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NAVIGATION AND VESSEL INSPECTION CIRCULAR NO. 5-01, CH-1

Subj: CHANGE TO NVIC 5-01, GUIDANCE FOR ENHANCING THE OPERATIONAL SAFETY OF DOMESTIC HIGH-SPEED VESSELS

1. PURPOSE. This change revises Navigation and Vessel Inspection Circular (NVIC) No. 5-01 by incorporating guidelines for manning domestic operating high-speed vessels with the addition of enclosure (2) to this NVIC. The focus of this guidance is to close the gap between the domestic manning regulations and the International Code of Safety for High-Speed Craft (HSC). This change will also incorporate applicable sections of enclosure (3) of NVIC 6-99, which discusses manning on non-HSC Code domestic passenger vessels. The goal is to produce a single document that covers operations, and manning for domestic high-speed vessels to which to the HSC Code does not apply.

2. ACTION.

a. Officers-in-Charge, Marine Inspection (OCMIs) should review this circular and ensure that the guidance included in enclosure (2) is brought to the attention of the affected vessel owners and operators within their zones. For any vessel meeting the applicability criteria of this circular, OCMIs should discuss with the owner/operator ways to reduce operating risks and to enhance vessel safety.

b. The owner/operator of a high-speed vessel may find the guidance contained in this circular useful when incorporating safety enhancement measures into their vessel operations and company procedures. Recognizing that high-speed vessel operations are often unique to each vessel, company, and area of operation, this guidance should not be considered as limiting or all-inclusive.

Distribution SDL No. 140

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A																										
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c. This NVIC provides the tools to be used as an interactive process between the OCMI and the owner including all factors relevant to both points of view. The Challenge Assessment Tool (CAT) and Manning Evaluation Matrix (MEM) offer a way to quantify the manning dialog. These tools also give both parties the ability to modify the parameters both during the initial evaluation and subsequently should operating conditions, routes, or vessel specifics change, while ensuring the same standards are applied.

d. Finally, the owners and operators of vessels not meeting the specific applicability criteria of this circular, such as those vessels operating at speeds just under 30 knots, are encouraged to apply the enclosed guidance to their own operations

3. IMPLEMENTATION. Add enclosure (2), Guidance For Evaluating Bridge Manning Of Domestic High Speed Vessels, to NVIC 5-01.

4. DIRECTIVES AFFECTED. Enclosure (3) of NVIC 6-99 is cancelled.

5. BACKGROUND.

a. In 1999, the Coast Guard through its industry partnerships recognized a need to address the potential safety risks associated with the growing fleet of domestic passenger vessels capable of high-speed operations. Vessels in domestic service are not required to comply with the international HSC Code. The guidance contained in the original NVIC 5-01 recommended that the OCMIs and the owner work together to identify the risks involved in operation of a particular high-speed vessel and mitigate the risks with an operations manual and training program as an alternative to strict compliance with the HSC Code.

b. The 30-knot threshold was recognized as a point at which vessel navigation becomes less routine and the risks associated with navigational safety become more apparent. The manning level when operating "at speed" was not originally addressed.

6. DISCUSSION.

a. Domestic regulations do not specifically address increased manning required for high speed vessels, but under 46 CFR 15.501, the OCMI is given broad authority to determine the minimum manning requirements on any inspected vessel. The HSC Code does set manning levels to cope with the increased difficulty of operating high speed vessels, but do not apply to vessels operated solely in the U.S. waters. Additionally, the Coast Guard Marine Safety Manual, Volume III, Chapter 21, Section (S), offers manning and training standards for hydrofoils and air cushion vehicles. Where comparable risks are involved, the OCMI may determine it appropriate to apply the same standards to high-speed passenger vessels as are required for hydrofoils and air cushion vehicles.

b. The enclosed guidance is predominantly geared toward modern high-speed vessels engaged in passenger service: particularly those inspected under 46 CFR, Subchapters H,

K, and T. These vessels are often equipped with highly sophisticated navigation and engineering equipment/systems. Their safe operation requires a high level of training, expertise and teamwork. The enclosed guidance, assumes that the training and operations manuals address other concerns associated with the operation of high-speed vessels and are appropriate for the systems installed on a given vessel.

c. Recognizing the OCMI's authority to set safe manning levels and the desire to maintain national consistency, vessel operators are strongly encouraged to comply with the enclosed guidance.

d. The owner of a high-speed vessel may elect to voluntarily comply with the HSC Code in lieu of using these guidelines.

7. APPLICABILITY. This circular applies to domestic, non-HSC Code vessels that are capable of loaded service speeds of 30 knots or more and subject to Coast Guard inspection.

