



National Association of State Boating Law Administrators Engineering, Reporting & Analysis Committee

August 2009

Charge One – Analysis of Recreational Boating Accident Patterns and Trends – Identifying Human-, Boat- and External Factors

Recommended Guidelines for Investigators and BARD-Web Data Entry Personnel: Types of Boating Accidents and Contributing Factors/Causes Defined

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Background

The FY09 Charge and Rationale

Analyze recreational boating accident data from selected states to describe patterns or trends in types of accidents. In the analyses, identify the human- and boat-related contributing and causal factors, and determine if there are any indications of relationships between accident trends and demographic, economic, climatic, and other "external" trends and patterns. Develop issue brief(s) on findings. Explore development of content for 2009 annual conference session. (Modification of 2008 Carryover Charge. NASBLA Objective 1.4; RBS Performance Goal and Sub-tier Goals; RBS 2.3.1, RBS 6.1, and RBS 9.7)

Over time, this project is intended to elicit answers to questions including: What do these data tell us right now and how can we apply findings so that states can become even more effective in their safety program efforts? Can we really isolate operator- and boat-related factors from other influences to give us a fuller understanding of problem areas now and possibly to anticipate future problems? **What are the limitations of the boating accident and other critical data, and what improvements could be made to reporting and collecting these data so that we can better address critical safety issues?**

Improving Accuracy in Reporting and Capturing Accident Types and Contributing Causes

The ERAC team assigned to this charge began its work with members compiling 10 years' worth of recreational boating fatality report data from their respective states, and examining patterns and variations across them.¹ In the process of evaluating the data—using templates to analyze the primary contributing factors/causes and accident types and applying their experiences of observing and investigating incidents—the team identified issues associated with the existing reporting categories, variations in definitions and coding, and data accuracy.²

¹ The team agreed to these parameters for the fatality data compilation: 1) only officer/investigator reports (no owner or operator boating accident reports) would be used; 2) only reports that a trained, experienced investigator reviewed for primary cause and type of accident would be used; 3) if a trained, experienced investigator did not make a determination for cause and type, team member was asked to review the report. Primary contributing factors were separated into operator-related, vessel-related and external (weather, water condition, etc.) factor categories. The results of that initial analysis of fatality data are discussed in a separate report.

² This was in alignment with the charge's intent. While there had been ongoing discussions regarding the need to improve different aspects of the data gathered in the U.S. Coast Guard's Boating Accident Report Database (BARD-Web), the preliminary review of the fatal accident reports from the team's own states yielded additional questions and helped to inform the recommendations for improvements to incident reporting and data entry (see bolded question in the above section, **The FY09 Charge and Rationale**)

Before the March 6, 2009, Committee meeting in Lexington, Ky., and with an eye toward improving the accuracy of future reporting and analyses, the team targeted an initial list of factors and categories it thought warranted further clarification and consistency in application.³ Discussions at the meeting led to a recommendation that the team proceed with developing further guidance on boat accident cause/contributing factor and accident type categories and definitions and to do so based on a comprehensive review of: the content of accident investigator training and manual, especially with regard to detail definitions of accident types and causes⁴; the general terms and definitions in the CG-449 working draft⁵; the definitions used in the BARD-Web Online Data Dictionary⁶; the contents of a recently-updated, state-issued watercraft incident reporting manual⁷; and fields appearing on the revised version of CG-3865.⁸

Notes for Reviewing Recommended Guidelines (pages 4-14)

Guidelines for Investigators and BARD-Web Data Entry Personnel: Types of Boating Accidents and Contributing Factors/Causes Defined is intended primarily for inclusion in NASBLA’s Boating Accident Investigation Comprehensive Course manual reference materials, and for potential use in the BARD-Web Online Data Dictionary and BARD-Web training.⁹

As presented here,¹⁰ the **Guidelines** show the recommended modifications to categories and definitions currently used in the “general terms and definitions” of the CG-449 working draft and/or the BARD-Web Data Dictionary, as applicable, and propose new categories and definitions, as warranted. The primary objectives for updating and adding categories and definitions are to assist investigators in capturing accident scenarios that cannot be accurately defined using the current list of options and to provide guidance to BARD-Web data entry personnel in reviewing and entering accident report data. Many of the recommended additions are offered especially to encourage officers to delve deeper into incidents to identify and list secondary and tertiary factors and to discourage the collapsing of identified factors into an undefined “Other” category.

