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CGC WINSLOW GRIESSER (WPC 1116)

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GRIESSERINST 3530.1A
19 Oct 2021

USCGC WINSLOW GRIESSER (WPC 1116) INSTRUCTION 3530.1A

Subj: NAVIGATION STANDARDS

- Ref:
- (a) United States Coast Guard Regulations, COMDTINST M5000.3 (series)
 - (b) Coast Guard Navigation Standards, COMDTINST 3530.2 (series)
 - (c) Cutter Training and Qualification Manual, COMDTINST M3502.4 (series)
 - (d) U.S. Coast Guard Boat Operations and Training Manual, Volume I, COMDTINST M16114.32 (series)
 - (e) U.S. Coast Guard Boat Operations and Training Manual, Volume II, COMDTINST M16114.33 (series)
 - (f) U.S. Coast Guard Boat Operations and Training Manual, Volume III, COMDTINST M16114.42 (series)
 - (g) U.S. Navy Ship Control and Navigation Personnel Qualification Standard (PQS), NAVEDTRA 43492 (series)
 - (h) Operational Risk Management, COMDTINST 3500.3 (series)
 - (i) Cutter Organization Manual, COMDTINST M54000.16 (series)
 - (j) Information and Life Cycle Management Manual, COMDTINST M5212.12 (series)
 - (k) Procedures for the Preparation and Disposition of Cutter Logs, COMDTINST M3123.12 (series)
 - (l) Coast Guard Publication 1, Doctrine for United States Coast Guard
 - (m) Coast Guard Directives System, COMDTINST M5215.6 (series)
 - (n) Telecommunications Tactics, Techniques, and Procedures, COMDTINST M2000.3 (series)
 - (o) Team Coordination Training, COMDTINST 1541.1 (series)
 - (p) Navigation Rules, International-Inland, COMDTINST M16672.2 (series)
 - (q) Standing Orders to the Officer of the Deck, GRIESSERINST 3121.1 (series)
 - (r) Fast Response Cutter Tactical Data, NSWCCD-80-TR-2013/028

1. PURPOSE. To promulgate unit navigation standards and watchstanding procedures for the safe navigation of WINSLOW GRIESSER and its cutter boat.
2. ACTION. All qualified and break-in Bridge watchstanders shall read, understand, and comply with these Standards. The Operations Officer (OPS) shall ensure each watchstander reads them and signs the signature page certifying understanding before their first underway watch, after any update, and reviews them at least semi-annually thereafter.
3. DIRECTIVES AFFECTED. GRIESSERINST 3530.1 is hereby cancelled.

4. DISCUSSION. Although these Standards address many navigational situations, this instruction is not intended to be all-encompassing. Instead, these standards establish a baseline for navigation, equipment configuration, and terminology. Watchstanders must use sound judgement and seamanship – if deviation from these standards is required, notify the Commanding Officer.
5. DISCLAIMER. This guidance is not a substitute for applicable legal requirements, nor is it itself a rule. It is intended to provide guidance for Coast Guard personnel and is not intended to, nor does it, impose legally binding requirements on any party outside the Coast Guard.
6. MAJOR CHANGES. This update contains substantive changes to nearly all aspects the previous navigation standards.
7. ENVIRONMENTAL ASPECT AND IMPACT CONSIDERATIONS.
 - a. The development of this directive and the general policies contained within it have been thoroughly reviewed by the originating office and are categorically excluded under current USCG categorical exclusion (CE) # 33 from further environmental analysis, in accordance with Section 2.B.2 and Figure 2-1 of the National Environmental Policy Act Implementing Procedures and Policy for Considering Environmental Impacts, COMDTINST M16475.1 (series).
 - b. This directive will not have any of the following: significant cumulative impacts on the human environment; substantial controversy or substantial change to existing environmental conditions; or inconsistencies with any Federal, State, or local laws or administrative determinations relating to the environment. All future specific actions resulting from the general policies in this Manual must be individually evaluated for compliance with the National Environmental Policy Act (NEPA), Department of Homeland Security (DHS) and Coast Guard NEPA policy, and all other environmental mandates.
8. DISTRIBUTION. A paper copy of this instruction will be maintained on the bridge. An electronic copy will be located in the unit's shared folders.
9. PROCEDURES. All bridge watchstanders shall navigate the cutter in accordance with these standards. Deviation from these standards may be authorized only by the Commanding Officer and shall be logged either in the ship's log (when verbal authorization is given) or via the CO's night orders.
10. RECORD MANAGEMENT CONSIDERATIONS. This Manual has been thoroughly reviewed during the directives clearance process, and it has been determined there are no further records scheduling requirements, in accordance with Federal Records Act, 44U.S.C. 3101 et seq., National Archives and Records Administration (NARA) requirements, and Information and Life Cycle Management Manual, COMDTINST M5212.12 (series). This policy does not create significant or substantial change to existing records management requirements.
11. FORMS AND REPORTS. None.

12. REQUEST FOR CHANGES. Individuals may submit recommended changes to the CO via the Navigator and the Executive Officer. Promulgated updates shall include a basic summary of the change within the Record of Changes table.

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Lieutenant, U.S. Coast Guard
Commanding Officer

- Enclosure:
- (1) Cutter Boat Speed-RPM Curve
 - (2) Line Handling Commands
 - (3) Helm and Engine Orders
 - (4) Navigation Teams
 - (5) Standard Plotting Symbology
 - (6) GPS Outage Reporting
 - (7) Entering Port Checklist
 - (8) Getting Underway Checklist
 - (9) Loss of ECDIS Checklist
 - (10) Navigation Brief
 - (11) Loss of Master Gyro Checklist

USCGC WINSLOW GRIESSER (WPC 1116) NAVIGATION STANDARDS

<u>No</u>	<u>Chapter</u>	<u>Page</u>
1.	Definitions	2
2.	Cutter Characteristics and Tactical Data	5
3.	Voyage Planning Requirements	10
4.	Voyage Monitoring Requirements	20
5.	Electronic Navigation Requirements	23
6.	Paper Chart Navigation Requirements	26
7.	Logs, Records, and Checklists	28
8.	Cutter Boat Navigation and Operations	31
9.	Anchoring Procedures	42
10.	Operational Risk Management	44
11.	Appendix I: Navigational Zone Chart	45
12.	Appendix II: Cutter Tactical Data	46
13.	Appendix III: ECDIS/VEGA Navigation Zones and Profile Setting	47
14.	Appendix IV: ECDIS/VEGA Additional Navigation Settings	49
15.	Appendix V: ECDIS/VEGA User Station Profile Settings	50

CHAPTER 1
DEFINITIONS

1. The following definitions shall apply to all situations involving the navigation and maneuvering of the cutter.
 - a. Anti-Grounding Alarm: A function within electronic navigation systems that uses hydrographic data contained in vector format electronic chart data to alert the mariner when the cutter is approaching any charted feature that is located at a depth less than a prescribed depth set by the operator.
 - b. Depth Below the Keel: The depth recorded by the fathometer. On WINSLOW GRIESSER, the 1-kilowatt transducer is located 1.3' (16 inches) above the keel. The depth sounder display, mounted above the chart table, shall include a 1.5' (18 inches) correction to account for this disparity.
 - c. Drag Circle: The Drag Circle is the radius of the scope of anchor line plus the distance from the hawse pipe to the GPS antenna (in ECDIS) or the hawse pipe to the radar antenna (if overlaid within the AN/SPS-50 radar).
 - d. Electronic Fix:
 - (1) Latitude and longitude obtained from electronic navigation systems (DGPS, GPS, WAAS, etc.) and plotted on an ECDIS or paper chart; or,
 - (2) The intersection of at least three radar ranges or a combination of radar and visual LOP's from at least three separate, prominent points of land or fixed objects.
 - e. Electronic Chart Display and Information System (ECDIS): An electronic navigation system that meets or exceeds international standards in that it displays positional information from navigation sensors on up-to-date charts complying with the 1974 SOLAS Convention. In this instruction, ECDIS (the system), VEGA (the computer application), and ECS (electronic chart system) are used interchangeably. ECDIS-backup is also a fully compliant ECDIS system. SINS (Scalable Integrated Navigation System) is **not** ECDIS, and cannot be used for primary navigation of the cutter.
 - f. ECDIS-backup: Refers to the independent backup to the primary SeaWatch ECDIS system located on the chart table. This system may be used for primary navigation of the cutter, particularly when the primary ECDIS system is inoperable.
 - g. Estimated Position (EP): An EP is a dead reckoning that has been updated with either one or two visual or electronic LOP's. For the cutter boat only, an EP can be obtained by seaman's eye using distances or angles paired with instinctive knowledge and experience.
 - h. Navigational Draft: The assumed depth of the keel for navigation purposes. This

depth shall be 12 feet, 4 meters, or 2 fathoms, with units applicable to the chart in use. Although these measurements are not exact equivalents, they are close approximation

- i. Navigational Hazard: A fixed object, charted or uncharted, which may or may not be marked by an aid to navigation, which could cause damage to the cutter, that includes: piles, pipelines, wrecks, overhead wires, bridges, offshore platforms, well heads, etc. Chart 1 shall be consulted for any unknown symbol on or near intended tracklines.
- j. Navigational Zones: An area of navigable water at a specified distance from shoal water for which standard fix intervals and manning requirements are specified in this instruction. The following Navigational Zones are in effect: Restricted, Coastal, and Open Ocean.
- k. Navigator: An experienced and qualified Underway OOD, designated by the Commanding Officer, possessing the requisite proficiency, training, maturity and judgment in accordance with applicable references (b) and (q).
- l. Raster Charts: Raster charts are flat images of paper charts. Each paper chart has a corresponding raster chart that is its digital equivalent. Users cannot query raster chart data for more information or use raster data for alarms.
- m. Restricted Visibility: When visibility is reduced to a distance that impacts safe navigation by any means (fog, smoke, rain, sand, etc). A reduction in visibility to less than 2 nautical miles in any direction **shall** be restricted, although the ship may be considered to have entered an area of restricted visibility well before this threshold.
- n. Safety Depth and Safety Contour: Settings within ECDIS that will trigger an alarm if the ship navigates in an area where the charted depth or depth contour is below the selected safety depth or safety contour. The Safety Depth and Safety Contour shall be set to: 18 feet, 6 meters, or 3 fathoms, with units applicable to the chart in use. Entry into waters less than the established Safety Depth require advance notification to the Navigator and Commanding Officer.
- o. SeaWatch: A computer system containing a suite of applications for navigation, internet communications, and tactical data. The SeaWatch server has two clients numbered 1 and 2 on the port bridge console. On this cutter, SeaWatch is connected to the SIPRnet and is therefore classified. Vega is one of the applications on the SeaWatch clients and is used as the primary ECDIS.
- p. Shoal Water: Defined by our Navigational Draft; any water with a charted depth at mean lower low water (MLLW) less than 12 feet, 4 meters, or 2 fathoms. Although these measurements are not exact equivalents, they are close approximations and shall be applicable to the chart in use. Any wreck or obstruction of unknown depth shall be considered shoal water. These waters shall be highlighted in blue on all frequently used charts, coastal charts, and harbor charts.

- q. Sounding Alarm: A function, using the fathometer and ECDIS, which alerts when the cutter encounters a specific depth beneath the keel. The Sounding Alarm shall be set to: 18 feet, 6 meters, or 3 fathom, with units applicable to the chart in use.
- r. Standard Fix Interval (frequency): The position of the cutter will be fixed continuously using ECDIS. However, when ECDIS is not online, and ECDIS-backup is impaired, fixes shall be taken on the appropriate chart at the prescribed intervals as defined in this instruction.
- s. Swing Circle: The radius of the scope of anchor line plus the length of the cutter. The Swing Circle shall be plotted on both electronic navigation systems and on the applicable paper chart with the anchor position in the center.
- t. Vector Charts: An electronic chart that consists of points, lines, and area data that represent real world objects. Since each object is separate, it allows for more information than can be displayed for each object to be stored in the chart data, allowing the user to query the chart. It also allows the navigation system to test each object for grounding or height alarms.
- u. Visual Fix: Three or more visual bearings plotted as Lines of Position (LOP) on a nautical chart. Since FRC's are not equipped with an alidade, an Electronic Fix is preferred.

CHAPTER 2**CUTTER CHARACTERISTICS AND TACTICAL DATA**1. Cutter Characteristics.

a. Tonnage:

(1) Standard operating: 335 long tons (340 metric tons)

(2) End of Service Life: 353 long tons (359 metric tons)

b. Draft:

(1) Typical Operating Draft: 7' 9" (forward), 9' 3" (aft)

(2) Full Load Draft: 9' 10" (2.9 meters)

(3) Maximum Draft at the Designated Waterline (DWL): 9' 8"

c. Height:

(1) Masthead Height above keel: 56.5 feet (17.2 meters)

(2) Main Deck Height: 8 feet (2.43 meters)

(3) Bridge Height: 13 feet (3.9 meters)

(4) Height of Bridge above the Waterline / approx. line of sight: 19.25' / 5.1 NM

d. Length Overall: 153.5 feet (46.8 meters)

e. Length at the Waterline: 145.5 feet (44.4 meters)

f. Beam: 25.4 feet (7.75 meters)

g. Watertight Frames: 3 – 10 – 17 – 22.5 – 27 – 36 – 40 – 45

h. Distances:

(1) Hawsepipe to GPS (1) antenna: 55.5 feet (16.9 meters)

(2) Hawsepipe to GPS (2) antenna: 55.5 feet (16.9 meters)

(3) Hawsepipe to radar antenna (primary): 77 feet (22.5 meters)

- (4) Hawsepipe to radar antenna (secondary): 77 feet (22.5 meters)
 - (5) Hawsepipe to stern: 153.5 feet (45 meters)
 - (6) Hawsepipe to SRVSS (pelorus): 76.5' (23.3 meters)
 - (7) GPS (1) antenna to stern: 102.5 feet (30 meters)
 - (8) GPS (2) antenna to stern: 102.5 feet (30 meters)
 - (a) GPS1 antenna location: Frame 16 on 01 Deck, just aft of starboard life raft mount.
 - (b) GPS2 antenna location: Frame 16 on 01 Deck, just aft of port life raft mount.
 - (9) Radar antenna (primary) to stern: 76.5 feet (22.5 meters)
 - (10) Radar antenna (secondary) to stern: 76.5 feet (22.5 meters)
- i. Main Propulsion System:
- (1) The cutter is equipped with two MTU model 20V 4000 M93L Main Diesel Engines, each rated to produce up to 4,300 kW (5,766 bhp) each. During the cutter class design, each engine was downrated to produce 3,800 kW (5,095 bhp), or about 88.4% of theoretical top-end power. This reinforces long-term reliability and increases efficiency through reduced fuel consumption over the service life of each engine.
 - (2) The Main Diesel Engines were originally equipped to include an alternator attached to the accessory drive on the front of each engine, providing power to myriad sensors and the electronically-timed and fired fuel injectors. To reduce weight, the alternators were removed in favor of a bank of batteries to provide standby power to each engine if each of the three onboard generators were to fail in producing power. The battery bank is designed to provide power to operate both engines simultaneously for at least 30 minutes before dropping voltage and securing both Main Diesel Engines.
 - (3) Each engine drives a ZF model 23560C reversing Marine Transmission via a strong torsional coupling to dampen vibrations. The reduction gears feature the ZF "autotroll" electronic control system allowing for slow- drive (clutchslipping).
 - (4) The cutter is equipped with two 6-bladed Michigan Wheel Marine, fixed-pitch propellers, each 6' diameter with 8' pitch, which rotate outward (port counter-clockwise, starboard clockwise). The shafts are 8" diameter and approximately 31' long fabricated from Nitronic 50HS alloy.
 - (5) The propellers extend 12" below the keel at even trim. The aft draft marks are referenced to the bottom of the propellers. The forward draft marks are referenced to the amidships keel line. Thus the cutter is at even trim when the stern draft reading is one foot greater than the forward marks.

