the TV was not on. Deckhand Ross L. Valigura testified that the crew had a television below in the galley. The *Brown Water Marine Safety Manual* tasks the Captain on duty with the responsibility for the overall vessel operation and safety. Although the manual does not specifically discuss the responsibility for operation of a television in the wheelhouse, it is presumably the Captain's responsibility to keep the television from interfering with the safe operation of the vessel.

05.10 During his post-casualty boarding, CWO Olmstead noted the starboard tachometer was not working properly. The vessel's logs indicated the starboard tachometer had been malfunctioning since July 2000.

05.11 The *Brown Water V* port throttle was sticking on the day before the casualty. *Brown Water Marine* mechanic Randy Elmore replaced the port Morse transmission, reconfigured the cables, and adjusted the gear and throttle linkage. In his September 17 interview with the Coast Guard, Captain Fowler indicated the throttle was working correctly at the time of the casualty. The captain, Rocky Wilson, testified that the throttle problem was repaired. Deckhand J.W. Blocker testified that the throttle was tested after the repairs and that it operated properly. CWO Alan Grodecki testified the Coast Guard checked out both throttles post-casualty and they were working properly.

06. The Bridge and the Area Relevant to the Casualty

06.1 The Gulf Intracoastal Waterway runs in a general north-south direction along the Texas coast. However, most mariners operating on the Gulf Intracoastal Waterway in the area consider their transits as either eastbound or westbound -- eastbound being toward lower mile markers and the Mississippi River, and westbound toward higher mile markers and Mexico. Directions in this report are stated in reference to truth north. Where necessary, the directions will be entered in parenthesis to clarify verbatim statements. Mile markers indicate statute miles west of the Harvey Lock on the Mississippi River at New Orleans.

(1) Queen Isabella Causeway Bridge

(2) Port Isabel

(8) Long Island Swing Bridge

(5) Long Island

(7) Ship Channel to Brownsville (13 miles)

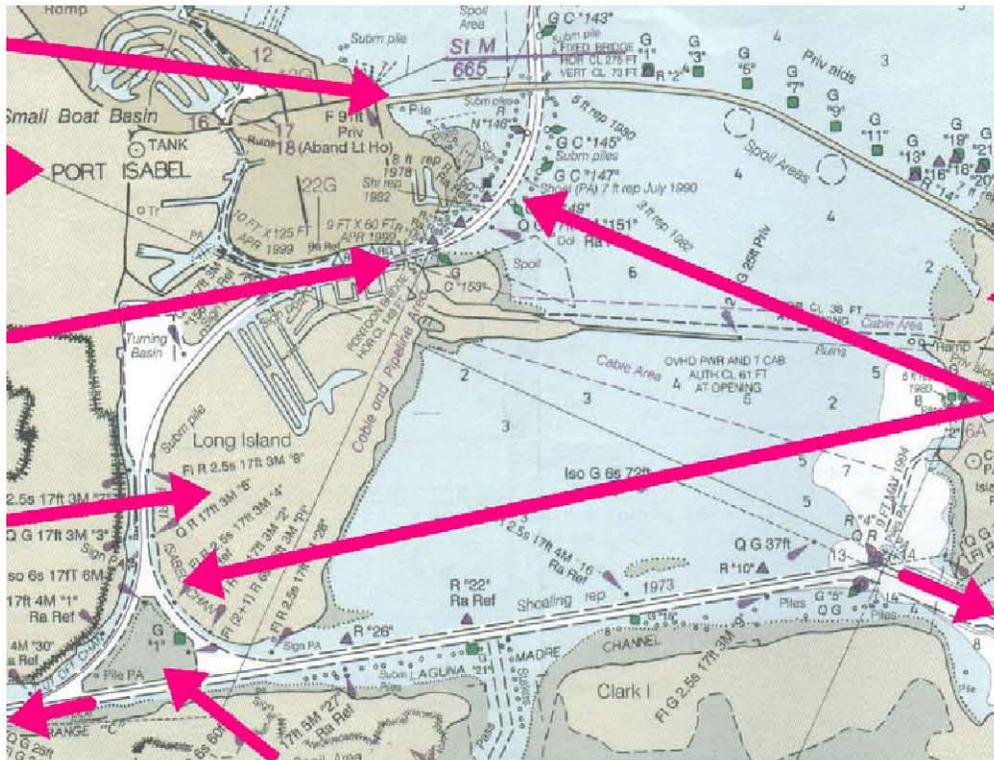
(6) The "Y"



(3) South Padre Island

(9) "S" Curve

(4) Gulf of Mexico



06.2 The Queen Isabella Causeway Bridge⁽¹⁾ crosses the southern end of Laguna Madre to connect Port Isabel⁽²⁾ on the Texas mainland with South Padre Island,⁽³⁾ a barrier island on the Gulf of Mexico.⁽⁴⁾ The commercial ship channel entrance from the Gulf of Mexico is located on the south side of South Padre Island. The channel runs west from the Gulf until it reaches the south end of Long Island.⁽⁵⁾

The channel at the south end of Long Island at mile marker 668.4 is locally deemed the "Y"⁽⁶⁾ as it is shaped like an upside down "Y". The channel splits at the "Y". Continuing west past the "Y" is the Brownsville Ship Channel.⁽⁷⁾ The section of the Gulf Intracoastal Waterway relevant to this casualty runs north from the "Y" at mile marker 668.4, and continues between the mainland and Long Island, up through the Long Island Swing Bridge⁽⁸⁾ that connects Port Isabel to Long Island at mile marker 666.0.

The channel then moves into the Laguna Madre at mile marker 665.9 before it enters a bend towards the Queen Isabella Causeway Bridge at mile marker 665.1.

The channel between the "Y" and the Queen Isabella Causeway Bridge is locally identified as the "S" curve⁽⁹⁾ due to its shape.

06.3 The channel between the "Y" and the Long Island Swing Bridge is narrow and lined with commercial and recreational facilities, including moored vessels. Channel vessel traffic includes towboats, barges, oil drilling equipment, dredges, pleasure craft, shrimp boats, and other commercial vessels.

Cargoes moved through the channel include petroleum products, chemicals, sand and gravel, and miscellaneous other products. The Long Island Swing Bridge has a 149-foot horizontal clearance.