Some edits are technical and global in nature—for example, “vessel” is used instead of “boat.” As with the CG-449 working draft, this document presents the source of the category/definition. As needed, explanations for recommended changes are presented in brackets below selected categories and definitions.

³ What criteria are currently being used to determine “alcohol use”?; What criteria are currently being used to determine “drug use”?; Is “careless and reckless operation” a cause or a conclusion?; Is the operator excluded from “occupant behavior”?; What criteria are used to distinguish between “improper loading” and “overloading”?; What criteria are used to distinguish between “vision obstruction” and “improper look out”?; Should the “unknown” category be further distinguished by identifying it as undetermined or no witnesses or both?; Should “machinery failure” be identified as “boat systems failure”?; Should “collision with floating object person”, “struck by boat”, “struck by propeller/skeg” be addressed in a better manner?; Separate the categories “flooding” and “swamping” with established criteria; Establish “voluntarily leaving the vessel” as a first event as a category that is investigated but considered non-reportable.

⁴ The NASBLA Comprehensive Course instructors provide an overview of accident types and causes in the first module of the class, but detailed definitions are not covered in the course or listed in this form in the student manual.

⁵ The U.S. Coast Guard “Standard Method of Reporting (Boating Accidents) CG 449” (working draft).

⁶ The U.S. Coast Guard National Boating Accident Report Database (BARD-Web).

⁷ The Ohio Watercraft Incident-Casualty Reporting Manual, issued by the Division of Watercraft, Ohio Dept. of Natural Resources (updated 01/2009).

⁸ The U.S. Coast Guard CG-3865 Recreational Boating Accident Report (Rev. 07-08).

⁹ The initial **Guidelines** draft was prepared by charge team member Gary Haupt, with input from colleague investigator instructors Jim Getz and Randy Dill; and with review and refinement by team members Ken Ripley, Ron Jendro, Eric Lundin, Ed Cates, and Donnie Pritcher, and ERAC staff liaison, Deborah Gona.

¹⁰ If adopted for inclusion in the accident investigator (and/or data entry) training and manual/materials, the **Guidelines** (pages 4-14 in this report) will be revised to eliminate the markings for deletions or additions.

GUIDELINES FOR INVESTIGATORS and BARD-WEB DATA ENTRY PERSONNEL: TYPES OF BOATING ACCIDENTS AND CONTRIBUTING FACTORS/CAUSES DEFINED

For the current review, **Guidelines** entries are presented as follows:

Term/Category Label (source(s) of definition-current and original, if known):

Recommended definition

NOTE: Recommended deletions to Terms/Category Labels or to language in definitions are shown with ~~strike-throughs~~. Recommended additional Terms/Category Labels and definitions or additions to existing language are underlined.

*[As warranted, explanation about term/category/definition is bracketed and italicized. In many cases, the bracketed information serves to describe why a change is proposed; in others, to further guide the investigator or data entry personnel—e.g., by describing the circumstances in which a category would be applicable to an accident scenario. The latter type of information will be retained in any versions of the **Guidelines** included in training manuals/materials.]*

TYPES OF BOATING ACCIDENTS

MULTIPLE TYPES SHOULD BE LISTED WHEN APPROPRIATE

Capsizing (BARD-Web/Investigator Manual):

Overturning of a vessel. The bottom must become uppermost, except in the case of a sailboat, which lies on its side.

Carbon Monoxide Poisoning (BARD-Web):

Death or injury resulting from an odorless, colorless gas generated from auxiliary ~~boat~~ vessel equipment (stoves, heaters, refrigerators, generators, hot water heaters, etc.), another ~~boat~~ vessel's exhaust, or the exhaust of the vessel on which persons were either aboard or in close proximity.

