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National Transportation Safety Board
Washington, D.C. 20594

Safety Recommendation

Date: October 19, 1995

In Reply Refer To: M-95-35

Admiral Robert E. Kramek
Commandant
U.S. Coast Guard
Washington, D.C. 20593-0001

About 0830 local time on June 18, 1994, three men, ages 31, 37, and 38, departed from the shore near Roosevelt Canal in Traders Bay on the southwest side of Leech Lake¹ near Walker, Minnesota. The men were aboard a 1988 18-foot-4-inch-long Champion bass boat (Minnesota State No. MN 3798 FG) owned by one of the occupants and apparently planned to go fishing for the day. The owner and one passenger were reported to be swimmers.

The weather was clear, the water was choppy (1/2 to 2-foot-high waves), the wind was 7 to 14 miles per hour from the northwest, the air temperature was about 65-70°F, and the water temperature was about 70°F. A Cass County employee, who had been fishing on Leech Lake about 0800 the same day, reported white caps on the water and winds of 16-17 miles per hour. No weather watches or warnings were in effect for Leech Lake on the morning of June 18.

About 1030, a couple boating on the lake noticed the unoccupied open fiberglass motorboat circling at slow speed between Pelican and Bear Islands, 10 to 12 miles east of Traders Bay. The boat was retrieved and the owner determined from State registration number records. After locating family members, the Cass County Sheriff Department learned that the boat's owner and two friends had been on the boat when it left shore. No witnesses saw the men in the boat after it got underway or witnessed the accident.

Shortly thereafter, a Civil Air Patrol aerial search and Cass County Sheriff Department water search commenced and continued until June 22, 1994, with no results. About 0800 on June 23, 1994, a boater found the body of one victim. A water search located the two other victims about 3 1/2 hours later. None were wearing personal flotation devices (PFDs), and all were fully clothed. The autopsy did not indicate that alcohol or drugs were involved, nor was trauma indicated. All three men drowned.

¹Leech Lake, which covers about 170 square miles, has a 630-mile shoreline and an average depth of 20 feet. Located in Cass County, the lake is about 190 miles north-northwest of Minneapolis/St. Paul.

On July 12, 1994, a Safety Board investigator and a Minnesota State Boating Safety Officer inspected the boat, with its outboard engine attached to the transom, at the police impound lot in Walker. They found that the steering wheel and the fast idle lever on the shift control were slightly bent and a small piece of the driver's left side plastic windshield was broken off and found in the boat. Neither the hull nor equipment on the boat had sustained any other damage. When the accelerator pedal was depressed fully and released, it did not return to the idle position, but remained partially depressed. It could not be determined if the conditions found were a result of this accident. A decal on the outboard engine cover read "150 hp," but the engine markings indicated a 200 hp outboard engine. The U.S. Coast Guard "maximum capacity" plate, permanently attached to the port console, showed a rating for 6 persons or 810 pounds and a 175 hp motor.² Fishing gear and five PFDs were found in seat lockers forward of the starboard console; one PFD had a cord with an engine kill clip attached to it.

Neither Coast Guard nor Minnesota regulations require that motorboats or watercraft be equipped with an engine kill switch. State law in Minnesota does mandate use of an engine kill switch if a personal watercraft, such as jet-skis, is equipped with one. Almost all personal watercraft manufacturers voluntarily install the switch on such equipment.

According to one passenger's brother, who had been on the motorboat when it was operated on the Mississippi River about 4 weeks before the accident, the boat tended to wobble, or rock from side to side, at a speed of 65 mph. The boat manufacturer's customer service manager stated that the boat was rated at 70 miles per hour with a 175 hp outboard motor. The person who sold the 200 hp motor to the boat owner on May 16, 1994, reported that a bass boat similar to the one involved in this accident tends to wobble ["chine³ walk"] before planing. Until recently, when manufacturers began selling stock boats that are capable of speeds exceeding 50 mph, chine walking was associated only with racing boats.

In this accident, the motion of the boat that probably caused the three occupants to fall overboard could have come from: striking a wave while chine walking, a sudden turn by the operator at high speed, or a sudden pitch or roll in response to striking a wave at high speed. They may not have recovered from the impact of entering the water in time to prevent their drowning or, if they did recover, they may not have been able to board the boat because the sticking accelerator pedal caused the engine to continue to operate. Had the occupants worn PFDs, they may have survived.

