



16500
31 May 2017

MEMORANDUM

From: CG-NAV-3 *[Handwritten signature]*

Reply to CG-NAV-3
Attn of: [REDACTED]

To: CG-NAV *[Handwritten signature]*, *Noted. 6/5/17*

Subj: WATERWAYS ANALYSIS AND MANAGEMENT SYSTEM (WAMS) STUDY FOR
THE ATLANTIC AND GULF COAST SEACOAST SYSTEM (June 2015-March 2017)

Ref: (a) Aids to Navigation Manual – Administration, COMDTINST M16500.7
(b) IALA NAVGUIDE 2014
(c) IMO Ships' Routeing 2015 Edition

1. PURPOSE. This WAMS study was conducted to determine the aids to navigation requirements for the Atlantic and Gulf Coast Seacoast System (AGSS), which spans four Coast Guard Districts. The recommendations and conclusions of this study are focused on providing consistent, program-wide policy necessary to support District Commanders' Aids to Navigation (ATON) services within the AGSS. The operating principle used during this study was to determine the navigation requirements of mariners to safely navigate the AGSS. Therefore, the outcome of this WAMS will not determine what individual ATONs to add, keep, or remove, but rather analyze the capabilities of the various user types to shape policy for the next generation waterway system management and design.
2. APPROACH. The AGSS was evaluated based on current common shipping lanes, international considerations from the International Maritime Organization (IMO) and the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), users of the system based on data collected by the Nationwide Automatic Identification System, training and carriage requirements, available technology other than carriage, environmental conditions, and ATON discrepancies. Analysis of these items was augmented with a user survey desired to evaluate user requirements as expressed by user responses.
3. WATERWAY DESCRIPTION. This study encompasses the Atlantic and Gulf Coast Seacoast System (AGSS), which is a Short Range Aids to Navigation system within U.S. Navigable Waters that spans along the United States eastern seaboard from the United States/Canada border south to the United States/Mexico border. In accordance with the Aids to Navigation Manual, Administration, "Coastal or Seacoast Lights assist vessels either during coastal navigation or when making landfall." In addition to Major Lights, ATON throughout this waterway consist of lateral, isolated danger, safe water, special, and other

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marks as described in section 4.C.1.a of the Aids to Navigation Manual, Administration. This study will focus solely on U.S. Navigable Waterways seaward, and will include the major lights, entrance, and approach buoys. A description of the ATON located within this area of study is listed in section 1.b.

- a. The history of the Atlantic and Gulf Seacoast System dates back 300 years to the construction of Boston Light on Little Brewster Island. Over 73 years later, in 1789, the first session of the first Congress passed an act placing the lighthouse service under the jurisdiction of the Department of the Treasury. Part of that act also included the construction of Cape Henry Lighthouse. Lighthouses were built up and down the East Coast to aid mariners in coastwise navigation, or to identify Estuaries and rivers leading to our harbors and ports.

In the 1960's and 1970's, a large amount of the traditional commercial sailing and freighter traffic gave way to tugs and barges for the movement of goods along the Atlantic and Gulf Seacoast System. The tugs and barges began transiting further offshore, making it difficult for them to use the current aids to navigation that were in place, which were lighthouses. A system of red, floating buoys offshore was put in place to assist these mariners in the same manner upon which lighthouses were originally established. Towing vessels were not required to be equipped with a marine RADAR until August 2, 1997. For over 20 years, tugs were transiting the Atlantic and Gulf Seacoast system using floating buoys as their primary aids to navigation. As of today, navigation requirements for these vessels are much more strict, requiring them to be equipped with GPS, RADAR, and AIS. It is recognized that it has become standard for the U.S. domestic fleet to carry and use some form of electronic charts in addition to the paper charts required by Federal regulations. However, mariners are now permitted to carry appropriate electronic charts in lieu of paper charts.

- b. The AGSS encompasses 466 ATON located within the area described above.
 - a. Per reference (a), the types ATON used throughout the AGSS include:
 - a. *Safe Water Marks*. Safe Water Marks indicate that there is navigable water all around the mark. They mark fairways, mid-channels, and offshore approach points. They can be used by a mariner transiting offshore waters to identify the proximity of landfall.
 - b. *Lateral*. Lateral marks define the port and starboard sides of a route to be followed. Their most frequent use is to mark the sides of channels. They

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may be used individually, however to mark obstructions outside of clearly defined channels.