*[CG-449 and BARD-Web use the category label "Carbon Monoxide **Poisoning**"; however, the most recent version of CG-3865 alternately uses 'carbon monoxide **exposure**' (p. 3 accident types) and 'carbon monoxide **poisoning**' (p. 4 details of injuries/deaths) on the form. "Poisoning" is retained here as everyone is exposed to carbon monoxide at some level everyday and "exposure" does not identify a toxic level.]*

Collision with Fixed Object (BARD-Web/1973 manual):

The striking of any fixed object (e.g., standing timber, pier, dock, a vessel moored to a pier or dock) above the surface of the water.

[Revised parenthetical information intended to clarify examples of "fixed object." Revised definition retains BARD-Web reference to object being "above the surface of the water," as opposed to the CG-449 version which includes "below the surface of the water." Revision intended to address overlap among original definitions for 'collision w/fixed object,' 'collision w/submerged object,' and 'struck submerged object.']

Collision with Floating Object (BARD-Web/Investigator Manual):

Collision with any waterborne object above or on the surface of the water that is free to move with the tide, current, or wind, ~~except~~ with the exception of another vessel.

Collision with Vessel (BARD-Web/Investigator Manual):

Any striking together of two or more vessels, regardless of operation at time of accident, is a collision. Also includes colliding with the tow of another vessel, regardless of the nature of the tow (e.g., surfboard, ski ropes, skier, tow line). A vessel does not have to be underway to be involved in a collision, but a collision with a vessel moored to a dock or pier is not considered be a collision with a vessel (considered Collision with Fixed Object).

[Additional language clarifies meaning of draft definition as appears in CG-449 working draft (showing investigator manual as source), and distinguishes accident type from ‘Collision with Fixed Object.’]

Departed Vessel Voluntarily (new/CG-3865):

Acting of their own free will, and as a first event, occupant departs from the vessel, and the departure results in occupant's injury or death. The vessel from which the occupant departed is not moored, beached or anchored,

[The revised CG-3865 presents an accident event labeled ‘Person left boat voluntarily.’ In 2009, an Accident Reporting Task Force, established by the U.S. Coast Guard in response to a 2008 action item of the National Boating Safety Advisory Council (NBSAC), recommended—and NBSAC subsequently approved—that this event not be considered a reportable boating accident. However, this category, with revised label, and definition is presented here—and in the list of Contributing Factors/Causes also—as clarification under the current accident reporting criteria. The expectation is that it would be deleted in subsequent versions of this list should the criteria be changed under the USCG guidelines. Elements of note in the definition are that: 1) the person was acting of their own free will in leaving the vessel; and 2) there were no other contributing circumstances and this was the first event.]

Ejected From Vessel (new/CG-3865):

Occupant thrown out of vessel due to external force (wake or wave) or a driving maneuver of the vessel’s operator with resulting injury or death.

[CG-3865 includes ‘Person ejected from boat (caused by collision or maneuver)’ under the accident events listed on page 3 of the form. This category, with revised label, and definition as presented here are separate from those of ‘Falls Overboard’ and ‘Departed Vessel Voluntarily.’]

Electrocution aboard Vessel (new):

Death or injury occurring to an occupant aboard a vessel resulting from electrocution due to lightning, system failure, or other external source.

Electrocution/Stray Voltage (BARD-Web):

Death or injury resulting from swimming around a vessel that was improperly connected to shore power and resultant stray electrical voltage entered the water causing electrocution of the victim.

[The addition of the ‘Electrocution aboard Vessel’ category is intended to make the original “Electrocution” category (presented above with modified label) more specific as to types/circumstances.]

Fall in ~~Boat~~ Vessel (BARD-Web):

Any slip, trip, or fall on board or within the vessel resulting in injury or death.

Falls Overboard (BARD-Web/Investigator Manual/1973 manual):

Falls from the vessel with resulting injury or death. Any unintentional spilling out of person(s) into the water without completely overturning the vessel. Using the vessel as a swimming platform and/or voluntarily departing the vessel as a first event whether the vessel was underway or not, should not be considered a reportable boating accident.

[This revised definition incorporates the element of unintentional action, distinguished from ‘Departed Vessel Voluntarily (see previous page for notation). The additional explanation coincides with a recommendation from the NBSAC Accident Reporting Task Force, February 2009, also referenced in the explanation for ‘Departed Vessel Voluntarily.’]