(6) Fuel consumption data on both MDEs at standard operating displacement:

Kts	eRPM	<u>Gal / Hr</u>
29.1	2100	500
24.4	1850	375
23	1800	350
20.6	1600	254
17.5	1350	148
15.5	1200	110
14.8	1100	85
11.6	850	35
10	735	19
6.5	500	10

Additionally, each SSDG consumes approximately 10 gallons per hour.

j. Electrical Generating and Distribution System:

- (1) The cutter has two installed Ship Service Diesel Generators (SSDG) and an Emergency Diesel Generator (EDG).
- (2) The two SSDGs are comprised of Cummins prime movers coupled to Stamford generators that are each capable of producing up to 215 kW, which is designed to be at least 20% greater than the maximum basic operating load.
 - (a) They can operate independently or in parallel through three different modes: Programmable Logic Controller (PLC) Power Management System (PMS), PLC Manual, and fully manual operation.
 - (b) When the load placed on the online generator has reached 85% of the generator's rated capacity for five minutes in PLC PMS mode, the offline generator designated as Secondary Priority will be brought online and paralleled onto the bus. When the demand has decreased to less than 35% on each, the generator with the highest priority will be removed from the bus and secure itself.
- (3) The EDG, comprised of an air-cooled Cummins diesel engine coupled to a Stamford generator, is rated to produce up to 78 kW. A 12-volt battery bank can light off the generator to pick up the cutter's electrical load on the Emergency Switchboard.

k. Auxiliary Systems:

- (1) The cutter is outfitted with the MTU Callosum system to control and monitor both Main Diesel Engines, remotely operate valves and provide readouts of switch positions, system alarms sensor data across the cutter at one of six terminals.
- (2) The 4-bladed electric bow thruster is a Schottel model STT60FP provides up to 75kW (101 hp) at 1,170 RPM. The bow thruster cannot be operated on the EDG alone.

- (3) The two Village Marine model 20700 reverse osmosis water makers are each capable of producing up to 440 gallons per day.

1. Anchor Handling Gear:

- (1) The Rocna 150 anchor weighs 331 lbs, is made of high-strength stainless steel, and has a designed 12,000 lb working load.
- (2) The anchor is shackled to 12 feet of 3/4" CRES 316L chain and two 1" CRES 316L swivels attached to 743 feet of 1 1/2" diameter, 4 1/2" circumference doubled-braided nylon with a thimble splice in each end with 2 7/8" round pin shackles.
- (3) The chain stopper is a 3/4" Devil's Claw.
- (4) The Coast Guard chain stopper (Pelican Hook) is provided for quick-release.
- (5) The Capstan is a 12" vertical electric motor-driven style.
- (6) Anchor Components:
 - (a) Fluke;
 - (b) Skid;
 - (c) Roll-bar;
 - (d) Shank;
 - (e) Shackle attachment point.

2. Tactical Data.

- a. The unclassified tactical data for the Sentinel Class 154' Fast Response Cutter analysis was collected using USCGC ROBERT YERED (WPC 1104) in December 2013. All published technical data can be found in reference (r), and Advance and Transfer information is provided in Appendix II.
- b. At a nominal approach speed of 29 knots (full ahead), the ship achieved an advance of 277 meters / 303 yards, a transfer of 166 meters / 182 yards, and a tactical diameter of 364 meters / 398 yards when turning using 35 degrees (full) rudder. The maximum tactical diameter is calculated to 2.0 ship-lengths for harbor maneuvering and 3.0 ship-lengths for transit and patrol.
- c. Crash-Stop: Crash-stop or crash-astern maneuvers were performed from the full-ahead condition as well as from the clutch-ahead condition with the port shaft trailing. The purposes of conducting crash-stop maneuvers is to determine how far the ship travels along its approach heading before it comes to a stop and subsequently begins backing down. Crash stops may be concluded in an emergency situation such as imminent collision and elision. From full ahead with an approach speed of 29.6 knots over ground, WPC 1104 stopped with a head reach of 243 meters/ 266 yards and a side reach of 3.8 meters/ 4 yards in about 38 seconds. WPC 1104

stopped in 5.4 ship lengths from full ahead. The crash stop from clutch ahead with one shaft trailing was performed to assess stopping ability for harbor maneuvering. WPC 1104 came to a stop within 21.8 meters/ 24 yards along the approach heading with a side reach of 8.1 meters/ 8.9 yards in 16 seconds from an approach speed of 4.6 knots over ground.

- d. Additionally, it should be noted that the cutter's bow tends to rise up when over 1220 RPMs are ordered to both engines. When the bow rises, this tends to challenge the OOD with seeing over the MK38 and the bow to sight contacts.

3. Important Notes about Navigation Equipment:

- a. **Note 1:** The cutter is equipped **one** SeaWatch system that has two clients on the bridge console, **one** backup ECDIS system on the chart table, and a Scalable Integrated Navigation System (SINS) chart plotter. SINS is not authorized as a primary means of navigation, but *should* be used as a situational awareness tool in the event of ECDIS failure. The SINS chart plotter should be equipped with an up-to-date chart card just like the cutter boat.
- b. **Note 2:** The SeaWatch system and backup ECDIS systems are mostly independent. Thus, care must be used to ensure track lines, waypoints, and chart updates match between the two systems. **Additionally**, the SeaWatch system is classified SECRET whereas the backup ECDIS system is not: data **cannot** be transferred from SeaWatch to the backup ECDIS system; however, data (tracklines, chart updates, etc.) can be transferred from the backup ECDIS to SeaWatch via CD.

CHAPTER 3

VOYAGE PLANNING REQUIREMENTS

1. Navigation Information. Regardless of actual drafts or displacement, the following values shall be used for voyage planning and navigation:
 - a. Navigational Draft: 12 feet, 4 meters, or 2 fathoms.
 - b. Navigational Masthead height (above waterline): 60 feet
2. Standard Commands. Standard helm, engine, and line commands are found in enclosures (2) and (3).
3. Navigational Zones / Areas
 - a. Shoal Water: Any area of water with a charted depth less than the Navigational Draft. This includes any hazards or obstructions of unknown depth. CO permission is required before standing the cutter into Shoal Water.
 - b. Shallow Water: Any charted water less than 18 feet, 6 meters, or 3 fathoms is considered shallow. Although operating in shallow water does not necessarily impose any additional fix interval or manning requirements, OODs should be cognizant of the risk of grounding due to excessive sea state, unusual tide data/shoaling, and the impact of shallow water on the cutter's maneuvering characteristics.
 - c. Restricted Waters: All waters 1 nautical mile and less from land or shoal water.
 - d. Coastal Waters: All waters between 1 and 3 nautical miles from land or shoal water.
 - e. Open Ocean: All waters 3 nautical miles and greater from land or shoal water.
4. Fix Intervals
 - a. The following are the fix intervals and cross-track deviations that shall be observed in the respective navigation zones for all modes of navigation. The Commanding Officer may adjust these intervals based on operational requirements and prevailing conditions.
 - (1) Restricted Waters
 - (a) Fix Interval – Every 3 minutes
 - (b) Max Allowable Cross-Track Error – 50 yards **or** half the track distance to any Navigation Hazards, whichever is less.
 - (2) Coastal Waters
 - (a) Fix Interval – Every 15 minutes

(b) Max Allowable Cross-Track Error – 500 yards

(3) Open Ocean

(a) Fix Interval – Every 30 minutes

(b) Max Allowable Cross-Track Error – 1000 yards

(4) At Anchor

(a) Fix Interval – Every 30 minutes

(b) Max Allowable Cross-Track Error – Not Applicable

- b. QMOWs shall plot a fix on the paper chart in use every time they relieve the watch, regardless of the mode of navigation in use. OOD's shall verify fix accuracy and confirm that it concurs with the ECDIS plot. No fix is required under emergent conditions or temporary watch reliefs (e.g, chow relief).
- c. A fix shall not be erased or deleted because it appears in error; rather, the QMOW shall immediately inform the OOD and take another fix.
- d. Every fix shall be labeled and have a properly labeled DR track for two fix intervals.

5. Route Planning

- a. The Navigator and OPS are responsible for identifying any NTM/LNM issued since the electronic chart data update, and shall discuss potential impacts with all Underway OOD's.
- b. The unit may develop principle tracklines and navigation routes, AOR- specific key waypoints, and AOR-specific key areas as required shall be identified by the following. Only the Navigator or Commanding Officer may alter an approved route or direct the modification of a waypoint.
 - (1) The ship's intended route and all waypoints shall be entered identically into ECDIS and ECDIS-backup. If transiting in restricted waters with paper charts as the primary plot, paper charts shall also match.
 - (2) Certain tracklines that have been approved by the Commanding Officer and Navigator will find regular use and will be considered "Standard Tracklines". On paper charts, standard tracklines may be permanently marked in pen.
 - (3) All tracklines shall be reviewed by the Navigator and approved by the Commanding Officer. In both primary (eNav) and secondary systems, the Commanding Officer will approve routes by entering a password into the approval block and saving the route. In certain circumstances, the Commanding Officer may give verbal approval, in that case the OOD will enter that they have received verbal approval and save the route. After the route has been approved, the approval status block will change from "U" to "A". All approved routes automatically display "ROUTE APPROVED BY

COMMANDING OFFICER” on the bottom of the screen. Tracklines on paper charts will be approved with the Navigator and Commanding Officers Signatures on the back of the chart.

(4) When using electronic navigation, single leg temporary track lines (termed “temp tracks”) may be used with verbal approval from the Commanding Officer.

(5) Standard navigation plotting symbols, as listed in enclosure (5), shall be used on all paper charts. Tracklines shall be labeled as follows with similar functions enabled in ECDIS and ECDIS-backup, unless otherwise noted.

c. Maximum allowable cross track error (XTE) along each track leg shall be IAW each navigation zone that is currently being operated in.

6. Additional Navigational Requirements

a. Only the Commanding Officer may authorize ship movements without a trackline or patrol area. In these cases, increasing the frequency of fixes should be considered.

b. Speed Management Expectations:

(1) Planned speed of advance must balance a multitude of factors. The ideal speed is one that balances fuel consumption and crew comfort while ensuring maximum on-scene time and operational relevance. Typical transit speeds will be between 15-20kts.

(2) OOD’s shall take measures to increase situational awareness when transiting at high speeds, or if circumstances dictate, reduce speed in accordance with COLREGS.

c. Cell Phone and Mobile Electronics Usage: Use of cell phones and other mobile electronics on the bridge is prohibited. When dictated by operational necessity or other unique circumstances, the Commanding Officer may authorize temporary exceptions.

7. Required Chart and Publication Preparations

a. General chart and Publication Preparation Requirements.

(1) At a minimum annually, all charts and publications shall be reviewed to ensure they are the latest edition and that all available corrections have been made. Any requests for new products or allowance changes shall be routed via chain of command.

(2) Prior to getting underway, ensure all electronic/paper ready charts, any patrol specific charts and required publications necessary for safe navigation are currently corrected and onboard.

(a) Electronic charts are considered up-to-date if the most recent chart update program has been loaded or all available corrections have been manually applied within 45 days. Both ECDIS and ECDIS-backup must have up-to-date charts. The Navigator and Operations Officers should take note of potential Local Notice to Mariners and

Notice to Mariners that may have occurred after electronic charts have been updated and prior to the next required electronic chart update for potential hazards to navigation that may have been identified during the 45 day window between required electronic updates. Any changes should be advised during navigation briefs.

- (b) Paper charts are considered to be up-to-date if they are the most current editions and corrected up to the latest Local Notice to Mariners, Weekly Notice to Mariners and Broadcast Notice to Mariners.
- (c) Publications will be maintained electronically or paper copy, and will be considered up to date if it is the current edition with any correction available made. The following publications are maintained in an electronic library within the public folder, with the exception of a paper copy of the Navigation Rules. This electronic library will be maintained and considered up to date if on the current edition with any corrections made.

Chart 1 Nautical Chart Symbols and Abbreviations
Pub 102 International Code of Symbols
Pub 110 List of Lights for Greenland, the East Coasts of North and South America
Pub 147 Sailing Directions for the Caribbean Sea
Pub 940 Fleet Guide
CLF 45 Port Directory, North/Central America
Coast Pilot 5 Gulf of Mexico, Puerto Rico and Virgin Islands
Navigation Rules, Inland - International, COMDTINST M16672.2 (series)
Light List, Volume 3 COMDTPUB P16502.3 (series)
Nautical Almanac (Current Year)
Bowditch's American Practical Navigator
Dutton's Nautical Navigation

b. Electronic Chart Preparations:

- (1) At a minimum, both ECDIS and ECDIS-backup shall have updated NOAA D7 ENC charts and NGA DNC regions 14, 15, and 16 loaded into each system.
- (2) All tracklines on electronic charts used in restricted waters must display at a minimum the following:
 - (a) True and Magnetic courses.
 - (b) Distance for each leg.
 - (c) Danger Bearings and Danger Ranges, as applicable.
 - (d) Turn Bearings and Turn Ranges (as applicable).

- (e) Visual and radar navigation points along each leg (to be reflected in a Gazetteer).
- (3) The Navigator must verify all tracks are well clear of any hazards or restricted zones on ENC, DNC, and RNC. Additionally, any special navigation requirements (e.g., speed restriction or special area) should be denoted using a navigation maker in ECDIS.
- (4) Use of the depth contour function shall be highlighted and outlined in ECDIS and ECDIS-backup for ENC and DNC charts. Notably, RNC charts do not permit shoal water to be electronically marked.
- c. Paper Chart Preparations.

- (1) The following is the list of ready paper charts that must be held on board. Bolded text denotes paper charts that are designated for restricted waters navigation and must be corrected and signed by the Commanding Officer.

24400	East Coast of Trinidad Including Tobago
24405	Gulf of Paria
24406	Port of Spain
24430	Cabo Cobera to Cabo Tres Puntas
24450	Punta San Juan to Cabo Codera
25001	Caribbean Sea, Eastern Part
25017	Puerto Rico OPS Area
25400	Trinidad to Saint Vincent
25480	Saint Georges Harbor
25481	Grenada
25484	Saint Vincent to Bequia
25485	Approaches to Barbados
25487	Bridgetown Harbor
25524	Martinique South and East Coast
25527	Martinique
25528	Approaches to Saint Lucia
25550	Saint Barthelemy to Guadeloupe
25561	Dominica
25563	Guadeloupe
25608	Plans of the Leeward Islands
25613	Approaches to Anguilla
25640	Puerto Rico and Virgin Islands
25641	Virgin Islands
25644	Frederiksted Road and Pier
25645	Christiansted Harbor
25647	Pillsbury Sound
25649	St Thomas Harbor
25650	Virgin Passage and Sonda de Vieques West Indies
25653	Isla de Culebra and Approaches

25654	Ensenada Honda Isla de Culebra West Indies
25655	Ensenada Honda to Canal de Luis Pena Isla de Culebra
25659	Puerto Maunabo
25661	Puerto Yabucoa
25663	Pasaje de San Juan to Puerto de Humacao
25664	Pasaje de Vieques and Radas Roosevelt
25665	Punta Lima to Cayo Batata
25666	Ensenada Honda
25667	Bahia de Fajardo
25668	North Coast Puerto Rico
25670	Bahia de San Juan
25671	West Coast of Puerto Rico
25673	Bahia de Mayaguez
25675	Bahia de Boqueron
25677	Guanica Light to Punta Tuna Light
25679	Bahia de Guanica
25681	Bahia de Guayanilla and Bahia de Trailaboa
25683	Bahia de Ponce
25685	Punta Petrona to Isla Caja de Muertos
25687	Bahia de Jobos and Bahia de Rincon
25689	Puerto Arroyo
25700	Mona Passage
25710	CoboFrances Viejo to Punta Nisibon
25720	Monti Cristi to Cobo Frances Viejo
25723	Approaches to Bahia de Samana
25724	Bahia de Samana
25800	Isla Beata to Isla Saona
25848	Approaches to Santo Domingo
25849	Approaches to Andreas, San Pedro
26229	Approaches to Guantanamo Bay
26230	Guantanamo Bay

- (2) The outer limits of shoal water and all hazards to navigation, including obstructions of unknown depths, shall be highlighted with a dark blue pen or highlighter/marker on Coastal and Harbor charts. Shoal water shall be marked on the depth curve equal to the navigational draft with sounding units corresponding to those indicated on the chart.
- (3) Commanding Officer approved tracklines on ready charts for restricted waters transits shall be labeled at a minimum with the following information:
- (a) True Course
 - (b) Magnetic Course
 - (c) Distance of each track leg

- (d) Intended track speed
 - (e) Visual and Radar navigation points
 - (f) Danger bearings/ ranges to navigational hazards within the allowable cross-track error that are not marked by navigational aids
 - (g) Turn bearings/ ranges
 - (h) Slide lines for advance and transfer based on the ship's tactical data for the intended speed/ rudder
 - (i) Label chart shifts
- (4) When plotting tracklines on paper charts for use outside of restricted waters, label with the following:
- (a) True Course
 - (b) Magnetic Course
 - (c) Distance of Track Leg

8. Navigation Briefs

- a. The Navigator, via the Operations Officer, is responsible for ensuring a safe navigation plan is prepared and documented in the form of a Navigation Brief any time the cutter is getting underway from a mooring or anchorage, entering port, or, if time permits, prior to entering Restricted Waters. The Navigation Brief duration, content and required attendees may be adjusted to meet the needs of the circumstances, but will typically include the Navigation Detail and Engineer Petty Officer. The Conning Officer, unless otherwise directed, shall prepare and present the brief using the template in enclosure (10) of this instruction. Additional information (listed below) may be required depending on the port, geographic area, and navigation methods.