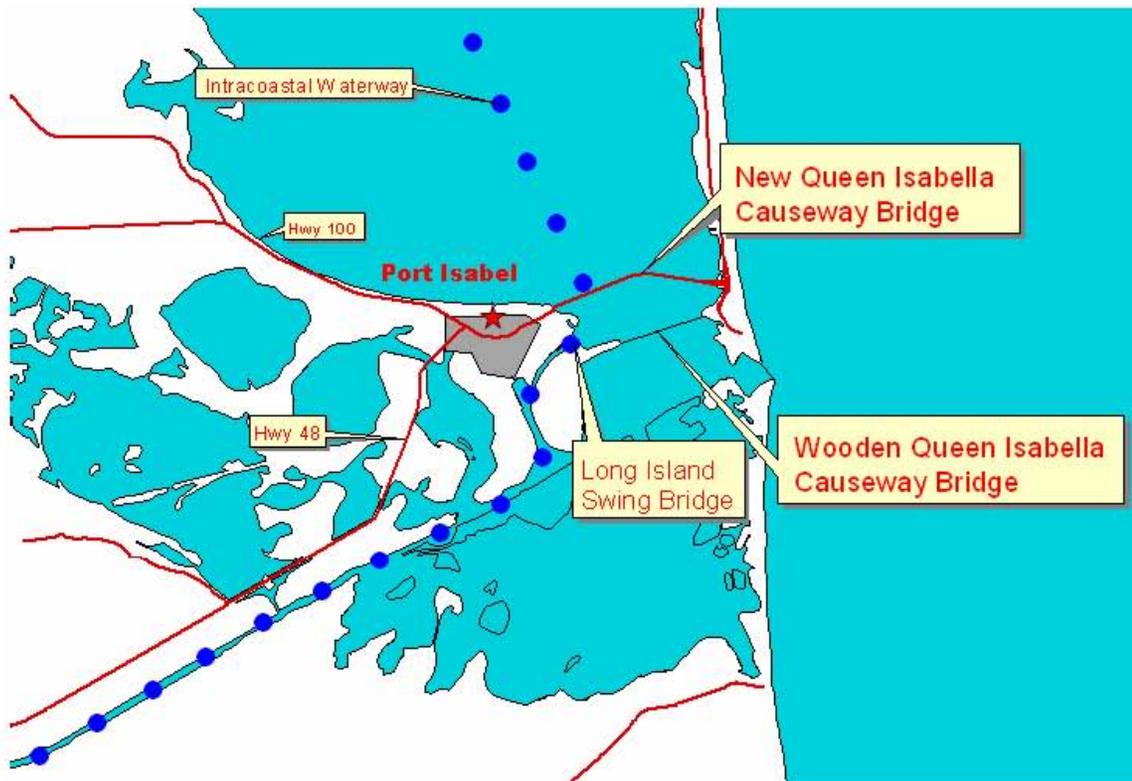


07. Bridge History

07.1 On July 17, 1970, the Texas Highway Department filed an application with the Coast Guard for a permit to build the new Queen Isabella Causeway Bridge to connect Port Isabel to South Padre Island. At that time, the only vehicle access from the mainland to South Padre Island was via the Long Island Swing Bridge to Long Island, then across Long Island to South Padre Island via the wooden Queen Isabella Causeway Bridge. The new bridge would be located at mile marker 667.4 (now mile marker 665.1) west of the Harvey Canal Lock, ninth tenths of a statute mile north of the Long Island Swing Bridge.

07.2 The bridge permit was approved with the proviso that both the Long Island Swing Bridge and the wooden Queen Isabella Causeway Bridge be removed. Construction on the new bridge began on January 20, 1972.

07.3 Removing the Swing Bridge would have left Long Island without a bridge to the mainland. Removing both bridges would completely eliminate automobile roadway ingress and egress to Long Island. Long Island's owner was in the process of developing the island and wished to preserve the Swing Bridge. The Texas Highway Department subsequently petitioned the Coast Guard to allow both the Swing Bridge and the wooden Queen Isabella Causeway Bridge to remain in place following the completion of the new bridge. Over maritime industry objections, both bridges were allowed to remain in place.

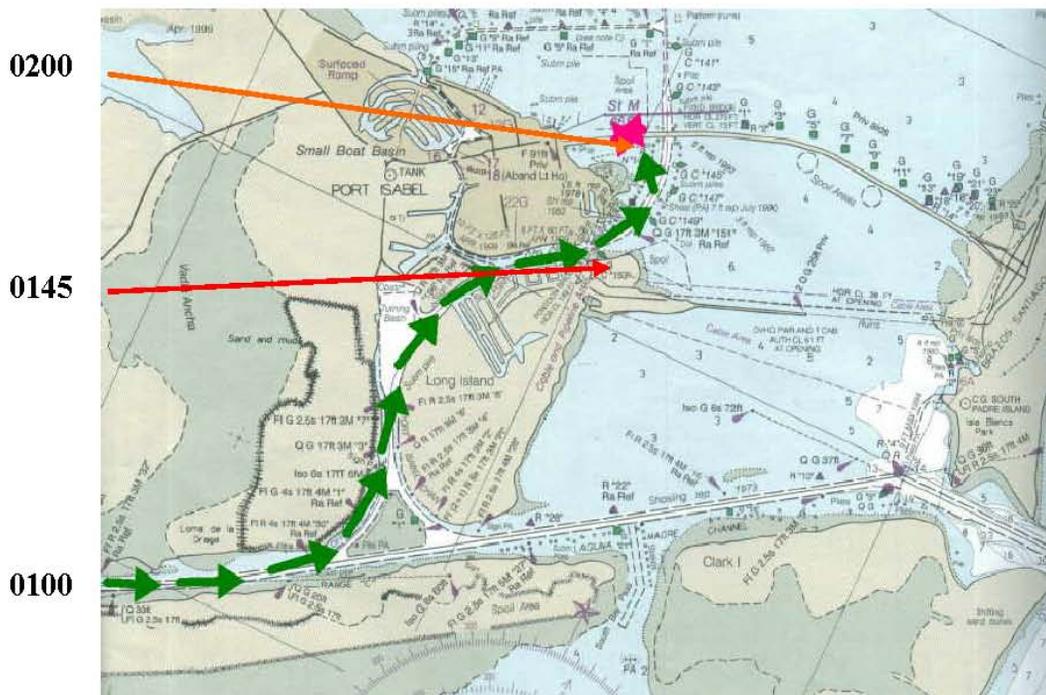
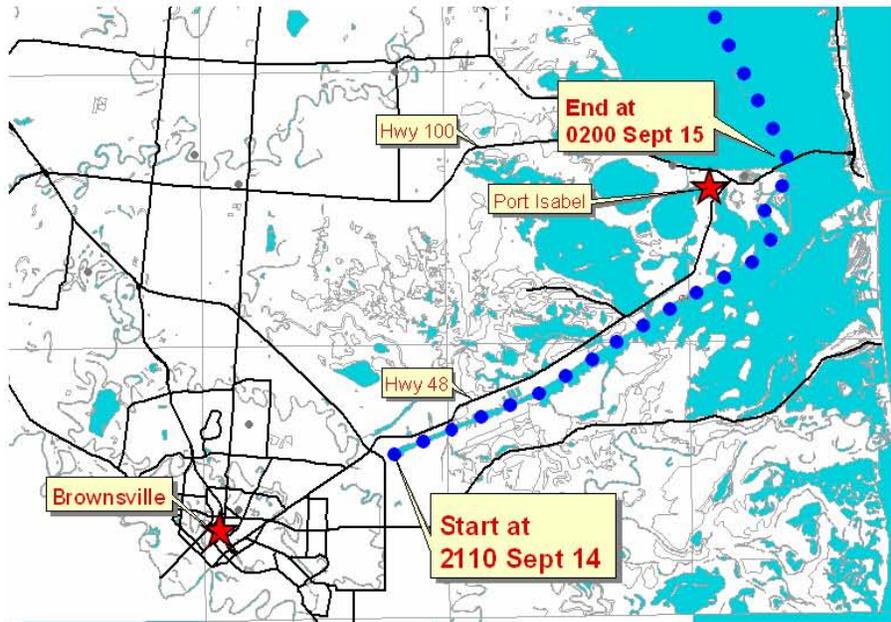