Fire/Explosion (Fuel) (BARD-Web/Investigator Manual):

Accidental combustion of vessel fuel: liquids, including their vapors, or other substances, such as wood or coal.

Fire/Explosion (Other than Fuel) (BARD-Web/Investigator Manual):

Accidental burning or explosion of any material on board except vessel fuels ~~or their~~ vapors.

Flooding /Swamping (Investigator Manual/1973 manual):

Filling with water, ~~regardless of method of~~ by means of entry of the water through a fitting, a drain plug, a hole or crack in the hull, or other means that allows ingress of water through the hull, not over the top of the gunwale, transom, or decking of the vessel. Vessel retains ~~but retaining~~ sufficient buoyancy to remain on the surface of the water.

[This revised category label and definition separates ‘Flooding’ from ‘Swamping’ and ‘Sinking’ categories. The addition of the qualifying sentence regarding buoyancy further distinguishes ‘Flooding’ from ‘Sinking.’]

Grounding (BARD-Web/Investigator Manual):

Running aground of a vessel, striking or pounding on rocks, reefs, or shoals; stranding.

[The above presents the definition for ‘Grounding’ as appears in the BARD-Web dictionary, not the CG-449 working draft (“An accident where: The vessel runs aground, strikes or pounds on rocks, reefs, shoals or the bottom so that the vessel ceases to be completely waterborne; stranding.”)]

Occupant Impacts Vessel (new):

Occupant strikes a surface of their vessel, resulting in injury or death. Occupant may or may not remain aboard the vessel.

[This category and definition is added to better describe scenarios where operators or passengers of a vessel, such as a PWC, strike their own vessel and sustain traumatic injury, or where other vessels operated at high speed strike waves or go airborne and the passengers strike the interior of their own vessel.]

Sinking (BARD-Web/Investigator Manual/1973 manual):

Where After swamping, flooding or capsizing, the vessel loses enough buoyancy to settle below the surface of the water.

[The above presents a modification of the definition for ‘Sinking’ as appears in the BARD-Web dictionary, not the CG-449 working draft (An accident where: Losing enough buoyancy to settle below the surface of the water for the vessel to become submerged). The addition of language acknowledges conditions that would precede or accompany the sinking.]

Skier Mishap (BARD-Web/Investigator Manual):

A person who suffers injury or death by

- (1) falling off their water-skis,
- (2) striking a fixed or submerged object, or by
- (3) becoming entangled or struck by the tow line. →

NOTE: Also includes mishaps involving ~~inner-tubes~~, wakeboards and other devices on which a person can be towed behind a ~~boat~~ vessel, or surfing on the wake created by the vessel, even if not being towed behind the vessel.

[The above presents a modification of the definition for ‘Skier Mishap’ as appears in the BARD-Web dictionary, not the CG-449 working draft (An accident where: An accident involving a person being towed behind a vessel on a device such as: water ski, aquaplane, kneeboard or tube who suffers injury or death. These may include: falling off the device, striking a fixed or submerged object or becoming entangled or struck by the tow line). The modification to include a “NOTE:” acknowledges the prevalence of other towed sports apart from water skiing, and accommodates other activities, including wakeboarding and/or wake surfing.]

Struck by Lower Unit/Propeller/Propulsion Unit (BARD-Web):

The propeller, propulsion unit, or steering machinery strikes a person who is located ~~inside or~~ outside of the ~~boat~~ vessel (not necessarily a swimmer). Does not include striking person in another vessel (that would be a ‘Collision with Vessel.’)

[This revision deletes the reference to “swimmer” (currently included in the BARD-Web definition) and to being “inside” the vessel (per both the BARD-Web and CG-449 draft definitions). The category label is revised to include reference to ‘Lower Unit.’]

Struck Submerged Object (BARD-Web):

The striking of any fixed object or a collision with any waterborne object that is below the surface of the water.