This accident demonstrates that all persons may unexpectedly enter the water from a boat, leaving no one to stop the boat, and also the need to wear PFDs. The "chine walking" phenomenon occurs at high speeds when a boat reaches a point at which it experiences reduced dynamic stability, which is a comparatively new problem for recreational boaters. The Safety

²The maximum safe horsepower plate required by Federal regulations does not prohibit a person from putting a larger engine on a boat. However, Minnesota law prohibits operating a boat equipped with a motor that exceeds the safe power capacity (as defined by the manufacturer or by formula if there is no plate).

³A chine is the intersection of the bottom and sides of a flat or V-bottomed boat.

Board believes that additional safeguards are needed to stop a boat when all occupants are ejected from it and the engine continues to operate, and that recreational boaters need to know how to recognize and prevent chine walking.

Therefore, the National Transportation Safety Board recommends that the U.S. Coast Guard:

Publish a boating safety circular that describes the circumstances of this accident, stressing the dangers of operating a boat at high speed and the phenomenon of "chine walking," the need to wear personal flotation devices, and the use of engine kill switches.
(Class II, Priority Action) (M-95-35)

Also, the Safety Board issued Safety Recommendation M-95-34 to the Boat Owner's Association of the U.S. If you need additional information, please call (202) 382-6860.

Chairman HALL, Vice Chairman FRANCIS, and Members HAMMERSCHIMIDT and GOGLIA concurred in this recommendation.

By: 
Jim Hall
Chairman

**NATIONAL TRANSPORTATION SAFETY BOARD
WASHINGTON, D.C. 20594**

Marine Accident No. DCA94MM030

Vessel: Champion bass motorboat, Minnesota State No. MN 3798 FG, HIN TSB112171788, 18 feet 4 inches long, built 1988, uninspected
Accident Type: Fall Overboard
Location: Vicinity of Pelican and Bear Islands, Leech Lake, Cass County, Minnesota (latitude 47° 8.1'N, longitude 94° 20.0'W)
Date: June 18, 1994
Time: 1030
Owner: John A. Klemke, Hastings, Minnesota
Property Damage: Minimal (slightly bent steering wheel and idle lever, and a small portion of the left side of the driver's side plastic windshield broken off)
Injuries: Three fatalities
Complement: Three

Description of the Accident

About 0830 local time on June 18, 1994,¹ three men, ages 31, 37, and 38, departed from the shore near Roosevelt Canal in Traders Bay, on the southwest side of Leech Lake² near Walker, Cass County, Minnesota, aboard an 18-foot-4-inch-long Champion bass boat owned by one of the occupants. The men were apparently planning to go fishing for the day. The owner and one passenger were reported to be swimmers.

The weather was clear, the water was choppy (1/2 to 2-foot-high waves), the wind was 7 to 14 miles per hour from the northwest, the air temperature was about 65-70°F, and the water temperature was about 70°F. A Cass County employee, who had been fishing on Leech Lake about 0800 the same day, reported white caps on the water and winds of 16-17 miles per hour. No weather watches or warnings were in effect for Leech Lake on the morning of June 18.

About 1030, a couple boating on the lake noticed the unoccupied open fiberglass motorboat circling at slow speed between Pelican and Bear Islands, 10 to 12 miles east of Traders Bay. The boat was retrieved and the owner determined from State registration number records. After locating family members, the Cass County Sheriff Department learned that the

¹On July 8, 1994, the Minnesota Boat and Safety Coordinator asked the Safety Board to help investigate the June 18, 1994 boating accident on Leech Lake. The Safety Board dispatched an investigator from Washington, D.C., to the scene on July 11, 1994.

²Leech Lake, which covers about 170 square miles, has a 630-mile shoreline and an average depth of 20 feet. Located in Cass County, the lake is about 190 miles north-northwest of Minneapolis/St. Paul.

boat's owner and two friends had been on the boat when it left shore. No witnesses saw the men in the boat after it got underway or witnessed the accident.

Shortly thereafter, a Civil Air Patrol aerial search and Cass County Sheriff Department water search commenced and continued until June 22, 1994, with no results. About 0800 on June 23, 1994, a boater found the body of one victim. A water search located the two other victims about 3 1/2 hours later. None were wearing personal flotation devices (PFDs), and all were fully clothed. The autopsy did not indicate that alcohol or drugs were involved,³ nor was trauma indicated. All three men drowned.

