



# UNITED STATES COAST GUARD

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## REPORT OF INVESTIGATION INTO THE CIRCUMSTANCES SURROUNDING THE INCIDENT INVOLVING M/Y ELAINE G COLLISION

ON 07/15/2001



MISLE ACTIVITY NUMBER: 1476414  
ORIGINATING UNIT: MSO LOUISVILLE  
MISLE CASE NUMBER: 83605



16732

SEP - 4 2008

**FORMAL INVESTIGATION INTO THE COLLISION BETWEEN THE TOW OF THE  
M/V ELAINE G AND A RECREATIONAL VESSEL (KENTUCKY REGISTRATION  
NUMBER KY 7808 PP) AT APPROXIMATELY MILE MARKER 568 ON THE OHIO RIVER  
ON JULY 15, 2001, WITH 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.

**ACTION ON RECOMMENDATIONS**

Recommendation 1: It is recommended that the Coast Guard initiate legislation and/or regulations to require uninspected towing vessels to maintain vessel logs.

Action: We do not concur with this recommendation. As noted by the District Commander, log-keeping requirements found in 46 USC 11301, which only apply to inspected vessels, do not include requirements to include entries for events identified by the Investigating Officer. As such, initiating a change to the law so that uninspected towing vessels are required to maintain a vessel log does not address the problems with identifying the timing of events as desired by the Investigating Officer.

Recommendation 6: It is recommended that owners of fiberglass and wooden recreational boats using commercially navigable waterways be encouraged through unit web pages, newsletters, the Coast Guard Auxiliary, and other boating safety education and outreach programs to install radar reflective devices on their vessels.

Action: We concur with this recommendation. We have encouraged owners of fiberglass and wooden recreational boats to install radar reflective devices on their vessels in the past via multiple means, including publication in our Boating Safety Circular 81, and will continue to encourage their installation and use.

Recommendation 8: It is recommended that, upon final review and acceptance, a copy of this report be provided to all Parties in Interest. In addition, this report should be made available to interested parties, especially the families of the victims, via G-MOA and Marine Safety Office Louisville websites.

Action: We concur with this recommendation. A copy of the report will be provided to all Parties in Interest and to the next of kin of the victims. In addition, this report will be presented to the National Boating Safety Advisory Council (NBSAC) and Towing Safety Advisory Committee (TSAC).

Recommendation 9: It is recommended that this investigation be closed.

Action: We concur with this recommendation. The investigation is closed.


Commanding Officer, Marine Safety Office Louisville, Recommendation 1: I recommend a review of the curriculum of Coast Guard-approved radar observer courses with a view toward ensuring that the following items are addressed: (1) tuning the radar for optimum effectiveness; (2) radar blind spot; (3) radar clutter or ghosting; and (4) the meaning of the Inland Navigation Rules 6(b), 7(b) and 7(c).

Action: We do not concur with this recommendation. We believe the current Radar Observer (Rivers) course and other marine training requirements are sufficient. The curriculum of Radar Observer (Rivers) courses, as specified in 46 CFR 10.305, already covers rules of the road and operational use of radar systems, including tuning, blind spots and clutter and/or ghosting. Testing on the rules of the road is also part of the initial licensing examination. In addition, towing vessel officers qualifying in accordance with new regulatory standards are required to complete a towing officer's assessment record (TOAR) that includes demonstration and assessment of their competence with the rules of the road.

Commanding Officer, Marine Safety Office Louisville, Recommendation 2: I concur with Conclusion 6; additionally, it is worth noting that the sides of the tow of the M/V ELAINE G were lighted with illuminated panels at each barge coupling. These optional lights are occasionally used on tows on the river system to increase visibility of the tow's profile between the navigation lights at the head of the tow and the navigation lights on the towboat. These lighted panels are only visible if the tow presents a side aspect to the viewer, and were likely not visible to the occupants of the recreational vessel as the M/V ELAINE G approached. Still, having observed these lights on passing tows at night, I consider them a worthwhile investment in safety. I therefore recommend that the Coast Guard propose to the Towing Safety Advisory Committee that other towing operators be encouraged to use similar devices, and propose to the American Waterways Operators that use of similar devices be required as a condition of compliance with the Responsible Carrier Program.

Action: We concur with this recommendation. At its spring 2003 meeting, the Towing Safety Advisory Committee (TSAC) formed a working group, originally called the "Barge Lighting Working Group" but subsequently renamed the "Commercial/Recreational Boating Interface Working Group", based on a 2003 port and waterway safety assessment (PAWSA) conducted in Louisville, KY. Among other things, this working group was tasked with studying all available assessment data to consider the adequacy of the navigation lighting currently required on barge tows and recreational boats, and to specifically consider the benefits & disadvantages of requiring supplemental marker lights at each barge coupling along the outboard sides of the tow.

This working group is currently ongoing and reports on its efforts to date can be found in the minutes of the TSAC meetings, available on the Coast Guard's Homeport Internet site (<http://homeport.uscg.mil/tsac>).

  
W. D. RABE  
U.S. Coast Guard  
Chief, Investigations Division  
By direction of the Commandant

moa  
16732  
March 11, 2003

SECOND ENDORSEMENT on Investigating Officer's memorandum 16732 of 16 Jan 2003

From: D. F. RYAN II  
CGD EIGHT (m)  
To: COMDT (G-MOA)

Subj: FORMAL INVESTIGATION INTO THE ALLEGED COLLISION BETWEEN THE TOW OF THE M/V ELAINE G AND A RECREATIONAL VESSEL (KENTUCKY REGISTRATION NUMBER KY 7808 PP) AT APPROXIMATELY MILE MARKER 568 ON THE OHIO RIVER ON JULY 15, 2001, WITH MULTIPLE LOSS OF LIFE

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1. Forwarded recommending approval. I concur with the Investigating Officer's conclusions and recommendations with the following exceptions and supporting statements.
2. I do not agree with recommendation #1 from the perspective that requiring an uninspected towing vessel to maintain a logbook in accordance with the current statutes outlined by Chapter 113 of Title 46, United States Code Annotated, would help the Coast Guard in the matter of marine casualty investigations. For those vessels to which the Code does apply, there are no specific entry requirements for watch relief, crew schedules, weather conditions, vessel contacts, and many other events that would be beneficial to a marine casualty investigation. The intent of the recommendation is noteworthy but is well beyond the scope of current logbook requirements for vessels.
3. I agree with intent of recommendation #2 and will forward a copy of this case to the Eighth District Recreational Boating Safety Officer for review.
4. Although I agree with the intent to initiate civil penalty action against violators of the Inland Navigation Rules as suggested by recommendations # 3 & #4, I do not believe that it should be conducted in a manner that is more aggressive than normal operations.
5. To help facilitate the partnerships mentioned in recommendation #5 and the information outreach mentioned in recommendation #6, I will forward a copy of this case to the Eighth District Director of Auxiliary Operations and to each Eighth District Marine Safety Office.
6. I strongly believe that the master and the pilot were negligent for failing to maintain a proper lookout as required by Rule #5 on the Inland Navigation Rules. The M/V ELAINE G was transiting the Ohio River with a barge tow of approximately 1000 feet in a weather state of restricted visibility due to fog. Witness testimony from the formal hearing infers that the operators could not see the river banks (approximately 1000 feet to either side of the tug), nor any farther than the bow of the lead barge (approximately 1000 feet from the wheelhouse). Despite this extremely restricted visibility, the operators chose to continue underway rather than pull to the side. Also, they chose not to post a lookout on the bow of the lead barge. I have

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directed MSO Louisville to initiate S&R administrative action against the Coast Guard licenses held by both.

7. The Commanding Officer of MSO Louisville made two additional recommendations in his endorsement of this case report. I agree with both recommendations. Further, I recommend that his first recommendation (regarding the approved radar observer courses) be forwarded to the National Maritime Center for review, and the second recommendation be forwarded to TSAC for review.

8. I recommend that this investigation be closed.

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Copy: CGD EIGHT (oax) (case report and endorsements w/o enclosures)  
CGD EIGHT (osr) (case report and endorsements w/o enclosures)  
All Eighth District MSOs (case report and endorsements w/o enclosures)

FIRST ENDORSEMENT on Investigating Officer's memo 16732 of 16 January 2003

From: T. D. Gilbreath, CDR  
CO, CG MSO Louisville  
To: COMDT (G-MOA)  
Thru: CGD EIGHT (m)

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1. Forwarded recommending approval. I concur with the Investigating Officer's conclusions and recommendations, with the following amplifying comments.
  