Struck by Boat Vessel (BARD-Web):

The ~~boat~~ vessel strikes a person who is located ~~inside or~~ outside of the ~~boat~~ vessel (not necessarily a swimmer). Does not include striking a person in another vessel (that would be a ‘Collision with Vessel.’)

[This revision deletes the original reference to being “inside or outside” the vessel, as strikes “inside” the vessel would be captured by incidents involving ‘Collision with Vessel.’ It also omits the swimmer reference.]

Swamping (new):

Ingress of water over the top of the gunwale, transom, or decking of the vessel. Vessel retains sufficient buoyancy to remain on the surface of the water.

[This category and definition separates ‘Swamping’ from the ‘Flooding’ and ‘Sinking’ categories. The addition of the qualifying sentence regarding buoyancy further distinguishes ‘Swamping’ from ‘Sinking.’]

Other Type Not Listed / Describe (new):

There are other possible types of accidents that do not fit into any of the described types and need to be categorized as “Other.” Provide brief description.

[Definition intended to clarify circumstances under which the category should be used.]

Unknown/Undetermined (new):

Insufficient information to determine the type of accident due to lack of survivors or witnesses.

[Definition intended to clarify circumstances under which the category should be used.]

LIST OF CONTRIBUTING FACTORS/CAUSES

MULTIPLE FACTORS/CAUSES SHOULD BE LISTED WHEN APPROPRIATE--PRIMARY, SECONDARY, TERTIARY

Alcohol ~~Use~~ Impairment (BARD-Web)

When alcoholic beverages are consumed and the investigating official has determined that the operator was impaired or affected while operating the ~~boat~~ vessel -- or -- the ~~boat~~ vessel's occupants ~~passengers~~ were impaired and such impairment contributes to the resultant accident. This includes alcohol consumption that may have occurred outside of the ~~boat~~ vessel and the occupants are now under the influence.

[In this revision, the ‘Alcohol Use’ label is deleted in favor of ‘Alcohol Impairment’ and the original definition for ‘Alcohol Use’ is clarified to stipulate impairment contributing to the event.]

Careless/Reckless Operation (BARD-Web):

~~A person operating a vessel in a negligent or grossly negligent manner and/or interfering with the safe operation of a vessel, so as to endanger the life, limb or property of a person.~~ This is a conclusion, not a contributing cause. The investigator should concentrate on determining the contributing cause(s) that led to this conclusion, rather than designating this as the contributing cause.

[This category is not included in the latest revision of CG-3865. However, the revision of the original definition addresses a concern as to whether this category signifies a ‘cause’ or a ‘conclusion’ and opts for the latter.]

Cold Water Immersion (new):

Immersion in cold water creates loss of ability to function or swim for safety. May also cause involuntary gasping for air and inhalation of water, as well as hypothermia. →

NOTE: Should only be considered as a secondary or tertiary cause.

[This new category and definition address the increase in paddle sports accidents where cold water immersion ultimately is the cause for drowning or death and would otherwise be lumped in as ‘Other.’ The “NOTE:” provides the guidance that it only be identified as a secondary or tertiary cause.]

Congested Waters (BARD-Web):

Where the body of water is either too small or narrow to safely accommodate the number of ~~boat~~ vessels on it or there are a large number of vessels operating in close proximity to one another.

[The original definition focused on the body of water. This revision addresses the volume of—or types of—activities that result in the congestion.]

Dam/Lock (BARD-Web):

A ~~boat~~ vessel(s) is (1) operated near a barrier built across a body of water that prevents water flow or impounds water—or—(2) being raised or lowered within a gate enclosure as it passes from level to level and the structure contributes to the incident.

[This revision indicates that the structure(s) played a role in/directly contributed to the incident.]

Departed Vessel Voluntarily (new/CG-3865):

Acting of their own free will, and as a first event, occupant departs from the vessel, and the departure results in occupant’s injury or death. The vessel from which the occupant departed is not moored, beached or anchored.

[See discussion under category as presented under TYPES OF BOATING ACCIDENTS.]

Drug Use Impairment (BARD-Web):

When non-prescription and/or prescription drugs are consumed ~~in the boat~~ and the investigating official has determined that the operator was impaired or affected while operating the ~~boat~~ vessel – or – the vessel’s occupant was passengers were impaired and such impairment contributes to the resultant accident. This includes drug use that may have occurred outside of the vessel and the vessel’s occupants are now under the influence.

