U.S. Department of Homeland Security
United States Coast Guard

Commandant
United States Coast Guard

2100 Second Street, S.W.
Washington, DC 20593-0001
Staff Symbol: CG-01
Phone: (202) 372-4546

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MEMORANDUM

From: C. I. PEARSON, VADM
COMDT (CG-01)

To: Distribution

Subj: CHIEF OF STAFF'S FINAL DECISION LETTER ON THE CLASS "B" MISHAP: CAPSIZING OF MSST ANCHORAGE (91111), CG 25501, IN VALDEZ, ALASKA ON 19 SEP 2005

Ref: (a) Safety and Environmental Health Manual, COMDTINST M5100.47
(b) Department of Defense Human Factors Analysis and Classification System (DoD HFACS)
(c) U.S. Coast Guard Maritime Law Enforcement Manual (MLEM), COMDTINST M16247.1 (series)
(d) Rescue and Survival Systems Manual, COMDTINST M10470.10 (series)

1. SYNOPSIS. On the evening of 19 September 2005, CG 25501 was conducting a security zone enforcement patrol with a crew of one coxswain, two crewmembers, and one passenger (break-in / not crew certified). At approximately 1928 local, the boat capsized near buoy "B" in the Port of Valdez while executing a high-speed turn. CG 25501 was completing an eight-hour patrol (1200-2000) and intended to meet the relief boat at buoy "B" at the northeast corner of the zone. Winds were 8-15 knots from the west which caused a slight 1-2 foot "chop," also out of the west. Sunset in Valdez was approximately 1953 local. CG 25501 departed the center of the zone and proceeded east at a high rate of speed (over 5000 RPM, near maximum), engines trimmed up/out one half to three quarters, with seas on the port quarter. The aft door was open. As CG 25501 approached the eastern end of the zone, the coxswain announced he was making a turn to port and commenced the turn (still at full power and engines trimmed up/out). The boat's port chine dug into the water as the coxswain turned on top of a small wave, which caused the boat to turn harder to port (about 60 degrees). The boat then suddenly flipped onto its starboard side, continued to roll to starboard and came to rest inverted. All four crewmembers egressed through the aft door and safely surfaced, inflated their Type-V PFDs (manual inflate), and climbed on top of the hull. Since no fuel was present in the water, they launched four pencil flares. CG 25500, the relief boat, saw the flares and called to CG 25502, also patrolling the zone. Both boats responded and recovered all four persons. They were taken to a local emergency room where they were treated and released. CG 25501 was towed to the pier and righted the following day by crane.

2. CLASSIFICATION. This is a Class "B" mishap due to the cost of repairs, approximately $76,000, per reference (a). This mishap also had a high potential for a fatality or serious injury.

3. CAUSAL AND CONTRIBUTORY FACTORS. A factor is considered "causal" when if removed in the sequence of events it would most likely have broken the chain of errors and the mishap would not have occurred. A factor is considered "contributory" when it is not singularly responsible for the mishap; however, when combined with causal or other contributory errors it influenced the progression of the mishap. "Non-contributory" factors are problems or hazards that are determined to not have been causal or contributory to the mishap, but are factors identified during the analysis process that could be causal or contributory factors in a future mishap.

A. CAPABILITIES: There were no limitations or equipment failures that caused this mishap.

B. HUMAN FACTORS: As outlined in reference (b), the Department of Defense Human Factors Analysis and Classification System (DoD HFACS) provides a systematic, multidimensional approach to error analysis, standardizing the human factors analysis approach for the investigation of mishaps. DoD HFACS examines four main tiers of failures/conditions: I Acts, II Preconditions, III Supervision, and IV Organizational.

I. ACTS: Are those factors that are most closely tied to the mishap, and can be described as active failures or actions committed by the operator that result in human error or unsafe situation.

1) Errors:

a. Skill-Based Error – Procedural Error. (Causal) The coxswain failed to trim in engines while performing a high-speed turn.

b. Judgment and Decision Making Error – Risk Assessment During Operation. (Causal) The coxswain failed to assess the level of risk associated with these types of high-speed maneuvers when operations did not require them. The coxswain also failed to recognize the risk of "hooking a chine" under the current sea conditions and with improperly trimmed engines.

2) Violations: Violation – Lack of Discipline. (Causal) Failure to follow the Command Navigation Standards. Specifically, there was a violation of "Coxswains Responsibilities" which dictates RPM limitations (day 4000 RPM and night 3000 RPM maximum). Additionally, the coxswain did not complete the GAR model prior to the security patrol, nor did he complete the GAR model prior to the high-speed turn.

II. PRECONDITIONS: Active and/or latent conditions of the operators prior to the mishap, or environmental or personnel factors which affect practices, conditions or actions of individuals and result in human error or an unsafe situation. The following preconditions existed:

1) Environmental Factors: Physical Environment – Maneuvering Forces. (Contributory) The following winds and seas contributed to the boat "hooking a chine" and capsizing.