07.4 The bridge permitting and amendment process documentation indicates the interested parties assumed the Gulf Intracoastal Waterway would be rerouted east of Long Island, eliminating the "S" curve. At the time of the casualty, 0200 on September 15, 2001, part of the wooden bridge connecting Long Island with South Padre Island had been partially removed. The Swing Bridge remained in place. The Gulf Intracoastal Waterway remained where it was when the Queen Isabella Causeway Bridge was completed on October 7, 1974.

07.5 The Queen Isabella Causeway Bridge is not on the list of backlog Truman-Hobbs unreasonably obstructive bridges projects that have been prioritized for study by the Coast Guard's Office of Bridge Administration. There is nothing in the Coast Guard's files to indicate that the bridge was ever studied or that there has ever been a request to study it. There are no complaints on file identifying the bridge as a hazardous or obstructive bridge. There is not a history of accidents to draw attention to the bridge for study. The Long Island Swing Bridge is not on the Truman-Hobbs backlog list either.

08. The *Brown Water V's* Route

08.1 The M/V *Brown Water V* spent the day of September 14 in the vicinity of the Port of Brownsville fueling, having repairs done to the throttle, and configuring the barges under the supervision of Captain Wilson.



08.2 According to Captain Fowler, he was asleep when the M/V *Brown Water V* and tow left Brownsville at 2110 on September 14, and he took over the wheel at 2400, approximately nine miles or so from the Long Island Swing Bridge at mile marker 675. The Long Island Swing Bridge logs indicated that the bridge was opened at 0145 the morning of September 15 to allow the *Brown Water V* with four loads to transit eastbound (north). The CG-2692, Report of Marine Accident, Injury or Death, indicates the casualty took place at 0200. The Port of Brownsville Guard Log shows that at 0200 the *Brown Water V* was calling mayday and reporting that cars were in the water.

09. Captain David D. Fowler

09.1 When the M/V *Brown Water V* and tow allided with the Queen Isabella Causeway Bridge, it was under the direction of Captain David D. Fowler. During the investigation, no one besides Captain Fowler was identified by any of the state or federal investigating agencies, nor by the Parties-in-Interest, as an eyewitness to the events leading up to the casualty. Captain Fowler was apparently the only person who had information concerning the events between 0145 when the *Brown Water V* passed through the Long Island Swing Bridge and 0200, the time of the casualty. Because Captain Fowler chose to exercise his Fifth Amendment right not to testify at the formal hearing, the only information available concerning the events between 0145 and 0200 were his three pre-hearing statements. Captain Fowler discussed the casualty with Coast Guard Investigators twice. Both discussions were tape-recorded. Captain Fowler also supplied a written statement. The first discussion took place onboard the *Brown Water V* approximately 2 ½ hours after the casualty on September 15. That same day he was given a witness statement form and returned it on September 17 at the time of his second taped discussion.

09.2 Captain Fowler is the holder of Operator of Uninspected Towing Vessels License Number 887687. He is on his third issue and has held the license for 12 years. Brown Water Marine had employed him since April 2001. In the September 15 Coast Guard taped statement he stated he had transited the area "maybe 50 times, back and forth." In his September 17 taped Coast Guard interview, he indicated he had been to Brownsville on a tug eight to ten times and all but one trip was with Brown Water Marine. Brown Water Marine records indicate Captain Fowler had been onboard during five trips through the area. Since Captain Fowler took the Fifth Amendment at the start of the formal hearing, there was no way to clarify his actual experience through the area during the previous 12 years.

09.3 As part of the investigation of Captain Fowler's actions prior to the casualty, a fatigue investigation was conducted in accordance with G-MOA Policy Letter 5-97. According to his September 17 taped Coast Guard interview, Captain Fowler stated that he worked a 6-hour duty rotation with the other master on board, which would result in Captain Fowler working 12 hours in the 24 hours prior to the incident. Captain Fowler did not report any fatigue symptoms prior to the casualty. The resultant fatigue index score is 19.2. In accordance with the Policy Letter, a fatigue index score of 19.2 is not classified as short-term fatigue.

09.4 A search of Coast Guard historical casualty records on Captain Fowler indicated that on August 30, 2000, he was operating the M/V *Janice Carol* when, according to casualty investigation MC00011686, during an outbound transit of the Corpus Christi ship channel, "Mr. David D. Fowler's inexperience with the local area, the vessel, and his failure to correctly judge the tidal influence directly led to the grounding of the T/B (tank barge) USL-148." Also, on March 7, 2001, he was operating the M/V *Golda Pickett* when according to MC01003217, "... vessel slowed to wait for west bound traffic to clear. With the speed slowed, the tide pushed the stern of the tug toward the bank. The starboard propeller touched ground and stalled the engine. While the crew was trying to start the engine, the tug and tow drifted into the (Bayou DuLarge, Houma, LA) bridge." No other entries were located.

09.5 Captain Fowler indicated that after transiting the Long Island Swing Bridge northbound, he began making his turn in the "S" curve towards the Queen Isabella Causeway Bridge when the starboard stern of the *Brown Water V* hit the bottom or something on the bottom. His impression was that this hit or bump caused him to lose control of the configuration, which was then overwhelmed by a starboard to port current.