[This revises the BARD-Web and CG-449 definitions to stipulate that impairment contributed to the event and to include drug use that might have occurred outside the vessel. The category label and definition have been made comparable to ‘Alcohol Impairment.’]

Environmental Conditions Affecting Visibility / Describe (new):

Operator’s ability to discern other vessels or hazards is affected by an external condition in the surrounding environment (e.g., sun glare, fog, background lighting (lights on docks and shorelines, etc.), rain, snow, minimal night visibility due to overcast skies or moon phase, etc.)

[This new category and definition—centered on factors in the environment and outside of the vessel—is intended to distinguish from the circumstances described in the revised ‘Restricted Vision Aboard Vessel,’ where the operator’s view was obstructed by something in or on the vessel.]

Equipment Failure (BARD-Web):**

Improper/unsafe installation or inadequacy or failure of the equipment on the ~~boat~~ vessel (e.g., communications, visual distress, seats, and sound producing equipment). Not lack of such equipment. Please indicate which part of the ~~boat~~ vessel's equipment failed in the designated field to follow.

** If you entered equipment failure in the Cause of Accident field, you need to indicate which equipment failed in the Equipment Failure field.

- Auxiliary equipment failure. Stoves, heaters, refrigerators, generators, battery chargers, hot water heaters, etc.
- Communication equipment failure. Radio, cell phones, CBs, Emergency Position Indicating Radio Beacons (EPIRBs), Digital Selective Calling (DSC) technology, GPS, etc.
- Fire extinguisher not serviceable. Fire extinguisher did not work.
- Sail dismasting when the mast (the principal vertical pole from which sails are set) falls down either onto the ~~boat~~ vessel or into the water.
- Seat broke loose Includes the back of the seat or the seat itself, or, the base structure that is fixed to the area of the ~~boat~~ vessel deck supporting the seat.
- Sound producing equipment failed. Horn
- Visual distress signals failed Includes any of the following used during the day: Day Flags, Shapes, and Smoke Includes any of the following used at night: SOS Light, flares and other pyrotechnics

Excessive Speed (BARD-Web):

Speed above that which a reasonable and prudent person would have operated under the circumstances that existed. It is not necessarily a speed in excess of a posted limit.

Failure to Vent (BARD-Web):

Prior to starting the engine, failure to turn on the powered ventilation system that brings in “fresh air” and expels gasoline vapors from the engine compartment.

Hazardous Waters Due to Currents (BARD-Web):

Rapid tidal flows (the vertical movement of water) and/or currents (the horizontal flow of water) resulting in hazardous conditions in which to operate a ~~boat~~ vessel.

[The revised category label is intended to distinguish this factor from weather-related hazardous waters.]

Hull Failure (BARD-Web):

Defect or failure of the structural body of a vessel (i.e., hull material, design, or construction) not including superstructure, masts, or rigging.

Ignition of Spilled Fuel ~~or~~ Vapor (BARD-Web):

Accidental combustion of vessel fuel, ~~liquids, and/or their~~ vapors, regardless of the cause of the spill.

Improper Anchoring (BARD-Web):

Where a ~~boat~~ vessel is either in the process of being anchored incorrectly or incorrectly held in place in the water by an anchor. For example, dropping anchor off of the ~~in the stern~~ of the vessel (rear end) of the boat instead of the bow in a condition of heavy current (~~forward part of the boat~~). This also includes a ~~boat~~ vessel that is improperly moored (fastened with cables and/or lines) to a buoy or anchored vessel.

Improper Loading (BARD-Web/Investigator Manual):

Loading, including weight shifting, of the vessel causing instability, limited maneuverability, or dangerously reduced freeboard.

~~No Proper~~ Improper Lookout (BARD-Web):

No proper watch. The failure of the operator to perceive danger using all available resources because no one was serving as lookout or the person so serving failed in that regard.

[This revision modifies the category label from the BARD-Web dictionary to match the term used on CG-3865, and adds “using all available resources” to include radar and other devices/resources.]