- c. *Isolated Danger*. These marks are erected on, moored over, or placed immediately adjacent to an isolated danger that may be passed on all sides of system users.
 - d. *Special*. Special marks indicate special areas or features referred to in charts or other nautical publication. Throughout the AGSS, Special marks are used to mark anchorages, cable or pipeline areas, traffic separations schemes, and military exercise zones.
 - e. *Coastal or seacoast lights*. These lights assist vessels either during coastal navigation or when making landfall.
- b. The breakdown of aids by district and by type is detailed in the table below:

<u>District</u>	<u>Aids</u>
1	182
5	109
7	128
8	47

<u>Aid Type</u>	<u># of Aids</u>
Coastal or Seacoast Light	135
Safe Water Mark	144
Lateral Mark	140
Isolated Danger Mark	2
Special Mark	45

The list of these aids can be found in enclosure (1). In addition to the physical ATON marking the AGSS, the U.S. Coast Guard has incorporated Automatic Identification System (AIS) based electronic ATONs (eATON) throughout the U.S. Aids to Navigation System to augment the physical signals, and improve mariner situational awareness. The list of eATONs included in the AGSS can be found in enclosure (2). These eATONs are transmitted from shore via The Nationwide AIS system (NAIS). NAIS coverage maps for Districts 1, 5, 7, and 8 can be found in enclosure (3).

The table below shows the characteristics of the different types of floating ATON found in the AGSS based on a height of eye of 15 ft.

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	Nominal Range	Radar Range	Maximum Mooring Depth	Minimum Mooring Depth	Sinker Size
9x35 LWR	3.2 NM	4.0 NM	125 feet	35 feet	12,750
9x32 LR	3.8 NM	4.5 NM	215 feet	30 feet	12,750
9x20 BR/GR	3.0 NM	3.7 NM	193 feet	15 feet	8,500
8x26 LR	3.2 NM	3.7 NM	126 feet	25 feet	8,500
8x26 LWR	3.2 NM	3.7 NM	119 feet	25 feet	8,500
8x21 LR	3.0 NM	3.7 NM	94 feet	18 feet	8,500
1CR	3.8 NM	3.5 NM	121 feet	15 feet	8,500
1NR	3.5 NM	3.5 NM	126 feet	15 feet	8,500
2CR	2.8 NM	2.5 NM	78 feet	15 feet	4,000
2NR	2.6 NM	2.5 NM	81 feet	15 feet	4,000

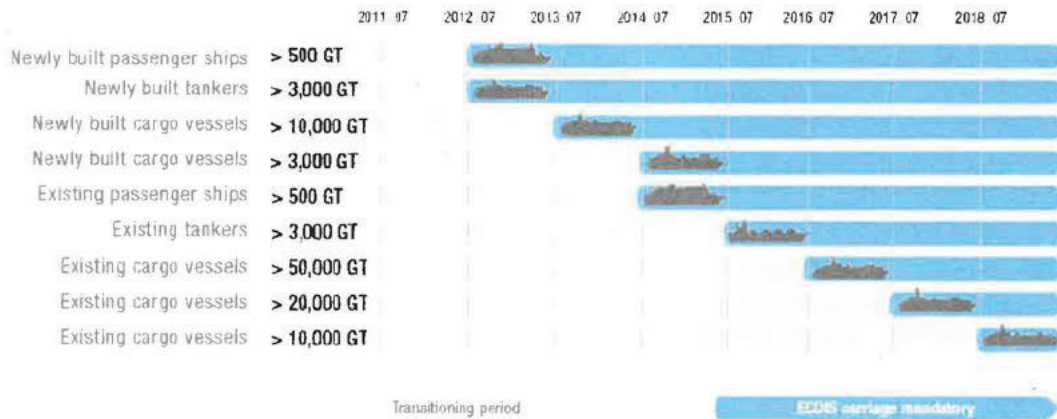
- c. Users of the AGSS consist of vessels on international voyages, vessels on domestic voyages, and recreational vessels. A breakdown of the vessels observed through NAIS can be found in section 5. The ports these users call on vary in size and commerce, with the largest having as many as 2000 vessel visits per year. Enclosure (4) provides a detailed list of the ports, types and amount of commerce, and number of visits per year.
 - d. Pilotage is common in several locations throughout the AGSS. Many of the pilot embarkation points for major ports are marked with Safe Water Marks being considered within this study.
4. INTERNATIONAL CONSIDERATIONS: The AGSS has traffic separation schemes and zones throughout. The International Maritime Organization's (IMO) *Ship's Routing Guide* provides general design criteria when designing ships' routing measures. Specific guidance applicable to the AGSS is provided below.
- a. Routes should follow as closely as possible the existing patterns of traffic flow in the areas as determined by traffic surveys.
 - b. Routes should be designed to allow optimum use of aids to navigation in the area, and of such shipborne navigational aids as are required or recommended to be fitted by international conventions or by IMO resolutions and recommendations.
 - c. Traffic separation schemes shall be designed so as to enable ships using them to fully comply at all times with the International Regulations for Preventing Collisions at Sea.