10. The Channel and Its Aids to Navigation

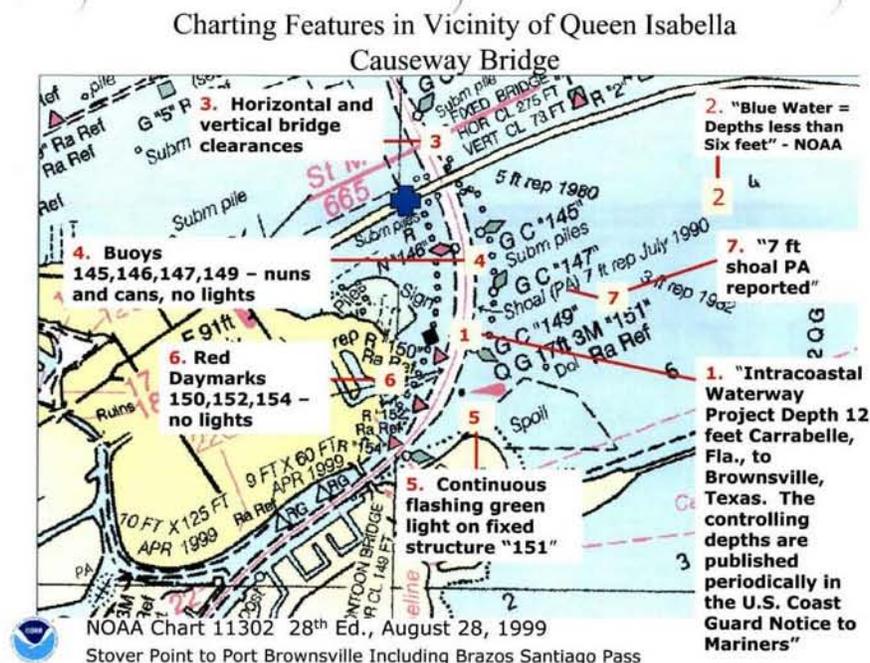
10.1 The channel from the Long Island Swing Bridge to the Queen Isabella Causeway Bridge has a project depth of 12 feet and a project width of 275 feet.

10.2 It contains nine Coast Guard aids to navigation. On the west side of the channel there are three red day markers: 154, 152, and 150, and a red floating 5 CPR can, aid 146. On the east side of the channel there are four green floating cans: 153, 149, 147, and 145, and a lighted fixed aid, 151. The cans are tethered by a 22-foot long half-inch chain and attached to thousand pound concrete sinkers. Aid 151 is a structure with a green flashing light on it. According to the U.S. Coast Guard Light List, all the aids are designated to be 50 feet outside of the surveyed channel limit unless otherwise noted. Aid to navigation 151 is noted as 70 feet outside the channel.

10.3 According to Nautical Chart 11302, aid to navigation 147 is approximately 240 feet outside of the channel. Historical research indicates it was moved to its present position in 1990.

10.4 The Coast Guard Aids to Navigation Team, South Padre Island, conducted a post-casualty survey of the relevant aids to navigation on September 15. The Aids to Navigation Team survey found that all the relevant Coast Guard aids were on station and watching properly.

10.5 The Army Corps of Engineers conducted a post-casualty channel survey (including areas outside of the channel) on September 15. The survey found the channel to be the proper depth and width and the aids to navigation, as displayed on the nautical chart, in their proper positions.



10.6 On September 25 the National Oceanic and Atmospheric Administration conducted a hydrographic survey of the channel between the Long Island Swing Bridge and the Queen Isabella Causeway Bridge. The results of the Army Corps of Engineers survey and the National Oceanic and Atmospheric Administration mirrored each other.

10.7 DWS International, Inc., a private survey firm engaged by Brown Water Marine, surveyed the channel between and around aid 147 and aid 149 on September 21. DWS accepted the National Oceanic and Atmospheric Administration findings as accurate.

11. The Queen Isabella Causeway Bridge Navigation Lights

11.1 In his September 15 written statement and during his September 17 taped interview, Captain Fowler stated that the Queen Isabella Causeway Bridge green channel centering lights were not working on the night of the casualty. He also stated that the red fender lights were working, indicating where the channel passed through the bridge.

11.2 The navigation lights marking the channel through and under the Queen Isabella Causeway Bridge consist of two 360-degree green centering lights hanging beneath the bridge in the center of the channel -- one on either side. There are also nine 180-degree red lights that are mounted on top of the fender system -- two each on the north and south fenders of the Port Isabel side, and two on the north side and three on the south side fenders of the South Padre Island side.

11.3 The Coast Guard has regulatory authority over the operation of the bridge navigation lights. The State of Texas is responsible for the physical maintenance and operation of the Queen Isabella Causeway Bridge green navigation lights and the red fender lights.

11.4 Captain Phillip Langley testified that the bridge navigation lights were not working when he transited the bridge northbound on the M/V *Bruce Bordelon* at 2045 the evening of September 14, five hours before the M/V *Brown Water V* made the transit. Captain Langley reported the lighting problem to the Port of Brownsville Harbormaster at 2110 on September 14. The State of Texas was not notified about this report.

11.5 Brown Water Marine provided written statements from eight people stating the bridge navigation lights were not working the night of the casualty.

11.6 On September 18, David Stuart Jenkins, Texas Department of Transportation, performed a post-casualty inspection of the bridge's two green navigation light fixtures. Chief Jeffrey Ingram, Officer in Charge of the Coast Guard Aids to Navigation Team, South Padre Island, was present during the inspection. The inspection indicated the filaments in all 12 bulbs (six in each fixture) were incapable of functioning at the time of the post-casualty inspection.

11.7 The state did not have a preventative maintenance program or program of routine bridge lighting inspections, so the exact date any or all of the navigation lights failed is not known. All the evidence leads to the conclusion the green navigation lights were not working prior to and during the casualty.