2. I concur with conclusion 3.e regarding the functioning of the M/V ELAINE G's radars; however, I am concerned that the apparent lack of understanding of the limitations of the radar sets and the extent of the radar blind spot forward of the tow may not be limited to the two licensed operators of the M/V ELAINE G (see analysis 1.d and 2.a) but may be indicative of a widespread problem among masters and operators of uninspected towing vessels on the Western Rivers. It is apparent to me that, despite having completed Coast Guard approved radar observer courses, neither of the M/V ELAINE G's licensed operators fully understood the need for and means of adjusting the radar sets for optimum effectiveness in varying atmospheric conditions, nor did they appear to appreciate the length of the radar blind spot or the deleterious effect of the radar clutter (ghosting) on the radar's ability to detect a small contact forward of the tow. It appears that the operators of the M/V ELAINE G placed undue confidence in the capability of the vessel's radars to allow them to operate safely in heavy fog. I recommend a review of the curriculum of Coast Guard-approved radar observer courses with a view toward ensuring that the following items are addressed: (1) tuning the radar for optimum effectiveness; (2) radar blind spot; (3) radar clutter or ghosting; and (4) the meaning of the Inland Navigation Rules 6(b), 7(b) and 7(c).
  
3. I concur with Conclusion 6; additionally, it is worth noting that the sides of the tow of the M/V ELAINE G were lighted with illuminated panels at each barge coupling. These optional lights are occasionally used on tows on the river system to increase the visibility of the tow's profile between the navigation lights at the head of the tow and the navigation lights on the towboat. These lighted panels are only visible if the tow presents a side aspect to the viewer, and were likely not visible to the occupants of the recreational vessel as the M/V ELAINE G approached. Still, having observed these lights on passing tows at night, I consider them a worthwhile investment in safety. I therefore recommend that the Coast Guard propose to the Towing Safety Advisory Committee that other towing operators be encouraged to use similar devices, and propose to the American Waterways Operators that use of similar devices be required as a condition of compliance with the Responsible Carrier Program.

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4. I recommend this investigation be closed.

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U.S. Department  
of Transportation

United States  
Coast Guard



Commanding Officer  
United States Coast Guard  
Marine Safety Office

600 Martin Luther King, Jr. Place  
Louisville, KY 40202-2230  
Staff Symbol: PSS  
Phone: (502) 582-5194, ext. 25  
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Email:

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## MEMORANDUM

From: LT [REDACTED] USCG  
Investigating Officer

Reply to Port Safety and Security  
Attn of: LT [REDACTED]  
502-582-5194

To: COMDT (G-MOA)  
Thru: (1) **Commanding Officer**, CG MSO Louisville  
(2) CGD EIGHT (m)

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### PRELIMINARY STATEMENT

A one man formal investigation was convened by the Commander, Eighth Coast Guard District to investigate the alleged collision on July 15, 2001 between the tow of the M/V ELAINE G and a recreational vessel with Kentucky registration number KY 7808 PP that resulted in the deaths of all six occupants aboard the recreational vessel. The Coast Guard held a public hearing in Louisville, Kentucky, on July 25 and 26, 2001. During the hearing, eight witnesses were called and 108 exhibits were entered into the record. At the conclusion of the hearing, the investigation was held open to receive additional items of evidence. A total of 141 exhibits were ultimately received into evidence. The investigation was formally closed on October 19, 2001. Midland Enterprises, Inc. as the owner of the M/V ELAINE G (O.N. D501444) and involved barges, The Ohio River Company as the operator of the ELAINE G and involved barges, and Mr. Terry M. Graham as the Master of the M/V ELAINE G at the time of the incident, were designated as Parties in Interest and accorded all rights thereto. During the hearing, an attorney representing the next of kin of one of the victims requested to be designated as a Party in Interest, this request was denied. A Court Reporter was present during all witness testimony, and a verbatim transcript of all witness testimony was produced. This transcript was made available to all Parties in Interest.

### FINDINGS OF FACT

#### 1. SUMMARY

On July 15, 2001 at 0525, the M/V ELAINE G (O.N. D501444), a 151-foot uninspected towing vessel, was downbound on the Ohio River at approximate river mile 568 pushing 14 empty hopper barges. The Master of the vessel notified United States Coast Guard Group Ohio Valley that he possibly heard a person in the water. Subsequent investigation by Marine Safety Office Louisville, Indiana Department of Natural Resources, and local agencies resulted in the recovery of a 17 foot recreational vessel, which was found awash on July 18, 2001, and the bodies of six



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victims, found between July 16 -18, 2001. Marks discovered on the bow rake of the center lead barge, OR 2110, and damage to the recreational vessel is consistent with a collision between the two vessels.

There is no evidence that any other vessel was involved in this accident.

\* All times as Eastern Daylight Time

### VESSEL AND CARGO DATA

#### 2. Tabulated Data on the M/V ELAINE G:

Name	ELAINE G
Official Number	D501444
Service	Uninspected Towing Vessel
Flag	United States
Owner	Midland Enterprises, Inc.
Classification Society	N/A
Build Date	1965
Builder	Dravo Corp., Neville Island, PA
Gross Tonnage	652
Net Tonnage	442
Length	151.0 Feet
Breadth	40.0 Feet
Depth	8.6 Feet
Bridge to Bow Distance	12 Feet
Propulsion	Twin Screw
Engines	F-M 38D8 1/8 Diesel
Horsepower	4320

#### 3. Narrative Description of the M/V ELAINE G:

The M/V ELAINE G is a 31 year old, 151-foot, uninspected towing vessel engaged in pushing open and covered hopper barges on the Ohio River. This vessel's primary route is from Pittsburgh, Pennsylvania, to Louisville, Kentucky, and return. The vessel picks up and drops off barges at various power plants and fleets between Pittsburgh and Louisville. The vessel is equipped with standard navigational equipment including two radars and two VHF radios. Both radars are 2070 BT models manufactured by Racal-Decca. The starboard radar was serviced on May 20, 2001, at which time the video and memory boards were cleaned and colors were adjusted. The port radar was serviced on May 20 and July 1, 2001. Maintenance on the port

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radar included replacing the HLRC board, repairing cables, replacement of resistors, and routine color adjustments. Radars are located on the port and starboard side of the helm, respectively. Radars are visible to the operator sitting or standing at the helm, but require the operator to turn slightly to port or starboard and look down to adequately view either radar display.

4. Tabulated Data for Barges in the tow of the ELAINE G: (taken from information on vessels' Certificate of Documentation).

Name	OR 3580
Official Number	D568929
Owner	Midland Enterprises, Inc
Operator	The Ohio River Company
Type of barge	Open Hopper
Type of bow	Raked
Length	195.0 Feet
Breadth	35.0 Feet
Depth	12.0 Feet
Gross Tonnage	703.79
Draft on 15 July 2001	1.5 Feet
Cargo	Empty

Name	OR 3677
Official Number	D602752
Owner	Midland Enterprises, Inc.
Operator	The Ohio River Company
Type of barge	Open hopper
Type of bow	Raked
Length	195.1 Feet
Breadth	35.0 Feet
Depth	11.0 Feet
Gross Tonnage	779.21
Cargo	Empty

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<b>Name</b>	<b>OR 3689</b>
Official Number	D602764
Owner	Midland Enterprises, Inc.
Operator	The Ohio River Company
Type of Barge	Open Hopper
Type of bow	Raked
Length	195.1 Feet
Breadth	35.0 Feet
Depth	11.0 Feet
Gross Tonnage	779.0
Cargo	Empty

<b>Name</b>	<b>OR 3705</b>
Official Number	D610308
Owner	Midland Enterprises, Inc.
Operator	The Ohio River Company
Type of barge	Open hopper
Type of bow	Raked
Length	195.1 Feet
Breadth	35.0 Feet
Depth	11.0 Feet
Gross Tonnage	779.21
Cargo	Empty

<b>Name</b>	<b>OR 3779</b>
Official Number	D628434
Owner	Midland Enterprises, Inc.
Operator	The Ohio River Company
Type of barge	Open hopper
Type of bow	Raked
Length	195.1 Feet
Breadth	35.0 Feet
Depth	10.7 Feet
Gross Tonnage	794.52
Cargo	Empty