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- d. It should be possible for ships to fix their position anywhere within the limits of and in the immediate approaches to a traffic separation scheme by one or more of the following means, both by day and by night:
 - a. visual bearing of readily identifiable objects;
 - b. radar bearings and ranges of readily identifiable objects;
 - c. D/F bearings; and
 - d. other radionavigation equipment suitable for use throughout the intended voyage.

- e. Reference (b), in examination of the design of an aid to navigation system, states, “The specific aids to navigation system implemented should enable waterway users to transit an area safely and efficiently, avoiding groundings, obstructions to navigation, and collisions with other vessels. In order to satisfy the information requirements of users, a system of aids to navigation must.”
 - a. be available at the time it is needed;
 - b. provide timely warnings of channel limits and fixed obstructions to navigation;
 - c. enable mariners to determine quickly their location within the channel, relative to fixed obstructions to navigation, and relative to other vessels;
 - d. enable a safe course for the vessel to be determined.

- f. IMO established an Electronic Charting Display Information System (ECDIS) implementation schedule which will conclude in July 2018. The ECDIS carriage requirement exceeds all U.S carriage requirements for our domestic fleet.



5. **NAIS DATA:** The most used tracks throughout the Atlantic and Gulf Seacoast System were identified using AIS heat maps provided by the U.S. Coast Guard Navigation Center (NAVCEN) and OSC Martinsburg. These heat maps are contained in enclosure (5). The

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high density areas, detailed in red, show the majority of traffic following the seacoast system, and transits seaward of the seacoast aids.

- a. NAIS data from March 01, 2016 to August 31, 2016 was collected and analyzed to determine the characteristics of the vessels transiting the AGSS. There were 5,543 unique vessels identified in the 6 months examined with 2783 of those vessels being US flag. The tables below provide a breakdown of key US vessel demographics. Based on data presented in the tables below, the predominant user of the AGSS are Commercial Fishing Vessels, Towing Vessels, and Inspected Passenger vessels. These three distinct user groups account for 71.84% of US vessels using the AGSS.

Vessel Type	
Foreign (SOLAS)	2760
Total US	2783
Military/Public/Commercial (US)	1083
Recreational (US)	1504
Unknown (US)	196
Total	5543

Vessel Type (US)			
Vessel Type	Number	% of total	% of Military/Public/Commercial
Recreational	1504	27.13%	--
Commercial Fishing Vessel	492	8.88%	45.43%
Freight Ship	39	0.70%	3.60%
Industrial Vessel	46	0.83%	4.25%
Mobile Offshore Drilling Unit	1	0.02%	0.09%
Offshore Supply Vessel	64	1.15%	5.91%
Oil Recovery	2	0.04%	0.18%
Passenger (Inspected)	130	2.35%	12.00%
Passenger (Uninspected)	21	0.38%	1.94%
Public Vessel, Unclassified	91	1.64%	8.40%
Research Vessel	12	0.22%	1.11%
School Ship	5	0.09%	0.46%
Tank Ship	24	0.43%	2.22%
Towing Vessel	156	2.81%	14.40%
Unkown	196	3.54%	--
Total:	2587		100.00%

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- b. In an effort to define the characteristics of the predominant user, the three user groups were combined and statistics for maximum draft, horsepower, gross tonnage, and length were pulled from the NAIS data provided. The table below provides the summary statistics for these characteristics.

