Case Study #5

Small Boat Capsizes, Class B

Mishap Analysis Report
CASE STUDY

1. SYNOPSIS

During the fifth day of TACT, 09 MAR 2009, CGC was preparing to launch cutter small boat for routine passenger transfer in the vicinity of WA. CGC was on an easterly heading with an approximate speed over ground of 5 knots with an ebbing current to the NNW of 1-2 knots. The resulting speed through the water was 6-7 knots. In the process of launching the cutter small boat, the small boat veered to stbd. The crew was unable to detach the release rig between the small boat and davit sled causing the boat to swamp resulting in 6 personnel in the water. Four were immediately recovered by ship personnel, and two were recovered by another CGC small boat. All six personnel were examined by the corpsman and EMT's with minor injuries. Damage to the small boat and davit resulted in a Class "B" Mishap.

2. HISTORY

In December of 2007, a prototype evaluation was completed on the small boat/davit system (Shat-Harding with OTECH boat). The prototype system was deemed a failure, however; the system continued to be used and no follow-up engineering assessment or action was performed.

On 08 May 2008, the CGC experienced a mishap with small boat/davit system while recovering their small boat. This mishap resulted in a cracked OTHEC boat hull and bent launching frame (sled) and was reported as a Class "C" Mishap.

On 9 March 2009, at approximately 1714, CGC launched CGC 1, a CB-L standard small boat, from their Miranda Davit located on the starboard side of the ship, just aft of the bridge superstructure. The small boat had six people in it – one qualified coxswain, one qualified boat engineer and four break-ins (one break in coxswain, two break-in crewmembers and one break-in boat engineer).

The break-in coxswain (BM3) was sitting in the coxswain's position and had control of the boat throttles and the helm. The qualified coxswain (BOSN) was next to the BM3 and standing outboard and holding on to the frame for the radar/radio antennas. The other four members were aft of the frame for the radar and while it is not clear where the four personnel were exactly located during the event, it is generally agreed that at least two people were aft of the small boat's pick up bar and at least one person was forward of the pickup bar (the qualified boat engineer).

Due to the location of the pickup bar, the small boat (unloaded) normally had a bow down attitude (10 degrees), but with six crew members aboard the small boat was bow down approximately 15-20 degrees. The crew was generally aware that there was a limitation on the operating conditions for the small boat (no more than 3 foot combined seas). There were no perceived limits on the loading of the small boat during operations. A mission brief was conducted with a risk assessment (GAR) in the amber for the event after assessing the following seven elements (crew fitness, crew selection, environment, supervision, equipment, evolution complexity and planning). The elements assessed as

the greatest risk were crew selection (5), environment (5) and equipment (5). The mission was to conduct a routine passenger transfer from the beach to the cutter.

The cutter was completing its fifth day of TACT and transiting Admiralty Inlet in the vicinity of WA near PT Wilson just outside the vessel traffic scheme. The ship was heading in an easterly direction with the current ebbing at approximately a 0.5-1.0 knots at the surface in a westerly direction so that the current was relatively off the ship's starboard bow at approximately 10 degrees. The ship was making turns to transit just over five knots over ground. However, the speed over ground combined with the current meant the CGC was making over six knots through the water (ECINS snapshot at minute 1714 confirm the situation). Other than the current, the seas were calm and there was no wind – it was the "best day that they had seen all TACT".

The small boat, attached to the launching frame (or sled), was lowered to the water. When the sled/small boat entered the water, both immediately dropped aft and veered drastically to starboard and within 8 seconds the small boat swamped/capsized while remaining attached to the sled and six personnel were put into the water. Four personnel were recovered by the CGC and two were swept away and recovered by small boats from another CGC. All six personnel were examined by corpsman and EMTs with only minor injuries resulting from the event. Damage costs to the small boat and davit resulted in a Class B Mishap.

TIMELINE:

25 OCT 2005 - ELC Authorized Prototype (small boat/davit system)
- Schat-Harding Miranda MRT-3900
- Replaced the existing MSB Davit

06 JUL 2006 - Davit installed by Todd Shipyard, STBD 01 Level Frames 76-85
- Prototype evaluation plan for 180 days
- Goal was to launch and recover fully laden rescue boat
- Reducing the swing of the small boat away from the ship is the highest priority

03 DEC 2007 - Prototype evaluation report returned by the CGC
- Position of the davit resulted in safety concern for raising & lowering small boat
- Not recommended for fleet wide application

08 MAY 2008 - OTECH (Hull # 221316) hull cracked (Class "C" Mishap).
- The small boat surveyed and sent to DRMO.

11 SEPT 2008 - Schat-Harding completed Level 1 inspection of the davit, however, no boat was onboard at time.

19 SEPT 2008 – Schat-Harding and ACB exchanged emails regarding boat davit specifications.

25 SEP 2008 - 0700 EST CG-731 sends CG-45 an e-mail to review the boat lifting package and would like results to be returned to CG-731 by 0700 PST in order to "cut metal for ships departure".
- CG-731 says it's a "reasonable solution"; however, CG-45 did not concur.