Cutter Navigation Brief Items	
1. Assignment of Navigation Team positions and review of duties as outlined in this chapter.	18. Review of pertinent information from Fleet Guide, Coast Pilot, and Sailing Directions.
2. Review of charts and intended track including results of scanned route.	19. Expected sightings and characteristics of key aids to navigation.
3. Electronic chart selection, specific type (e.g., ENC, DNC, etc.) and paper chart selection (if used), and any known chart offset.	20. ATON discrepancies along track or other items of note from LNM, NTM, or current Broadcast Notice to Mariners.
4. Restricted, prohibited, and cautionary areas along intended track.	21. Anticipated vessel traffic (cutters should plan to avoid meeting deep draft vessels at turns or intersections).
5. Maximum allowable deviation from track and confirmation that electronic chart cross track warnings are aligned with max deviation from track, if applicable.	22. Environmental considerations including tides, currents, weather, and environmentally sensitive areas (e.g., marine sanctuaries). Note: Tide and current data

	should be available at all conning stations and CIC.
6. Planned speed of advance and maximum safe speed.	23. Areas where the cutter can/cannot anchor in an emergency.
7. Intended speed/rudder combination for turns, if different than specified standards.	24. Port or Vessel Traffic Service (VTS) requirements including speed limits, pilotage, working frequencies, and check in points.
8. Chart shifts, if paper charts are used.	25. Agreed-upon rendezvous/recovery points.
9. Demarcation line crossings.	26. Traffic Separation Schemes.
10. Planned fix interval.	27. Engineering plant status.
11. AIS mode to be used (e.g., normal, receive only, encrypted, etc.). Method and date of most recent AIS vessel information verification for cutters and cutter boats. Ensure encrypted AIS key is current per Chapter 5 D.6 of Reference (l).	28. Identification of hazards to navigation and how the risks will be mitigated and/or accepted, including: Navigation warnings, danger bearings/ranges, danger soundings, bridge vertical clearances, proximity-guard alarms, depth alarms, etc.
12. Navigation equipment status.	29. Mooring or anchoring arrangements including time to moor/unmoor and pier face.
13. eNav back up arrangement, if applicable.	30. Port information and availability of shore-based resources (if applicable).
14. Status of electronic position fixing systems (GPS/NDGPS) to include expected accuracy and outages.	31. Anticipated time of setting the Special Sea Detail, Anchoring and Mooring Bills, Engineering Restricted Maneuvering Doctrine, and Navigation Detail.
15. International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA) buoyage system and whether inbound or outbound.	32. Conduct risk assessment in accordance with Reference (g).
16. Communication requirements.	33. Conduct debriefs following navigation evolutions to evaluate and recognize performance.
17. Chart datum (e.g., WGS 84) and verification of positioning source datum.	34. The planned engineering plant status for the transit.

9. Verify Essential Systems are Ready for Navigation

- a. Prior to getting underway or entering restricted waters, the checklist in enclosures (7) and (8) of these instructions shall be completed. The Commanding Officer may authorize limited completion of the checklist when necessary to facilitate operations.
- b. Any discrepancies noted on the underway/entering port checklist shall be briefed to the Commanding Officer.

10. Watch Station Manning Levels

- a. The below assignments constitute the typical manning requirements the underway watch and while at anchor. Other operational manning requirements, such as Special Sea Detail, Anchoring Detail, and Modified Navigation Detail are set in the Cutter Organization Manual. Specific assignments will be made in the Watch, Quarter, and Station Bill (WQSB) by the Navigator, Operations Officer, and WQSB Coordinator.
- b. *Underway Bridge Watch.* The Underway Bridge Watch is the minimum manning requirement required while the cutter is transiting in Open Ocean or Coastal Waters. Unless the Navigation Detail or Modified Navigation Detail is set, the Underway Bridge Watch shall consist of:

- (1) Officer of the Deck (OOD) fulfills duties as Deck and Conn.
- (2) Quartermaster of the Watch (QMOW)
- (3) Engineer of the Watch (EOW)

NOTE: The OOD may supplement the underway watch with extra watchstanders at any time they deem necessary.

c. *Anchor Watch.* The watch at anchor or when tied off to a mooring ball will consist of:

- (1) Officer of the Deck (OOD)
- (2) Quartermaster of the Watch (QMOW)
- (3) Engineer of the Watch (EOW)

NOTE 1: If traffic and weather conditions permit, the Commanding Officer may permit the OOD or QMOQ to stand watch at places other than the Bridge. At least one member of the watch team must be on Bridge at all times while at anchor

NOTE 2: The Commanding Officer may alter the fix interval and manning requirement for: weather, proximity to shoal water or hazards to navigation

11. Selecting the Appropriate Navigation Mode

a. The appropriate navigation mode shall be selected utilizing the following hierarchy:

- (1) Automatic Plotting using ECDIS
- (2) Automatic Plotting using ECDIS-backup
- (3) Manual Plotting using ECDIS **or** ECDIS-backup
- (4) Manual Plotting using paper chart

NOTE 1: A corrected paper chart is required if used as the designated primary navigation mode. The appropriate paper chart **does not need to be corrected** if used solely as a backup to an approved eNav system. In any event, the appropriate paper chart shall **always** be available on the chart table for immediate use.

NOTE 2: Radar and visual gazetteer objects must be displayed on both ECDIS and ECDIS-backup in order to use Manual Plotting (on ECDIS) as an approved backup.

NOTE 3: Navigation equipment with a known casualty cannot be designated as a backup.

12. Enabling Appropriate Sensors and Systems Alarms

a. The depth alarm shall be properly configured for transducer offset and set to activate at

depth equal to the Shallow Water defined in this instruction. NOTE: Depth alarms on both ECDIS **and** the fathometer are required.

- b. Maximum allowable Cross Track Error shall be set IAW chapter three of these standards.

CHAPTER 4

VOYAGE MONITORING REQUIREMENTS

1. Fixing Vessel Position

- a. At the fix interval prescribed by the current navigation zone a fix shall be taken by the following methods.
 - (1) *Automatic Plotting*: When navigating using automatic plotting, the ship's position is fixed continuously using the selected position source. Ensure the listed fix interval is set appropriately to ensure accurate DRs, set and drift calculation, and to facilitate a rapid shift to manual plot if needed.
 - (2) *Manual Plotting*: When navigating using manual plotting, the ship's position shall be fixed at the prescribed interval using an Electronic Fix or Visual Fix. Although valuable for navigation, an Estimated Position or Dead Reckoning does not count as a fix for the purposes of this instruction.
 - (3) *Designated Backup*: There will always be a designated backup navigation mode in case of system failure. The backup system or chart shall be immediately available at all times.

NOTE: All fixes shall be labeled with standard plotting symbols which are located in Enclosure (5)

2. Verifying Vessel Position

- a. GPS is almost always the cutter's primary position source. In order to prevent overreliance on GPS, bridge watch-standers should make every reasonable attempt to verify the ship's position using all available means after each fix. These methods include chart matching against a radar overlay, seaman's eye, relative position of nearby ATON, and fathometer readings.
- b. The OOD and QMOW should periodically verify fathometer readings against charted soundings and take appropriate action if there is substantial difference between the two.
- c. Do not erase or delete fixes because they appear in error.
- d. If position ambiguity exists, all appropriate team members must be verbally informed and another fix taken immediately to ascertain the vessels position.

3. Evaluating Position Fixes

- a. At each prescribed fix interval, all appropriate team members shall ensure the evaluation of the ship's position with due regard to proximity of shoal water, environmental conditions, and any

current mission parameters.

- (1) *Restricted Waters*: In restricted waters, or when the OOD deems necessary, position fixes shall be evaluated by the Navigation Evaluator.
- (2) *Open Ocean and Coastal Waters*: In Open Ocean or Coastal Waters, the OOD shall evaluate fixes at the prescribed interval.

4. Requirements for Set and Drift

- a. Set and drift is a vector result of the combined external forces of wind, seas, and current on a ship. Set and drift shall be shown in ECDIS/ECDIS-backup at all times.
- b. *Automatic Plotting*. Set and Drift is automatically calculated by ECDIS; however, the selected method of calculation dramatically impacts the reliability of this information. Set and drift source should always be selected as “HDG/COG” and “SPD/SOG” unless a sensor is not operating or updating properly.
- c. *Manual Plotting*.
 - (1) ECDIS: When manual plotting in ECDIS (formerly Mode II), shift the Set and Drift calculation source to the mode that maximizes available sensors. If no sensors are available, select the source that compares ordered course/speed to calculated COG/SOG.
 - (2) Paper Chart: When manual plotting on a paper chart, set and drift shall be calculated after every good fix unless precluded by speed or course changes. This requirement is reduced to every other good fix if the fix interval is less than three minutes.

5. Precautionary Actions

- a. If at any time fix quality comes into question, particularly while operating in high risk areas (e.g., near shoal water or obstructions), crews must initiate appropriate actions to minimize risk to the vessel and crew. Some actions may include:
 - (1) Reducing speed or taking all way off
 - (2) Increasing fix frequency or shifting position sources

6. GPS Accuracy and Outage Reporting

- a. Independent verification is challenging in Open Ocean because FRC’s are not equipped with an alidade nor required to maintain celestial navigation proficiency. Once per watch, OODs or QMOWs shall verify that all three GPS receivers are in agreement (GPS1, GPS2, and AIS), and confirm the relative position of any available AToN or prominent land features. Early warning signs, such as disagreement between GPS units, large variance between GPS COG/SOG and ordered course/speed, and excessive GPS HDOP should prompt OOD’s to take appropriate action and regard GPS positions with suspicion.

- b. All Coast Guard GPS/DGPS/WAAS users must report GPS outages, anomalies, and suspected spoofing or jamming. Enclosure (6) provides detailed information concerning reporting processes.

7. Navigation Reports

- a. Navigation reports shall follow the format prescribed in ECDIS when operating in Automatic or Manual Plotting mode. Reports shall be given at standard fix intervals for the prescribed zone.
- b. The following shall be the standard format for reporting the ship's position when giving a navigation report:

Conn, Nav Eval: Based on a (GOOD / FAIR / POOR) (DGPS / GPS / VISUAL / ELECTRONIC) fix at minute ____, I hold you ____ yards (LEFT / RIGHT) of track. Recommend you (MAINTAIN COURSE AND SPEED or COME LEFT / RIGHT TO COURSE) ____ to (PARALLEL / REGAIN TRACK).

Pause for OOD acknowledgement, then provide the following additional information:

Nearest hazard to navigation is (SHOAL WATER / WRECK / etc.) ____ yards off your (PORT / STBD) (BOW / BEAM). Depth of water is ____ (FEET / METERS / FATHOMS) beneath the keel (CONCURS / DOES NOT CONCUR) with charted depth of ____ (FEET / METERS / FATHOMS). Next aid to navigation is (RED BUOY #X, GATED PAIR X AND Y, etc.) off your (PORT / STBD) (BOW / BEAM, etc.). Set and drift was calculated to be ____ (DIRECTION) at ____ knots. Time to turn is ____ minutes in ____ (YARDS), next course ____.

- c. When authorized by the Commanding Officer, the navigation report may be condensed to include on applicable information under all other circumstances.

CHAPTER 5

ELECTRONIC NAVIGATION REQUIREMENTS

1. Restricting Applications. On computers designated specifically for navigation or situational awareness, only navigation related applications must be open. The navigation software must be the active application and operators must only minimize it when using another navigation-related application. Unauthorized applications not part of the system baseline must not be installed.
2. Personal Navigation Applications. The use of personal navigation applications using cellular/GPS technology is not permitted for Coast Guard navigation.
3. Electronic Navigation as Primary Means of Navigation. The use of Coast Guard installed electronic navigation systems is approved as the primary means of navigation aboard Coast Guard cutters. Additionally, personnel must understand how to load/install charts on electronic navigation systems in order to use them as a primary means of navigation.
4. eNav Display Requirements
 - a. While underway or at anchor, the starboard SeaWatch terminal shall always have ECDIS displayed. The port SeaWatch terminal may display SIPR chat, System Chart, C-ARPA, or other applicable programs at the OOD's discretion.
 - b. Heading and Speed Input – The course and speed should be in the setting of ground stabilized, and sensors set to the automatic selection after verifying the hierarchy. The OOD (or Navigation Evaluator as applicable) is responsible for ensuring that ordered course and speed get manually updated, following every course change and speed change.
 - c. ENav Display Parameters – In the ECDIS system you have the option of choosing one of three display settings. Base, Standard, and Custom. The system will not allow you to make changes to the base or standard display. Profiles listed in appendix V, list all the settings and display parameters for each navigation zone, and will fall under the custom display.
 - (1) Base Display: this is the minimum display the system offers it only shows the charted area, including land. This display will never be used for navigation, shall only be used for “big picture” views.
 - (2) Standard Display: Above water dangers, anchorage, archipelagic data, Current Information, Depth Contours/Area, Fishery Zone, Magnetic Information, Obstructions (known), Obstructions (unknown), Seabed Area, Soundings, Submarine Cable, Territorial Areas, Water Turbulence, Anchorage, Archipelagic Data, Beacons, Built Up Area, Buoys, Cautionary Areas, Daymark, Direction of Buoyage, Dumping Ground, Ferry Route, Fishing, Light Vessel, Lights, Low Visibility Aids, Navigation/Traffic Data, New IMO Objects, Pilot Boarding Point, Pipeline and Cables, RACON, Radar Conspicuous, Radar Reflector, Recommended Nav, Restricted Area, Seabed Dangers, Signal Stations, Specialized Areas, Swept Area, Topmarks, Unknown Objects, Visually Conspicuous, Inland Waters, Shore Structures, Geographic Names.