Max Draft (m)		Horsepower		Length (m)	
Provided Data	119	Provided Data	634	Provided Data	774
Min	1.40	Min	52.00	Min	6.91
Max	8.46	Max	48546.00	Max	93.26
Mean	3.47	Mean	3557.52	Mean	27.74
Median	3.29	Median	2618.00	Median	26.71
Mode	3.46	Mode	3129.67	Mode	24.59
Standard Deviation	0.91	Standard Deviation	4077.09	Standard Deviation	10.43

- c. Foreign flagged vessels were intentionally scrubbed from the examined data set. Since the purpose of the AGSS is, “to assist vessels either during coastal navigation or when making landfall,” the study chose to focus on those predominant users that were using the system as a whole, that is for both coastal navigation and when making landfall. This was interpreted as departing a U.S. port, transiting along the U.S. coast, and then pulling into another U.S. port without ever departing U.S. navigable waters. In accordance with the Merchant Marine Act of 1920 (Jones Act), as codified in 46 USC 883, merchandise can only legally be transported by U.S. vessels between two ports in the United States. As such, foreign flagged vessels, are therefore traveling through the AGSS vice within. Although these foreign flagged vessels could leverage the availability of landfall lights, they are not likely not using the system as a whole to include coastwise transit. Additionally, as detailed below in section 6, the ECDIS carriage requirement for foreign flagged vessels include and exceed the requirements for the predominant user defined in section 4.f. Therefore if the level of service provided meets the needs of the predominant user and adheres to IMO and IALA guidance, it can be assumed it will meet the need of the foreign flagged vessels.
- d. Recreational vessels were intentionally removed from the examined data set. Although 27.13% of the U.S. vessels observed over NAIS were broadcasting a Recreational vessel type, the intent of the AGSS as described in section 3 alludes to the fact that as the system grew the primary customers were those vessels conducting coastwise trade. While the needs of the largely seasonal recreational users will not be ignored, the level of service for this specific system of USATONS will focus on the predominant user conducting year-round coastwise trade.

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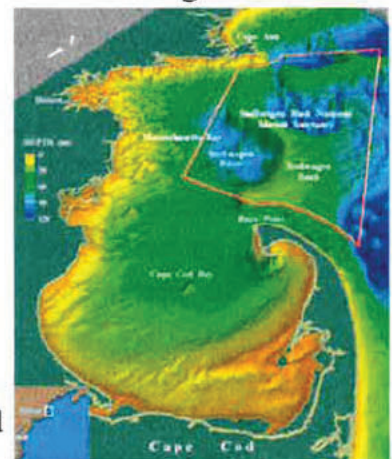
6. **CARRIAGE REQUIREMENTS:** Carriage requirements vary depending on the vessels length, horsepower, gross tonnage, vessel type, and geographic area of operation. In an effort to codify general carriage requirements for the predominant user of the AGSS the demographic information provided in section 5 was considered. Although the predominant user has been defined as a self propelled vessel conducting coastwise trade, the term self propelled vessel encompasses three distinct vessel types, as mentioned in section 5: Commercial Fishing Vessels, Towing Vessels, and Inspected Passenger Vessels. In order to encapsulate the widest number of users within this user group, the maximum draft, horsepower, and length, with considerations of current carriage requirements per 33 CFR 164, were specified. With this consideration, the predominant user can be further defined to be at least 12 meters (39.24 ft) in length, have at least 600 horsepower with a maximum draft of 4.59 meters (15 ft) or less. In accordance with 33 CFR 164, the navigation requirements for a vessel with these characteristics are:

- a. Marine Radar
- b. Searchlight
- c. VHF-FM Radio
- d. Echo Depth-Sounding Device
- e. AIS
- f. Charts

7. **ENVIRONMENTAL CONSIDERATIONS.** The AGSS spans a large area containing multiple sensitive marine environmental areas and is home to threatened or endangered species.

- a. **Stellwagen Bank:** Encompasses an area of approximately 600 square nautical miles at the mouth of Massachusetts Bay. Stellwagen Bank serves as feeding and nursery grounds for numerous species of whales, turtles, sea birds, and pelagic fish species.

- b. **National Marine Sanctuaries:** The National Marine Sanctuaries Act authorizes the National Oceanic and Atmospheric Administration (NOAA) to designate, protect, and manage offshore areas of special national significance. The primary objective of NOAA is, “to protect marine resources, such as coral reefs, sunken historical vessels or unique habitats.” To complete their objective, NOAA issues regulations for each sanctuary that specify what activities can and cannot occur within the



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bounds of the sanctuary. The marking of waterways or any potential routing measures need to take into account impacts to marine sanctuaries or sanctuary resources. The following national marine sanctuaries are within the Atlantic and Gulf Seacoast System:

- c. **Gray's Reef:** Natural live-bottom reef habitat located off the coast of Georgia. The National Marine Sanctuary covers 22 square miles and serves as vital habitat for numerous species of turtles, whales, and over 200 fish species. The anchoring of vessels or stopping of vessels in certain areas is prohibited within the sanctuary.