8. DISCLAIMER. While the guidance contained in this document may assist the industry, the public, the Coast Guard, and other Federal and State regulators in applying statutory and regulatory requirements, the guidance is not a substitute for applicable legal requirements; nor is it itself a rule. Thus, it is not intended to nor does it impose legally-binding requirements on any party, including the Coast Guard, other Federal agencies, the States, or the regulated community.

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Encl: NVIC 5-01, CH-1, Encl (2) Guidance For Evaluating Bridge Manning Of Domestic High Speed Vessels

Guidance For Evaluating Bridge Manning
Of
Domestic High Speed Vessels

ENCL (2)

1. **Discussion**

a. The domestic regulations that cover manning for inspected passenger vessels are contained in 46 United States Code (USC) 8101, and 46 CFR Part 15. Additional Coast Guard guidance is contained in the MSM volume III. Coast Guard policy regarding the senior deckhand position is contained in NVIC 1-91. The regulations covering the licensing of merchant marine officers are contained in 46 CFR 10. Guidance for safe operation of domestic high-speed craft is contained in this NVIC.

b. Alternately, the international treaty, which covers high-speed vessels on international routes, is the HSC Code. The Coast Guard policy for issuance of type rating endorsements for high-speed craft subject to the HSC Code is contained in NMC Policy Letter 6-01. Chapter 18.1.3.6 of the HSC Code specifies "The crew complement should be such that two officers are on duty in the operating compartment when the craft is underway, one of whom may be the master[1]." U. S. law specifies when there must be two licensed personnel on board a vessel, but it does not specify when they must both be on the operating station/bridge.

c. The CG has concluded a need for a bridge team that includes a minimum of two qualified persons on vessels operating at speeds of 30 knots or more under the following circumstances:

(1)Reduced visibility
(2)Night operations
(3)Increased recreational or commercial traffic
(4)Special weather conditions
(5)Other conditions as appropriate

d. There are a number of "T" boats operating at speeds of 30 knots or more, which do not require a Mate or a Qualified Deckhand (High Speed) by existing regulations. Some of these vessels may have the same challenges and/or technical sophistication as the present class of high-speed "K" or "H" vessels. It is, by regulation, within the OCMI's discretion to apply manning criteria on all inspected vessels.

e. The above discussion establishes a need to determine requirements for a two-person bridge team during these specific circumstances. Paragraph (5) below establishes a methodology for determining when these circumstances exist for a particular operation.

2. Skill Sets

a. A study of the industry conducted in 1999 indicated most operators of high-speed vessels have been voluntarily manning their bridges with two licensed individuals. The current license-testing regime does not address these vessel types. The skills necessary to operate these vessels safely are being "grown" in the industry through hands-on operation and "in-house" vessel specific training. Enclosure (1) of NVIC 5-01 contains guidance for the training of crewmembers manning high-speed vessels.

[1] International Maritime Organization, International Code of Safety for High-Speed Craft (HSC Code), (London: IMO Publication, 2000) 146.

In order to meet changing operational conditions, the focus on adjusting bridge manning follows the recommended Vessel Operations Manual procedures found in paragraph 3.b (9) of enclosure (1),.

b. The skill sets needed to operate a high-speed vessel differ in many ways from the skill sets needed to safely operate a traditional slower speed vessel. In some ways, such as reaction time, the high-speed vessels pose a greater challenge to the operators. In others, such as maneuverability, the high-speed vessels are superior. Regardless of the final bridge manning requirements (licensed or unlicensed; Master, Mate, or Qualified Deckhand (High Speed); one or two…) needed in the operation of these vessels, the below listed skills sets are recommended:

(1) Collision avoidance:
- (a) Rules of the road knowledge
- (b) Radar skills

(2) Local knowledge:
- (a) Sensitivity to other waterway users
- (b) Weather conditions

(3) Knowledge of piloting techniques:
- (a) Ability to use and update publications
- (b) Ability to use navigation and communications electronics effectively

(4) Comprehensive knowledge of vessel characteristics and operating limitations:
- (a) Turning radii and stopping distances
- (b) Docking and vessel handling characteristics
- (c) Comprehensive knowledge of vessel systems
- (d) Wake generation
- (e) Maximum wave height and sea/speed conditions
- (f) Back-up systems
- (g) Mechanical systems aptitude/awareness

(5) A set of emergency preparedness and evacuation procedures which encompass demonstrated skills:
- (a) Passenger communication and control
  - Proper use of public address systems
  - Emergency crew communication and crowd control
- (b) Grounding, flooding, fire, medical emergency (including the ability to anchor the vessel).
- (c) Regional emergency response assets
- (d) Knowledge of station bill or muster list
- (e) Pollution response