2) Condition of Individuals: Psycho-Behavioral Factors – Overconfidence. (Causal) The coxswain had a reputation for aggressive driving. The crew and other MSST Anchorage members described this coxswain as the one who was the most aggressive at the unit. For this coxswain, exceeding the engine RPM limitation was routine. Crew members enjoyed the experience of riding with this coxswain and noted nothing abnormal about the preparation for this maneuver—only its outcome. Preparation for high-speed maneuvers did not include wearing seat belts or helmets. Additionally, the coxswain and crew of CG 25501 were not wearing body armor, as required per reference (c). A fourth break-in crewmember boarded CG 25501 approximately 10 minutes prior to the mishap. This crewmember was already wearing body armor, but had left his SAR vest on another boat. The coxswain allowed the break-in crewmember to board CG 25501 without a SAR vest, a critical piece of survival equipment that reference (d) requires all boat crewmembers to wear during all Coast Guard missions.

III. SUPERVISION: Methods, decisions or policies of the supervisory chain of command which directly affect practices, conditions, or actions of individuals and result in human error or an unsafe condition. The following supervisory factors were identified:

1) Inadequate Supervision.

a. Leadership / Supervision / Oversight Inadequate. (Causal) The Command Cadre was not engaged and failed to provide the required Boat Force leadership. They did not receive nor did they seek adequate information from their Deployable Team Leaders (DTL) and other front-line supervisors. There were many indicators that signaled the potential for a mishap, including crew comments about hot-dogging, burning excessive fuel, and a disregard of the PPE requirement. These indicators went unanswered by the Command Cadre.

b. Local Training Issues / Programs. (Contributory) MSST Anchorage (91111) stood up thirteen months before this mishap. Local training opportunities were limited during the winter months in this AOR, leaving a compressed schedule for underway training within the AOR. This training limitation combined with a lack of supervised on-the-job training contributed to the coxswain's flawed understanding of the importance of proper trim during high-speed maneuvers and the crew's willingness to take unnecessary risks. The Commanding Officer's "limiting thresholds," which were used to identify prospective coxswain trainees, included completion of the Navigation Rules examination and an initial assessment of the member's judgment. These minimal requirements combined with the perceived need to send a newly

certified Level I coxswain to advanced tactical coxswain training set the stage for the member to certify as a coxswain on an accelerated schedule (within three months of the unit standing up).

2) Failure to Correct Known Problem: (Causal)

a. Personnel Management. The Command Cadre of MSST Anchorage failed to address the coxswain's risky behavior and unsafe tendencies. With no remedial actions taken, high-speed maneuvers essentially became a Command endorsed practice.

b. Operations Management. The Command Cadre of MSST Anchorage failed to correct a known hazardous operation. The Assistant Operations Officer provided extensive egress training to the boat crews, indicating that the Command Cadre "trained to the consequence" (i.e. capsizing) instead of mitigating the hazard by implementing speed, maneuvering, and training restrictions to ensure that the boat crews conduct safe operations.

3) Supervisory Violations: Supervision Discipline Enforcement (Supervisory Act of Omission). (Causal) MSST Anchorage's Command Cadre was not enforcing the Commanding Officer's Navigation Standards, specifically in the area of coxswain speed restrictions, requiring boat crew PPE, and conducting the GAR model prior to getting underway and prior to major evolutions.

IV. ORGANIZATIONAL: Communications, actions, omissions or policies of upper-level management directly or indirectly affect supervisory practices, conditions or actions of the operator(s) and result in system failure, human error or an unsafe condition.

1) Resource /Acquisition Management: Personnel Resources. (Contributory) The number and experience of personnel assigned to MSST Anchorage were inadequate for mission demands, which played a role in creating an unsafe situation. Compounding this body-to-billet mismatch issue was the compressed timeframe in which MSST Anchorage was expected to stand up.

2) Organizational Climate: (Contributory)

a. Unit / Organizational Values / Culture. Organizational pressure and the natural eagerness of the Commanding Officer and crew to be "Semper Paratus" contributed to MSST Anchorage's accelerated training and certification schedule. The resultant internal and external pressure forced this unit to stand up on a compressed timeline, at the expense of training and certification.

b. Perceptions of Equipment. The Coast Guard had not responded to the widespread introduction of a high-end capability like the Defender Class boat by providing the necessary training—basic and tactical.

c. Organizational Process:

i. Ops Tempo / Workload. The pace of deployments, workload, and additional duties at MSST Anchorage detracted from training and created an unsafe situation. Specifically, the Command Cadre did not have sufficiently experienced staff to provide proper Boat Forces oversight.

ii. Program Oversight / Program Management. The MSST program for boat operations was rapidly implemented without sufficient support, oversight, training, and planning, which led to an unsafe situation. The Coast Guard did not have single program oversight for all units operating boats.