On July 12, 1994, a Safety Board investigator and a Minnesota State Boating Safety Officer inspected the boat, with its outboard engine attached to the transom, at the police impound lot in Walker. They found that the steering wheel and the fast idle lever on the shift control were slightly bent and a small piece of the driver's left side plastic windshield was broken off and found in the boat. Neither the hull nor equipment on the boat had sustained any other damage. When the accelerator pedal was depressed fully and released, it did not return to the idle position but remained partially depressed. It could not be determined positively if these conditions were a result of this accident. A decal on the outboard engine cover read "150 hp," but the engine markings indicated a 200 hp outboard engine. The U.S. Coast Guard "maximum capacity" plate, permanently attached to the port console, showed a rating for 6 persons or 810 pounds and a 175 hp motor.⁴ Fishing gear and five PFDs were found in seat lockers forward of the starboard console; one PFD had a cord with an engine kill clip⁵ attached to it.

Neither Coast Guard nor Minnesota regulations require that motorboats or watercraft be equipped with an engine kill switch. State law in Minnesota does mandate use of an engine kill switch if a personal watercraft, such as jet-skis, is equipped with one. Almost all personal watercraft manufacturers voluntarily install the switch on such equipment.

According to one passenger's brother, who had been on the motorboat when it was operated on the Mississippi River about 4 weeks before the accident, the boat tended to rock from side to side at a speed of 65 mph. The boat manufacturer's customer service manager stated that the boat was rated at 70 miles per hour with a 175 hp outboard motor. The person

³If the victims had ingested alcohol or drugs before the accident, their bodies would not have had time to metabolize these chemicals in the 2 hours between departure from shore and retrieval of their boat.

⁴The maximum safe horsepower plate required by Federal regulations does not prohibit a person from putting a larger engine on a boat. However, Minnesota law prohibits operating a boat equipped with a motor that exceeds the safe power capacity (as defined by the manufacturer or by formula if there is no plate).

⁵The clip, which fits into the engine kill switch box next to the control console, stops the engine when removed. The boat operator can remove the clip either deliberately, by pulling it out of the switch box, or accidentally, by leaving the console with the clip attached to his person, for example, by a cord to his wrist or to a lifejacket he is wearing.

who sold the 200 hp motor to the boat owner on May 16, 1994, reported that a bass boat similar to the one involved in this accident tends to wobble ["chine⁶ walk"] before planing.

Until recently, when manufacturers began selling stock boats that are capable of exceeding speeds of 50 mph, chine walking was associated only with racing boats. The phenomenon occurs at high speeds when a boat reaches a point at which it experiences reduced dynamic stability. At high speeds, boats are not always neutrally or positively stable in the fore-and-aft, port-and-starboard, and up-and-down motions. As a boat gains speed, it rides increasingly higher out of the water; when it becomes so high out of the water that the wetted hull area is small, the boat flops from one side or chine, giving it hydrodynamic lift, and then shifts to the other chine, dynamically shifting the stability of the boat. In other words, the boat chine walks. To stop chine walking, the boat must be slowed. Weight distribution of occupants and gear can also affect at what speed chine walking will occur. A boat that is chine walking while in a turn can capsize or spin out of control; if the bow catches a wave, the boat may make rapid 360-degree turns or the sudden deceleration can throw the occupants out.

In this accident, the motion of the boat that probably caused the three occupants to fall overboard could have come from: striking a wave while chine walking, a sudden turn by the operator at high speed, or a sudden pitch or roll in response to striking a wave at high speed. They may not have recovered from the impact of entering the water in time to prevent their drowning or, if they did recover, they may not have been able to board the boat because the sticking accelerator pedal caused the engine to continue to operate. Had the occupants worn PFDs, they may have survived.

Probable Cause

The National Transportation Safety Board was unable to determine the probable cause of the accident; however, it is likely that the accident was the result of (a) the boat striking a wave while chine walking, (b) a sudden turn by the operator at high speed, or (c) a sudden pitch or roll in response to striking a wave at high speed, or a combination of them, throwing the occupants overboard. Contributing to the accident was the operator's powering of the boat beyond the manufacturer's recommendation and the Coast Guard maximum guidelines. Contributing to the loss of life were the occupants' failure to wear personal floatation devices, the operator's failure to use the boat's installed engine kill switch, and a sticking accelerator pedal, which allowed the boat to continue to operate.

⁶A chine is the intersection of the bottom and sides of a flat or V-bottomed boat.

BY THE NATIONAL TRANSPORTATION SAFETY BOARD

JAMES E. HALL
Chairman

ROBERT T. FRANCIS II
Vice Chairman

JOHN A. HAMMERSCHMIDT
Member

JOHN J. GOGLIA
Member