<b>Name</b>	<b>OR 4788</b>
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Official Number	D942056
Owner	Midland Enterprises, Inc.
Operator	The Ohio River Company
Type of barge	Open hopper
Type of bow	Boxed
Length	195.0 Feet
Breadth	35.0 Feet
Depth	12.0 Feet
Gross Tonnage	687.0
Cargo	Empty

<b>Name</b>	<b>OR 5540</b>
Official Number	D1107888
Owner	Midland Enterprises, Inc.
Operator	The Ohio River Company
Type of barge	Open hopper
Type of bow	Raked
Length	200 Feet
Breadth	35.0 Feet
Depth	13.3 Feet
Gross Tonnage	782.00
Cargo	Empty

<b>Name</b>	<b>T13522B</b>
Official Number	D1032930
Owner	Midland Enterprises, Inc.
Operator	The Ohio River Company
Type of barge	Open hopper
Type of bow	Boxed
Length	200.0 feet
Breadth	35.0 Feet
Depth	13.0 Feet
Gross Tonnage	764.0
Cargo	Empty

<b>Name</b>	<b>T13571B</b>
Official Number	D1032979

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Owner	Midland Enterprises, Inc.
Operator	The Ohio River Company
Type of barge	Open hopper
Type of bow	Boxed
Length	200.00 Feet
Breadth	35.0 Feet
Depth	13.0 Feet
Gross Tonnage	764.00
Cargo	Empty

<b>Name</b>	<b>T13607B</b>
Official Number	D1039550
Owner	Midland Enterprises, Inc.
Operator	The Ohio River Company
Type of barge	Open hopper
Type of bow	Boxed
Length	200.00 Feet
Breadth	35.0 Feet
Depth	13.0 Feet
Gross Tonnage	764
Cargo	Empty

<b>Name</b>	<b>OR 3766</b>
Official Number	D625904
Owner	Midland Enterprises, Inc
Operator	The Ohio River Company
Type of barge	Open hopper
Type of bow	Raked
Length	195.1 Feet
Breadth	35.0 Feet
Depth	10.7 Feet
Gross Tonnage	794
Draft on 15 July 2001	1.5 Feet
Cargo	Empty

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<b>Name</b>	<b>OR 2110</b>
Official Number	D646934
Owner	Midland Enterprises, Inc.
Operator	The Ohio River Company
Type of barge	Open hopper
Type of bow	Raked
Length	195.1 Feet
Breadth	35.0 Feet
Depth	10.7 Feet
Gross Tonnage	867.86
Draft on 15 July 2001	1.5 Feet
Cargo	Empty

<b>Name</b>	<b>OR 3579</b>
Official Number	568928
Owner	Midland Enterprises, Inc.
Operator	The Ohio River Company
Type of barge	Open hopper
Type of bow	Raked
Length	195.0 Feet
Breadth	35.0 Feet
Depth	12.0 Feet
Gross Tonnage	703.79
Draft on 15 July 2001	1.5 Feet
Cargo	Empty

<b>Name</b>	<b>T13534B</b>
Official Number	1032942
Owner	Midland Enterprises, Inc.
Operator	The Ohio River Company
Type of barge	Open hopper
Type of bow	Boxed
Length	200.0 Feet
Breadth	35.0 Feet
Depth	13.0 Feet
Gross Tonnage	13.0 Feet
Draft on 15 July 2001	1.5 Feet
Cargo	Empty

5. Summary of the ELAINE G's tow arrangement on the morning of July 15, 2001:

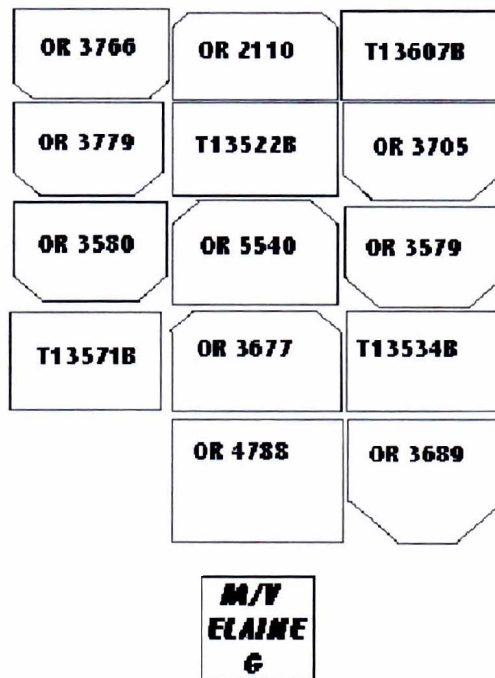
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The M/V ELAINE G's tow consisted of 14 empty hopper barges arranged in a 3 wide x 5 long configuration with an open space on the port string closest to the towboat. All barges were empty and the overall draft of the tow, excluding the M/V ELAINE G, was approximately 1.5 feet. The depth of the barges in the tow ranged from 10.7 to 13.3 feet and their length ranged from 195 to 200 feet. The port lead barge, OR 3766, had the raked end turned to the rear, the center lead barge, OR 2110, had the raked end facing forward, and the starboard lead barge, T13607B, was boxed. The overall length of the tow, excluding the M/V ELAINE G, was 998 feet (see Figure 1).

Figure 1  
 TOW DIAGRAM

(Head of Tow)



6. Tabulated Data for Recreational Vessel KY registration Number KY 7808 PP:

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Name	N/A
Registration Number	KY 7808 PP
Year	1987
Make	Wellcraft 180
Model	W17
Type	Runabout
Length	17 Feet 2 Inches
Beam	7 Feet 2 Inches
Capacity	7 passengers/1050 lbs
Propulsion	Inboard/outboard
Hull material	Fiberglass
Horsepower	175
Fuel Capacity	20 Gallons
Owner	Kimberlin, Thomas Jr.
Hull Identification Number	WEL963OC787

#### 7. Narrative Description of Recreational Vessel KY7808 PP:

The recreational vessel involved in this accident is a 1987 Wellcraft 180 runabout. The vessel is 17 feet 2 inches long and has a beam of 7 feet 2 inches. The registered owner of the vessel is Mr. [REDACTED] Mr. [REDACTED] and Mr. Robert Valentine, one of the victims, had worked out an agreement whereby Mr. Valentine would make payments and purchase the vessel. Mr. Valentine took possession of the vessel in March of 2001. The vessel was rated for seven passengers or 1050 pounds and was not equipped with VHF radio or radar.

#### 8. Weather Information:

Data from the closest National Weather Service Station in Louisville, Kentucky (approximately 36 miles from the accident location) reports the weather at that station at 0551 EDT on July 15, 2001 to be 57 degrees Fahrenheit, no winds, clear visibility, and 90% relative humidity. All witness testimony verified foggy conditions in the vicinity of mile 568. The lower gauge at Markland Locks and Dam showed the river stage to be at 12.5', which would result in a minimal current of approximately one to two miles per hour.

#### 9. Record of Deceased:

Name:	John Beatty	Name:	Terrance Hites
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Home Address:

[REDACTED]

Age:

Next of Kin:

[REDACTED] (mother)

Home Address:

[REDACTED]

Age:

Next of Kin:

[REDACTED] (wife)

Name:

Bennie Burgan

Home Address:

[REDACTED]

Age:

Next of Kin:

[REDACTED] (wife)

Name:

Robert Valentine

Home Address:

[REDACTED]

Age:

Next of Kin:

[REDACTED] (wife)

Name:

[REDACTED]

Home Address:

[REDACTED]

Age:

Next of Kin:

[REDACTED] (son)

Name:

[REDACTED]

Home Address:

[REDACTED]

Age:

Next of Kin:

[REDACTED] (mother)

#### 10. M/V ELAINE G's Personnel and qualifications:

On July 15, 2001 the M/V Elaine G had a crew of eight personnel. The crew consisted of one Master, one Operator of Uninspected Towing Vessels (serving as Pilot), four Deckhands, one Cook, and one Engineer.