Improper Type/Size Of Vessel For The Conditions (new):

The type/size of vessel being used was unsafe and not that which a reasonable and prudent person would have utilized under the circumstances that existed.

[This addition is intended to address situations where the vessel was too small/unstable/ inappropriate for the prevailing water conditions, and would have been characterized as ‘Careless/Reckless Operation.’]

Lack of or Improper ~~boat~~ Navigation Lights (BARD-Web):

Insufficient and/or improper navigation lights shown by a ~~boat~~ vessel that indicate course, position, and occupation, such as fishing or towing.

[This revision to the category label and definition is intended to distinguish from other lights in vessel. The latest version of CG-3865 refers to ‘Inadequate on-board navigation lights.’]

Machinery/Vessel System Failure (BARD-Web):

Defect and/or failure in the machinery or material, design or construction, or components installed by the manufacturer involved in the mechanical propulsion of the ~~boat~~ vessel (e.g., engine, transmission, fuel system, electric system, and steering system). Please indicate which part of the ~~boat~~ vessel's machinery failed in the designated field to follow.

If you entered Machinery Failure in the Cause of Accident field, you need to indicate which part of the ~~boat~~ vessel's machinery failed in the Machinery Failure field.

- Electric system failure. Shock hazard, system shorts out, and/or failure of the battery.
- Engine failure. Engine won't start, engine stalled.
- Fuel system failure. Fuel tank and/or fuel lines leaked, clogged fuel lines.
- Shift failure. The shifting mechanism would not operate. Either the engine started in gear, wouldn't go into gear, or went into gear by itself without warning.
- Steering system failure. Failure of the assembly including all components necessary to transmit remote manual effort to the rudder, ~~inboard-out drive~~ sterndrive, water jet drive or outboard ~~motor~~ engine (Cable, Pulleys, Fittings).
- Throttle failure. Unable to speed up or slow down due to the throttle “sticking”
- Ventilation system failure. Failure of the powered ventilation system that brings “fresh air” into the engine compartment and expels gasoline vapors.

~~Missing/Inadequate Navigation Aids:~~

[This category, 'Missing/inadequate aids to navigation (e.g., buoy, daymarker),' appears on the latest version of CG-3865. However, for reasons of subjectivity and potential to open issues of liability, it is excluded from this list and the recommendation is for its exclusion from future forms.]

~~Rules of the Road~~ **Navigation Rules** Infraction/**Violation** (BARD-Web):

Violation of the statutory and regulatory rules governing the navigation of vessels. Investigator needs to be careful to remember that all operators are required to take whatever action is necessary to avoid a collision with another vessel whenever the risk of collision exists.

[This category is alternately labeled 'Navigation rules violation' on CG-3865 and 'Rules of the Road Infraction' in the BARD-Web dictionary and CG-449 working draft. The revision to the definition incorporates additional guidance to investigators.]

~~Passenger/Skier~~ **Occupant Behavior / Describe** (BARD-Web):

Behavior by any of the ~~boat's~~ **vessel's** passengers ~~as well as those being towed that~~ interferes with the safe operation of a vessel so as to endanger life, limb or property of a person. Briefly describe specific behavior (i.e. failure to wear PFD, standing in vessel, loss of balance, jumped overboard, swam from a vessel voluntarily, etc.)

[This revised category label and definition separates "occupant" (passenger) behavior from the currently combined "Passenger/Skier Behavior" category presented in the BARD-Web dictionary and CG-449 working draft (but not on the latest version of CG-3865). The separation is intended to provide more options for officers to utilize, instead of defaulting to the 'Other' category, in which factors such as these tend to be slotted without differentiation. If this category is used, the investigator should list the specific occupant behavior ("failure to wear PFD" is an optional description). As revised, this category would afford a more appropriate, accurate and descriptive contributing cause regarding paddle sports accidents or 'Departed Vessel Voluntarily' situations that result in a drowning death.]

Off Throttle Loss of Steering (BARD-Web):

The situation that exists when an operator releases the throttle and then attempts to execute an unsuccessful turn because there is little or no steering capability when the throttle is not engaged (usually associated with jet propulsion units).

