

## Case Study #6

Collision, Class C-HIPO

# Mishap Analysis Report

## CASE STUDY

### 1. SYNOPSIS

At approximately 1850 hours on October 24, 2009 a CG Station, 25 foot response boat was initiating the up bound escort of a High Value Asset (HVA) during a Ports, Waterways and Coastal Security (PWCS) Naval Protection Zone (NPZ) mission on the River. Escort assets consisted of a CG 25 foot response boat, a local sheriff boat, and a U.S. Navy vessel. The HVA, a barge with cargo consisting of a U.S. submarine's decommissioned nuclear reactor compartment, was being pushed ahead on the stern by two tugs. While transiting ahead of the HVA, the Coxswain of the CG response boat turned to look aft in order to check the position of the advancing HVA. The act of turning caused an inadvertent activation of the man-overboard engine kill switch. The Coxswain was unable to re-start the engines. Within minutes the barge's port bow violently struck CG response boat's port quarter, knocking the response boat clear of the advancing barge. Two of five RBS crewmembers were able to abandon the CG response boat at the Coxswain's command. The sheriff boat participating in the escort recovered the persons in the water. The CG response boat was towed to a local boat ramp, trailered and returned to Station without incident. Four out of five crewmembers sustained minor injuries. The CG response boat suffered major damage to the port engine and minor damage to the aft deck areas.

### 2. HISTORY

In May, 2006 Commander CG District entered a Memorandum of Understanding (MOU) with regional U.S. Navy interests regarding Naval Protection Zone (NVPZ) security escorts for decommissioned and de-fueled U.S. navy nuclear Reactor compartments. The operation uses a navy barge, commercial tugs, and a dedicated Navy escort vessel "AGATE PASSAGE" (civilian crewed) for the duration of the five to six day passage from Pleasantville Naval Shipyard to Port of Caribbean. The MOU calls for the Coast Guard to provide two liaison personnel to the escort unit (AGATE PASSAGE), for the liaisons to conduct vessel examinations of the contracted towing vessels prior to shipment, and to assist possible CG forces in the enforcement of the NVPZ. The MOU calls for the CG to deploy forces to enforce the NVPZ if a threat assessment indicates additional security is warranted.

An interagency planning meeting was held on September 3rd, 2009; in attendance was CCGD representative LT. During this meeting plans for the Coast Guard to provide liaison personnel were affirmed. Plans for the CG to provide NVPZ security enforcement were deferred pending a threat assessment to be proved later. On October 5<sup>th</sup>, the Navy issued OPORD 09-1, Decommissioned Reactor Compartment Tow Escort. On October 13<sup>th</sup>, Sector Response Department, Enforcement Branch began operational planning directly with BM2, the only certified Tactical Coxswain at Station. Sector provided OPORD 09-1, and briefing slides. On October 19<sup>th</sup>, Sector provided Incident Command System (ICS) ASSIGNMENT LIST and COMMUNICATIONS LIST.

CG Station is a one boat station; boat crews stand port and starboard duty. At the time of

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the incident, Station had only one certified tactical boat crew for the NVPZ enforcement mission. The tactical boat crew is formed by pulling from the normal port and starboard duty section. Station had been scheduled for Response Boat Tactics, Techniques and Procedures training (needed to qualify additional tactical coxswains), but the training was cancelled by Training Team West 3 weeks before the incident (on or about September 30<sup>th</sup>). The Station Officer in Charge (OIC) notified Sector of the negative impact on capability and personnel that the training team cancellation created, and immediately pursued training quotas for the Tactical Coxswain Course at Joint Missions Training Center (JMTC). Sector later assisted in locating RB-TTP training at JMTC Center. The boat crew was fully qualified for their assigned positions.

During the week of October 19<sup>th</sup>, the Weapons Restraint System-Aft Tether U Bolt Time Compliance Technical Order was installed on 25469 by Station personnel.

On October 24<sup>th</sup> at approximately 1400 hours, BM2 arrived at the station and began preparing for the escort mission. At approximately 1610 BM2 (1) and BM2 (2) conducted a General Assessment of Risk (GAR) and arrived at a combined score of 18. A few minutes later, BM2 (1) briefed BM3, MK3, and FN about the risk assessment. About this time the boat crew drew weapons including two M240 Mounted Automatic Weapons (MAW).

At 1633 CG 25469 proceeded to get underway from Station, enroute the PWCS mission with the following personnel assignments:

BM2 (1)	Coxswain
MK3	FWD Gunner
BM3	AFT Gunner
FN	Crewman/Boarding Team Member:
BM2 (2)	Crewman/Boarding Officer

At approximately 1650 hours, AGATE PASSAGE was on scene with the HVA when 25469 arrived in the vicinity of Ken Point and Open water Barge Lines terminal. At about 1720 hours County Sheriff Office (CSO) marine patrol unit arrived on scene and requested escort position instructions from 25469. From about 1740 until 1830 the HVA was moored at Open water Barge Lines terminal while being shifted from an alongside tow to pushing ahead configuration. At 1830 Tugs PINVADER (port stern) and DEFIANCED (STBD stern) underway from Open water Barge Lines mooring, pushing barge "DELUGA" ahead, heading up current. The HVA cargo loading arrangement creates significant blind-spots for the tug operators in the area dead ahead of the barge out to a range of approximately 200 yards or more. At 1845 the HVA overtook and left the tug CAPT DOLE (stationing on the river awaiting a bridge opening) down the portside.