##### Master:

The Master aboard the M/V ELAINE G was Mr. Terry Max Graham. Mr. Graham holds a fourth issue of a Coast Guard license, serial number [REDACTED], endorsed "MASTER OF STEAM OR MOTOR VESSELS OF NOT MORE THAN 1600 GROSS TONS UPON WESTERN RIVERS, OPERATOR OF UNINSPECTED TOWING VESSELS UPON WESTERN RIVERS, ALSO RADAR OBSERVER (RIVERS) TO EXPIRE JUNE 2003". Mr. Graham is [REDACTED] years old, has operated towing vessels for approximately 18 years, and has been a vessel Captain for The Ohio River Company for approximately 2.5 years. Mr. Graham has been assigned to the M/V ELAINE G for approximately 1.5 years and had been aboard the vessel for 21 days. Mr. Graham was on watch when the first call for help was heard.

##### Pilot (Licensed Operator):

Mr. Clinton Pauley was the additional licensed operator employed aboard the M/V ELAINE G on July 15, 2001. Mr. Pauley holds a second issue of Coast Guard license, serial number [REDACTED], endorsed

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“MASTER OF WESTERN RIVERS STEAM OR MOTOR VESSELS OF NOT MORE THAN 1600 GROSS TONS, OPERATOR OF UNINSPECTED TOWING VESSELS UPON THE WESTERN RIVERS, ALSO RADAR OBSERVER-RIVERS (EXPIRES SEPTEMBER 2001).” Mr. Pauley is [REDACTED] years old and has operated towing vessels for approximately seven years, all with the Ohio River Company. Mr. Pauley operates different vessels for the company and had been aboard the M/V ELAINE G for four days (since July 11, 2001).

Deckhands:

Mr. [REDACTED] was employed as Watchman (deckhand) on the M/V ELAINE G and was on watch at the time of the incident. Mr. Ratcliff is [REDACTED] years old, does not hold a Coast Guard license, and has been working as a deckhand for approximately five years. He alternates vessels and had been aboard the M/V ELAINE G for seven days at the time of the collision.

Mr. [REDACTED] was employed as a Deckhand on the M/V ELAINE G and was on watch at the time of the incident. Mr. [REDACTED] is [REDACTED] years old and has been employed by the Ohio River Company for three years and four months. He holds a Coast Guard issued license, serial number [REDACTED], endorsed “SECOND CLASS OPERATOR OF UNINSPECTED TOWING VESSELS UPON WESTERN RIVERS, ALSO RADAR OBSERVER (RIVERS) TO EXPIRE OCTOBER 2004.” Mr. [REDACTED] was not operating under the authority of this license at the time of this incident.

Mr. [REDACTED] was employed as a Deckhand aboard the M/V ELAINE G and was not on watch at the time of this incident.

Mr. [REDACTED] was employed as a Mate (unlicensed) aboard the M/V ELAINE G and was not on watch at the time of this incident.

Mr. [REDACTED] was employed as the Chief Engineer (unlicensed) aboard the M/V ELAINE G and was just going on watch at the time of this incident.

Ms. [REDACTED] was employed as a Cook aboard the M/V ELAINE G and was serving breakfast at the time of this incident.

**11. Relevant facts related to the M/V ELAINE G:**

a. The M/V ELAINE G locked through Markland Locks, Ohio River mile 531.5, down bound at 2305 on July 14, 2001, pushing 15 barges (14 empty and 1 loaded).

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b. On July 14, 2001, at 2355, the M/V ELAINE G picked up four empty barges at Ghent Power Plant, Ohio River Mile 536.8.

c. On July 15, 2001, at 0055, the M/V ELAINE G dropped off one loaded barge at North American Stainless, Ohio River Mile 539.30.

d. On July 15, 2001, at 0320, the M/V ELAINE G dropped four empty barges at Nugent Sand Company, Ohio River mile 552.3

e. At the time of the incident, all barges in the tow of the M/V ELAINE G were empty, uncovered, open hoppers, drafting approximately 1.5 feet.

f. According to the testimony of the crew, the M/V ELAINE G was displaying the following lights at the time of the collision: on the top of the pilothouse, a green running light on the starboard side and a red running light on the port side; and two amber towing lights on the stern. The tow was lit with a green running light on the forward starboard corner, a red running light on the forward port corner, a special flashing amber on the forward centerline, and a seven watt white "steering light" on a seven to eight foot pole located all the way forward in the center of the tow. The tow also had 2 foot x 2 foot low-intensity lights at each barge coupling on the port and starboard sides (four on each side).

g. Mr. Clinton Pauley was the operator aboard the M/V ELAINE G on the 0000-0600 watch on July 15, 2001. Mr. Pauley testified that he was serving as his own lookout from the pilothouse for the duration of his watch, which is his common practice unless there are a large number of recreational vessels in the area. He denied any fatigue symptoms, stated that he had about eight hours of sleep in the 24 hours preceding the accident, and was taking the [REDACTED]. According to the "2002 Mosby's Nursing Drug Reference", possible side effects related to [REDACTED] are rash pruritus, alopecia, flatus, dyspepsia, liver dysfunction, pancreatitis, lens opacities, myalgia, and headaches. According to the United States Coast Guard Regional Exam Center in Memphis Tennessee, [REDACTED] would not disqualify a person from obtaining a Coast Guard issued license.

h. The Ohio River Company policy states, "In most cases, the vessel operator shall be sufficient to perform look-out duties". The policy also gives the operator responsibility to take extra precautions in any situation he deems appropriate, including "appointing a qualified person to perform look-out duties". (See exhibit 106, page 8)

i. Each watch section on the M/V ELAINE G is comprised of a licensed operator and two deckhands.

j. Mr. Pauley wears prescription eyewear that corrects his vision to [REDACTED] and testified that he was wearing his glasses during his watch.

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k. Mr. Pauley testified that he observed a pleasure craft in the vicinity of Clifty Creek light at Ohio River mile 561.2, given the reported speed of six miles per hour. This would have been approximately one hour prior to the collision. He stated that he could visually see the lights on the vessel. He was unsure if the vessel was distinguishable from the buoy on his radar. This vessel was not the same vessel involved in the collision.

l. Mr. Pauley testified that he began seeing fog when the vessel was in the vicinity of Cooper Bar Light at Ohio River mile 563, approximately 3.5 miles from Spring Creek Light at Ohio River mile 566.7 where he was relieved. He stated that when looking forward he could see the "swing light" and the glow of the navigation lights mounted on the head of the tow and possibly a little bit further. He was unable or unwilling to estimate a distance related to the visibility.

m. Mr. Pauley denied having any radar or visual contacts when he was relieved of the watch and that the ranges on the radars were set at 1.5 mile and  $\frac{3}{4}$  miles, which are the ranges commonly used aboard the vessel. He also testified that he had made no adjustments to either radar during his watch.

n. Mr. Pauley stated that he activated the automatic fog signal just prior to the watch relief as Captain Graham was coming up the stairs to the pilothouse.

o. Captain Terry Max Graham relieved Mr. Pauley of the watch in the vicinity of Spring Creek Light at Ohio River Mile 566.7 between approximately 0510 and 0515. The exact time of the watch relief was not logged by the crew of the M/V ELAINE G.

p. Captain Graham does not wear prescription eyewear and testified that he was taking the [REDACTED], [REDACTED], and [REDACTED]. Potential side effects/adverse reactions of [REDACTED] include increased or decreased appetite, weight loss, heat intolerance, fever, sweating, headache, anxiety, insomnia, tremors, thyroid storm, palpitations, tachycardia, hypertension, angina, cardiac arrest, dysrhythmias, nausea, diarrhea, and abdominal cramps. Potential side effects of [REDACTED] include leukopenia, thrombocytopenia, myelosuppression anemia, nausea, vomiting, anorexia, diarrhea, stomatitis, hepatotoxicity cramps, ulcer, gastritis, gastrointestinal hemorrhage, abdominal pain, hematemesis, urinary retention, renal failure, hematuria, azotemia, uric acid nephropathy, rash alopecia, dry skin, urticaria, photosensitivity, folliculitis, vasculitis, petechiae, ecchymosis, acne, headache, dizziness, seizures, leukoencephalopathy, confusion, fever, malaise, chills, hemiparesis, fatigue, and arachnoiditis. [REDACTED] is a water-soluble B vitamin that can be used to decrease the toxic effects of low dosage Methotrexate. [REDACTED] supplements may cause bronchospasm or flushing. Potential side effects of [REDACTED] include depression, flushing, sweating, headache, mood changes, hypertension, circulatory collapse, thrombophlebitis, embolism, tachycardia, fungal infections increased intraocular pressure, blurred vision, diarrhea, nausea, abdominal distention,