- (3) Custom Display: this display is anything other than the base or standard. All of the unit created profiles fall under custom. Changes to the profile while in use is not allowed unless approved by the Commanding Officer.
- (4) Display while at Anchor: while at anchor, the cutter will display the profile associated with the given navigational zone, in addition to the anchoring function in ECDIS.
5. Advance of Vessel Position. At each course or speed change, the ordered course and speed shall be updated by the OOD or QMOW in ECDIS to ensure DRs are accurate.
6. Dead Reckoning (DR). The Dead Reckoning function in ECDIS shall be enabled for the applicable fix interval based on the prescribed navigation zone. In the event of a loss of position source, ECDIS will automatically attempt to fix the ship's position using dead reckoning. These DRs can quickly become inaccurate, and OODs and QMOWs should immediately switch position sources or shift to the appropriate navigation mode.
7. System Configuration and Settings. All system configurations and settings shall be utilized IAW Appendix III & IV based on the Navigation Mode, Navigation Zone or unique evolution.
8. Profile Information. OODs shall verify the profile in use before relieving the watch and verify all inputs are being properly received. The appropriate Navigational Zone profile shall be used for the cutters relative positions IAW Appendix III & IV.
9. Alarm Settings. ENav Alarm Settings – eNav Profiles for the different navigation zones are listed in Appendix III & IV, these profiles shall be used at all times. The profile settings also include the alarm requirements to be set for each perspective Navigation Zone.
10. Electronic Chart Hierarchy:
 - a. Always ensure the best scale electronic chart is on display. The following constitutes the hierarchy for electronic chart selection:
 - (1) Official ENC
 - (2) NGA DNC
 - (3) Official RNC
 - (4) Commercial Vector Chart
 - (5) Commercial Raster Chart

NOTE 1: OOD's and QMOW's are encouraged to shift between chart types to maintain situational awareness; however primary navigation **MUST** be in accordance with the hierarchy above.

NOTE 2: Use of Raster charts greatly impairs the features available in ECDIS. Bridge watch standers must use extreme caution when navigating with Raster charts, particularly in regards to depth of water, special marine areas, and chart scaling.

- b. An electronic chart is considered currently corrected if it has been updated within the last 45 days. However, it is recommended to download the latest chart updates at every opportunity.
 - c. Full file replacement is the only authorized update method for electronic charts. If extenuating circumstances require chart file updates or manual corrections, the Commanding Officer shall be consulted.
11. Display Matching. When the system displays radar and electronic chart data on the same screen, the display must match in scale, orientation, and projection.
12. Casualty response for loss of Enav Systems:
- (1) ECDIS has a tremendous amount of redundancy built in. Losing various sensors often should not prompt a casualty response – instead, OODs and QMOWs should be intimately familiar with how to shift sensor sources, such as position, heading, and speed. If ECDIS experiences an unrecoverable failure, follow procedures in the Piloting-Loss of ECDIS Checklist, Enclosure (9).
 - (2) Loss of the master gyro (not simply loss of heading feed to ECDIS) impacts numerous systems on board and should be managed according to the checklist found in enclosure (11).

CHAPTER 6

PAPER CHART NAVIGATION REQUIREMENTS

1. Paper Chart Requirements. While eNav systems have become accurate and reliable enough to use as the primary means of navigation for Coast Guard cutters and boats, a thorough understanding of paper chart navigation is critical to asset and crew safety. To help facilitate achieving and maintaining proficiency, we will complete chart corrections and updates IAW reference (b) to the applicable restricted waters charts prior to each patrol.
2. Fix Intervals
 - a. Watchstanders are required to conduct fixes on the appropriate paper chart at the prescribed interval in Appendix I when using paper charts for the primary navigation plot. Regardless of navigation mode, the correct paper chart shall always be on the chart table ready for immediate use.
 - b. When three LOPs are not simultaneously available, advance previous LOPs to a common time to create a running fix.
 - c. If, when using manual plot on a paper chart as the primary means of navigation, the ship's position cannot be fixed after 2 intervals, the Nav Plot or QMOW shall inform the OOD immediately so he/she may take appropriate action. Note that an Estimated Position or DR does not count as a fix for the purposes of this rule.
 - d. Do not erase a fix because it appears to be in error. Rather, take another fix immediately to ascertain the vessel's position and the source of the error. Upon determining the source of the error, correct for the error so that it does not recur.
 - e. Fix quality is determined by the size of a triangle formed by intersecting LOPs.
 - (1) Excellent: The intersection of three LOPs is 25 yards or less. If using GPS, the intersection of the latitude and longitude lines is considered an excellent fix.
 - (2) Good: The intersection of three LOPs is within 25–50 yards
 - (3) Poor: The intersection of three LOPs is greater than 50 yards
3. Set and Drift Requirements
 - a. The Nav Plot or QMOW shall calculate Set and Drift in accordance with Ch 4 para 4.c.2 of this instruction.
 - b. If there is no fix, consider set and drift as part of determining an estimated position (EP).
4. Dead Reckoning Requirements (DR)

- a. When plotting DRs on a paper chart, properly label and project the track for at least two fix intervals and utilize the six rules of DR to maintain the plot.

Six Rules for Dead Reckoning
<ol style="list-style-type: none">1. Plot a new DR position at least every hour on the hour.2. Plot a new DR position at every course change.3. Plot a new DR position at every speed change.4. Plot a new DR position after each fix or running fix.5. Plot a new DR position when obtaining a single line of position.6. Plot a new course line from each fix or running fix.

CHAPTER 7

LOGS, RECORDS, AND CHECKLISTS

1. Electronic Logs and Records. The following navigational logs shall be maintained aboard the cutter as official records. Amplifying information regarding the standards for log keeping can be found in reference (k). Corrections will be made by lining out errors with a single horizontal line followed by the correcting member's initials in the right margin of the log.
 - a. *Log-Remarks Sheet (Deck or Smooth Log) (CG-4380A)* – Maintained in electronic format until printed for records, both inport and underway. The “Smooth Log” will be broken into segments every 4 hours for review and electronic signature by the on-watch OOD and QMOW. A new log will be started at 0000, local, each day. The log may be electronically signed by the Navigator and Commanding Officer at the end of each day.
 - b. *Weather Observation and Operational Summary Sheet (CG-4380B)* – Maintained in electronic format until printed for records, both inport and underway. The “Weather Log” will be started at 0000, local, each day. When inport, observations will be recorded every four hours or as needed to record unusual weather observations. The log may be electronically signed by the Navigator and Commanding Officer at the end of each day.
 - c. *Standard Bearing Book (OPNAV Form 3530/2)* – Maintained in paper format to record the data obtained in determining the cutter's position by radar ranges and electronic LOPs. The Standard Bearing Book will primarily be used to record the cutter's position while at anchor. Date, chart in use and gyro error shall be noted at the top of each initial page. Upon conclusion of the Special Sea Detail, the Bearing Recorder will break up the logs with a signature. A new page will be utilized at the beginning of each navigation evolution while at anchor or loss of electronic navigation.
 - d. *Commanding Officer's Night Orders* – The Commanding Officer will, as applicable, issue “Night Orders” to provide specific guidance to the watch team. They will be maintained on paper in the CO's Standing Orders Binder and retained for at least three years. The Night Order's will be read and initialed by OODs, QMOWs, and EOWs prior to the relief of watch.

2. Alternate Logs. In the event that ECDIS is not utilized as the primary means of navigation or is otherwise unable to adequately record the information contained in the “Nav Data Log,” the following logs shall be maintained:
 - a. *Log-Navigation Data Sheet (Form CG-4380C)* – Maintained in electronic format to record ship's course and speed at each fix. The “Nav Data Log” will be broken into segments every 4 hours for review by the on-watch OOD and QMOW. The log will be started at 0000, local, each day and printed for signature by the Navigator at day's end.
 - b. *Ship's Position Log (OPNAV 3100/3)* – Maintained in paper format to record the cutter's GPS position and fathometer reading at each fix. A new entry shall be made at 0000, local, each day to indicate the date and chart currently navigating on.

- c. *Navy Navigation Workbook (OPNAV 3530/1)* – The Navy Navigation Workbook is a record of observations and computations used for navigation of the ship. This shall include data relating to tides, currents and gyro error. The individual making the observation and Navigator shall review and sign the workbook, as appropriate.
 - d. *Communications Log* – In the event that the KITE system’s automated recording function is not operating properly, a standard Communications Log will be kept for all external communications (Station Calling, Station Receiving, Channel / Frequency, Traffic).
3. Records.
- a. Logs shall be maintained onboard or in the cutter’s shore side storage cage, as required. Sets of logs shall be uploaded to the National Archives and Records Administration’s (NARA) Federal Records Center or destroyed, in accordance with the Information and Life Cycle Management Manual, reference (j).
4. Checklists.
- a. The following checklists shall be maintained onboard for quick reference and if time allows used by the OOD. With the exception of those marked with asterisks, these checklists reside in the CORM. Those marked with asterisks are enclosures of this instruction:
 - (1) Getting Underway Checklist*
 - (2) Entering Port / Restricted Waters Checklist*
 - (3) Man Overboard Checklist
 - (4) Abandon Ship Checklist
 - (5) Helicopter Operations Checklist
 - (6) Towing Checklist
 - (7) Small Boat Operations Checklist
 - (8) Restricted Visibility Checklist
 - (9) Anchoring Checklist
 - (10)Steering Casualty Checklist

(11) Search and Rescue Response Checklist

(12) General Quarters Checklist

(13) Flooding Checklist

(14) Machinery Space Fire Checklist

(15) Fire Checklist

(16) Non-Compliant Vessel Checklist

b. Paper copies of completed checklists shall be retained for 90 days, and then destroyed.

CHAPTER 8
CUTTER BOAT NAVIGATION AND OPERATIONS

This chapter outlines capabilities, characteristics, and requirements for safe operation of the CB-OTH-IV.

1. Navigational and Voyage Planning Information

a. Boat characteristics:

(1) Length overall: 26 feet

(a) Length at waterline (full load): 20 feet 9-3/16 inches

(2) Vessel beam: 8 feet 6 inches (including collar)

(3) Operational draft: 2 feet 4 inches / 28 inches; Draft 28 inches static

(a) Navigational draft: 6 feet (2 meters or 1 fathom)

(4) Maximum and fixed height above the waterline:

(a) Unfixed (mast raised): 8 feet 10-3/4 inches

(b) Fixed (mast lowered): 5 feet 6 inches

(5) Trailer weight: 1890 pounds

(6) Distance between transducer and lowest point of hull: -0.4 feet

(7) Lowest point of the hull: Bulkhead 14

b. Crew manning requirements and personnel limits:

(1) Launch and recovery requirements (minimum):

(a) Coxswain

(b) Engineer

(c) Boat Deck Captain

(d) Deck Seaman

(e) Deck Safety

(2) Maximum personnel limits

- (a) Crew capacity (crew seats): 5
 - (b) Passenger capacity: 8
 - (c) Total POB: 13
- (3) Crew requirements for Law Enforcement/Pursuit and other operations:
- (a) Law Enforcement: minimum small boat crew in addition to Boarding Officer and Boarding Team Member
 - (b) Pursuit: Pursuit Coxswain, Pursuit Crewman, Pursuit Mission Commander, and Boarding Officer (additional engineer if not certified in one of the pursuit qualifications)
 - (c) Man overboard recovery: minimum small boat crew. Additionally, it will be accessed on scene if the EMT and cutter surface swimmer shall go in the small boat or remain on the cutter.
- c. Environmental limitations and operating parameters:
- (1) Maximum winds/seas:
 - (a) Maximum operating winds: 30 knots sustained
 - (b) Maximum sea state: 8 feet, no surf
 - (2) Maximum operating distance from the cutter: 30NM
 - (3) Maximum crew endurance:
 - (a) Maximum range at cruise speed: 227 nautical miles (with 10% fuel reserve)
 - (4) Maximum seas for launch and recovery:
 - (a) Maximum seas for the OTH-IV is 8 feet, however, should only exceed pitch and roll parameters IAW CGTTP 3-91.11 during urgent missions or with explicit permission from the Commanding Officer
 - (b) Pitch is defined as less than or equal to 5 (observed on cutters clinometers)
 - (c) Roll is defined as less than or equal to 15 (observed on cutters clinometers)
 - (5) Maximum cruising speed and engine RPMs:
 - (a) Maximum speed: 42 knots (around 3300 RPMs)

- (b) Cruising speed: 25 knots (around 2600 RPMs)
 - (c) Speed / RPM curve: see Enclosure (1)
- d. Other navigation requirements:
- (1) High-speed operations: 30 knots and over
 - (2) Speed management expectations: Coxswains transiting close to hazards to navigation, shoals, within high traffic areas, in or near areas of restricted visibility, after sunset, or in an unfamiliar area shall operate the boat with extreme caution. Consider the following actions:
 - (a) Coordinate the boat crew as a navigation team to specifically observe the compass heading, fathometer, radar, electronic navigation systems, or otherwise augment the cutter boat navigation.
 - (b) Reduce speed as appropriate for the prevailing circumstances.
 - (c) Take all way off, as appropriate, to better evaluate the navigational picture.
 - (d) Utilize navigational data including soundings, ranges, or bearings to verify position.
 - (e) Increase fix frequency.
 - (3) High-speed and tactical operations:
 - (a) NCV Operations. NCV pursuit missions may be conducted up to the maximum weather limitations of the cutter boat at the discretion of the Commanding Officer and Pursuit Coxswain. Such operations shall be conducted using the principles of prudent seamanship and ORM. All Pursuit Crewmembers shall be certified Boarding Officers or Boarding Team Members.
 - (b) The risk versus gain of pursuit missions in rough weather will constantly be evaluated by the Commanding Officer and Coxswain.
 - (c) Pursuit Coxswains: As a supplement to all applicable instructions regarding NCV pursuit missions, Coxswains are expected to maintain an heightened level of situational awareness to ensure use of force decisions are correctly made, options are weighed, and the mission is effective. An effective mission includes returning to the cutter with all members of the team.
 - (d) Pursuit Mission Commander (PMC): The designated law enforcement team

leader of the NCV pursuit crew. As a supplement to all applicable instructions regarding NCV pursuit missions, PMCs are expected to maintain an appropriate level of situational awareness to ensure the pursuit team executes a lawful case and makes correct use of force decisions. The PMC shall not be the pursuit coxswain and shall be a certified boarding officer. The PMC directs the maritime law enforcement mission, to include internal/external communications, leads the execution of the NCV UOF continuum at the direction of the Commanding Officer, and directs cutter boat response in unit self-defense, including disengagement / reengagement of a NCV.

- (e) Gunner Location: For high speed training and NCV pursuit missions in any weather conditions, the gunner will be positioned in the fifth seat in the cutter boat (aft most boat crew seat) and belted in; any warning shots or disabling fire will be conducted from that position (for safety and stability). (Weather limitations match the max allowable seas/winds for the OTH.) The weapons and munitions used for warning shots and disabling fire are defined in COMDTINST M16247.1 (series) Chapter 4.D.
 - (f) Use of Force Continuum against Non-Compliant Vessels: Shall be executed in accordance with the Maritime Law Enforcement Manual, COMDTINST 16247.1 (series). During any NCV operations, the applicable District 7 references and checklists shall be broken out to ensure legal / procedural compliance. Debriefs shall be conducted upon securing from NCV Operations in accordance with reference (f).
 - (g) Use of Force Continuum against Persons: Shall be executed in accordance with the Maritime Law Enforcement Manual, COMDTINST 16247.1 (series).
- (4) High-speed and tactical operations for training:
- (a) During briefings prior to boat movements, during training, and during actual operations, the Commanding Officer and Coxswain will continually assess the risk versus gain of using high-speed maneuvers as compared to other available means to compel compliance.
 - (b) Standards of conduct at high speed: All coxswains shall operate the cutter boat in a professional manner with full knowledge of the consequences of improper or unnecessary maneuver ejection. High speed maneuvers and rapid acceleration / deceleration may be potentially harmful to the crew and cutter boat, and should only be used when absolutely necessary for training or operations.
 - (c) Non-Compliant Vessel Pursuit training may only be conducted within sight of the cutter or another safety platform (District Seven, cutter, or more capable station boat). When conducting training in homeport, the San Juan Bay area shall serve as the authorized training location unless otherwise designated by

competent authority. OPFOR must be a graduate of Pursuit Coxswain School and will be designated in writing by the Commanding Officer. The operational training plan shall be approved by the Commanding Officer at least 24 hours in advance of any pursuit training.