(6) Multi-tasking skills:
- (a) Ability to prioritize functions appropriately
- (b) Manning the bridge with the appropriate compliment under differing challenges
  - Reduced visibility

- Night operations

(c) Increased traffic, both recreational and commercial
(d) Other conditions as appropriate

(7) Physical Characteristics -Tested
(a) Color vision
(b) Hearing
(c) General health
(d) Prescription drug use

(8) Crew Endurance Management
(a) Crew Endurance Risk Factors – Consult "Crew Endurance Management Practices, A Guide for Maritime Operations"

(9) Demonstrated night operations skills

3. **The Qualified Deckhand (High Speed) Program**

a. The senior deckhand position, officially promulgated in NVIC 1-91, was the result of the Coast Guard recognizing the expanding passenger capacity of the small passenger vessel fleet and that a need exists for a person other than a licensed operator to respond to emergencies. The purpose of the senior deckhand position is to coordinate emergency response on vessels with high passenger capacity and act as a team leader of multiple deckhands.

b. The regulations state, "the movement of the vessel shall be under the direction and control of the master or a licensed mate at all times," which effectively restricts the licensed operator to the bridge while underway. On some high-speed vessels this senior deckhand position has evolved into a member of the bridge team who is qualified to sit in the "second seat." The Qualified Deckhand (High Speed) may assist the licensed operator with navigation duties, including: lookout, interpretation of radar data, and assistance with vessel navigation and communications. These skills required of the Qualified Deckhand (High Speed) are now addressed in NVIC 1-91, Ch-1.

c. An individual may act as both a senior deckhand and a qualified deckhand (high speed). If the same individual is acting as both the senior deckhand and the qualified deckhand (high speed), these duties must not interfere with each other. For example, if the senior deckhand is required to investigate a fire alarm in the engine room, that same individual could not also assist on the bridge at the same time. The vessel's operations manual should clearly define the responsibilities of each position to avoid unsafe situations. A solution to the above example would be to reduce speed to negate the need for the qualified deckhand (high speed) on the bridge, to allow that person to act as senior deckhand and investigate the alarm. Such situations should be addressed in the operations manual to make it an effective document.

4. **Challenge Assessment Tool (CAT) and Manning Evaluation Matrix (MEM)**

a. The Challenge Assessment Tool (CAT): The CAT (Table A) is designed to be used as a working document between the OCMI and high-speed vessel operator. Its purpose is to evaluate the challenges facing a vessel's bridge team. All items should be considered in the special circumstance of the vessel being discussed, operating at high-speed (e.g. operating at night at high-speed). The CAT also serves as the record of the discussion and agreements between the OCMI and the operator.

(1) Step 1: The first step is to arrange a face-to-face meeting between the vessel operator and the cognizant OCMI. This meeting may be part of, or follow-on to, a meeting(s) held to apply the guidance of NVIC 5-01.

(2) Step 2: For each item under the six navigational challenges, answer "yes" or "no". If the answer to a question is "yes", mutually agree to the rating for each line item. Each item should be rated as: low; medium; or high. If the answer to any question is "no" then it should be rated as "low." Again the items should be addressed in the context of the vessel operating at high-speed (e.g. if the vessel does not operate at night at high-speed, then the answer to the question regarding nighttime operations is "no").

(3) Step 3: Use mitigating factors such as specialized training, or equipment to adjust the level of the navigational challenge. During this step those mitigating factors found in the vessel's operations manual should also be considered. It should be noted that the starting point is the typical manning for a vessel of this class. Addition of bridge personnel should not be used during this step as a mitigating factor.

b. The Manning Evaluation Matrix (MEM): The MEM (Table B) is designed to be the final evaluation document used by the OCMI and the prospective operator to determine the vessel's final bridge complement. The finalized MEM will provide a subjective determination of the relative need for increases in the bridge crew above standard manning for the vessel's size and type. If result is all the checkmarks are in the left column of the matrix, then the vessel operation should be judged as relatively similar to other operations in the area. If the checkmarks are all on the right, the vessel operation should be viewed as very challenging and at least two, full-time, qualified personnel should be considered. Results in between the two extremes are indicative of an increased challenge for the bridge crew and the need for a second qualified person. The second person may not be required at all times. As the number of separate factors on the right side of the MEM increases, the need for a second, full-time, qualified person also increases. The steps for the use of the MEM follow:

(1) Step 1: Transfer the six values associated with the six navigational challenges to the Manning Evaluation Matrix (MEM) for further evaluation.