- d. **USS Monitor:** The wreck of the USS Monitor is located 16 miles off the coast of Cape Hatteras, NC. Monitor National Marine Sanctuary was established to preserve the historic shipwreck. Regulations prohibit, "Anchoring in any manner, stopping, remaining and drifting without power at any time." Currently the sanctuary encompasses small areas around historic wreckage, but NOAA is proposing to expand the park to cover a larger area.

- e. **Florida Keys:** One of the largest sanctuaries, the Florida Keys National Marine Sanctuary covers 2,900 square miles from just south of Miami to the Dry Tortugas. The area includes: "the world's third largest barrier reef, extensive seagrass beds, mangrove-fringed islands, and more than 6,000 species of marine life." The sanctuary is managed by numerous regulations pertaining to the operation of vessels that vary based upon location within the park.

- f. **Flower Garden Banks:** Area of shallow habitat that is located approximately 100 miles offshore Texas and Louisiana. The Sanctuary includes three separate shallow banks that serve as habitat for corals, sea turtles, whales, and crustaceans. Anchoring and discharging materials is prohibited within the sanctuary.



- g. **Protected Species and Habitats:** Numerous endangered and threatened species and associated critical habitat are located within the Atlantic and Gulf Seacoast WAMS.

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Although the navigation of vessels and marking of waterways are unlikely to impact the majority of these resources, there are some species and habitat that could be impacted by seacoast navigation.

- h. **Corals:** The National Marine Fisheries Service has listed five species of corals found in the Atlantic and Gulf Seacoast system as endangered or threatened under the Endangered Species Act. Although the normal operation of vessels has negligible impact on corals, the potential for ship grounding and the siting of aids to navigation can have a major impact on protected corals. As such, vessel routing and the management of the aids to navigation system must take into account impacts on corals. More information on coral species can be found at: http://sero.nmfs.noaa.gov/protected_resources/coral/
 - i. **North Atlantic Right Whale:** The North Atlantic Right Whale is a critically endangered species of whale that ranges along the east coast of the United States. The population is estimated to be less than 500, and requires all vessels to report sightings of Right Whales. The National Marine Fisheries Service (NMFS) has designated critical habitat both northeast off the coast of New England and in the south east from North Carolina to Florida. There are also mandatory vessel speed restrictions in certain areas during specific times of the year. Information on the speed restrictions can be found at: <http://www.fisheries.noaa.gov/pr/shipstrike/>
8. **USER FEEDBACK:** A voluntary user feedback form (OMB Control Number 1601-0014) was available on surveymonkey.com from March 2, 2016 through May 31, 2016 consisting of 30 questions. The questions were aimed at determining the navigational requirements of waterway users navigating within the AGSS. The list of questions and possible responses is provided in enclosure (6). Of the 486 total responses, 317 (65%) respondents identified their vessel type as recreational, while the remaining respondents identified their vessels as military, motor vessel, towing vessel, fishing vessel, or passenger Vessel. For the purposes of this study, military, motor, towing, fishing and passenger vessels were grouped together. For the reasons identified in section 5.d, feedback from the recreational boaters was not included in this study. The information provided by the recreational boaters was archived and will be used on future studies. This exclusion of data reduces the number of respondents to 169 vessels, which would account for 15.6% of the 1083 predominant user vessels operating in the AGSS per NAIS data discussed in section 5.

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a. *Positioning Source.* “What is your Primary means to determine your position.”

Positioning Source	Primary	Secondary
GPS	85%	16%
Visual Fixes	13%	47%
RADAR	2%	28%
Fathometer	0%	9%
Pelorus	0%	<1%

Based on the data listed in the table above, the majority of the respondents claim to use GPS as a primary positioning source over visual fixes, radar, fathometer, and pelorus.

In addition to the user feedback, this information is supplemented by the NAIS data collected. As detailed in the table below, 95.75% of the predominant users who were broadcasting navigation sensor data were using GPS, including the use of Internal GNSS.

Nav Sensor Encoding			
Type	Encoding	Number	% of Total
Undefined	0	10	3.55%
GPS	1	199	70.57%
GLONASS	2	0	0.00%
Combined GPS/GLONASS	3	2	0.71%
Loran-C	4	0	0.00%
Chayka	5	0	0.00%
Integrated Navigation System	6	0	0.00%
Surveyed	7	0	0.00%
Galileo	8	0	0.00%
Not Used	9-14	0	0.00%
Internal GNSS	15	71	25.18%
Total:		282	100.00%

b. *Shoal Water.* Four questions were focused on determining navigation requirements near shoal water. The table below provides a grouping of the majority.