4. ADDITIONAL FINDINGS / LESSONS LEARNED.

A. All levels of the Coast Guard should closely review timelines for the commissioning of new units to ensure they are realistic for the units to achieve the status of "Full Operational Capability" (FOC). If a new unit is not ready for operations, either by formal assessment or just the "gut feeling" of the Commanding Officer, the Coast Guard's organizational culture should encourage the Commanding Officer to make that fact known to the operational chain of command. Also, during the planning stages, sufficient time should be allotted for personnel assignments, training, and the development of required competencies and experience. If an accelerated stand-up is necessary, risk assessments should include mitigation strategies to deal with personnel and/or training and experience shortfalls. Prior to attaining FOC, new units should receive a STAN or RFO assessment.

B. The EPIRB on a Defender Class boat is mounted on the exterior bulkhead on the aft part of the cabin and is not a hydrostatic/automatic activation style EPIRB. Its current location is not conducive to the EPIRB floating free due to the collar and deck on the stern hindering its path to the water's surface.

C. The manner in which this boat was being operated was suitable for a high-threat, high-consequence environment; however, the true environment was a low-threat environment. To continuously operate this boat in the high-threat, high-consequence mode exposes boat crews to a high-level of operational risk with an ill-defined gain.

5. CORRECTIVE ACTIONS.

A. Completed Actions: The following actions were accomplished by the Office of Boat Forces (CG-731) and Deployable Operations Group (DOG) through a reprioritization of existing resources or by using the resource proposal process:

1. A revision to the Defender Class Operator's Handbook, which includes comprehensive discussion on egress procedures, effects of trim on boat handling, and promulgation of policy regarding the wearing of seat belts and helmets.

2. An Engineering Change to install emergency egress lighting inside the Defender Class cabin has been approved and procured for Coast Guard-wide installation.

3. A Defender Class Safety Advisory (COMDT COGARD WASHINGTON DC 301916Z SEP 05) provided Boat Forces units with guidance on safety considerations while operating Defender Class Boats at high speed and factors to consider following a capsizing.

4. A message outlining the "Safety Stand-down" areas of emphasis for Boat Forces (COMDT COGARD WASHINGTON DC//G-RCB// 182011Z SEP 06) reiterated the lessons learned in this mishap.

5. An approved and promulgated Engineering Change provided the installation of screens over the under-seat stowage compartments and a gear cargo net in the cuddy cabin of the Defender Class boat to prevent loose gear from impeding crew egress following a capsizing.

6. An Engineering Change to remove the cabin's deck matting to eliminate the hazard of impeding crew egress following a capsizing has been approved and promulgated.

7. Deployment of a Defender Class Simulator at TRACEN Yorktown to facilitate coxswain and boat crew training in various operational environments without risk.

8. Production and distribution of a DVD entitled "Surviving a Defender Class Capsizing" to all Boat Forces units, which complements the guidance contained in the newly revised Defender Class Boat Operator's Handbook. The DVD includes a comprehensive seventeen-minute video designed to increase crew awareness on how capsizing occurs, operational risk management, egress, and post-egress survival procedures.

9. The curriculums for BM "A" and the Tactical Coxswain "C" courses have been revised and improved to incorporate lessons learned from this mishap. Reinforced the importance of operational risk management, high-speed outboard engine boat tactics, techniques, and procedures (e.g. effects of trim on boat handling), and egress and post-egress survival.

10. As of Spring 2007, prospective MSST Commanding Officers and executive officers are now required to attend the Boat Forces Command Cadre course, which has been modified to include a mission preparedness block of instruction.

11. Safe speed and guidelines for boat RPMs under various operating and training conditions are taught at the Tactical Coxswain and Boat Crew Member courses and are available to Boat Force Unit Commanding Officers and Officers-in-Charge.

12. Work is currently ongoing to construct and provide Dunker/Shallow Water Egress Training (SWET) in Elizabeth City, NC. The training will provide Defender Class coxswains and crewmembers the sensation of being inverted in the water and the task of unbuckling themselves from a seat.

13. Instead of redesigning and/or relocating Defender Class EPIRBs so that they can automatically activate and float-free in the event of a capsizing, all boat crews have been outfitted with personal locator beacons (PLB).

14. The DOG has provided guidance to CGPC through command concerns in regard to waterside section personnel given this mishap and this investigation's finding. The DOG has also made recommendations to CG-PSC to modify the command cadre screening process to ensure adequate tactical MLE and boat experience. DOG Deputy/DG-3 now approves final slate.

15. The DOG has drafted for final review a message that requires each MSST establish a Training/STAN position. This position, in addition to the day to day management of training and qualification, will serve as the liaison to the DOG's annual RFO inspection. Comprehensive RFO reports capture progress, identify concerns and require formal correspondence between DOG and unit to rectify problems. The DOG is standardizing the organizational structure of the MSST. As part of the structure, each unit will be required to have a training officer and a STAN officer and Petty Officer (Checks and Balances) designated following the aviation model.

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Dist: COMDT (CG-00, CG-09, CG-092, CG-094, CG-ACO, CG-1, CG-4, CG-5, CG-7, CG-8, CG-11, CG-13, CG-53, CG-113, CG-132, CG-45, CG-532, CG-731)
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