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gastrointestinal hemorrhage, increased appetite, pancreatitis, thrombocytopenia, acne, poor wound healing, ecchymosis, petechiae, fractures, osteoporosis, and weakness. Information regarding side effects/adverse reactions was gathered from the "2002 Mosby's Nursing Drug Reference". According to the United States Coast Guard Regional Exam Center in Memphis Tennessee none of these medications would disqualify a person from obtaining a Coast Guard license. Captain Graham denied suffering any side effects from these medications. He also denied any fatigue symptoms and stated he slept approximately five hours prior to the 0600-1200 watch on July 15, 2001.

q. According to testimony by both Captain Graham and Mr. Pauley, the vessel's speed was approximately six miles per hour and the tow was positioned near the center of the river slightly favoring the right descending bank (Indiana bank). Captain Graham testified that at this speed he could stop the tow within approximately one tow length. Both operators confirmed the 1.5 and  $\frac{3}{4}$  mile range settings on the radars.

r. Captain Graham was also serving as his own lookout and was the only person in the pilothouse. The two deckhands on watch were in the "doghouse" on the main deck. The doghouse is a lounge area on the main deck beneath the pilothouse that has an intercom for the operator to contact the crew.

s. Captain Graham, as well as the two deckhands on watch, heard a yell for help off the starboard side of the towboat approximately ten minutes after assuming the watch. The vessel log indicates the time was 0525. All witnesses denied hearing or feeling anything that would indicate that a collision had occurred.

t. After hearing the call for help Captain Graham sounded the general alarm and brought engines to all stop, then all back. He attempted to maintain position in the river for approximately twenty minutes while the crew searched for the source of the call for help and checked the tow. Crewmembers never identified the source of the call for help or saw anyone in the water. Crewmembers testified that fog was present, but were unable or unwilling to estimate how far they could actually see.

u. Captain Graham backed the tow onto the left descending bank (Kentucky bank) at Ohio River mile 568 for further investigation at approximately 0550. Crewmembers recovered various items including two seat cushions, from between the starboard and center strings and the port and center strings of the barges.

v. After the fog lifted, the M/V PAT MCBRIDE assisted in breaking the tow of the M/V Elaine G apart. At that time, other items including two paddles, a plastic bucket, and a ball cap were recovered.

w. Captain Graham contacted Coast Guard Group Ohio Valley by VHF radio at 0550 and reported that the vessel was stopping to investigate after hearing a yell for help.

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x. Indiana Department of Natural Resources (IDNR) conservation officers were the first investigators to arrive on-scene at approximately 0800. Indiana law gives IDNR authority to investigate boating casualties in Indiana waters.

y. Coast Guard Marine Safety Office Louisville investigators arrived on-scene at approximately 1300 and along with IDNR investigators observed scrape marks on the bow rake of the center lead barge, OR2110. The marks were also observed by Mr. [REDACTED] (retired Commander, USCG), a marine surveyor hired by the barge owner, with the barge on drydock (see exhibit 125). These marks began at 42.5 inches above the waterline and extended down approximately 20 inches. These marks are consistent with the damage later found on the recreational vessel, indicating collision between the two vessels.

z. MSO Louisville investigators attempted to identify other vessels possibly involved in this accident through examination of lock reports from McAlpine and Markland Locks. Investigators identified 2 vessels, the M/V BILL CARNEAL, which transited the area after the incident was reported and the M/V ROBERT M. STOUTD that locked through Markland at 2040 on July 25, 2001. The M/V ROBERT M. STOUTD is operated by The Ohio River Company, a Party in Interest in this case. Attorneys for The Ohio River Company spoke to the vessel's Master who was unable to recall any meaningful information about the transit through this area. There is no evidence that any vessels, other than the M/V ELAINE G and the recreational vessel, were involved in this casualty.

aa. An IDNR Officer observed the M/V ELAINE G's radars while the vessel was pushed up on the Kentucky bank. Both radars appeared to be working properly, the IDNR officer observed a "ghost" area of radar return directly in front of the tow, and was able to track two personal watercraft and a fiberglass recreational vessel on both radars.

bb. An IDNR Officer administered a portable breath test to Captain Graham after arriving on-scene (approximately 0800-0900), which was negative for alcohol. Captain Graham also submitted to a drug test following the accident on July 15, 2001, the results of which were [REDACTED]

## **12. Relevant facts related to the Recreation Vessel KY 7808 PP**

a. On July 14, 2001, at approximately 1300, Mr. Burgan, Mrs. [REDACTED], their children, and Mr. Valentine launched the vessel from the Westport Boat Ramp at [REDACTED] river mile 580.5 and proceeded to Cox's Park at Ohio River Mile 599.7. They were joined by Mr. Valentine's spouse and children and spent the next several hours engaged in recreational boating activities. At approximately 2000 they were joined Mr. Beatty and Mr. Young. At approximately 2130 they were joined by Mr. Hites and Mr. Lucas and, at approximately 2200, the six men departed Cox's Park to go fishing. Mrs. [REDACTED] and Mrs. Valentine departed Cox's park approximately 2130.

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b. Around 0000 on July 15, 2001, Mr. Young was dropped off at Westport Boat Ramp where he left the group for about one hour to retrieve Mr. Hites' cell phone from a friend's car before again boarding the boat. This was the last known contact with any of the victims.

c. The total weight in the vessel was approximately 1279 lbs; this included all six occupants, a dog, and various equipment.

d. The victim's bodies were recovered between July 16 and 18, 2001, between Ohio River miles 568 & 575. None of the victims were wearing personal floatation devices (PFDs) when recovered. A witness who routinely boated with the victims testified that they normally carried sufficient PFDs but habitually did not wear them.

e. The recreational vessel was recovered on July 18, 2001 at approximate Ohio River mile 571. The vessel was found floating awash in a vertical position with the stern down. One of the victims, Mr. Burgan was found under the starboard side steering console. A large boxer dog belonging to Mr. Hites was found under the port side console.

f. Many of the heavier items onboard remained in the stern of the vessel, including a bucket of tools, an anchor with fifty feet of line, seven fishing rods with lines reeled in tight, a twelve volt handheld light attached to the starting battery, and a spare 12 volt battery.

g. The stern light was not functioning properly on July 12, 2001. Mr. Burgan purchased an Attwood stern light model number 910958-7 that fit the stern light socket on this vessel (see analysis) on July 13, 2001. The light purchased has a post 24 inches long and does not come with a base or locking mechanism (see analysis). The vessel was recovered with no stern light in place and no locking mechanism on the stern light base. The stern light was never recovered.

h. The vessel had scrapes in an approximate 80 degree pattern on the port gunwale beginning approximately 19 inches from the stern and continuing forward 3 feet, 4 inches; this is believed to be the initial contact point with the rake of the barge OR 2110. A similar pattern of 85-degree scrapes appeared on the port transom top, indicating a slight twisting motion near the time of the initial contact. The front windshield was shattered and bent to starboard and the forward handrail was compressed and bent in a direction similar to the windshield (75 degrees) and partially missing. The starboard forward handrail, which was partially missing, was bent forward and down, puncturing the hull coating at the bow. Other damage was noted in the re-creation (see exhibit 129). Rust colored transfer marks were also found at several points on the vessel and rusty flakes were found inside of the vessel, indicating contact with a rusty surface.

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- i. The vessel's integral gasoline tank contained 5.5 inches of gasoline. A witness stated that the vessel had 2 extra gasoline containers on board when it departed Cox's Park at 2200 on July 14, 2001. These containers were never recovered.
- j. Upon recovery, no sound producing device was recovered from the vessel, and the vessel's electric horn was not operable after the vessel was recovered.
- k. When the vessel was recovered, the throttle was pulled completely to the rear with the hub of the throttle pulled out, meaning the lower unit was disengaged. According to testimony this would allow the vessel to be started by providing fuel to the carburetor, but would not result in propeller rotation, similar to stepping on the accelerator of a car with the transmission in neutral. The ignition key was in the "on" position; and the light switch was in the "navigational" (on) position.
- l. On July 21, 2001, a team of engineers from Mercury Marine examined the vessel. This examination was inconclusive as to whether the vessel was running at the time of impact, but identified no mechanical reason that would have made the engine inoperable. It was also determined that the outdrive could not be shifted into reverse due to a mis-adjustment of the shift cable on the engine mounted shift plate; however, they were unable to determine if this problem was present before the accident or was caused by the accident. There was damage to all three propeller blades that was not consistent with propeller rotation under power. The battery connected to the engine was discharged, with an output of only 0.04 volts. A 12-volt light was attached to this battery, with the switch in the "off" position, and was functional when connected to a fresh battery. The spare battery was tested at 11.7 volts.
- m. When the vessel was recovered the red and green lens for the bow light was not in place and the glass part of the bulb was broken. The broken light was removed from the socket and sent to Indiana State Crime Laboratory for analysis. Examination of the bulb by the Indiana State Crime Lab indicated that the light was off at the time of impact.
- n. Post mortem examination [REDACTED] of all six victims. Tests were also [REDACTED] for all six victims, however the [REDACTED] tests may have resulted from or been elevated by the decomposition of the bodies. (See analysis) Autopsy reports also determined the cause of death in all six victims to be consistent with drowning.