25 SEP 2008 - CG-731 requests new CB-L supported lifting arm assembly
- CG-45 first answer is "no" regarding new lifting frame
- Questions are raised about the design.

22 OCT 2008 - OEM modified CB-L is delivered to CGC.

23 OCT 2008 - CGC departed on patrol with modified CB-L.

28 NOV 2008 - CB-L port aft sponson is CASREP'd for being blown during small boat recovery operations.

15 DEC 2008 - Standby for Deep Freeze.
- CB-L sent to ACB for sponson repairs (CASREP 28NOV08).

31 JAN 2009 - Cutter Engineering report lists the cutter boat davit as the #1 Engineering and Safety concern on board CGC.

09 FEB 2009 - ELC begins to analyze the CB-L/Miranda Davit system after receiving pictures via email of the CB-L cradled on the CGC with a bow down attitude.
- Phone conference between ELC, Cutter (CO & EO), and CG-452. During the phone conference ELC advised the cutter that the current configuration was unsafe, that the lifting frame (pick up point on small boat) is currently aft of the LCG of the small boat. To be correct, the lifting frame must be slightly forward of the LCG of the boat

10 FEB 2009 - ELC engineers note that bow down attitude as unsafe.
- ELC is concerned about lack of davit OEM involvement in the interface with the CB-L, since the small boat is required to be matched to the sled.
- Platform manager puts out a "do not use" e-mail with regards to the CB-L/Miranda Davit interface.
- ELC platform Division decides the CB-L is "not safe for use" on CGC.
- Questions arise about who is authorized changes in boat types for the CGC? When this occurred? What is the compatibility?

11 FEB 2009 - ELC-01 informs CG-45 of Situation w/ Miranda davit/CB-L via email.
- Phone conference

12 FEB 2009 - ELC-02 suggested removing radar frame completely and to operate only the CB-L in sight of the cutter
- Tri-P meeting, CG -45 acknowledged that insufficient analysis was conducted last October by (CG-45, SBPL, ELC). CG-45 tasked CG-452, SBPL and ELC to work with CG-751 and CG-731 to resolve for upcoming mission..
- CG-45 requested review of the TCTO MSG prior to release if the message is still going to be released, not to approve/disapprove but to provide input from the program perspective.
- CGC voiced to CG-751 that they were not unnecessarily concerned about the small boat/davit situation via email.
- ELC-02 suggests short term fix for CG issues - keep 2 crew aft of lifting frame, while a long term solution being that the davit be replaced via email.

13 FEB 2009 – Phone Conference E-mail from CG-751 to CO CGC "Boat/Cutter Forces concluded phone conference w/ engineers. CB-L stays on CGC.
- Discussion of weight test procedures for modified CB-L lifting frame CG-731 via e-mail.

17 FEB 2009 - ELC discussion that center of gravity CBL is much farther forward then originally predicted via e-mail.

18 FEB 2009 - MLC PAC states in a Surface Force Logistics Center Project report entry that "Alternative to the Miranda Davit will be made but are dependant on clear direction from HQ on what the Polar Icebreaker's Operational Requirements will be. An increase in Law Enforcement mission is expected."

09 MAR 2009 1635 - Held a boat brief on the bridge conducted GAR, 33.
1647 - ENS assumes the deck and the conn under the instruction of BMCM.
1656 - Boat deck manned and ready.
1705 - According to the TANO, the B/I OOD orders port and starboard engine shafts to position 1 ahead and the center engine shaft to 2 ahead (this is thought to be approx 5 knots). *
1706 - ECPINS reports Course 169T, SMG 9.3 knots, LOG 10.7 knots.
1708 - ECPINS reports Course 184T, SMG 9.7 knots, LOG 8.8 knots.
1710 - ECPINS reports Course 177T, SMG 5.1 knots, LOG 6.6 knots.
1712 - ECPINS reports Course 097T, SMG 3.9 knots, LOG 5.1 knots. According to the TANO, the OOD orders center engine shaft to position 3 astern, then orders it to position 4 astern. *
1713 – According to the TANO, OOD orders the port and starboard engine shafts to handle position 0 and the center engine shaft to 4 astern. *
1714 - ECPINS reports Course 093T, SMG 4.8 knots, LOG 5.9 knots.
1715 - Man overboard starboard side; hoisted Oscar; sounded six short