What depth do you consider shoal water?	Less than 29ft (78%)
What is your preferred minimum distance to shoal water?	Less than 2NM (81%)
How do you verify your proximity to shoal water?	GPS Position on Chart/ECDIS/ECS (66%)
At what distance do you require a visual indication of shoal water?	Less than 3NM (78%)

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It should be noted that the next two most prominent verification methods used to verify proximity to shoal were Visual Distance estimation using ATON (9%), and visual distance estimation using geographic features (8%).

- c. *Landfall Lights*. “At what distance do you require visual indication of landfall?”

Distance	Percentage
<1	33%
1-2 NM	23%
2-3 NM	9%
3-5 NM	14%
5-7 NM	7%
7-10 NM	8%
>10NM	7%

When grouped together to determine a majority response, 79% of the respondents answered that they required a visual indication of landfall at 5NM or less, while only 7% stated that they needed a visual indication of landfall at greater than 10NM.

- d. *RACONs*. 51% of the professional mariner respondents answered that they use RACONs. The most common uses provided were:
- a. As a backup
 - b. In restricted visibility
 - c. Marking of Sea Buoys
 - d. Locate the center of a Bridge span
 - e. Rig avoidance in the Gulf of Mexico

Per 33 CFR, RACONs used on bridges and rigs are private aids to navigation, and therefore are not provided by the U.S. Coast Guard.

Of the aids being considered as part of the AGSS as defined in this study, only 20 of them are equipped with a RACON. In the last 5 years, 18 (or 90%) of these aids have been discrepant, for a total of 102 separate discrepancies. 37 of the 102 (or 36%) discrepancies were due to a problem with the RACON. Of the 37 RACON related discrepancies, 18 (49%) of them lasted for longer than 30 days. On average, the RACONs within the AGSS go discrepant every 2.5 years. Additionally, almost half of

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those discrepancies last greater than 30 days. Of the aids that are discrepant for over 30 days, the median length of time that they are discrepant is 69 days.

- e. *Sound Signals.* 69% of the professional mariner respondents answered they do not require an audible indication of shoal water. Of the 31% that do require an audible indication of shoal water, 83% stated that they required an audible indication of shoal water at 2NM or less.

- f. *Additional ATON discrepancy data.* Discrepancy data for the aids being considered within this study is included in enclosure (7). Approximately 24% of the aids were discrepant 4 times or more in the last 5 years. 25% of the discrepancies over the last 5 years lasted longer than 30 days. In accordance with the Discrepancy Response Factor (DRF), ATON discrepancies shall be responded to within 72 hours or as soon thereafter as weather and resources permit, with the exception of those aids that are DECISION/DEFERRED. For aids that are DECISION/DEFERRED, as stated in the ATON Administration Manual, "If a long period of time will elapse before the primary servicing unit can make the correction, district should coordinate available servicing facilities in order to correct the discrepancy." For the purposes of this study "a long period of time" was assumed to be 30 days or more. 83% of the discrepancies in the AGSS were assigned a discrepancy response level of ROUTINE or lower, with 39% assigned a discrepancy response level of DECISION/DEFERRED.

The most common discrepancies are seen below, with the vast majority being Light Extinguished.

Discrepancy	Percentage of Overall Discrepancies
Light Extinguished	53.44%
Light Improper Characteristics	9.46%
Reduced Intensity	8.49%
Off Station	7.52%
Sound Signal Inoperable	6.31%
Missing	4.45%
RACON Inoperable	3.07%
Topmark Missing	1.94%

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9. OPINIONS AND CONCLUSIONS.