## ANALYSIS

### 1. VISIBILITY

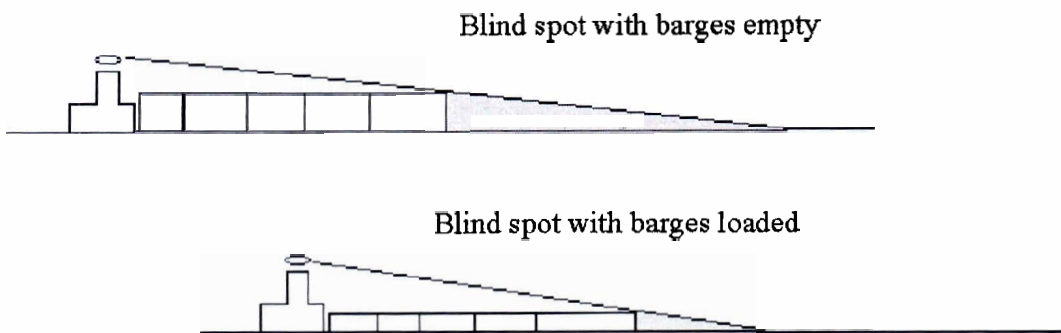


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- a. The existence of significant blind spots extending forward from the head of the tow of the M/V ELAINE G was a significant factor at critical moments before the collision. The visual and radar blind spots from the vantage point of the M/V ELAINE G's pilothouse prevented the Pilot and/or Master from detecting the recreational vessel once it entered into those areas. Low visibility due to fog and darkness contributed to the Pilot and/or Master's inability to detect the recreational vessel prior to its entry into the blind spots.
- b. All blind spot distances were significantly increased because the barge string was empty, creating minimal draft. Had the barges been fully loaded, the string would have ridden lower in the water and presented less of an obstruction between the pilothouse and the area immediately ahead of the tow (see figure 2 for example). Further, the M/V ELAINE G's pilothouse is relatively low to the waterline. This low height of eye produces a situation of obscured vision in the area ahead of its tow when pushing ahead empty strings of a similar length to that of July 15, 2001.

Figure 2  
BLIND SPOT DIFFERENCES UNDER LOADED AND UNLOADED CONDITIONS  
(Not to scale)



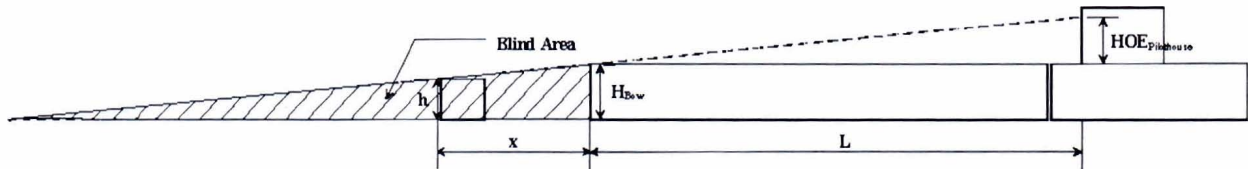
c. Numerous measurements of the towboat and barge configuration were taken by investigators on-scene; these are consistent with the loading information provided by the owner. With these measurements and consultation from the Coast Guard Marine Safety Center, the blind spots of both radars and the pilot's line of sight were calculated (see Figures 3, 4, & 5).

FORMULA FOR DETERMINING BLIND SPOTS

Figure 3

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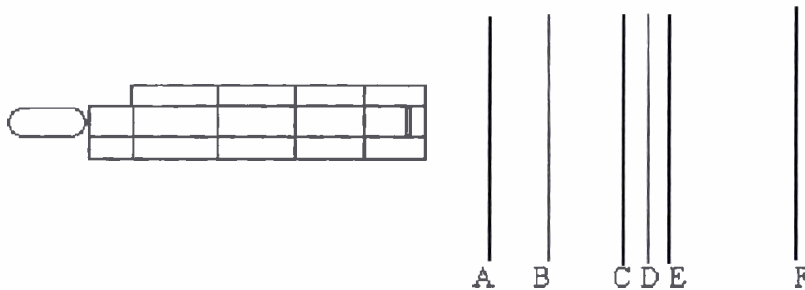
- $H_{Bow}$ : Height of bow from waterline (ft)
- $HOE_{Pilothouse}$ : Height of eye of pilothouse above bow (ft)
- L: Length from pilothouse to bow (ft)
- x: Position of object/vessel from bow (ft)
- h: Height of object above waterline (ft)

An object of a height meeting the following equation will be obscured within the blind area:

$$h \leq H_{Bow} - \frac{x(HOE_{Pilothouse})}{L}$$

**BLIND SPOT DISTANCES PAST HEAD OF TOW**

Figure 4



426 feet	A - Highest radar to recreational boat
462 feet	B - Low radar to recreational boat

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529 feet	C - High radar to water surface
570 feet	D - Low radar to water surface
624 feet	E - Pilot's eye to recreational boat
765 feet	F - Pilot's eye to water surface

### BASIC MEASUREMENTS AND DISTANCES

Figure 5

Distance from Pilot's eye to head of tow	1010 feet
Barge deck to water surface	10 feet
Coaming height above barge deck	3 feet 6 inches
Coaming distance from head of lead barge	15 feet
Recreational boat height above water	2 feet 6 inches
Pilot's eye to first barge (horizontal)	10 feet
Pilot's eye to barge deck (vertical)	21 feet
Pilot's eye to barge coaming (vertical)	17 feet 6 inches
Highest radar to water surface	38 feet 5 inches
Low radar to water surface	36 feet 5 inches

d. Neither Captain Graham nor Mr. Pauley were cognizant of the full extent of the blind spots. Both were aware that a visual blind spot existed, but neither demonstrated awareness of any fact-based calculations as to the distance during the initial questioning. Furthermore, it was not clear whether the two understood that both radars had blind spots. Because Captain Graham and Mr. Pauley were relying heavily on the radars due to the reduced visibility that morning, awareness of the full extent of the radar blind spots, particularly while pushing unloaded barges, was especially critical to the safe navigation of the vessel. A better understanding of these factors, including the severity of the fog, may have been influential in any deliberations regarding halting the voyage until conditions improved.

e. The visibility was significantly reduced due to fog. Mr. Pauley testified that he engaged the automatic fog signal shortly before Captain Graham relieved the watch, and that he could see the reflected light from the navigation lights mounted on the head of the tow and possibly a little further. MSO Louisville investigators gathered sufficient information from maritime professionals and other people who work, live, or frequently recreate on the Ohio River to conclude that fog signals are rarely heard, even in periods of significantly reduced visibility. Therefore, this activation of the M/V ELAINE G's automatic fog signal implies that substantial fog was present. Captain Graham and Mr. Pauley also testified that they were unable to see either riverbank. The Ohio River is approximately 2000 feet wide in this area and the tow was reportedly in the middle of the river, making the distance to the banks approximately 1000 feet. Captain Graham was not able to confidently convey the extent

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of his field of vision. Other members of the crew also attested to the fact that fog was present, but were not clear on the extent of the reduction in visibility.

f. Captain [REDACTED], who was operating the M/V PAT MCBRIDE approximately 1.5 miles upriver of the M/V ELAINE G at the time of the collision, testified that the fog had reduced visibility to the point that he was predetermining a location to push his vessel into the bank if visibility did not soon improve. Captain [REDACTED] also testified that he was neither able to see the M/V ELAINE G's stern tow lights nor hear her sound signals from this distance away and his position in the enclosed pilothouse. Captain [REDACTED] further testified that he offered to provide assistance to the M/V ELAINE G in breaking apart the tow after the apparent collision, but only after the fog lifted and visibility improved sufficiently to render the operation safe.

g. Captain [REDACTED] testified that he did not hear sound signals from the M/V ELAINE G until after being notified by the vessel's Master of a potential problem. Captain [REDACTED] stated that after being informed of the possibility that someone was in the water he sounded a fog signal and shortly afterwards heard a signal from the M/V ELAINE G.

h. The opportune moments to detect the recreational vessel before it entered into the blind spots may have come during, or just before, the watch relief between Mr. Pauley and Captain Graham. The first indication of trouble came when a cry for help was heard abaft the M/V ELAINE G's starboard beam. Considering the tow was moving at a reported six MPH (approximately 8.8 feet per second), one minute and forty-five seconds would have passed from the time the collision took place at the head of the tow until the person in the water would be abaft of the M/V ELAINE G's beam. Neither Captain Graham nor Mr. Pauley could confidently determine how much time the watch relief took to complete; both attested to an estimated time of about five minutes. However, MSO investigators later conducted several mock watch reliefs and determined that it is possible for the process to have been completed in significantly less time.