12. Weather Conditions

12.1 Time of sunrise: 0715
Winds: 068 degrees true at 3.5 meters per sec (about 6.8 knots) with gusts to 9.5 knots
Visibility: Clear
Precipitation: None
Fog: None
Tide: 2.19 feet above Mean Lower Low Tide at 0200 local time (incoming)

13. Currents Directions

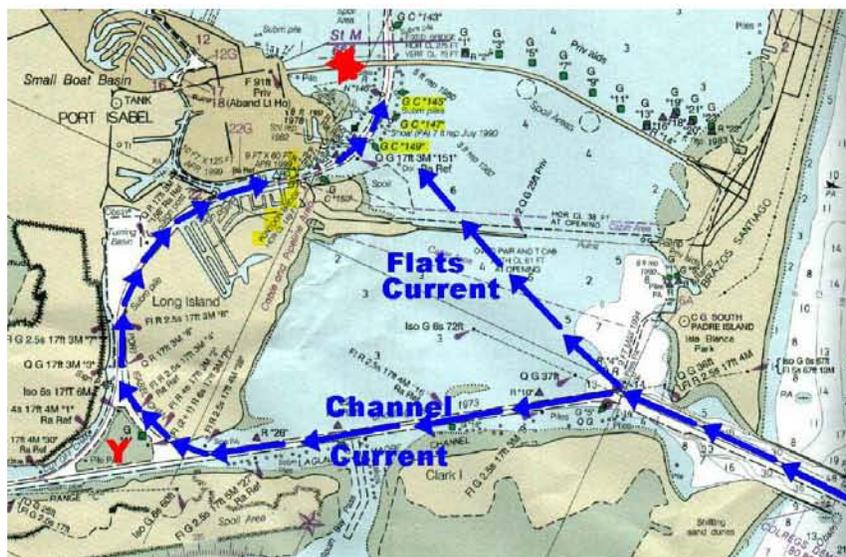
13.1 M/V *Brown Water V* Captain Rocky Wilson testified that his normal route took him through the Queen Isabella Causeway Bridge and that he was very knowledgeable with the area. He stated that at the time of the casualty the current was coming in from the Gulf of Mexico and moving across the flats almost directly from the southeast to the northwest. Captain Wilson also pointed out that the direction and strength of the current in the channel from the "Y" to the Long Island Swing Bridge is an indicator of how strong the flats crosscurrent is in the curve before the Queen Isabella Causeway Bridge. Captain Wilson indicated that if the current in the channel was strong and northbound, as it was on the morning of the casualty, he would set the tow to the starboard side of the curve because the flats current would be pushing against the starboard side of the barges.

13.2. On September 17, LT Robert Helton, the Senior Investigating Officer at Marine Safety Office Corpus Christi, and CWO Alan Grodecki, Supervisor of the Marine Safety Satellite Office in Brownsville, interviewed *Brown Water V* Captain David D. Fowler. Captain Fowler indicated that after exiting the Long Island Swing Bridge northbound in the curve before the Queen Isabella Causeway Bridge, the flats current was hitting his configuration on the starboard side.

13.3. *Brown Water V* deckhand Levie Old indicated in his written statement on the morning of the casualty that the current was coming across the flats almost directly from the southeast to the northwest.

13.4. The Coast Guard selected witness, Captain Alton Chadwick, was qualified as an expert witness by the Coast Guard and without objection from any of the Parties-in-Interest. Captain Chadwick explained that when the current comes in from the Gulf of Mexico, it runs southeast to northwest across the flats in the area of the casualty. He also pointed out that when this same current comes in from the Gulf, it also flows from south to north in the channel from the "Y", through the Long Island Swing Bridge, and into the curve before the Queen Isabella Causeway Bridge.

13.5 Two other licensed mariners and a marine engineer were present throughout the hearing. All three were familiar with the facts surrounding the casualty and with the waterway. All three were accepted as expert witnesses by the Coast Guard and without objection from any of the Parties-in-Interest. All agreed with Captain Alton Chadwick's explanation concerning the currents. The three were Captain Stephen (Mike) Wike of Hollywood Marine, present as a spectator throughout the hearing and used as an expert based on Captain Chadwick's personal knowledge of Captain Wike's towing experience and familiarity with the casualty area; Captain Ronald Yates, provided by Brown Water Marine; and marine engineer Captain Richard Silloway, provided by the State of Texas.



14. Current Speed at 0200 on September 15

14.1 Although exact current speeds were not available, the Coast Guard-provided expert witness, Captain Alton Chadwick, explained that the higher the tide in the area the stronger the currents. Captain Chadwick surmised the current at the time of the casualty was between four and five miles per hour.

14.2 Captain Nick Perugini, the Chief of the Marine Chart Division, National Oceanic and Atmospheric Administration, provided information that the tide was 2.19 feet above Mean Lower Low Tide at the time of the casualty. He also testified that there were three occasions in the six months prior to the casualty when the high tide exceeded 2.19 feet above Mean Lower Low Tide. The National Oceanic and Atmospheric Administration also provided information that the high tide was probably due to tropical storm Gabrielle in the Gulf of Mexico.

14.3 Captain Perugini explained that even though the National Oceanic and Atmospheric Administration maintained a tide and wind gauge at Port Isabel near the channel, it was not possible to accurately model current speeds for the morning of the casualty. This was so because the currents are controlled by the tides and the tides are a factor of the wind over an extended period.

14.4 M/V *Brown Water V* Captain David D. Fowler stated in his September 17 interview with LT Robert Helton, the Senior Investigating Officer at Marine Safety Office Corpus Christi, and CWO Alan Grodecki, Supervisor of the Marine Safety Satellite Office in Brownsville, that the current "... was running pretty hard."

14.5 Deckhand Levie Old, a member of the *Brown Water V* crew, stated that when he awoke after the allision, "It was flowing really good," at the time of the casualty and later, that the current was, "Real strong."

14.6 *Brown Water V* Captain Rocky Wilson, who was very experienced with the area of the casualty, stated that when he awoke immediately after the allision, the current was "The strongest I've seen it."

14.7 Chief Jeffrey Ingram, Officer in Charge of the Coast Guard Aids to Navigation Team, South Padre Island, when asked what the current was on scene the morning of the casualty stated, "It was running pretty good."

14.8 Senior Chief Paul Inskeep, Officer in Charge of the Coast Guard Cutter *Mallet* out of Corpus Christi, was on scene two and one-half hours after the casualty. When discussing the current he stated, "It was running very hard."

15. Setting Up for the Currents

15.1 During the September 17 taped interview with the Coast Guard, Captain Fowler indicated that he was surprised by the crosscurrent when he entered the curve near the bridge. He also indicated that he would have set up his approach to the curve differently had he known a crosscurrent was present.

15.2 Captain Alton Chadwick, the Coast Guard-selected expert witness, testified that the crosscurrent at the curve before the Queen Isabella Causeway Bridge could be predicted by judging the channel current when transiting from the "Y" to the Long Island Swing Bridge. He also stated that, "In my opinion, anybody that runs in there ought to know which way that current's running."