[The category label revision is intended to clarify factor and association with jet propulsion units. This category does not appear on the latest version of CG-3865.]

Operation Too Close to Other Vessel/Person in the Water (new):

Operator purposely maneuvered their vessel so close to other vessel or swimmer that avoidance of collision was not possible.

[This addition is intended to apply to collisions where operators purposely maneuver their vessels too close to other vessels or swimmers (for example, horseplay in operating PWCs). Use of the contributing cause of 'Navigation Rules Violation/Infraction' would not accurately describe this type of scenario.]

Operator Inattention (BARD-Web):

Failure on the part of the operator to pay attention to the vessel, its occupants, or the environment in which the vessel is operating.

Operator Inexperience (BARD-Web):

Lack of practical experience or knowledge in operating the ~~boat~~ vessel involved in the accident.

Overloading (BARD-Web):

Excessive loading of the vessel causing instability, limited maneuverability, and dangerously reduced freeboard.

Restricted Vision Aboard Vessel (BARD-Web):

Operator's ~~Limited vision of the environment in which the vessel is operating~~ limited due to the ~~boat's~~ vessel's ~~bow in the air, sun glare, bright lights, etc~~ elevation or vision obstruction in/on vessel.

[This revised category and definition centers on circumstances in which the operator's view was obstructed by something in or on the vessel—as opposed to factors in the environment and outside of the vessel as described in new category, 'Environmental Conditions Affecting Visibility / Describe.']

Sharp Turn (BARD-Web):

An immediate or abrupt change in the ~~boat~~ vessel's course or direction.

~~Passenger/~~**Skier Behavior (BARD-Web):**

~~Behavior of any of the boat's passengers as well as those being towed that interferes with the safe operation of a vessel~~ contributes to a boating incident so as to endanger life, limb or property of a person.

[This revised category label and definition separates "skier" (person being towed) behavior from the currently combined "Passenger/Skier Behavior" category presented in the BARD-Web dictionary and CG-449 working draft (but not the latest version of CG-3865), and further describes that the behavior contributed to the incident. See also, 'Occupant Behavior/Describe.']

Standing/Sitting on Gunwales, Bow, and Transom (BARD-Web):

Standing/sitting on the upper edge of the side of a ~~boat~~ vessel, usually on a small projection above the deck; and/or standing/sitting on the most forward part of the ~~boat~~ vessel; and/or standing/sitting on the back of the ~~boat~~ vessel.

~~**Starting in Gear (BARD-Web):**~~

~~The boat's engine is started in a position of operation that propels the boat either forward or backwards.~~

*[This is recommended for deletion as a stand-alone category. Shift failure, including starting in gear, is addressed under **Machinery/Vessel System Failure.**]*

Swimming Ability (new):

An occupant of a vessel drowns after entering the water, level of swimming ability not adequate to survive (weak swimmer, non-swimmer, diminished ability due to circumstances or injury).

NOTE: Should only be considered as a secondary or tertiary cause.

[This addition is intended to address the increase in paddle sports accidents, as well as the category of "Departed Vessel Voluntarily" where lack of swimming ability, for whatever reason, is the primary or secondary cause for a drowning death. See also, commentary under 'Cold Water Immersion' and the "NOTE," based on current criteria available to investigators.]

Wake from Vessel(s) (BARD-Web):

The track in the water of a moving ~~boat~~ vessel; commonly used for the disturbance of the water (waves) resulting from the passage of the ~~boat~~ vessel's hull.

Weather/~~Wind Creating Hazardous Water Conditions (Heavy)~~ (BARD-Web):

Stormy, windy weather, usually connoting rough or high seas and dangerous operating conditions.

Other Cause Not Listed / Describe (new):

There are many possible contributing causes that do not fit into any of the described causes and that need to be categorized as "Other." Provide brief description.

[Definition intended to clarify circumstances under which the category should be used.]

Undetermined (new):

After thorough investigation, the officer was unable to reach a conclusion as to a contributing cause, due to lack of witnesses or insufficient evidence.

[Definition intended to clarify circumstances under which the category should be used in lieu of 'unknown.']