- (d) Weather limitations for high speed training will be 4 foot seas, winds less than 30 knots sustained, no reduced visibility conditions.
 - (e) Debriefs will be conducted upon securing from boat operations in accordance with reference (f).
- (5) Safety systems, personal protective equipment, and restraints:
- (a) Helmets and Eye Protection:
 - Coxswains shall ensure that all crewmembers are wearing approved boat crew safety helmets prior to launch or recovery from the notch and prior to approaching alongside all cutters and other vessels.
 - Ballistic helmets or approved boat crew helmets and eye protection (appropriate for day or night) shall be worn during Non-Compliant Vessel Pursuit operations and training.
 - The above requirements excluded, boat crew helmets may be donned or doffed at the discretion of the Coxswain.
 - (b) Personal Flotation Devices: PFDs shall be worn at all times by crew and passengers in the cutter boat.
 - (c) Crew Restraint System:
 - Quick-release seatbelts shall be worn during Non-Compliant Vessel Pursuit operations and training/certification.
 - Seatbelts shall be worn during high-speed Operations and/or training in excess of 30 knots.
 - Quick-release seatbelts shall be worn when conditions warrant, such as when experiencing an increased sea state, or at the discretion of the Coxswain or Commanding Officer.
 - (d) Other Safety Equipment: Weapons, Law Enforcement gear, body armor, and boarding kits shall be worn in accordance with Coast Guard, unit policy, and mission requirements. The Coxswain and Boarding Officer will be responsible for wear and ensuring the boat crew / law enforcement team are properly equipped for each mission, to include normal boat outfit.

- (e) Unit PPE Waiver Policy: Any Commanding Officer-waived minor, major, or restrictive discrepancies will be logged in the cutter's smooth log. Any waivers from OPCON for restrictive or disabling discrepancies will be noted via message traffic, or as directed by OPCON, and also in the cutter's smooth log. Any waivers granted for PPE shall be logged in the unit's PPE waiver log and discussed during the mission brief and GAR 2.0 assessment.

2. Additional Voyage Planning Requirements

- a. Operational Testing Requirements: as long as the cutter is in a non-maintenance status (Alpha or Bravo), boat checks shall be completed daily (not to exceed 24 hours) utilizing the approved checklist by a qualified coxswain or boat crewmember (preferred) or a qualified inport OOD.
- b. The following checks should also be completed IAW CGBOH 16233.26 (series) to verify the essential systems necessary for navigation:
 - (1) Daily and, if possible, prior to getting underway / launching, entering restricted waters, or mooring / recovery, conduct steering and propulsion tests.
 - (2) Daily, verify all positioning sources and navigational equipment. Ensuring no GPS/Radar/AIS alarms are present is sufficient for verification in most cases.
 - (3) Prior to getting underway, conduct radio checks on all applicable frequencies.
 - (4) If discrepancies are found while conducting check offs of equipment, the EPO shall be notified.
 - (5) Coxswain shall discuss with crew and Commanding Officer during the Boat Mission Brief the mitigating factors to any casualties found and make a determination to continue or cancel the mission.
- c. Fathometer shall be set with a -0.4 feet offset IAW CGBOH 16233.26 (series).
- d. Fix intervals shall be continuous when using automatic plotting with the SINS package. No fixes are required when utilizing Seaman's Eye for primary navigation.
- e. Navigation modes:
 - (1) Automatic Plotting: A fully functional SINS may be used as the primary means of navigation; GPS position is input automatically; operating on an up-to-date chart card with approved and corrected chart database; current edition of applicable paper chart is available onboard the cutter and ready charts are corrected; SINS is configured IAW these navigation standards with route planning information loaded.
 - (2) Manual Plotting: Manual plotting is neither practical nor recommended for use on

the OTH-IV.

- (3) Seaman's Eye: In the event of SINS failure – or if the coxswain determines that available chart data is inaccurate, Seaman's eye shall be the primary mode of navigation. The coxswain shall be sufficiently familiar with the operating area, to include the location of shoals and hazards before navigating using this method.
 - (4) Casualty Response Procedures for Loss of SINS Automatic Plotting Navigation:
 - (a) Notify Navigator and Commanding Officer of the casualty; consider returning to the cutter.
 - (b) Loss of SINS, navigate by Seaman's Eye.
- f. Electronic Navigation System (eNav) Information, Equipment Configuration and Operational Testing Requirements
- (1) eNav Display. If SINS is being used as the primary means of navigation, the standard display shall adhere to the following (none of this guidance is meant to restrict the coxswain from using different displays and setups during operational needs, but these parameters shall be utilized under normal conditions, including high speed operations and during pursuit missions.):
 - (a) The Chart Plotter shall normally be setup to standard display split screen mode with the electronic chart on the left and the RADAR on the right side of the display. Under normal conditions the plotter scaling and orientation should match that of the RADAR; however, there may be circumstances that require deviation from this such as collision avoidance, long and short range RADAR scanning for contacts, conducting search operations, etc. The minimum scaling shall be .125 nm for both plotter and RADAR. It is important that Coxswains remain cognizant of the speed of the boat in relation to the navigational and RADAR information available at various scales.
 - (b) The RADAR shall be utilized to the fullest extent practical. The RADAR display shall be set to multicolor background unless operational conditions dictate otherwise. The RD-33 (Remote display) shall normally be set to standard display with the depth displayed as a large block on the left side of the screen, and GPS Position on the top right with speed over ground displayed directly underneath the GPS Position. Other display pages may be used so long as the depth is being displayed on the SINS plotter.
 - (2) Set & Drift: This data will be computed automatically within SINS, however the best assessment of Set and Drift may be made using Seaman's Eye in Restricted or Coastal waters.
 - (3) System Configuration and Settings (these apply in all Navigation Zones):

- (a) The velocity vector length shall be set to match the required fix interval; this is the SINS display equivalent of a DR plot and is continually updated based on course and speed over ground.
 - (b) The own ships track color shall be set to light blue and the XTE limits shall be set based on Navigation Zone. The NAVNET TZ Touch will default to red (port) and green (starboard) for the cross track error display on the electronic chart. Shoal water for the small boat has been defined as anything less than 6 feet; therefore, the depth contour display base setting on the chart plotter shall be set to 6ft. The plotter will be set to automatically utilize the 9ft contour line and shade everything less than 9ft to blue and all soundings above 9ft to white.
- (4) Profile: Only one standard profile will be utilized within the SINS.
- (5) eNav System Alarm Settings:
- (a) Depth Sounder Alarm shall be set to 6 feet / 2 meters / 1 fathom.
 - (b) XTE Alarm shall be set to 25 yds (Restricted Waters), 50 yds (Coastal Waters), and 100 yds (Open Ocean).
 - (c) Transducer Offset shall be set to -0.4 feet / 4.8 inches.

g. Route Planning

- (1) Under circumstances where the track-line monitoring function is utilized, such as a poorly marked restricted waters transit, the track-line used shall be approved by the CO and the letter's "CO" added to the track-line name.
- (2) The Navigator and OPS are responsible for identifying any NTM/LMN issued since the electronic chart data update, and shall discuss potential impacts with the coxswain.

h. Navigational Zones / Areas

- (1) Shoal Water: Any waters with a depth of less than 6 feet, 2 meters, or 1 fathom, including navigation hazards and obstructions. The limits of shoal water and hazards to navigation shall be outlined on navigational charts in blue.
- (2) Restricted Waters: Waters less than 200 yards from land, shoal water, or a hazard to navigation.
- (3) Coastal Waters: Waters between 200 yards and 1000 yards from land, shoal water, or a hazard to navigation.

(4) Open Ocean: Waters more than 1000 yards from the nearest land, shoal water, or a hazard to navigation.

(5) AOR Risks, Safe Operating Distances, and Restricted Operating Areas:

- (a) These will be determined for the operating area and briefed to the boat crew prior to launch. Of note, surf zones may be particularly hazardous, safe operating distances of 100 yards should be maintained around large merchant vessels, and restricted operating areas may apply near military facilities.

Navigation Zones	Distance From Land or Shoal		Water Depth	Maximum XTE
Restricted Waters	Less than 200 yards	or	Less than 12 feet	25 yds
Coastal Waters	Between 200 and 1000 yards	or	Between 12 and 50 feet	50 yds
Open Ocean	Greater than 1000 yards	and	Greater than 50 feet	100 yds

(6) Principal navigation routes / special training areas:

- (a) Non-Compliant Vessel Pursuit training may only be conducted within sight of the cutter or another safety platform (District Seven, cutter, or more capable station boat). When conducting training in homeport, the San Juan Bay area shall serve as the authorized training location unless otherwise designated by competent authority.

i. Chart and Publication Preparations:

(1) Electronic charts must be currently corrected to ensure proper display and highlighting on hazards to navigation along the intended route and within the AOR.

- (a) An electronic chart is considered currently corrected if it has been corrected within the last six months.
- (b) Updated electronic charts for SINS-II is contracted and should be provided every six months. In the event that SINS-II electronic charts are out of date, the Commanding Officer shall specifically address and authorize the use of SINS-II as the primary means of navigation.
- (c) SINS-II must make use of the depth contours function to highlight shoal water. The use of this function may be waived for areas where the use of this function would prevent the effective use of the eNav system.

j. Boat mission briefs:

- (1) Briefs are a critical element of the navigational planning process and ensure safe navigation. Coxswains are not required to complete and AOR familiarization. Therefore, briefs for missions operating in restricted waters are more extensive. Boat mission briefs shall be conducted prior to all cutter boat operations. Briefs must include the following information, when applicable:
- (a) Conduct a Risk Assessment (as evaluated by GAR 2.0 model)
 - (b) Assignment of crew positions, including navigation support functions (if assigned), and any passengers
 - (c) Review of charts and intended track / patrol area. Restricted, prohibited, and cautionary areas along intended track. Safe speed for mission and conditions.
 - (d) Identification of hazards to navigation and how the risk will be controlled IAW command navigation standards. Anticipated traffic and AIS correlation procedures, if available.
 - (e) Environmental considerations including tides, currents, weather (winds, precipitation, visibility), and environmentally sensitive sea areas (marine sanctuaries)
 - (f) Boat status and cutter boat's handling equipment status.
 - (g) Personal protective equipment requirements: Including mission specific needs, such as high speed, law enforcement, and pursuit operations.
 - (h) Communications plan and call signs. Anticipated total underway and return time, sunrise or sunset, and mission tasking. Agreed-upon rendezvous / recovery point for cutter boat.

NOTE: The boat crew shall maintain a radio guard with TACON (usually the cutter if underway or at anchor, applicable Sector) with an operations and position report made at least every 30 minutes, however when out of sight regarding high risk operations Commanding Officer can reduce the interval.

3. Electronic Navigation Requirements/Restricting Applications. Within SINS-II, only navigation related applications must be open. Unauthorized applications not part of the system baseline must not be installed.
4. Cell Phone and Mobile Electronics Usage
 - a. In accordance with Reference (c), the use of cell phones/texting/mobile devices and phone/device applications aboard boats is prohibited without permission of the

Coxswain: permission can be granted only on a case by case basis (e.g., mission execution, tertiary communications, etc.).

- b. In the case where the use of a cellphone/texting device is approved, the Coxswain must assure a safe and efficient navigational environment by posting proper lookouts and the assigned navigation support functions are attentive to their duties. Helmsman is prohibited from using a cell phone/texting device.
5. Personal Navigation Applications. The use of personal navigation applications using cellular/GPS technology are not permitted for cutter boat navigation.

CHAPTER 9
ANCHORING PROCEDURES

1. General. Bridge watch standers must remain proficient in anchoring procedures. It is the Navigation Division's responsibility to prepare appropriate charts or plotting sheets for precision anchorage.
 - a. OODs and QMOWs shall be able to stand their respective watches during a precision anchoring approach, while at anchor, and while weighing anchor.
 - b. In the absence of emergent circumstances, a Navigation Brief will be held to review the anchoring and conduct a risk assessment.
 - c. The Navigation and Anchor Detail will be expected to follow the Anchoring Checklist and utilize Standard Commands to ensure proper procedures are followed.
2. Approach Trackline and Fixes.
 - a. An approach trackline will be entered into ECDIS or on the paper chart (if applicable). If possible, the anchorage should be approached into the prevailing conditions.
 - b. If available, appropriate navigation aids should be used for: a head bearing, drop bearing, and drop range. In addition, applicable hazards to navigation will be marked by danger ranges and danger bearings.
 - c. Approved eNav systems feature various anchor dragging alarms and plotting options. These features may be utilized in lieu of a paper chart / plotting sheet as long as the system is fully operational.
 - d. In addition to taking fixes and monitoring swing circle alarms in ECDIS, appropriate navigation aids shall be selected for fix verification to ensure we are not dragging anchor and in the event that ECDIS or GPS fails.

NOTE: Navigation Team or Anchor Watch will verify position accuracy by other than primary means every other fix interval while at anchor.

3. Logs.
 - a. The following shall be recorded in the Smooth Log upon anchoring:
 - (1) Time of anchoring;
 - (2) Position and name of anchorage (if applicable);
 - (3) Depth of water;

- (4) Scope of line;
 - (5) Type of bottom;
 - (6) Ship's heading;
 - (7) Bearings and ranges to navigation objects designated by the Navigator.
- b. In the event the voyage recorder in ECDIS fails to record navigation sensor data, the following "Anchor Log" information will be entered into the Standard Bearing Book (OPNAV 3520/2) upon each fix:
- (1) Time of fix;
 - (2) Vessel position;
 - (3) Ship's heading;
 - (4) Bearings and ranges to navigation objects designated by the Navigator;
 - (5) Depth of water

CHAPTER 10

OPERATIONAL RISK MANAGEMENT

1. General. Operational Risk Management (ORM) the continuous process of evaluating risk factors versus gain. It is integral to every evolution completed onboard the cutter and small boat. All officers and crew are required to participate in ORM discussions, and to notify the proper authorities of any changes that alter the risk vs gain calculus. Although each evolution will begin with a formal and annotated ORM discussion, the act of continuously reevaluating ORM need not be formal and can be as simple as verbalizing concerns.
2. Risk Assessment. Prior to commencing a major shipboard evolution (mooring, towing, cutter boat operations, fueling, major maintenance work, helicopter operations, etc.), risk shall be assessed and mitigated to the extent possible.
3. GAR 2.0 Model. Unless otherwise directed by the Commanding Officer, risk assessments will be done utilizing the General Assessment of Risk 2.0 (GAR 2.0) Reference COMDINST 3500.3A. If a GAR 2.0 Model cannot be completed due to operational necessity, those personnel conducting the risk assessment shall, at a minimum, discuss the factors covered by the GAR 2.0 Model.
 - a. Prior to conducting a GAR 2.0 model, applicable equipment casualties, degradations and personnel shortages shall be identified for consideration on mission success and safety.
 - b. Mitigation strategies should be recommended and, if applicable, implemented with special emphasis for those evolutions evaluated to be Medium or High Risk. Although not every risk can be eliminated or mitigated, steps should be taken to ensure minimal risk to maximum benefit.
 - c. The results of each ORM assessment shall be logged in the cutter's Smooth Log.
 - d. If the plan or circumstances change from the original brief during the evolution, a new risk assessment should be conducted if practical

APPENDIX I
NAVIGATIONAL ZONE CHART

ZONE NAME	DEFINITION	FIX INTERVAL	MAX CROSS- TRACK ERROR	PERSONNEL MANNING REQUIREMENT ³
Restricted Waters	All waters 1 nautical mile and less of land or shoal water, or as the Commanding Officer directs.	3 minutes	50 yards or Half the track distance to shoal	Special Sea Detail ⁴
Coastal Waters	All waters between 1 and 3 nautical miles of land or shoal water, or as the Commanding Officer directs.	15 minutes	500 yards	Standard Underway Bridge Watch
Open Ocean	All waters 3 nautical miles and greater from land or shoal water, or as the Commanding Officer directs.	30 minutes	1000 yards	Standard Underway Bridge Watch
At Anchor	In any Navigational Zone where the cutter is at anchor or made off to a mooring ball.	30 minutes	Not Applicable	Anchor Watch ⁵

³ The Commanding Officer may set the Navigation Detail or Modified Navigation Detail based upon mission tasking, the specific navigational situation, proximity of hazards to navigation and shoal water. The Navigator and OOD retain the right to increase navigation team manning requirements.