(2) Step 2: Address each factor on the MEM that is scored "medium" or "high". Mutually agree to the method for dealing with the challenge, e.g. specifying additional personnel during a particular section of a route due to a navigational challenge. The OCMI and the operator then need to ensure the operations manual reflects this agreement.

(3) Step 3: Using the MEM, the OCMI and the Operator should agree upon an overall challenge value for the six categories and assign the vessel with a low, medium, or high score. This overall score will determine when the vessel is required to have two qualified personnel on the bridge when the vessel is operating at a high-speed.

(a) Low: vessel manned as a typical "T," "K," or "H." A vessel will only be assigned an overall score of low when all categories are scored as a "low."

(b) Medium: vessel operates with two qualified personnel during all periods when the matrix indicates a score of medium or high in any operational category

(c) High: the vessel operates with two qualified personnel at all times.

c. The above evaluation and conditions should be included in the operations manual. The OCMI should be aware that in cases where the second person is needed on the bridge most of the time, this person cannot be counted on to perform normal deck hand duties and manning may need to be increased by OCMI accordingly. Also the term "qualified" should not be taken to mean licensed. A qualified senior deckhand, whose training has been augmented for high-speed vessels, may be adequate.

d. It is important to recognize that this is designed to be an iterative process between the OCMI and the prospective operator including all factors relevant to both points of view. Although subjective, it provides a way to quantify the manning dialog and give both parties the ability to modify the parameters both during the initial evaluation. These tools may also be usefully should operating conditions, routes, or vessel specifics.

Table A

High-Speed Vessel – Challenge Assessment Tool (CAT)

Company:	**Vessel:**
OCMI Zone:	**Date:**

	Yes	No	Identify mitigating factors that are covered in the operations manual or local operational circumstances that address the specific challenge.	Low	Med	High
1. Restricted Visibility						
Does the vessel operate at speed in restricted visibility?						
			Result:			
2. Night Operations						
Does the vessel operate at speed at night?						
Does the vessel normally operate more than twelve hours per day?						
			Result:			
3. Vessel complexity (extent of distraction from navigation)						
Is the on-board navigation equipment operation or lay out a challenge to manage?						
Is the machinery monitoring system a challenge to manage?						
Are the fire detection & alarm systems a challenge to manage?						
Is the on-board video system a challenge to manage?						
Does the bridge visibility pose a challenge to navigation? (blind areas, glare)						
			Result:			
4. Complexity of route(s)						
Does/will the vessel operate on multiple routes? (may do separate assessments)						
Does the vessel encounter heavy traffic along the route(s)?						
Does the route cross traffic schemes or separation zones?						
Does the route(s) encounter low profile traffic? (kayaks, windsurfers, swimmers…)						
Does traffic cross the vessel's route(s)?						
Are there other high speed vessels along this route(s)? (recreational or commercial)						
Do the nav aids pose a navigational challenge? (city lights, small size, etc.)						

Does the route(s) transit narrow channels or shallow water?						
Does the route encounter obstructions (debris, pots, rocks, etc.)?						
Are numerous course changes required?						
Does the operation call for short turnaround between runs?						
			Result:			
5. Special weather conditions and sea state						
Do currents along the route(s) pose a navigational challenge?						
Do winds along the route(s) pose a navigational challenge?						
Do tides along the route(s) pose a navigational challenge?						
Does sea state pose a navigational challenge? (fatigue, passenger safety...)						
Does ice or icing pose a navigational challenge?						
			Result:			
6. Company Experience						
Is the Company new to high speed vessel operations?						
Is the vessel operating on a new route?						
Is this the only high speed vessel operated by this Company?						
Is vessel equipment different on one or more vessels in the company's fleet?						
Is the crew unfamiliar with the vessel's navigational equipment?						
Does the vessel have limited mechanical support - shore/onboard?						
Does the crew have limited or no experience in high speed ops?						
			Result:			

Comments/Additional Challenges:

Reviewers:

Company Representative:

USCG Representative:

Table B

High-Speed Vessel – Manning Evaluation Matrix (MEM)

Company:	Vessel:
OCMI Zone:	Date:

Level / Categories	Low	Medium	High
1. Restricted Visibility			
2. Night Operations			
3. Vessel Complexity			
4. Route Complexity			
5. Special Weather Conditions or Sea State			
6. Company Experience			
Overall Evaluation			

Low: vessel will remain manned as a typical "T," "K," or "H." A vessel will only be assigned an overall score of low when all categories are scored as a "low."

Medium: vessel will operate with two qualified personnel on the bridge during all periods when the matrix indicates a score of medium or high in any operational category.

High: vessel will be required to operate with two qualified personnel during all operational periods.