## **2. FAILURE OF RADAR TO DETECT THE RECREATIONAL VESSEL**

a. It may have been appropriate, even necessary, to make adjustments to the radar settings to obtain optimal sensitivity and clarity. Throughout the voyage, neither the Master nor the Pilot adjusted either of the two radar screens (i.e., gain control, anti-clutter sea, clear picture switch, brilliance, and anti-clutter rain control). It is, therefore, not possible to determine if the sensitivity adjustments were such that targets with weaker radar signatures could inadvertently have been rendered undetectable. The possibility that the radar was not properly tuned at the time of the collision is undeterminable, but cannot be ruled out.

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b. It is highly likely the recreational vessel had a poor radar signature. Because of the recreational vessel's fiberglass construction, inboard/outboard propulsion plant, decreased freeboard caused by overloading, and the stern profile that the recreational vessel may have presented, return signals may not have been strong enough to have been clearly received by the M/V ELAINE G's radars. This probability, together with the significant blind spots forward of the tow, limited the opportunities to detect the recreational vessel by radar.

c. Radar clutter, referred to during the investigation by the M/V ELAINE G's pilot as a "ghost" return may have deleteriously affected the radars' ability to display the recreational vessel on the screen at critical moments before the collision. A large "ghost" image was likely present on each of the radar screens, making the tow appear longer and wider than it actually was. Investigators consulted a radar expert, Mr. [REDACTED] of Gemini Marine Electronics in Paducah, Kentucky, who stated that open hopper barges, especially those that are light (i.e., empty) and without metal covers, typically cause radar signals to bounce erratically off the inside plating, producing a large cluttered image that appears on the radar screen. These bouncing signals make the image of the tow itself appear significantly larger to the radar observer, a phenomenon confirmed by Mr. Pauley. Any possible radar contacts that fall within a cluttered image may be obscured and, therefore, not visible on the radar screen. However, the possibility that the pleasure craft may not have been detectable on the M/V ELAINE G's radar due to clutter can neither be definitely confirmed nor ruled out.

### 3. LIGHTING ON THE RECREATIONAL VESSEL

a. Evidence uncovered during the accident investigation by Indiana Department of Natural Resources officers and MSO investigators showed the recreational vessel was not properly lighted. Although the navigation light switch was in the activated position when the vessel was recovered, tests conducted by the Indiana State Police Laboratory on the damaged bow light bulb indicated it was off at the time of impact.

b. Whether or not the stern light of the recreational vessel was in place and properly operating is questionable. Mr. [REDACTED], a friend of the victims, testified that the stern light was not on the vessel a few days before the collision and that one of the victims had indicated that it was not operable. [REDACTED], the wife of Mr. [REDACTED], provided Coast Guard Investigators with a receipt for a new stern light purchased two days prior to the collision, proving the purchase was made. Investigators could not confirm whether the purchased light was installed and working properly at the time of the collision. MSO investigators purchased the same model of stern light in the accident reconstruction process, installed it on the recreational vessel, and confirmed that it would illuminate. However, a locking mechanism necessary to hold the light securely in place and maintain electrical continuity was not shown by the receipt as having been purchased. The previous owner stated that the condition of the stern light socket on the vessel following recovery was as it was when he sold the

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vessel, indicating the locking mechanism was never in place. Without this mechanism, the reliability of the stern light, if installed, is in question. The light and pole purchased by Mr. [REDACTED] was 24 inches long; this does not comply with 33 C.F.R. 84.03(d), which requires the stern light to be carried at least one meter above the side lights.

#### 4. OPERATIONAL CONDITION OF THE RECREATIONAL VESSEL

a. It is not likely that the engine of the recreational vessel was running at the time of the collision. Technicians from Mercury Marine, the engine manufacturer, performed an extensive examination of the engine and found no signs of internal damage typically found when an engine is submerged in water while it is running (bent rods, head discoloration, etc.). Damage was found to the linkage that would prevent the vessel from going in reverse; however, the previous owner stated that he had observed the vessel operate in both forward and reverse several days prior to the accident. The damage to the recovered vessel was consistent with a low impact collision, further suggesting that the vessel was not moving under power at the time of impact. Also, two cell phones were recovered from the vessel's glove box that could have been used to call for assistance had the vessel been inoperable.

b. Mr. Valentine had some repairs made to the engine after assuming possession of the vessel; however, witness testimony indicates there were no apparent problems with the engine on the day before the accident. Witnesses indicated the boat was running well and everyone was happy with the performance of the engine.

#### 5. ACTIONS BY VICTIMS ABOARD THE RECREATIONAL VESSEL

a. The persons onboard the recreational vessel likely had little time to take evasive actions to avoid the collision prior to impact. If the vessel operator was unable to start the engine (due to a weak battery or flooding with fuel), other options were readily available. A spare battery was discovered aboard the vessel; had time permitted, it could easily been connected to the boat's electrical system if the need was present. Additionally, two adequately sized boat oars were onboard the vessel at the time of the collision and could have been used to paddle to the bank. The ignition key was in the "on" position and the throttle was disengaged and pulled all the way back, indicating that someone may have attempted to start the vessel prior to the collision. According to testimony, Mr. Burgan normally drove the boat and was the only non-swimmer aboard, and his body was recovered under the steering console.

b. During the formal hearing Mr. [REDACTED] testified that he was good friends with all of the victims, except John Beatty, and fished with them on many occasions. He testified that all were experienced

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fisherman and knew the hazards inherent to navigating on the busy Ohio River. Mr. [REDACTED] stated that they were always well prepared when night fishing and it was their common practice to fish close to the Indiana bank and that they never fished in the middle of the river. Based on the information gathered during the preliminary and formal investigations there is no evidence to dispute Mr. [REDACTED] testimony. While the actions of the victims cannot be conclusively determined, there is no apparent reason for the vessel to have been in the middle of the river at night and in heavy fog. In keeping with customary practices, it is possible that the vessel was waiting for daylight in order to return to the boat ramp at Westport, Kentucky. The vessel was not anchored, the only anchor and line was found inside the vessel at the time of recovery, and likely drifted into the middle of the river. As the fog obscured the bank, the victims would have no point of reference and may have been unaware of their position in the river.

## 6. IMPACT OF DRUGS

a. The victims may have had severely diminished situational awareness. [REDACTED] all six of the victims [REDACTED]. The toxicologist, Dr. [REDACTED] of AIT Laboratories, stated that the levels of [REDACTED] in the victims indicated that several hours had passed since the [REDACTED]. [REDACTED] While it is impossible to determine the exact mental state of all the victims, [REDACTED]. [REDACTED] The results could have been anything from extreme fatigue to, in some cases, loss of consciousness. All victims had been out all night and, in the case of Mr. Burgan and Mr. Valentine, had been on the water boating for approximately sixteen hours.