⁴ The Modified Navigation Detail may be set while the ship is transiting Restricted Waters for extended periods of time, when not intending to moor or anchor or as determined by the Commanding Officer. The anchor shall be rigged for letting go with one person identified to let go the anchor if it becomes necessary.

⁵ The Commanding Officer may alter the fix interval and manning requirement, typically adjusted for: weather, proximity to shoal water or hazards to navigation.

APPENDIX II

WPC-154 Tactical Data – Port Rudder												
Change of Heading (°)	10° Rudder			15° Rudder			20° Rudder			35° Rudder		
	Time to turn (s)	Advance (m)	Transfer (m)	Time to turn (s)	Advance (m)	Transfer (m)	Time to turn (s)	Advance (m)	Transfer (m)	Time to turn (s)	Advance (m)	Transfer (m)
6.5 kts												
10	19	71	1	14	50	0	14	48	-1	12	40	1
20	31	103	7	23	77	4	20	69	1	16	54	2
30	41	137	19	31	100	12	26	86	6	20	66	4
40	52	169	36	37	119	21	31	103	13	24	77	8
50	63	196	59	45	136	32	37	118	23	28	87	13
60	75	222	87	53	151	49	43	133	36	32	95	19
12 kts												
10	11	71	0	10	59	-1	7	44	0	9	54	-1
20	18	113	7	15	87	4	13	74	4	12	69	0
30	25	150	19	19	113	11	16	93	9	14	80	2
40	30	182	35	24	136	23	20	110	17	17	91	6
50	37	213	59	28	156	38	24	127	29	20	104	15
60	43	236	84	33	173	56	27	138	40	22	112	21
15 kts												
10	10	73	1	9	66	-2	7	50	0	8	58	0
20	16	114	9	13	97	3	11	79	4	11	79	2
30	22	153	23	17	123	11	14	100	11	14	96	7
40	27	186	42	20	146	22	17	117	19	16	108	13
50	33	217	68	24	164	36	20	135	32	18	120	20
60	38	240	95	27	181	54	25	154	55	20	130	29
20 kts												
10	9	86	2	6	66	1	6	61	-1	6	56	-2
20	13	129	10	10	102	7	9	87	2	9	87	1
30	17	166	24	13	129	16	12	113	9	12	111	9
40	21	201	44	16	153	30	15	132	19	15	133	20
50	25	234	71	19	175	47	17	150	31	17	149	31
60	31	270	113	22	194	70	20	169	50	20	163	46

WPC-154 Tactical Data – Starboard Rudder												
Change of Heading (°)	10° Rudder			15° Rudder			20° Rudder			35° Rudder		
	Time to turn (s)	Advance (Yds)	Transfer (Yds)	Time to turn (s)	Advance (Yds)	Transfer (Yds)	Time to turn (s)	Advance (Yds)	Transfer (Yds)	Time to turn (s)	Advance (Yds)	Transfer (Yds)
6.5 kts												
10	19	78	1	14	55	0	14	52	-1	12	44	1
20	31	113	8	23	84	4	20	75	1	16	59	2
30	41	150	21	31	109	13	26	94	7	20	72	4
40	52	185	39	37	130	23	31	113	14	24	84	9
50	63	214	65	45	149	35	37	129	25	28	95	14
60	75	243	95	53	165	54	43	145	39	32	104	21
12 kts												
10	11	78	0	10	65	-1	7	48	0	9	59	-1
20	18	124	8	15	95	4	13	81	4	12	75	0
30	25	164	21	19	124	12	16	102	10	14	87	2
40	30	199	38	24	149	23	20	120	19	17	100	7
50	37	233	65	28	171	42	24	139	32	20	114	16
60	43	258	92	33	189	61	27	151	44	22	122	23
15 kts												
10	10	80	1	9	72	-2	7	55	0	8	63	0
20	16	125	10	13	106	3	11	86	4	11	86	2
30	22	167	23	17	135	12	14	109	12	14	105	8
40	27	203	46	20	160	24	17	128	21	16	118	14
50	33	237	74	24	179	39	20	148	35	18	131	22
60	38	262	104	27	198	59	25	166	60	20	142	32
20 kts												
10	9	94	2	6	72	1	6	67	-1	6	61	-2
20	13	141	11	10	112	8	9	95	2	9	95	1
30	17	182	26	13	141	17	12	124	10	12	121	10
40	21	220	48	16	167	33	15	144	21	15	145	22
50	25	256	78	19	191	51	17	164	34	17	163	34
60	31	295	124	22	212	77	20	185	55	20	178	50

APPENDIX III
ENAV (VEGA) Navigation Zone Settings

The following will be indicated on the VEGA Navigation Zone Settings.

Profile→View Profile→ **Navigation Zones**

Zone	RESTRICTED WATERS	OPEN OCEAN
<i>Chart Settings Tab</i>		
Deep Contour	50ft	50ft
Safety Depth	18ft	18ft
Safety Height	65ft	65ft
Shallow Contour	12ft	12ft
<i>Alarm Settings Tab</i>		
Chart Objects		
Aids to Navigation	Ignored	Ignored
Canals, Locks, Dams	Caution	Caution
Docking and Anchoring	Caution	Caution
Fishing	Ignored	Ignored
Navigation and Traffic Data	Caution	Caution
Restricted and Prohibited Areas	Warning	Warning
Shoreline Construction	Danger	Danger
Soundings	Danger	Danger
Un-surveyed Area	Warning	Warning
Water Turbulence and Hazards	Danger	Danger
<i>Collision Avoidance</i>		
Bow Crossing Alarm	Deselected	Deselected
CPA Alarm	Selected	Selected
CPA	.1nm	.5nm
TCPA	6min	12min
Lost Target Warnings		
Apply Max Limit	5nm	10nm
Raise Warnings	Selected	Selected
<i>Route Monitoring Chart Objects</i>	Same as "Chart Objects" above	Same as "Chart Objects" above
<i>Safety Checking</i>		
Alarm in Shallow Danger	Selected	Selected
Look Ahead Distance	.2nm	.2nm
Look Ahead Time	12min	12min
Look Ahead Type	Time	Time
Proximity Buffer Aft	100yds	100yds
Proximity Buffer Fore	100yds	100yds
Proximity Buffer Port and Stbd	25yds	25yds
Sensor Integrity	Select All	Select All

<i>Target Settings Tab</i>		
Composite Track Enabled	Selected	Selected
Association Type	Standard	Standard
Custom Association Angle	1 degree	1 degree
Custom Association Distance	.06nm	.06nm
Custom Association Speed	5kts	5kts

APPENDIX IV**ENAV (VEGA) Additional Navigation Settings**

The following settings are not automatically changed by shifting the Navigation Zone profile – OOD’s, QMOW, and Navigation Evaluators shall confirm that these settings are applied as appropriate.

Show Menu→Settings→Route Settings

- Defaults
- Select Default-
 - Restricted Waters
 - XTE- 50 yards
 - Speed- 10 kts
 - Leg Type- Rhumb Line
 - Turn Type- Rudder Angle
 - Turn- 015 Degrees
 - Strict Turn Validation- Selected
 - Coastal Waters
 - XTE- 500 yards
 - Speed- 10 kts
 - Leg Type- Rhumb Line
 - Turn Type- Rudder Angle
 - Turn- 015 Degrees
 - Strict Turn Validation- Selected
 - Open Ocean
 - XTE- 1000 yards
 - Speed- 10 kts
 - Leg Type- Rhumb Line
 - Turn Type- Rudder Angle
 - Turn- 015 Degrees
 - Strict Turn Validation- Selected

Show Menu→Settings→Sensor Settings

- Position-**GPS1, GPS2, GP1B, GP2B, AWG** (this entry indicates the hierarchy)
- COG- **GPS1, GPS2, GP1B, GP2B, AWG** (this entry indicates the hierarchy)
- Depth-**DBT1, DB1B, DB2B** (this entry indicates the hierarchy)
- STW-**LOG**
- HDG-**GYR1, GYR2** (this entry indicates the hierarchy)
Set and Drift-**COG&HDG, CMG&HDG, COG&ORD, CMD&ORD** (this entry indicates the hierarchy)

APPENDIX V**ENAV (VEGA) User Station Profile Settings**

The following will be indicated on the VEGA display settings.

Profile → View Profile → User Station → User Station → USCGC WINSLOW GRIESSER → Edit → Alarm Settings

- Select All

Profile → View Profile → User Station → User Station → USCGC WINSLOW GRIESSER → Edit → Target Settings

- Affiliation: Select all
- Composite Track: Select all
- Dimension: Select All
- Target Display Options: Select all
 - Target Priority: AIS
 - Deselect Target Source
 - Interval: 1 min
 - Target Display Type: IMO

Profile → View Profile → User Station → User Station → USCGC WINSLOW GRIESSER → Edit → Chart Settings

- All Chart Types
 - Select all with the exception of “Chart Scale Boundary” and “Two Shade Depths”
- DNC-VPF
 - Select All
- ENC-S57
 - Select All with the exception of the following:
 - Ignore Time Attributes
 - Plain Line Boundaries
 - Text (other)
- RNC
 - Select All
- Other
 - Select All
- Standard
 - Select All
- Total Tide
 - Select All

Profile → View Profile → User Station → User Station → USCGC WINSLOW GRIESSER → Edit → Display Settings

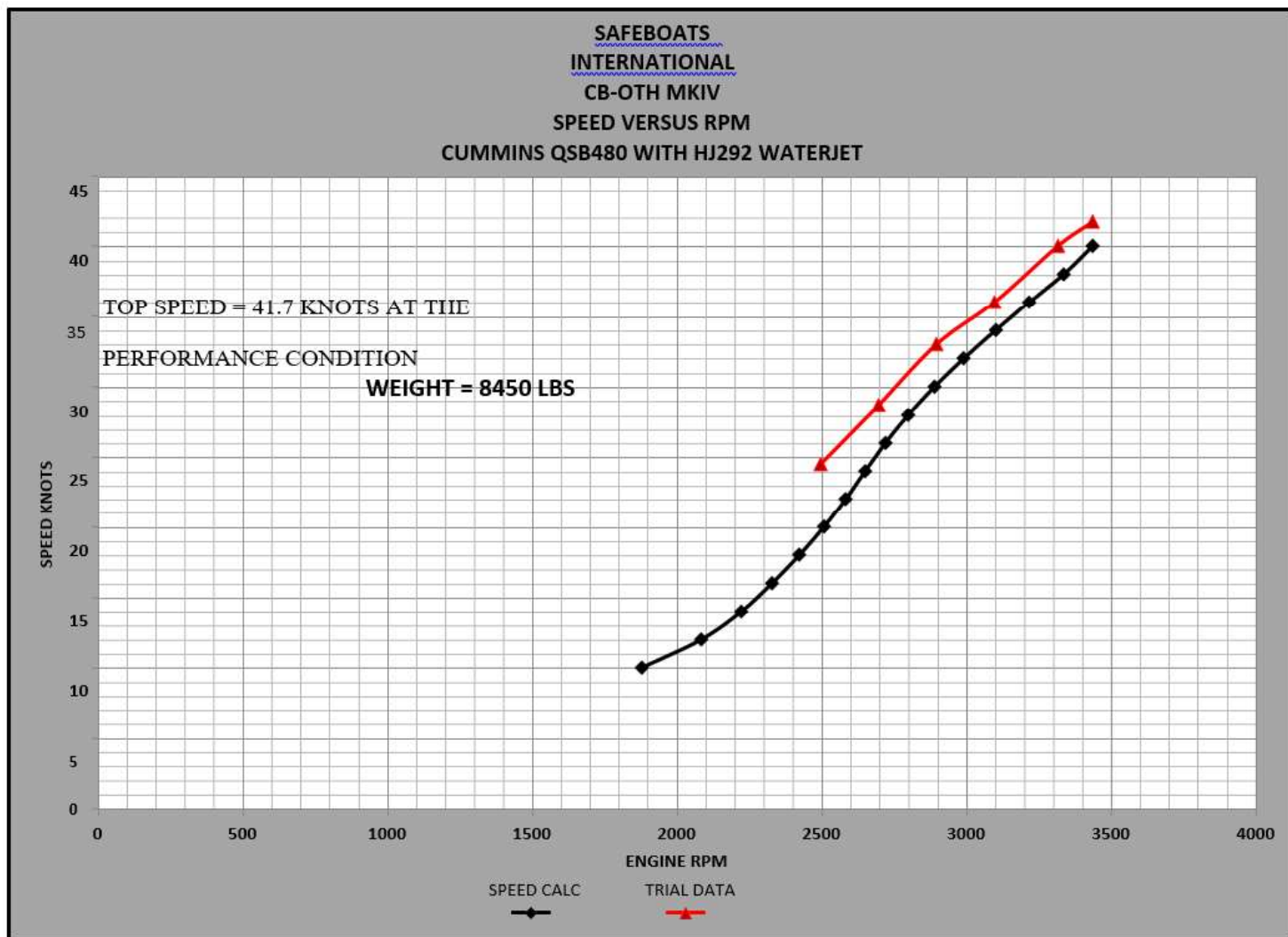
- Base Settings
 - Beam Line Length: 10mm
 - True Scale Ship: Default Symbol
- Grid

- o Deselect All
- Own Ship Vector
 - o Show Vector Tick Marks
 - o Vector Tick Mark Intervals: 10.0
 - o Past Positions (select)
 - Time Span: 1hr
 - Dot Spacing: 60sec
 - o Position Sensors: GPS1 (GP37)
 - o Predicted Ship
 - Predicted Ship Count: 6
 - Prediction Seconds: 360
 - o Wing Vector Settings
 - Show wind vector (select)
 - Wind Vector Type (true)

**Profile → View Profile → User Station → User Station → USCGC WINSLOW GRIESSER →
Edit → Route Settings**

- Base Settings: Select All
- Extended Settings: Select All

ENCLOSURE 1 – OTH MKIV SPEED vs RPM



ENCLOSURE 2 – LINE HANDLING COMMANDS

This Enclosure provides a list of standard line handling commands

<u>COMMAND</u>	<u>ACTION</u>
PUT OVER (line number)	Pass the specified line to the pier and provide enough slack to allow line handlers to place the line over the bit, cleat, or bollard.
HOLD (line number)	Do not let any more line out even though the risk of parting may exist.
CHECK (line number)	Hold heavy tension on the specified line but render it as necessary to prevent parting the line.
SURGE (line number)	Hold moderate tension on a line but render it enough to permit movement of the ship.
EASE (line number)	Let a line out until it is under less tension, but not slacked.
SLACK (line number)	Take all tension off a line.
TAKE THE SLACK OUT OF (line number)	Take all the slack out of a line, but do not take a strain.
SHIFT (line number)	Move a line to the specified location.
HEAVE AROUND ON (line number)	Take a strain on a line.
TAKE (line number) TO POWER	Take the specified line to the capstan or gypsy head and make ready to heave around (DO NOT heave around until told to do so).
SINGLE UP (line number)	Take in all but one bight so there remains a single part to the line. Can also be used to single up all normal mooring lines.
DOUBLE UP (line number)	Pass an additional bight on the specified line so there are three parts to the line. This can also be used to double up all normal mooring lines. Cutters without sufficient mooring line for three parts should just pass the bitter end of the single up to the pier.
AVAST or AVAST HEAVING (line number)	Stop taking a strain on a line with capstan.
CAST OFF (line number)	When using another ship's lines to secure your ship, it means to cast off the ends of their lines.
TAKE IN (line number)	Allow the pier line handler enough slack to take the line off the fitting and bring the line aboard. Used when secured with your own line.
STAND BY YOUR LINES	Man the lines, ready to cast off or moor.
BACK EASY	A command to the capstan operator to ease tension on the line once the stopper is passed. This command is given before up-behind.