15.3 On the first day of the hearing, Rocky Wilson, Captain of the *M/V Brown Water V*, testified generally about his experience in the area of the "Y" and the "S" curve. He testified specifically about the importance of knowing the currents prior to entering the curve before the Queen Isabella Causeway Bridge. Captain Wilson indicated he not only checked the "tails" coming off the beacons but also called the Long Island Swing Bridge operator to determine the currents before he entered the curve. Captain Wilson indicated that he couldn't understand anybody transiting the curve from the Long Island Swing Bridge to the Queen Isabella Causeway Bridge without knowing what the currents were, because "If you didn't set up right, you could lose it in there" (referring to the curve before the Queen Isabella Causeway Bridge).

15.4 The *M/V Bruce Bordelo* transited the Queen Isabella Causeway Bridge at 2245 the evening prior to the allision. Captain Langley was called as a witness to provide information on the bridge lighting on the night of the casualty. Once it was determined that Captain Langley had been operating towboats through the area for the five previous years, he was questioned about the currents in the area of the bridge. Captain Langley testified that he tried to get all the information he could concerning the current prior to entering the curve before the Queen Isabella Causeway Bridge. He did such things as questioning other vessels that had recently transited the area and calling the Long Island Swing Bridge operator to get an opinion on the currents. He stated that he did this because, "Some people think it's not vital, but you try to cover all your bases."

15.5 Although there is a tide and wind gauge in close vicinity to the channel between the "Y" and the Long Island Swing Bridge, there are no current meters in the area.

16. The Coast Guard-Requested Expert Assistance

16.1 Following the presentation of all of the evidence, the Coast Guard-selected witness, Captain Alton Chadwick, a mariner familiar with the area and the facts surrounding the casualty, took the witness stand. The Coast Guard requested Captain Chadwick's analysis as to the circumstances surrounding the casualty.

16.2 To help explain his opinion, Captain Chadwick used a magnified section of Nautical Chart 11302 marked with the depths of water in feet at the time of the casualty. These charts were provided by the National Oceanic and Atmospheric Administration and covered the area between the Long Island Swing Bridge and the Queen Isabella Causeway Bridge, including between aids 149 and 147, the area where Captain Fowler stated he bumped bottom.

16.3 On day three of the formal hearing, Captain Chadwick presented his professional opinion regarding the apparent cause of the casualty. Because of Captain Chadwick's use of demonstrative evidence such as chart blow-ups and to-scale visual aids, it was determined that typed transcripts would be insufficient to explain his presentation. On day four, in order to properly preserve his presentation for future review, Captain Chadwick repeated this presentation. At the Coast Guard's request, Channel 10, KZTV, Corpus Christi, attended Captain Chadwick's day-four presentation and preserved his testimony on a 30-minute videotape. This videotape was provided to the Coast Guard as a public service. (Enclosure (18)).

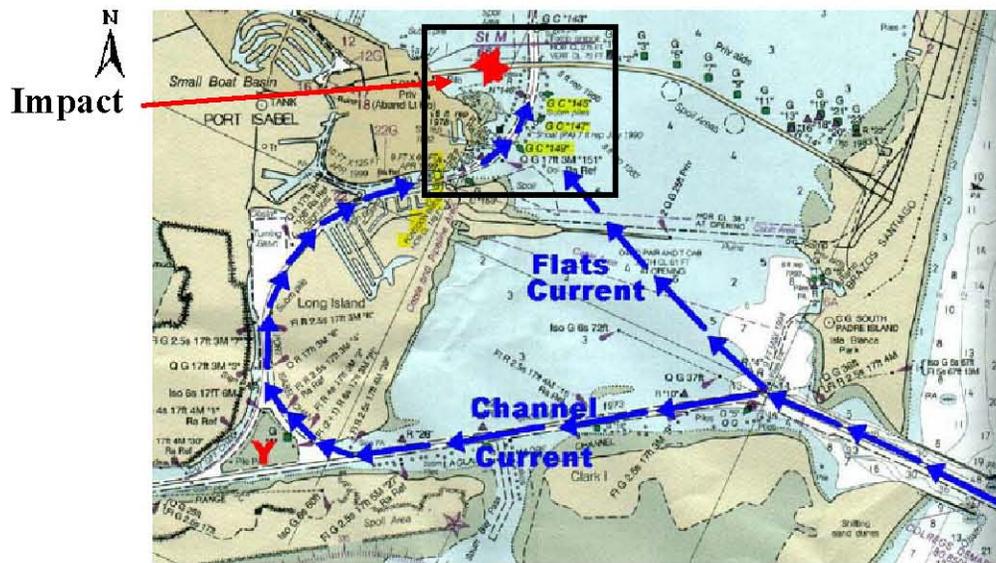
16.4 Captain Ronald Yates, a towing vessel operator and marine consultant, Captain Richard Silloway, a forensic marine engineer, and Captain Stephen (Mike) Wike, a towing vessel operator, were subsequently qualified and accepted as expert witnesses by the Coast Guard at the formal hearing. All three agreed with Captain Chadwick's opinion regarding the apparent cause of the casualty.

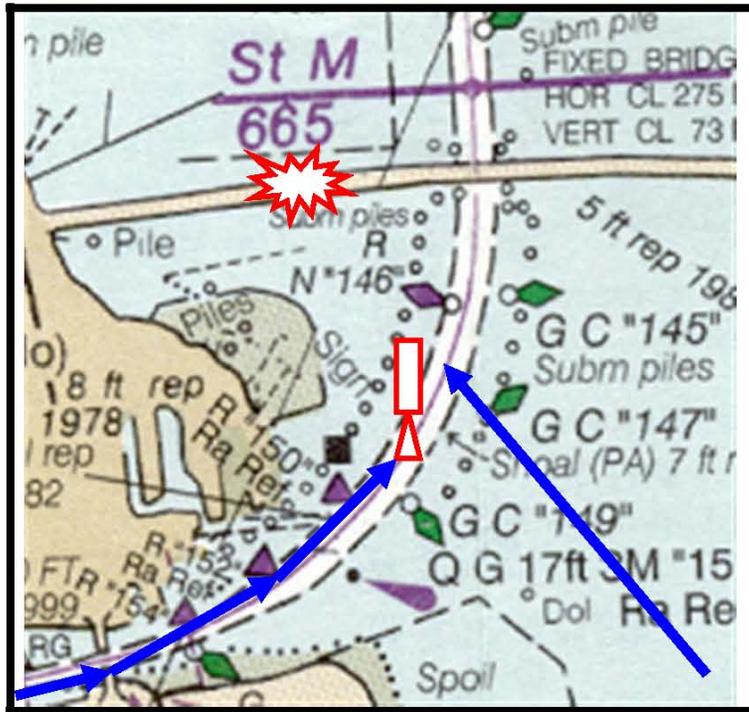
16.5 A synopsis of the consensus opinion follows:

The M/V *Brown Water V* and its tow, transiting east in the Brownsville Ship Channel with Captain Fowler at the helm, turned north into the "Y" at the south end of the "S" curve between the mainland and Long Island. Captain Fowler did not recognize that the channel current from the "Y" to the Long Island Swing Bridge was running hard at the time. The speed of the channel current was a direct indicator of the speed and force of the flats crosscurrent that the M/V *Brown Water V* and its tow were soon to enter.