- a. Vulnerabilities in GPS have been identified, and currently there is no back-up system, except for physical aids to navigation. The need for physical ATON as a minimal backup for GPS is still valid.
- b. With the waterway design focused on providing ATON services to the predominant user, strong consideration should be made to adjust the AGSS level of service appropriately to account for carriage requirements described in section 6. With the large number of respondents relying heavily on GPS, validated by the NAIS data set, to determine their position diminishes the need for physical ATON as a primary positioning source throughout the AGSS. This reliance on GPS, however, does not diminish the need for visual indications of landfall and shoal water. (Section 5, 6, 8)
- c. The Maximum Draft of the predominant user group ranges from 4.57 ft to 27.66 ft with an average of 11.34 ft. When split apart to their separate classifications Commercial Fishing Vessels have an average draft of 10.71 ft, Inspected Passenger vessels have an average draft of 8.25 ft, and Towing vessels have a median draft of 15.05 ft. A majority (69.75%) of the entirety of the predominant user group has a draft less than 15 ft. The Coast Guard should consider an up to 100% safety factor for under keel clearance to account for different requirements per user. When considering a draft of 15ft with a 100% under keel clearance safety factor, shoal water for should be determined to be 30 feet or less, and marked with appropriate ATON. Given that 78% of respondents considered shoal water to be 29 feet or less, this determination meets both the construction needs for the predominant user group and the opinions from the user feedback. (Section 5, 8)
- d. According to user feedback, 81% of respondents prefer a minimum safe distance from shoal water to be 2 NM. Additionally, 78% of all responds prefer visual indication of shoal water at least 3 NM from the hazard. The Coast Guard should provide physical ATON with a nominal range of at least 3 NM. That said, only 7% of respondents indicated they need visual indication of shoal water beyond 5 NM. Therefore, the need to provide physical ATON with a visual geographic range beyond 5NM is not justified. The Coast Guard's current buoy inventory is sufficient to meet this need. (Section 3, 8)
- e. The need for landfall lights with visual operational range greater than 5NM from shoal water is unnecessary. (Section 5, 8)

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- f. Safe Water Marks that mark the entrance to a channel are unnecessary. These aids neither, “provide timely warnings of channel limits and fixed obstructions to navigation,” nor, “enable mariners to determine quickly their location *within the channel*, relative to fixed obstructions to navigation, and relative to other vessels. Additionally, these aids are not needed to, “enable a safe course for the vessel to be determined.” These aids primarily provide information to the mariner for pilot embarkation or merely that the entrance to a channel is relatively nearby. If it is necessary to provide continuous marine information to the mariner in these locations it should be provided via separate means that are available to the predominant user. Given the coverage of the NAIS network and the predominant user’s AIS carriage requirement, AIS-ATON would be an adequate means of providing this marine safety information where available. However, due to NAIS coverage limitations, the use of NAIS broadcasted AIS-ATONs may not be available and would require installation of an AIS-ATON nearby. (Section 4, 5, 6)
- g. Given the majority of respondents do not need an audible indication of shoal water, and the predominant use of GPS as a positioning means, bells, whistles, and gongs are not required on buoys within the AGSS. (Section 5, 8)
- h. The predominant user group is required to carry AIS, and properly operate the AIS within U.S. Navigable Waters (12 NM). Electronic ATONs are a reliable and efficient means of providing a backup, for identification of physical ATON in restricted visibility, and for providing vessel positioning assistance in areas that have safe water. A vessel can only see the eATON broadcast when operating within the transmit range of the broadcasting tower or physical eATON unit. The Coast Guard should define a consistent operational range of eATON to be the minimum distance from the transmit range to the broadcast position of the eATON. Use of eATON should consider this operational range and ensure the ATON provides a minimum indication of position of at least 5NM given respondents prefer a minimum 5NM visual indication of landfall and 3 NM from shoal water. (Section 5, 6, 8)
- i. There are a large number of discrepancies among the aids in the AGSS, with many of the aids going discrepant multiple times. Additionally, the fact that 25% of the discrepancies last longer than 30 days. District (dpw) staffs should further investigate discrepancy data to determine if the aids within the AGSS are providing the intended and appropriate level of service to the mariner. (Section 8.f.)