UP-BEHIND

Cease hauling on the line and slack it quickly.

ENCLOSURE 3 – STANDARD HELM AND ENGINE ORDERS

This Enclosure provides the helm and engine commands that shall be used when there is either a dedicated helmsman or when bells are answered from the engine room. Standard phraseology governing orders to the Helmsman is required to ensure the Helmsman understands and promptly executes all orders. The Helmsman must repeat each command word-for-word and must report when the ordered action is complete. The Conning Officer/Coxswain must acknowledge the Helmsman's responses with "VERY WELL."

STANDARD HELM COMMANDS

<u>COMMAND</u>	<u>ACTION</u>
RIGHT (LEFT) STANDARD (FULL) RUDDER	Apply the ordered rudder. Standard rudder is the amount required to turn the ship on its standard tactical diameter. The rudder angle varies from ship to ship. Full rudder is normally the amount required for reduced tactical diameter.
RIGHT (LEFT) ## DEGREES RUDDER	Apply the ordered rudder. The Conn can follow this order with a new course for the Helmsman to steer, such as "STEADY ON COURSE 256" or another rudder command. If the Conn does not specify a course, the Helmsman must call out the heading at 10degree increments, such as "PASSING 150, PASSING 160," until the Conn orders a course.
EASE YOUR RUDDER/EASE YOUR RUDDER TO RIGHT (LEFT) ## DEGREES	Decrease the rudder angle by half the amount currently applied or by the amount ordered. The Conn can follow this order with a new course for the Helmsman to steer or another rudder command. If the Conn does not specify a course, the Helmsman must call out the heading at 10-degree increments until the Conn orders a course.
RUDDER AMIDSHIPS	Place the rudder at zero degrees.
MEET HER	Use the rudder as necessary to check the swing of the ship without steadying on any specific course.
STEADY, STEADY AS SHE GOES, STEADY ON COURSE ###	Steer the course on which the ship is currently headed or the ordered course. If the ship is turning and the Conn gives the command STEADY or STEADY AS SHE GOES, the Helmsman notes the heading and brings the ship back to the heading. The Helmsman should then reply "STEADY; COURSE ###."
STEER ON	The Helmsman steers on a range or object identified by the

Conning Officer.

<u>COMMAND</u>	<u>ACTION</u>
SHIFT YOUR RUDDER	Move the rudder to the same angle in the opposite direction from where it is currently ordered. The Conn can only give this order when a specific rudder angle is in effect.
NOTHING TO THE RIGHT (LEFT) OF COURSE ###	Steer nothing to the right (left) of the course specified.
HOW'S YOUR RUDDER	This is a query from the Conn to ascertain the current rudder placement. The Helmsman replies, "MY RUDDER IS RIGHT (LEFT) ## DEGREES."
MARK YOUR HEAD	A command to the Helmsman to state the heading of the ship at the moment the command was given. The Helmsman responds, "MARK ###."
COMMAND	The Helmsman's response to the Conn if he/she did not hear a command, misunderstood a command, or believes a command is improper.
SALLY YOUR RUDDER	Shifting back and forth between a set number of degrees of right and left rudder as ordered by the OOD.
MIND YOUR HELM	A command from the Conn, CO, OOD (if separate), or the Navigator to the Helmsman to pay closer attention to his/her steering.

STANDARD ENGINE ORDERS

Lee Helmsman: Engine orders are given in the following format when engines are answered by dedicated lee helm:

Conning Officer: "(All/Port/Starboard) Engine(s) (Ahead/Stop/Back) (Dead Slow/Slow/Half/Full)"

Lee Helm: Repeat back + "aye"

Once Engines have answered fully (i.e., are stopped or turning for the desired RPM)

Lee Helm: "Engines answer (All **or** Port **and** Starboard) (Ahead/Stop/Back) (Dead

Slow/Slow/Half/Full)”

NOTE 1: Regardless of engine order given, the Lee Helm shall always report back the condition of **both** engines once they have answered (e.g., if the Conning Officer orders “Starboard Engine Back Dead Slow”, the Lee Helm would report “Engines answer Port Stop, Starboard Back Dead Slow” once the engine answers)

NOTE 2: The engine room Local Operating Panels must be continuously manned when the maneuvering via Engine Order Telegraphs with the engines in local control.

Engine Order Telegraph: When using the Engine Order Telegraph, the Conning Officer will indicate the engine order by turning the appropriate dial on the bridge, prompting an audible alarm on both the bridge and in the engine room. Once the engine commands are answered (i.e., the desired RPM has been achieved), the engine room shall match position on the telegraph dial.

ENGINE RPM's AND SPEED

EOT Order	Engine RPM	Speed (kts) BMDE	Speed(kts) Single Engine
Full Ahead	1500	19	16
Half Ahead	1200	15.5	14
Slow Ahead	850	11.5	9
Dead Slow Ahead	500	6.5	5.6
Stop	500	0	0
Dead Slow Astern	500	6	3
Slow Astern	850	7.5	6
Half Astern	1200	11	9
Full Astern	1407	12.8	10

ENCLOSURE 4 - NAVIGATION TEAMS

A. Boat Navigation Team Organization. The Coxswain may assign navigation support functions to members of the boat crew. If the Coxswain decides to do this, then he or she must use the Bridge Navigation Team roles described in this Enclosure (modified as needed to address boat navigation capabilities and crewing). Combining roles may be necessary, depending on boat crew size. For example, the Coxswain can assign a crewmember as Helmsman and assign another crewmember as Plotter/Navigation Evaluator.

B. Bridge Navigation Team Organization. Bridge navigation teams must complete applicable Sections of Reference (f) and cutter specific job qualification requirements (JQR) for their assigned billets. Assign Navigation Team positions as appropriate for the method of navigation in use. The following are standard navigation team positions and duties:

1. Navigation Evaluator. If not the Navigator, this person is responsible to the Navigator and must:
 - a. Coordinate the actions of all bridge navigation team members.
 - b. Use all available information to ensure the safe passage of the vessel including electronic fixes plotted on a paper chart, or displayed on an electronic navigation system.
 - c. Evaluate fix accuracy from the Bridge and CIC (if equipped).
 - d. Evaluate ship's projected movements.
 - e. Make reports to the Conn as specified in the Command Navigation Standards.
 - f. Ensure information displayed on eNav correlates to environment by visual verification.
2. Navigation Plotter. The Navigation Plotter should not be the same individual as the Navigation Evaluator, unless there is a lack of available cutter personnel. The Navigation Plotter must maintain the navigation plot as follows:
 - a. When using manual plotting methods:
 - (1) Plot and label each fix on the chart in use.
 - (2) Extend the DR at least two fix intervals.
 - (3) Compute set and drift since last fix.
 - (4) Identify nearest hazard to navigation.
 - (5) Determine time and distance to the next course change.
 - (6) Revise turn bearings.
 - (7) Complete other tasks as directed by the Navigator/Navigation Evaluator.
 - b. When using automated plotting:

- (1) Plot various types of fixes as applicable, based on the installed electronic navigation system.
- (2) Maintain best scale of chart and adjust chart view area to best match navigational picture.
- (3) Complete other tasks as directed by the Navigator/Navigation Evaluator.

3. Bearing Book Recorder. When the cutter is navigating using manual plotting, the recorder must:

- a. Maintain the Standard Bearing Book (OPNAV 3530/2 or equivalent) in accordance with this Manual.
- b. Maintain communications with the Bearing Takers.
- c. Mark fixes at intervals specified by the Navigation Evaluator.
- d. Pass pertinent information to the Navigation Plotter/Navigation Evaluator.

4. Bearing Takers.

- a. Obtain accurate bearings to navigation aids designated by the Navigation Plotter/Navigation Evaluator.
- b. Advise the Navigation Plotter regarding the navigation aids available for use, including when navigation aids are acquired visually or lost from sight.

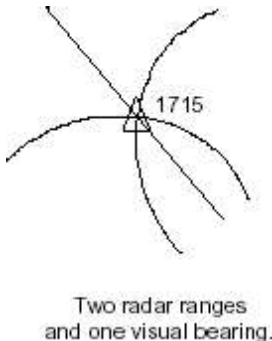
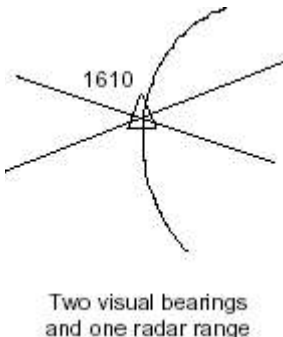
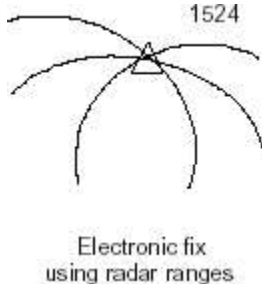
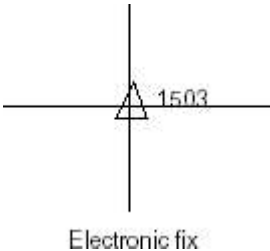
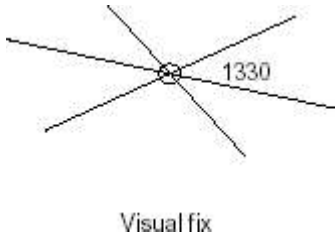
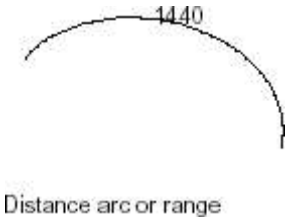
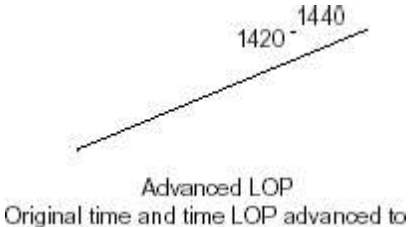
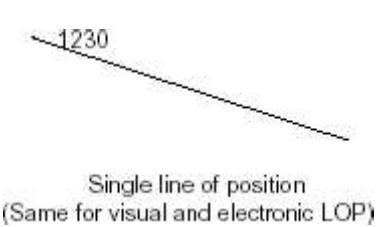
5. Bridge Radar Observer.

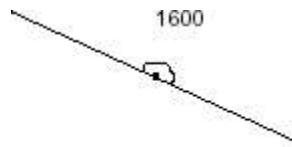
- a. Provide all radar navigation data as directed by the Navigation Plotter/Navigation Evaluator.

Perform the duties of Navigation/Shipping Radar Operator on cutters without a CIC.

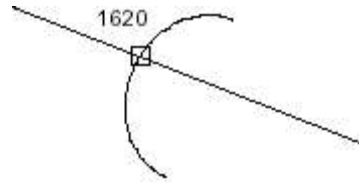
ENCLOSURE 5 - STANDARD PLOTTING SYMBOLOGY

1. When plotting on paper charts, the following navigation plotting symbols shall be used.

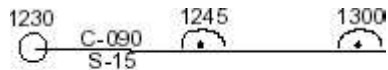




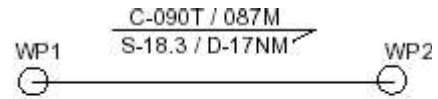
DR position.



EP based on two LOPs.



DR course line



Trackline. Used between intended waypoints.

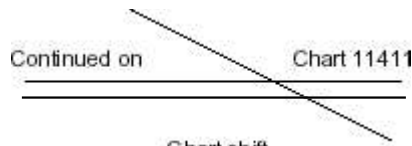
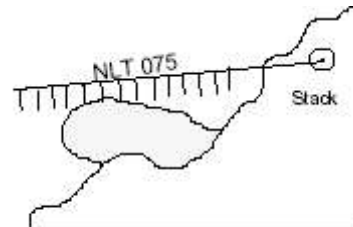
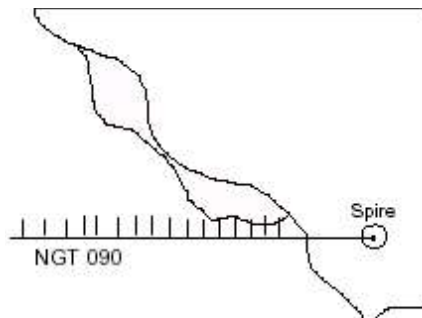





Chart shift



Danger bearing No Less Than 075 Deg T



Danger bearing No Greater Than 090 Deg T

Marking of Visual and Radar Navigation Points		
Symbol	Type of Aid	Highlighted Color²
	Visual Object – sequentially labeled V1, V2, V3, or VA,VB, VC, etc.	Yellow
	Radar Object – sequentially labeled R1, R2, R3, or RA, RB, RC, etc.	Orange
	Used for both (visual and radar) – sequentially labeled VR1, VR2, VR3, or VRA, VRB, VRC, etc.	Yellow and Orange

ENCLOSURE 6 - GPS OUTAGE REPORTING

A. General. All Coast Guard GPS/NDGPS/WAAS users must adhere to the following:

B. GPS and WAAS. Units must report degradations, outages, and other incidents or anomalies to the Navigation Center via the GPS Problem Worksheet located at:

<http://www.navcen.uscg.gov/?pageName=gpsUserInput>.

C. NDGPS. Units must report degradations, outages, and other incidents or anomalies at:

<http://www.navcen.uscg.gov/?pageName=dgpsUserInput>.

D. Connectivity Restricted Units. Users must submit reports via priority message to COGARD NAVCEN ALEXANDRIA VA//NIS//.

1. GPS reports must contain the following information, if available:
 - a. Start time of outage/anomaly.
 - b. End time of outage/anomaly.
 - c. Location where the outage/anomaly occurred.
 - d. GPS user equipment make/mode.
 - e. Elevation of GPS antenna.
 - f. GPS frequencies (L1/L2) in use at time of outage/anomaly.
 - g. Number of satellites the system was tracking at time of outage/anomaly.
 - h. Which satellites the system was tracking at time of outage/anomaly.
 - i. Summary (provide additional information, unusual screen display indicating problem).
 - j. Point of contact.
2. NDGPS reports must contain the following information, if available:
 - a. Start time of outage/anomaly.
 - b. End time of outage/anomaly.
 - c. Location where the outage/anomaly occurred.
 - d. NDGPS user equipment make/mode.
 - e. Elevation of NDGPS antenna.

- f. NDGPS beacon in use at time of outage/anomaly.
 - g. Availability of standard positioning via GPS at time of outage/anomaly.
 - h. Summary (provide additional information, unusual screen displays indicating problem, steps taken to troubleshoot/resolve).
 - i. Point of contact.
3. WAAS reports must contain the following information, if available:
- a. Start time of outage/anomaly.
 - b. End time of outage/anomaly.
 - c. Location where the outage/anomaly occurred.
 - d. WAAS user equipment make/mode.
 - e. Elevation of WAAS-capable GPS antenna.
 - f. Availability of standard positioning via GPS at time of outage/anomaly.
 - g. Summary (provide additional information unusual screen displays indicating problem, steps taken to troubleshoot/resolve).
 - h. Point of contact.