Shortly there afterward a rapid sequence of events unfolded. Items in italics are estimated.

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1845:10 25469 maneuvers to port; throttles increased to 2200 RPM. position: DELUGA's port bow at *a range of 200 YDS*. PINVADER throttles up. As the Coxswain turned to check position on accelerating HVA, the kill switch lanyard became taught; tripping engine safety interlock, resulting in a complete loss of propulsion.

Aft gunner notes loss of power and looks forward.

FWD gunner notes loss of engines, looks aft and notes coxswain move throttles.

Coxswain informs crew of loss of engines.

Coxswain directed BM2 (2) to advise HVA of situation.

1849:19 25469: BM2 (2) "Tug, attention tug, 222 on 16 we have lost power DIW at this time, over". (No response from PINVADER.)

Coxswain reset kill switch with finger pressure to up position, then cycled ignition switch from run to start position with negative results.

Aft Gunner began shouting distance from DELUGA to 25469

Coxswain removed keys from ignition switch, used key to trip interlock, then used finger to again reset the switch.

BM2 (2) heads aft.

The Coxswain checked throttles for neutral (Aft gunner recalls engines making clicking noises).

FN shouted "what do we do?!"

Turning aft to see the closing DELUGA, Coxn places ignition keys on FWD port cabin seat.

DELUGA range: 20 yds.

Coxswain directs abandon ship.

FN passes through aft cabin door, steps down on the Aft Gunner's taunt restraint tether. Aft Gunner is taken off balance from behind and is driven to the deck.

FN goes over STBD side, simultaneously Aft Gunner yelled that his gunner restraint was not releasing ("I'm stuck").

BM2 (2) follows in same path as FN, steps on Aft Gunner's gunner restraint system, momentarily stopping the aft Gunner's attempts to release the gunner restraint system.

BM2 (2) goes over STBD side.

BM2 (1) attempts to assist Aft Gunner in releasing the gunner restraint tether.

DALUGA range: 10 yds.

Aft Gunner's restraint releases.

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The Coxswain and Aft Gunner huddle on aft deck and brace for impact. Aft Gunner is kneeling on deck, Coxswain is crouching facing aft just fwd of gun mount.

Bow Gunner faces aft, uses hand rails to brace for impact.  
**1849:50 DELUGA strikes CG25469; 25469 pushed aside while pivoting to port, leaves DELUGA down 25469's portside.**

Coxswain impacts M-240 MAW assembly and receives chest wall contusion. Bow gunner impacts left knee against cuddy cabin door resulting in fracture of left knee cap.

BM2 (2) passes under DELUGA's hull, underwater swims to egress, surfaces to STBD of DEFIANCED.

CSO recovered the persons in the water within four minutes. CG 25470 arrived on scene and towed CG 25469 to a local dock where MK3 and BM3 were evaluated and transported by EMS to Hospital. CG25470 then side towed CG25469 to a local boat ramp where CG 25469 was trailered and returned to Station without incident.

Shortly after arriving at Station, BM2 (1) (complaining of rib pain), BM2 (2) (complaining of intense headache) and FN were transported to Hospital. All personnel were released from the hospital later that evening. Four out of five crewmembers sustained minor injuries.

CG 25469 sustained major damage to the port engine, taff rail, MK-16 gun mount, transom, aft deck and mast.

### 3. INJURIES

Four out of five crew members of CGC-25469 sustained minor injuries with diagnoses of non-displaced patellar fracture, low back pain, chest wall contusion, and headache. They were evaluated at the hospital the night of Saturday, 24 October 2009. None of the injured members required hospitalization.

MK3, the bow gunner slammed his left knee against the cuddy cabin door on impact as he was holding on to the railing of the cabin and facing aft to brace for the collision. MK3 sustained a non-displaced simple fracture of his left knee cap and is anticipated to return to FFFD in 8 to 10 weeks.

FN, the aft gunner, sustained low back injury due to a fall hitting his back against the starboard aft deck. He is anticipated to return to FFFD within one week.

BM2 (1), the coxswain sustained a blunt trauma to the back of his right chest wall. He was hit by the machine gun mount and possibly the buttstock of the aft MAW, while helping the aft gunner in releasing the gunner restraint tether. The member is considered FFFD.

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BM2 (2), a cabin crew member complained of an intense generalized headache which started a few hours after the mishap and lasted less than a day. He was one of the two cabin crew members who jumped overboard from the starboard side shortly before the collision. BM2 (2) reported coming in contact with the barge in the water, went under the barge, and swam away quickly to clear himself. He is considered FFFD.

FN was the only crew member who did not sustain injury. He was the first crew member who jumped overboard from the starboard side prior to the collision. He is considered FFFD.

Toxicology reports were negative for all boat crew members. 72-Hour Pre-mishap History Questionnaires were negative for crew fatigue. None of the crew members carried MSM-IV Axis I or II diagnoses. No family or social stressors were reported.