## 7. TIMELINE

a. The witnesses involved have given only rough approximations of critical times related to this incident. Since uninspected towing vessels are not required to keep official logs, the exact time of the watch relief and the first call for help are estimates. Both operators testified that the watch relief occurred at approximately 0515 on July 15, 2001 and that at approximately 0525 the first call for help was heard. Given that the call for help was heard off the starboard beam of the towing vessel and the speed of the vessel was approximately six miles per hour, the collision probably occurred approximately one minute and forty-five seconds before hearing the first call for help. This would indicate that the collision occurred approximately eight minutes after Captain Graham assumed the watch. Mr. Pauley stated that he dropped some items off in his room, went to the galley and had started to eat when the general alarm sounded. It is quite possible that Mr. Pauley's actions after being relieved of the watch took less than eight minutes. It is likely that the approximate times given by

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these witnesses could be several minutes off in either direction. It is also possible, but impossible to definitively ascertain, that the recreational vessel could have already been in the M/V ELAINE G's radar and/or visual blind spot when Captain Graham relieved the watch, or could have entered the blind spots during the watch relief when the attention of the two operators was likely diverted. The recreational vessel, if discernable visually or by radar, should have been identified prior to the watch relief.

### CONCLUSIONS

1. On July 15, 2001 at approximately 0520 the center lead barge, OR 2110, in the tow of the M/V ELAINE G collided with the recreational vessel KY 7808 PP. The collision rolled the recreational vessel causing the recreational vessel to take on water over the stern. The swamping of the vessel and the force exerted by the towing vessel resulted in the recreational vessel becoming awash below the water's surface. This accident resulted in the drowning deaths of all six persons aboard the recreational vessel.

2. The primary cause of this collision was the failure of the operator(s) of the M/V ELAINE G to detect the recreational vessel and the failure of the persons aboard the recreational vessel to detect the tow of the M/V ELAINE G in time to take evasive action.

### 3. Contributing Factors:

- a. Decreased Visibility: While the exact range of visibility at the time and location of the collision is debatable, it is apparent that the fog in the area significantly limited visibility. Based on testimony, visibility was likely less than ½ mile.
- b. Improper Lighting: The recreational vessel was not displaying any navigation lights prior to the collision.
- c. Fatigue: There is no evidence that fatigue on the part of the crew of the M/V ELAINE G was a factor in this accident. Due to the amount of time the victims had been onboard the recreational vessels, it is probable that fatigue had a significant negative impact on their level of awareness, ability to respond to a dangerous situation, and survivability in the water after the accident occurred.



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- d. Drugs/Alcohol: All six persons on the recreational vessel were [REDACTED] decomposition; however, beer containers were recovered following the accident indicating that at least some amounts of alcohol had been consumed by one or more of the victims. The exact mental state of the victims cannot be determined, [REDACTED], would reasonably be expected to exacerbate fatigue symptoms, decrease reaction time, and have a negative impact on awareness and judgment.

There is no evidence that [REDACTED] used by Captain Graham and Mr. Pauley contributed to this casualty.

- e. Failure of ELAINE G's Radar to Detect the Recreational Vessel: Both radars were functional prior to and following the accident. The M/V ELAINE G's radar failed to get an adequate signature from the recreational vessel; it either did not pick up the recreational vessel, or the radar return was so weak that it was not identifiable as a contact. It is also possible the M/V ELAINE G's radar did detect the recreational vessel, but it was not observed by the Master or Pilot.

4. The recreational vessel was adrift near the middle of the river at the time of the collision. The engine of the recreational vessel was functional, but was not running. The occupants were not actively engaged in fishing at the time of the collision.

5. The M/V ELAINE G was operating near the middle of the river in close proximity to the sailing line identified on Army Corps of Engineer charts.

6. The lights displayed by the M/V ELAINE G prior to the collision were in compliance with Inland Navigation Rule 24.

7. Mr. Burgan was at the steering console and attempted to start the engine prior to the collision. The position of the other victims in the vessel and their actions prior to the collision is undetermined.

8. The victims were not wearing personal floatation devices. The wearing of approved personal floatation devices could have possibly saved lives, since the coroner concluded that none of the external injuries found on the victims were severe enough to have been a direct and sole cause of death.

9. The recreational vessel's loading exceeded the maximum capacity recommended by the manufacturer by approximately 229 pounds. The extra weight would have had minimal effect on the

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freeboard of the vessel, but may have had some negative influence on the vessel's radar signature and reflexivity.

10. The practice of the operator of an uninspected towing vessel serving as his own lookout in low visibility conditions despite the presence of a significant blind spot in front of the tow is inherently unsafe and in many cases would be inadequate. A dedicated lookout positioned on the head of the tow has a view of the vessel's blind spot not available to the operator in the pilothouse and would be in a better position to hear any sounds that may indicate a risk of collision. Based on the visibility conditions at the time of the collision, it is impossible to determine if a bow lookout would have identified the unlit vessel prior to the collision.

11. There is no credible evidence that the operators of the M/V ELAINE G were not sounding fog signals as described in their testimony.

12. There is some evidence to suggest possible violations of the following Inland Navigation Rules by the operator of the recreational vessel:

- Rule 5 - "Every vessel shall at all times maintain a proper lookout by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision"
- Rule 9 (b) - "A vessel of less than 20 meters in length or a sailing vessel shall not impede the passage of a vessel that can safely navigate only within a narrow channel or fairway"
- Rule 19 (c) - Every vessel shall have due regard to the prevailing circumstance and conditions of restricted visibility when complying with Rules 4-10"
- Rule 35 (b) - " A power driven vessel underway but stopped and making no way through the water shall sound at intervals of not more than 2 minutes two prolonged blasts in succession with an interval of about 2 seconds between them".
- Rule 23 (c)(i) - A power driven vessel of less than 12 meters in length may in lieu of the lights prescribed in paragraph (a) of this Rule exhibit an all-round white light and sidelights"

13. There is some evidence of possible negligence on the part of both Captain Graham and Mr. Pauley in that neither licensed mariner took any action under limited visibility conditions to identify or prevent a possible collision. There is also evidence that both individuals were in violation of Inland Navigation Rule 5, "Every vessel shall at all times maintain a proper lookout by sight and hearing as well as by all available means appropriate in the prevailing circumstances and conditions so as to make a full appraisal of the situation and of the risk of collision" prior to the collision.

14. There is no evidence that material failure of the components of either vessel contributed to this casualty.

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15. With the exception of the fog, weather and river conditions did not contribute to this casualty.

16. There is no evidence that any personnel of the Coast Guard, or any other governmental agency, contributed to this casualty.

### RECOMMENDATIONS

1. It is recommended that the Coast Guard initiate legislation and/or regulations to require uninspected towing vessels to maintain vessel logs.

2. It is recommended that the Coast Guard be more aggressive on the Inland Rivers in promoting existing recreational boating safety education programs with emphasis on the Inland Navigation Rules, dangers involved when interacting with commercial towing vessels, and the importance of wearing personal floatation devices.

3. It is recommended that Inland River MSOs continue to aggressively pursue violations of the Inland Navigation Rules by commercial vessels, especially Rules 5, 19, and 35, that contribute to even minor casualties. OCMI's should be encouraged to initiate civil penalty and/or suspension and revocation action for violations to promote compliance.

4. It is recommended that Inland River MSOs partner with state, county, and local law enforcement agencies to aggressively pursue violations of the Inland Navigation Rules by recreational vessels and initiate civil penalty action as appropriate.

5. It is recommended that Inland River MSOs develop partnerships with state, county and local law enforcement agencies having a presence on the Rivers to identify violations of Inland Navigation Rule 35 and ensure towing vessels sound appropriate signals in low visibility. Reported violations of this rule should be investigated and appropriate civil penalty or suspension and revocation action should be initiated, even if the violation does not result in a marine casualty.

6. It is recommended that owners of fiberglass and wooden recreational boats using commercially navigable waterways be encouraged through unit web pages, newsletters, the Coast Guard Auxiliary, and other boating safety education and outreach programs to install radar reflective devices on their vessels.

7. It is recommended that a Personnel Action Investigation be initiated to determine if suspension and revocation action is warranted against the Coast Guard issued license number [REDACTED] issued to Terry Max Graham and license number [REDACTED] issued to Clinton Pauley.

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8. It is recommended that, upon final review and acceptance, a copy of this report be provided to all Parties in Interest. In addition, this report should be made available to interested parties, especially the families of the victims, via G-MOA and Marine Safety Office Louisville websites.

9. It is recommended that this investigation be closed.

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Enclosures: (1) Exhibit List  
(2) Transcripts and Exhibits  
(3) Administrative Letter File  
(4) Non-evidentiary File (Subpoenas, Conversation sheets, SITREPS, MSIS  
History, etc.)  
(5) MISLE Casework