The M/V *Brown Water V* and its tow continued northbound through the Long Island Swing Bridge into the curve between the Long Island Swing Bridge and the Queen Isabella Causeway Bridge. The vessel and its tow were being pushed from behind in an east to northeast direction by the "hard running" channel current.

As the head of the tow passed Long Island and neared aid 149, the flats current began working on it. The vessel and tow were now being affected by two separate currents -- a channel current pushing the stern of the tow from behind in a northeast direction, and a flats crosscurrent pushing the head barge northwest. As the 851-foot long vessel and tow configuration continued past Long Island and further into the flats crosscurrent, more of the configuration was affected, and the head of the tow began swinging to port. The head of the tow continued swinging northwest in response to the increasing effect of the flats crosscurrent, while the stern of the towboat continued to be pushed northeast by the channel current. This swinging action pivoted the stern of the *Brown Water V* into the shallows on the east side of the channel near aid 149. Whether or not the towboat bumped bottom, this pivoting action had taken control of the configuration and the flats crosscurrent swept the configuration west, out of the channel and into the bridge.





Inset

17. Coast Guard-Requested Expert Remedial Suggestions

17.1 Once it was known the experts had a consensus opinion concerning the cause of the casualty, the Coast Guard requested the four to provide suggested remedial actions.

17.2 Below are the experts' verbatim recommendations:

RECOMMENDED PERMANENT SOLUTIONS

- 1 - Install a tidal current meter and warning signs. Exact locations of each were not recommended.
- 2 - Widen the GICW channel between the Long Island Pontoon (Swing) Bridge and the Queen Isabella Causeway to allow a larger margin for error when towing vessels transit that turn.
- 3 - USCG or ACOE to mandate channel closings during extreme current conditions - As indicated by proposed tidal current meter.
- 4 - Install moorings or dolphins in Port Isabel (between Long Island and Port Isabel proper) and north of the Queen Isabella Causeway. These would serve the purpose of mooring or tripping tows when extreme tidal currents exist.
- 5 - Install "allision prevention cells" on the east and west sides of both the northern and southern GICW channel approaches. These would be large concrete barriers (similar to concrete fendering system currently being used) and should be placed in an area where a towing vessel could reasonably be expected to cross the flats in an unloaded condition at extreme high tide.

RECOMMENDED SHORT TERM SOLUTIONS

- 1 - Limit tow length on eastbound, night time transits of the turn between Long Island Swing Bridge and Queen Isabella Causeway. This measure would be lifted when a permanent solution is applied.
- 2 - Similar to warning sign recommendation listed in #1 above. These signs could be installed relatively soon and would serve as an interim warning to mariners.

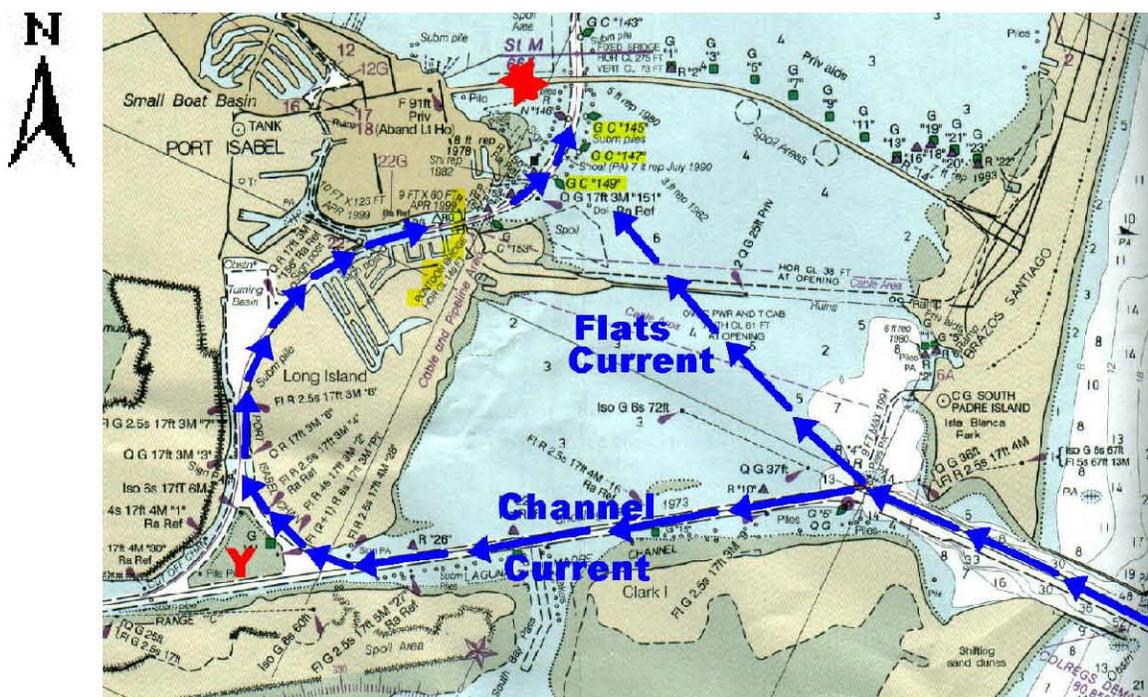
Analysis

Early Saturday morning, September 15, 2001, with Captain Fowler at the helm, the M/V *Brown Water V* and its tow entered the "Y" at the south end of the "S" curve between the mainland and Long Island. Captain Fowler did not know the channel current in the "S" curve was running hard at the time.

At or near 0145 on Saturday, September 15, 2001, the M/V *Brown Water V* and its tow continued northbound through the Long Island Swing Bridge into the channel between the Long Island Swing Bridge and the Queen Isabella Causeway Bridge. The vessel and its tow were being pushed in an east to northeast direction by the "hard running" channel current. The speed of the channel current is a direct indicator of the speed and force of the flats crosscurrent that the M/V *Brown Water V* and its tow were about to enter.