blasts in position N W, depth 188 ft.
1716 - ECPINS reports Course 095T, SMG 3.5 knots, LOG 5.2 knots.
1717 - In the event of non-recovery, JOOD recommended "VS" search plan.
1721 - Port CHS online; Anchored with four shots on deck in position N W, 150 swing circle, 250 drag circle; hoisted day shape ball
1722 - Contacted Seattle traffic on channel 5A.
1724 - Initiated PAN PAN on Ch 16, hailed another CGC on channel 16; requested assistance via small boat.
1728 - Hailed Air Station and requested helicopter assistance on channel 81A, Air Station will issue UMIB.
1725 - 04 personnel recovered via shipboard pickup: SN, FN, MK3, and SN; BM3 and CWO2 still in the water and remain in sight. Established communications with another CGC small boat on channel 81A.
1731 - CWO2 and BM3 recovered by another CGC small boat.
1736 – Another CGC small boat alongside rescue deck.
1737 - CWO2 and BM3 onboard .
1738 - Struck Oscar.
1750 - Contacted Traffic by phone to pass intentions; Traffic agreed to keep all traffic clear.
1800 - BMCM assumes the "at anchor OOD".
1803 – Another CGC small boat recovered CGC life rings.
1822 - Anchor Dragging; Notified VTS on channel 5A.
1825 - Commenced Salvage Operations, recovering CGC1 via the Miranda Davit and foc'sle capstan.
1831 - Dragged anchor 900 YDS.
1835 - Energized navigation lights for vessel underway making way.
1837 - Energized navigation lights for a vessel restricted in its ability to Maneuver.
1838 - Dragged anchor 1000 YDS; Dewatering CGC1 via bucket, rigging electrical submersible pumps; Raised day shape for a vessel restricted in its ability to maneuver.
1844 - Veered anchor to six shots on deck.
1847 - Anchor tends at 5 o'clock, Moderate Strain, Displayed underway restricted in ability to maneuver.
1851 - CGC1 at the hip.
1853 - Contacted Traffic via 5A; notified them of intentions to weigh anchor en route Everett, CGC1 at the rail
1854 – Another CGC contacted on 81A to ask intentions for CGC small boat.
1903 - Began to weigh port anchor.
2150 - Port anchor at water's edge, Anchor fouled with 2 inch cable.
2329 - Slipped port anchor and one shot of chain in position N, W.

* The TANO's clock may not be perfectly synchronized with the ECPINS.

3. INJURIES

	CREW	PASSENGERS	OPERATOR	OTHER	TOTAL
INJURIES	1*	0	0	0	1
FATALITIES	0	0	0	0	0
NO INJURIES	0	0	0	0	0

* The break-in coxswain suffered impact bruises associated with the urgent egress from the capsized small boat.

4. BOAT INFORMATION

A. Daily boat checks were conducted the day of the incident. It was noted that the port sponson was deflated. The crew was unable to inflate until released from the davit.

B. CG 24206 had no other discrepancies the day of the incident.

C. An inspection of PMS records indicates that maintenance on the boat was within program standards.

D. Bow number CG 24206

E. CG 24206 was accepted as new by CGC on 22 October 2008.

F. General Description:

Hull Design –Inflatable fabric collars on planning hull.

Propulsion Machinery –Single Cummins Mercruiser diesel engine, 230 HP with Mercruiser Bravo 1X Outdrive.

Propellers – Stainless Steel 15 1/4 inch diameter and a 19 inch pitch Bravo 1X 4 blade

Hull and Deck – The hull and deck structure of the RB-S is constructed of marine grade aluminum and are welded using Metal Inert Gas (MIG) or Tungsten Inert Gas (TIG) welding techniques, as required.

Walking Surface – Non-skid material is installed on the deck areas except that a 1-inch "no non-skid" area is provided around fittings, between non-skid pads, and around deck drains.

Collar – The collar is manufactured from nylon fabric coated with polyurethane. The collars are mechanically attached to the hull structure.

Operational Characteristics:

Maximum Speed:	30+ knots
Cruise Speed:	20 knots
Maximum Range at Cruising Speed:(in calm water)	100 NM
Maximum Operating Distance from Cutter	12NM
Maximum Operating Winds:	30 knots
Maximum Operating Seas:	6'
Maximum Towing Capacity:	Not specified
Operation in Ice:	None

Manufacturer: American Chambered Boats, Inc.
809 Harris Ave.
Bellingham, WA

5. METEOROLOGICAL INFORMATION

Date: Monday, 09 March 2009
Location: Admiralty Inlet/Point Wilson/0.5 NM from land, WA, USA
Sunrise: 0734
Sunset: 1904

Observed:
Winds: 350T, 14 knots
Seas: 0.5 foot
Precipitation: None
Visibility: 10 nautical miles
Sky Condition: Scattered Clouds
Air Temperature: 34F
Water Temperature: 44F

6. COMMUNICATIONS

The CB-L is outfitted with the standard SINS package consisting of: L3 Communications AIS, Motorola XTL 50000 Tactical VHF-FM, Motorola XTL 500 Tactical UHF-FM, and the Standard Horizon GX 85000 VHF-FM. These radios are capable of operating w/ encrypted communications in the AES, DES, DES-XL & DES-OFB modes.