ENCLOSURE 7 – ENTERING PORT AND RESTRICTED WATERS CHECKLIST

Date: _____ Port: _____

Time/ INT**24 HOURS PRIOR TO ENTERING PORT/RESTRICTED WATERS:**

___ / ___ (OPS) Ensure LOGREG has been released and/or DIPCLEAR approved.

12 HOURS PRIOR TO ENTERING PORT (RESTRICTED WATERS):

___ / ___ (QMOW) Log “COMMENCED ENTERING PORT (OR RESTRICTED WATERS) CHECKLIST.”

___ / ___ (OOD) Confirm mooring time and pier assignment.

4 HOURS PRIOR:

___ / ___ (ET) Ensure all handheld radios are charged.

___ / ___ (OPS) Ensure harbor charts are ready for use. (N/A if using Automatic plotting)

2 HOURS PRIOR:

___ / ___ (OPS) Fill out navigation brief, submit to CO for approval

___ / ___ (OOD) Inform EOW to secure OWS (12NM), R/O Units (12NM), & Sewage (3NM).

___ / ___ (OOD) Pipe, “Now, make preparations for entering port. WINSLOW GRIESSER will moor Starboard/Port side-to at (time). All hands shift to uniform of the day; uniform of the day is _____. The Navigation Brief will be held on the bridge at (time).”**1 HOUR PRIOR:**

___ / ___ (OOD) Verify operation of both steering pumps in Full Follow-up mode.

Log Entry: “CONDUCTED SATISFACTORY STEERING CHECKS.”

___ / ___ (OOD) Test backing bell on both MDEs, operation of the pendant, and operation of the Bow Thruster. Log Entry: “CONDUCTED SATISFACTORY PROPULSION TEST FROM THE BRIDGE.”

___ / ___ (OOD) Test emergency alarms and whistle (log).

Log Entry: “CONDUCTED SATISFACTORY TEST OF THE SHIP’S EMERGENCY ALARMS AND WHISTLE.”

___ / ___ (OPS) Verify line handler arrangements.

___ / ___ (OOD) Ascertain schedule of other vessel movement in the port/ harbor.

___ / ___ (OPS) Hold Navigation Brief. Conduct risk assessment. Log Entry: “NAVIGATION BRIEF HELD. CONDUCTED PRE-EVOLUTION RISK ASSESMENT Enclosure (7) to GRIESSERINST 3530.1A (PORT/RESTRICTED WATERS). GAR SCORE ___”

___ / ___ (EOW) Verify material condition Yoke.

30 MINUTES PRIOR:

___ / ___ (OOD) Set the Special Sea/Navigation Detail.

- ___ / ___ (OOD) Hoist International Call Sign (N-D-O-D)
- ___ / ___ (OOD) Shift AIS Transponder to “Class A” Mode. (N/A if remaining in secure TX per CO)
- ___ / ___ (OOD) Activate inbound tracklines and RESTRICTED WATERS setting on primary and secondary navigation systems.
- ___ / ___ (OOD) Check in with harbor control/ VTS as needed.
- ___ / ___ (OOD) Make SECURITE call on appropriate VHF channel.
- ___ / ___ (Deck) Verify anchor is ready for letting go with an appropriate scope of line for the water depth and bottom type. Verify the capstan operates properly.
- ___ / ___ (OOD) Set RMD.
- ___ / ___ (OOD) Hoist Code Hotel (N/A if not embarking pilot).
- ___ / ___ (Deck) Receive manned and ready reports:

<input type="checkbox"/> Bridge <input type="checkbox"/> Foc’sle <input type="checkbox"/> Fantail <input type="checkbox"/> EOW
--

- ___ / ___ (Deck) Checklist complete, request CO permission to enter port. Log: “COMPLETED ENTERING PORT CHECKLIST.”

OOD: _____ CO: _____

POST MOORING:

- ___ / ___ (OOD) Shift colors, hoist required pennants and courtesy flag.
- ___ / ___ (OPS) Secure steering pumps and bow thruster before shifting power.
- ___ / ___ (GM) Place high security locks on magazines.
- ___ / ___ (OPS) Verify all classified material is secured using the watch-to-watch inventory.
- ___ / ___ (OPS) Notify TACON of mooring.
- ___ / ___ (OOD) Secure communications and navigation equipment.
- ___ / ___ (EOW) Secure MDEs.
- ___ / ___ (EOW) Secure SSDGs (if applicable).
- ___ / ___ (OOD) Return checklist to Operations Officer. Retain on file for 30 days.

ENCLOSURE 8 – GETTING UNDERWAY CHECKLIST

Date: _____ Departing: _____

48 HOURS PRIOR:

TIME/ INT

- ___/___ (XO) Ensure WQSB is up to date and accurate.
- ___/___ (ILT) Ensure adequate AMIO gear is aboard.
- ___/___ (GM) Ensure pre-fire checks have been completed on all mounted weapon systems.

24 HOURS PRIOR:

- ___/___ (OOD) Log “COMMENCED PREPARATIONS FOR GETTING UNDERWAY” and draft readings.
- ___/___ (OPS) Energize and verify the operation of all Bridge equipment.
- ___/___ (OOD) Test all navigation lights, blue light, and spotlights. Report any discrepancies to EPO.
- ___/___ (OPS) Ensure all charts are prepared and that tracklines match on ECDIS, ECDIS-backup and applicable paper charts.

12 HOURS PRIOR:

- ___/___ (OOD) Conduct and log completion of boat checks. Ensure fuel tank is at 95%.
- ___/___ (OOD) Ensure potable water tanks are full.
- ___/___ (NAV) Check Gyro repeater for error.

2 HOURS PRIOR:

- ___/___ (OPS) Navigation Brief to CO.
- ___/___ (ILT) Single up all lines.
- ___/___ (OOD) Muster, brief and assign life raft positions to any visitors at the XO’s direction.
(N/A if no visitors on board)
- ___/___ (OOD) Pipe, “Now, make preparations for getting underway. All hands shift to uniform of the day, uniform of the day is: _____. A Navigation Brief will be held on the Bridge at (time).”
- ___/___ (ET) Load codes and complete all necessary destructions.
- ___/___ (ET) Conduct radio checks on all required circuits.
- ___/___ (ET) Energize and verify the operation of all Bridge equipment.
- ___/___ (NAV) Calculate radar error _____yds, check Gyro repeater, verify GPS position.
- ___/___ (OPS) Ascertain schedule of other vessel movements in current port or harbor.

___ / ___ (OPS) ALMIS entry for getting U/W.

1 HOUR PRIOR:

___ / ___ (OOD) Coordinate with the EOW and pipe, “We will be shifting from shore power to ship’s power in approximately ___ minutes.”

___ / ___ (OOD) Test emergency alarms and whistle. Log Entry: “CONDUCTED SATISFACTORY TEST OF THE SHIP’S EMERGENCY ALARMS AND WHISTLE.”

NOTE: Don’t test alarms or whistle between sunset and 0800 local time. Consider not testing alarms when it may be overly conspicuous or unprofessional (i.e. – close proximity to residential areas)

___ / ___ (OOD) Set up pendant on the 01 Deck.

___ / ___ (OOD) Verify arrangements for line handlers and pilot (if applicable).

___ / ___ (OOD) Confirm primary and secondary navigation systems are online. Activate track lines and RESTRICTED WATERS navigation zone.

___ / ___ (OOD) Ensure accountability of all hands.

___ / ___ (OPS) Verify AIS Transponder is on “Class A” Restricted Mode (as applicable)

___ / ___ (GM) Unlock Pyro/ Ready Sevice Locker, and bring M-16 to the bridge.

45 MINUTES PRIOR:

___ / ___ (OPS) Hold Navigation Brief. Conduct risk assessment.

Log Entry: “NAVIGATION BRIEF HELD. CONDUCTED PRE-EVOLUTION RISK ASSESSMENT FOR GETTING UNDERWAY, RISK/GAIN IS ___”

___ / ___ (ET) Disconnect all electrical shore ties and T-1 Cable.

___ / ___ (EOW) Set material condition Yoke throughout ship.

___ / ___ (OOD) Set the Special Sea Detail. Log Entry: “SET THE SPECIAL SEA DETAIL.”

___ / ___ (Deck) Deck and Conn assume their positions and announce the same on the Bridge (log).

Log Entry: “_____ ASSUMED THE DECK, _____ ASSUMED THE CONN.”

___ / ___ (EOW) Light off both MDEs and (QMOW) log.

___ / ___ (QMOW) Hoist international call sign

20 MINUTES PRIOR:

___ / ___ (Deck) Verify anchor is ready for letting go with an appropriate scope of line for the water depth and bottom type. Verify the capstan operates properly.

___ / ___ (EOW/OOD) Shift both MDEs to Pilothouse control.

___ / ___ (EOW/OOD) Close bow thruster breakers in the Generator Room and the Pilothouse.

___ / ___ (Conn) Conduct steering checks (both pumps).

Log Entry: "STEERING TEST SAT ON BOTH PUMPS."

___ / ___ (Deck) Energize and fins, place in center.

___ / ___ (Deck) Pipe "Now, all visitors lay ashore." With permission of the XO, pull the brow once visitors are ashore.

___ / ___ (Deck) Receive manned and ready reports:

<input type="checkbox"/> Bridge <input type="checkbox"/> Foc'sle <input type="checkbox"/> Fantail <input type="checkbox"/> EOW
--

10 MINUTES PRIOR:

___ / ___ (Deck) Pipe, "Now, all hands stand clear of mooring lines while the OOD rocks the shafts."

___ / ___ (Conn) Conduct propulsion and bow thruster tests from bridge and pendant. Log Entry: "CONDUCTED SATISFACTORY PROPULSION TEST FROM THE BRIDGE AND PENDANT."

___ / ___ (Deck) Set RMD.

___ / ___ (Deck) Make SECURITE call on appropriate VHF channel as applicable.

___ / ___ (Deck) Checklist complete, ask for CO's permission to get underway:

Log Entry: "COMPLETED GETTING UNDERWAY CHECKLIST, CO GRANTED PERMISSION TO GET UNDERWAY."

OOD: _____	CO: _____
------------	-----------

AFTER GETTING UNDERWAY:

___ / ___ (OPS) Notify TACON of underway time via chat or voice circuit.

___ / ___ (ILT) Secure from Mooring Stations.

___ / ___ (Deck) Place fins in auto.

___ / ___ (OPS) Ensure all required classified material for the Bridge is broken out.

___ / ___ (Deck) Secure bow thruster once clear of pier and on track.

AFTER EXITING RESTRICTED WATERS:

___ / ___ (OOD) Secure from Special Sea Detail.

___ / ___ (ILT) Stow anchor line/gear.

___ / ___ (OOD) Set the at sea watch.

___ / ___ (OOD) Return checklist to Operations Officer. Retain on file for 30 days.

___ / ___ (QMOW) Shift AIS to "Secured TX" Mode.

ENCLOSURE 9 – LOSS OF ECDIS CHECKLIST

1. Indications and Warnings:

- ECDIS data field turns red and/or ECDIS alarm
- Position/Heading in ECDIS does not correlate to available AToN or other references
- GPS HDOP above 5.0 for an extended period of time
- GPS position different between receivers, Gyro and Magnetic heading do not agree

2. Initial Actions:

(OOD) Announce “I have a loss of ECDIS component” on the bridge (specify which component OR “loss of ECDIS” if entire system)

(OOD/Conn) Consider reducing speed if needed based on closest navigation hazard and traffic picture

(OOD/Nav Eval) Attempt shift to backup ECDIS components

- *Loss of position source:* attempt shift to backup GPS source (NOTE: GPS1B and GPS2B receive a direct position feed from the head units and may be the best backup).
- *Loss of heading source:* attempt shift to GYR2 source (Fluxgate compass)
- *Failure of a SeaWatch client:* attempt shift to other SeaWatch client.
- *Failure of both SeaWatch clients:* attempt shift to backup ECDIS (announce shift on bridge)
- *Failure of backup ECDIS:* shift to manual plot on paper chart (announce on bridge). Use SINS chart plotter for additional situational awareness.

3. Follow Up Actions:

(OOD) Notify CO, call ET’s to the bridge.

(OOD/QMOW) If using paper chart, verify chart edition and last correction date (paper chart may not be suitable for long-term navigation)

(OOD) Consider returning to open ocean, safe water, or anchorage/mooring if needed.

NOTE 1: The Bridge SINS chart plotter function should be used for situational awareness in the event of ECDIS failure, but cannot be used for primary navigation.

NOTE 2: If position/heading feeds into SeaWatch clients 1 and 2 cannot be restored, automatic plotting on the backup ECDIS client is preferred to manual plotting on SeaWatch clients. Manual plot on ECDIS should only be used if position/heading feeds cannot be restored on either system.

NOTE 3: If manual plot is used on one ECDIS client, the position displayed on other ECDIS clients may be different.



USCGC WINSLOW GRIESSER (WPC 1116)
ENCLOSURE 10 - NAVIGATION BRIEF
IN/OUTBOUND LOCATION
DATE: DDMMYY



DECK	
CONN	
COACH	
SAFETY	
NAV EVAL	
NAV PLOT	
LOOKOUT/FLIR	
RADAR/SHIPPING	
FOC'SLE I/C	
FANTAIL I/C	
EOW	

NAV BRIEF	
SPECIAL SEA	
U/W TIME	

CHARTS	CORRECTED
CHART DATUM	WGS 84
BOUYAGE	IALA B
GYRO ERROR	
RADAR ERROR	
ERROR AS OF:	

NAV MODES	
PRIMARY	AUTO/ECDIS
SECONDARY	MANUAL/ECDIS
TERTIARY	MANUAL/PAPER

WEATHER	
SEAS	FT
TEMPS	H / L
SUNRISE/SUNSET	/
WINDS	KTS
PRECIPITATION	

COMMS	
VHF (PORT CONTROL)	
UHF (HANDHELD)	
SMALL BOAT	

TIDES	TIME	HEIGHT
HIGH		FT
LOW		FT
U/W		FT
CURRENTS	TIME	SPEED/DIR
MAX FLOOD		KTS
MAX EBB		KTS
SLACK		-----

EQUIP STATUS	
MDE'S	
SSDG'S	
EDG	
DISCREPS	

TRACKLINES

LEG	CRS T/M	DIST (NM)	SPD (KTS)	TB T/R	TR (YDS)	RUDDER (DEGREE)	ATON	EMERGENCY ANCHORAGE
1	T M			T				
2	T M			T				
3	T M			T				

SIGNIFICANT INFO: (LNM, COAST PILOT, SAILING DIRECTIONS, PORT VISIT AAR, ETC)

RISK ASSESSMENT	
PLANNING	
EVENT COMPLEXITY	
ASSET (CREW)	
ASSET (CUTTER)	
COMMS/SUPERVISION	
ENVIRONMENT	
OTHER	
OVERALL RISK	
OVERALL GAIN	

CO: _____

NAV: _____

ENCLOSURE 11 – LOSS OF MASTER GYROCOMPASS

1. Indications and Warnings:

- HDG field turns red in ECDIS or ECDIS-backup
- Heading in ECDIS does not correlate to available AToN or other references
- MCS alarm indicating fault or loss of power to the gyro
- Gyro indicates “0” and/or does not move
- Master gyro (main deck, athwartship passageway) audible or visual alarm

2. Initial Actions:

- (OOD) Announce “I have a loss of gyro” on the bridge
- (OOD/Conn) Shift steering to Full Follow Up and steer by magnetic (fluxgate)
- (OOD/Conn) Consider reducing speed if needed based on closest navigation hazard and traffic picture
- (OOD/Nav Eval) Shift heading source in ECDIS to “GYR2” (fluxgate compass)
- (OOD/Nav Eval) Shift SPS-50 and SINS radar to “heads up” and “relative motion”

3. Follow Up Actions:

- (OOD) Notify CO and EOW.
- (OOD/QMOW) Verify fluxgate compass heading correlates to ship’s COG or available AToN.
- (OOD) Consider returning to open ocean, safe water, or anchorage/mooring if needed.

NOTE 1: The master gyrocompass feeds many systems on the ship, including radars, FLIR, SATCOM antenna, KVH antenna, autopilot, etc. After assessing the navigational picture and ensuring vessel safety, functionality of this equipment should be verified as soon as feasible.

NOTE 2: The gyro is self-settling and will automatically “find” true north during the power-on cycle. The settling process may take up to 24 minutes in heavy seas or when maneuvering. The gyro output is NOT reliable until the “ready” light on the master gyro is illuminated.