	CREW	PASSENGERS	OPERATOR	OTHER	TOTAL
INJURIES	3	0	1	0	4
FATAL	0	0	0	0	0
NON-FATAL	3	0	1	0	4

#### 4. VESSEL INFORMATION

A. Daily boat checks were conducted the day of the incident, no discrepancies were noted.

B. CG 25469 had no 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 25469, Hull Identification Number EG000466C404T1749

E. CG 25469 was accepted as new by STATION on 11MAY04.

#### F. General Description:

**Hull Design** – Deep-V hull, rigid mono-hull with a stabilizing solid, closed cell polyethylene foam collar.

**Propulsion Machinery** – Twin 225 horse power 4-stroke outboard engines manufactured by Honda Corporation.

**Propellers** – Stainless Steel 14x19 inch Mercury Offshore Series.

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**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.

**Cabin** – The cabin is constructed of 5052 marine grade aluminum and is welded to the hull. The cabin provides seating for four crewmembers. All boat systems operating controls are contained in the cabin. A small cuddy cabin, forward of the main cabin area, provides access to the electronics, the heater, and the forward deck area. A hinged radar pod and VHF antennas atop the cabin can be lowered for transport on a C-130 aircraft.

**Collar** – The collar is manufactured from closed cell polyethylene foam with an ultraviolet (UV) stable polyethylene coating. The collar is bolted directly to the outside of the hull and cannot lose buoyancy or absorb water.

**Operational Characteristics:**

Maximum Speed:	46 knots at 6000 RPM
Cruise Speed:	35 knots at 4100 RPM
Maximum Range at Cruising Speed:	150 NM
Maximum Operating Winds:	25 knots
Maximum Operating Seas:	6’ (no surf)
Maximum Towing Capacity:	10 displacement tons
Maximum Operating Offshore:	10 NM
Outside Air Temperature:	0 to 105 degrees Fahrenheit
Outside Water Temperature:	28 to 95 degrees Fahrenheit
Operation in Ice:	None

**Manufacturer:** Safe Boat International (SBI)  
8800 Barney White Road  
Port Orchard WA, 98367

A complete inspection of CG 25469 was conducted. The taff rail was severely bent, the port engine cowling cracked, crank case cracked, mast bent, aft deck buckled, transom caved in, aft hand rail bent, MK16 gun mount destroyed. Estimated costs of repair are 40K.

SINS data cannot be effectively extracted from the RDP-139 Radar/Chart Plotter for analysis since the reader hardware/software, PC Planner, was not available. The Mishap Analysis Board took a photograph of the chart plotter monitor displaying the tracklines of CG 25469 at the time of the mishap (See Appendix T). During interviews, the statements

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of the coxswain and crew of CG 25469 validated the trackline information that the Mishap Analysis Board had collected.

Both port and starboard engine ECM data was extracted and analyzed, no anomalies were noted. A local Honda marine technician inspected the engines and found no abnormalities.

The Mishap Analysis Board systematically validated the 25 RBS Propulsion Safety Interlock (kill cord) function and restart procedures. No unexpected results were found. However, conducting the tests did allow the MAB to positively identify the “clicking noise” reported by BM3 Daly as the sound of throttle linkage being shifted back and forth. This was a key finding in the causal analysis.

The stability of 25469 is not considered to be contributory to the mishap.

### 5. METEOROLOGICAL INFORMATION

**Date:** Saturday, 24 October 2009

**Location:** River, Lower Channel Turning Basin, Distance to land: 350 YDS, Pleasantville, United States

**Forecast:**

*Winds:* SW, 10 knots becoming light

*Seas:* Wind waves 1 foot or less

*Precipitation:*

*Sunrise:* 0738

*Sunset:* 1811

**Observed:**

*Winds:* West, 6-7 KTS

*Seas:* 1 foot

*Precipitation:* None

*Visibility:* 5 nautical miles

*Sky Condition:*

*Air Temperature:* 55F

*Water Temperature:* 59F

### 6. COMMUNICATIONS

The RB-S communications suite consists of two VHF radios. Both radios are similar in capability. The Raymarine 215 VHF Transceiver radio has built-in digital selective calling (DSC) for transmitting and receiving DSC distress calls. The Motorola VHF-FM Astro Spectra W9 has the ability to utilize digital encryption to transmit and receive



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secured communications. Both personal and unit cellular phones are used for secondary communications.

The radio communications guard for CG 25469 was held by Sector at the time of the mishap. Recordings of the radio and telephone conversations between Sector, CG 25469, and the other vessels were provided to the Mishap Analysis Board, and are included as.

The Boat Crew Communications System (BCCS) fielded for 25RBS was not used. Communications to the forward and aft gunners were limited to hand signals, or yelling through the back door or an open side window. The enclosed cabin allows crewmembers to communicate verbally inside the cabin. Due to the windshield barrier and noise associated with operations, the Forward Gunner is out of the verbal communications loop unless communications are used. A loudhailer/intercom system can be used, but this method is known to have limited effectiveness once the RBS is at speed due to wind noise interference.