Subj: WATERWAYS ANALYSIS AND MANAGEMENT SYSTEM STUDY FOR THE
ATLANTIC AND GULF COAST SEACOAST SYSTEM

10. RECOMMENDATIONS. The following Level of Service recommendations should be adopted into Coast Guard policy:

- a. The Coast Guard maintains the Atlantic and Gulf Coast Seacoast system to ensure safe navigation during coastal transits or when making landfall. The level of service provided for the system should be designed for U.S. flagged, self-propelled vessels engaged in coastwise trade with a length of 12 m, draft of 15 ft, 600 horsepower, and a height of eye of 15 ft. The System shall be marked in a manner which is justifiable due to the volume of traffic, and the degree of risk in the specific area of the system.
(Opinions a – h)
- b. The Coast Guard, if deemed necessary, may provide landfall lights with a nominal range of 5nm from the 30 ft curve for a vessel with a height of eye of 15 ft. If it is determined that the largest draft of the predominant user entering the port has a maximum draft less than 15 ft, District Commanders can adjust the level of service as appropriate. Landfall lights must provide a nominal range of 5 nm from a depth of two times the maximum draft of the defined predominant user, not to exceed 30 ft. (Opinions a, b, d)
- c. The Coast Guard, if deemed necessary, may provide ATON for isolated areas of water 30 feet or less with physical ATON with a minimum visual, geographic range of 3 NM, but not exceeding 5 NM, for a vessel with a height of eye of 15 ft within the AGSS. The ATON shall be visible at a range of 3 NM during the day, and if lit, 3NM at night.
(Opinions a, c, d)
- d. The operational range of an eATON as equal to the minimum distance from the transmit range to the broadcast position of the eATON. (Opinion g)
- e. Safe Water Marks used to indication of channel entrance or pilot embarkation will be marked with eATON where the operational range of the eATON is 5NM or greater.
(Opinion a, d, g, e, h)
- f. The Coast Guard no longer provide bells, gongs, or whistles on ATON within the AGSS. (Opinion f)

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Enclosures: (1) List of Aids to Navigation
(2) List of eATONs

16500
31 May 2017

**Subj: WATERWAYS ANALYSIS AND MANAGEMENT SYSTEM STUDY FOR THE
ATLANTIC AND GULF COAST SEACOAST SYSTEM**

- (3) Nationwide AIS Coverage Map
- (4) USACE Waterborne Commerce Data
- (5) AIS Traffic (Mar 17 – Aug 17)
- (6) WAMS User Feedback Questions
- (7) ATON Discrepancy Summary Data

Dist: All CCGD (dpw)
LANTAREA (54)
PACAREA (54)



16500
9 June 2017

MEMORANDUM

From: 
M.D. Emerson
COMDT (CG-5PW)

Reply to [REDACTED]
Attn of: [REDACTED]

To: Distribution

Ref: (a) 5PW Memo 16500 of 9 June 2015
(b) AGSS WAMS CG-NAV-3 Memo 16500 of 13 Jan 2017

Subj: INTERIM GUIDANCE ON LEVEL OF SERVICE IN ATLANTIC AND GULF COAST
SEACOAST SYSTEM (AGSS)

1. Purpose: The purpose of this document is to provide interim policy guidance for ATON Levels of Service in the Atlantic and Gulf Coast Seacoast System in accordance with ref (a) and ref (b).
2. Responsibility: District Commanders shall incorporate this guidance into their Aids to Navigation (ATON) planning and operations.
3. Background: Our waterways have become increasingly congested and complex. While the number and size of the ships traveling through the U.S. Marine Transportation System (MTS) has increased, the number and size of U.S. navigation corridors has not. To address these changes, the Coast Guard conducted a Waterways Analysis and Management System (WAMS) study of the AGSS Aids to Navigation (ATON) system. As a result of this study, the Levels of Service guidance below will provide the District Commanders the ability to adjust the USATONS appropriately to ensure the Coast Guard is meeting the modern day navigational requirements with modern day navigational capabilities.
4. In accordance with ref (b), this interim policy guidance focuses solely on U.S. Navigable Waterways seaward, including major lights, entrance buoys, and approach buoys.
5. Level of Service for AGSS:
 - a. The Coast Guard shall maintain the Atlantic and Gulf Coast Seacoast system to ensure safe navigation during coastal transits or when making landfall. The level of service provided for the system shall be based on the navigation capabilities associated with the predominant users of the waterway. The District Commanders shall make all efforts to mark the system in a manner which is justifiable due to the volume of traffic and the degree of risk in the specific area.
 - b. The Coast Guard shall no longer provide bells, gongs, or whistles on ATON within the AGSS.
 - c. The Coast Guard provides ATON for charted hazards of 30 feet or less in predominant offshore shipping lanes. These ATONs shall have a minimum visual/operational range of 3NM.
 - d. Where required, the Coast Guard provides landfall lights with an operational range of 5NM from the 30 foot curve. At the discretion of the District Commander, if the predominant user of the port supported by the landfall light has a draft of less than 15 ft, the operational range

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Subj: INTERIM GUIDANCE ON LEVEL OF SERVICE IN ATLANTIC AND GULF SEACOAST SYSTEM (AGSS)

of the light can be measured from a depth curve of two times the maximum draft of the predominant user, not to exceed 30 ft.

- e. If deemed necessary by the District Commander, entrances to major channels or pilot embarkation areas shall be marked with virtual ATON where an operational range of 5NM or greater can be attained. If virtual ATON cannot be used, a physical aid may be considered.

6. My POC is [REDACTED].

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