As the head of the tow passed Long Island and the spoil area east of the island and neared aid 149, the flats current began working on it. The vessel and tow were now being affected by two separate currents -- a hard running channel current pushing the entire configuration northeast and a flats current pushing the head barge northwest. As the 851-foot long vessel and tow configuration sailed past the current-sheltering island and spoil area, the intruding flats crosscurrent increased its effect, and the head of the tow began swinging to the port. Because Captain Fowler was not aware of the crosscurrent and had not "set up for it," the converging currents overwhelmed the configuration.

The head of the tow continued swinging northwest in response to the increasing effect of the flats crosscurrent, while the stern of the towboat continued to be pushed northeast by the channel current. This swinging action may have pivoted the stern of the *Brown Water V* into the shallows on the east side of the channel near aid 149, and the stern of the vessel may have bumped bottom. Whether or not the towboat bumped bottom, the configuration was past the point-of-no-return when Captain Fowler failed to set up for the flats current as he exited the Long Island Swing Bridge. The vessel and its tow were swept west of the channel and into the bridge.



Captain Fowler stated that he was in the channel when he bumped bottom. If the *Brown Water V* bumped bottom, the vessel was not in the channel at the time. The *Brown Water V*'s draft was 8' 6", and there was no place in the channel that was less than 12 feet deep. It is likely when Captain Fowler stated he was in the channel, he meant he was between the red and the green aids to navigation. The red and green aids to navigation do not define the edge of the channel.

Although the green channel centering lights beneath the bridge were not working at the time of the casualty, because the red fendering lights were working, Captain Fowler knew where the channel under the bridge was. Primarily though, when Captain Fowler lost control of the configuration, he was not lining up to center the vessels under the bridge. He was trying to make the bend in the channel and was using Coast Guard aids as reference points. Because he knew where the channel passed under the bridge and because he was not to the point of trying to pass under the bridge when he lost control, the green channel centering lights were not a cause or contributing cause to this casualty.

The current was a factor in this casualty but not a contributing cause. Although an exact current speed was not available for the time of the casualty, it was "running hard." Scientific evidence indicates that the current speed had equaled or surpassed that of the morning of September 15 on three occasions in the previous six months. Mariners on the witness stand testified to the methods they used to gauge the tide and current in the "S" curve prior to entering the bend before the Queen Isabella Causeway Bridge. The current was foreseeable by a prudent mariner, and the casualty was not inevitable. "An accident is said to be 'inevitable' not merely when caused by...(an)...Act of God, but also when all precautions reasonably to be required have been taken, and the accident has occurred notwithstanding." Decision of the Vice Commandant on Appeal, United States Coast Guard, 2217, Michael Hugh Quinn.

The Queen Isabella Causeway Bridge was completed on October 7, 1974. Six years after the bridge was completed, Army Corps of Engineers Publication Number EM 1110-2-1611, titled "Engineering and Design - Layout and Design of Shallow-Draft Waterways," stated:

Numerous accidents involving collision with bridge piers have occurred on inland waterways with considerable damage to property and, in some cases, loss of life. It is important, therefore, that the location and orientation of bridges and clearances provided for navigation be such as to eliminate as far as practicable any danger of collision with the bridge structure. As a general rule, bridges should not be located in a bend, just downstream of a sharp bend, or where crosscurrents can be expected. When more than one bridge is required in a given locality, the bridges should either be close together with the piers in line or far enough apart to permit tows passing one bridge to become properly aligned for passage through the next bridge (Enclosure (26), paragraph 4-12).

For northbound Intracoastal Waterway traffic, with an incoming tide, the Queen Isabella Causeway Bridge is just downstream of a bend and where crosscurrents can be expected. This location obviously contravenes the above-quoted Army Corps advice. While this casualty was caused by the failure to set up properly, mechanical failures such as a loss of steering or loss of power could result in a similar catastrophe anytime the current is running hard and despite the degree of care exercised by the vessel's operator.

Conclusions

1. The equipment on the *Brown Water V* did not contribute to the casualty. The propulsion and steering systems functioned as designed.
2. The two green navigation channel centering lights beneath the Queen Isabella Causeway Bridge were not lit during the time leading up to the casualty. The unlit green navigation lights did not contribute to the casualty.
3. The *Brown Water V* was capable of handling the tow as configured and the configuration did not contribute to the casualty.
4. The *Brown Water V* had sufficient horsepower to safely navigate through the Long Island Swing Bridge and the Queen Isabella Causeway Bridge if suitable precautions had been undertaken prior to entering the bend.
5. The Coast Guard aids to navigation were on station and watching properly at the time and did not contribute to the casualty.
6. The channel was the proper depth and width as charted at the time and did not contribute to the casualty.
7. The channel between the Long Island Swing Bridge and the Queen Isabella Causeway Bridge is subject to crosscurrents and can be subject to hard running crosscurrents. The bend in the channel is in close proximity to the Queen Isabella Causeway Bridge. Either of these, by themselves, could cause a problem; both together could increase the problem.
8. As a licensed operator, Captain Fowler was responsible for ascertaining that his vessel could safely traverse the planned route. This included knowledge of the state of the currents. See, i.e., Commandant's Decisions on Appeal Nos. 2379 (DRUM) and 2367 (SPENCER). Captain Fowler took no steps to determine the conditions, especially the current and crosscurrent, prior to proceeding into the bend.

Apparent Cause

The apparent cause of this casualty was Captain David D. Fowler's failure to exercise reasonable care according to the standards of the ordinary practice of good seamanship.

There were no contributing causes to this casualty.

Recommendations

1. Due to the proximity of the Queen Isabella Causeway Bridge to a bend and a crosscurrent, I recommend that the Eighth Coast Guard District distribute this report to area agencies and entities for review and possible bridge protection action. (Perhaps along the lines of the protection provided for Florida's Sunshine Skyway Bridge over Tampa Bay following the 1980 bridge collision resulting in multiple loss of life.) (Enclosure (45)).
2. I recommend that the Officer in Charge, Marine Inspections, Corpus Christi, review this report for possible civil penalty action against deckhand J.W. Blocker for intoxicated operation due to his positive marijuana drug screen.
3. I recommend that the Officer in Charge, Marine Inspections, Corpus Christi, review this report for possible Suspension and Revocation action against the Coast Guard-issued License Number [REDACTED], held by David D. Fowler.
4. I recommend that the Eighth Coast Guard District review this report for possible criminal action against David D. Fowler.