Chapter 20: Heavy Weather Addendum

Introduction

Heavy weather conditions can pose many threats to boat crews in their attempts to safely and successfully accomplish missions. It is essential that crewmembers understand the various types of heavy weather operations so that they may plan appropriately and take any necessary precautions to ensure safe operations for all persons and vessels involved.

In This Chapter

This chapter contains the following sections:

Section A. Heavy Weather Mission Preparations

Introduction

Any operation executed in heavy weather requires greater crew coordination and communication. Risk is inherently higher due to the environment in which small boat crews operate. A thorough understanding of the risks and benefits for every mission should be the highest priority in mission planning.

In This Section

This section contains the following information:

Heavy Weather Risk Management / TCT

A.1. Description
The discomfort that can be experienced when underway on boats in heavy seas is hard to describe to those who have not experienced them before. It can drain a person of all their energy and willpower at the times that they are needed most. It can hamper the capacity for a person to make a rational and prudent decision in tough situations.

On Great Salt Lake this can be accelerated due to the density of the water. This density in big seas will sap energy and willpower much more quickly than on fresh water.

In heavy weather, team coordination and risk management decisions are more difficult due to the inherent stress of the environment, mission, fatigue that crews will face. Missions in heavy weather are riskier than a mission in calm conditions. The crew must be ready to face unexpected challenges and be prepared to effectively and safely deal with them as they happen. If there are waves of any size, the effects they will have on the boat and crew must be understood.

Chapter 4 of this Manual outlines team coordination and risk management steps that should be taken to reduce the probability of a mishap.

A.2. Risk vs. Gain
The following paragraphs establish guidelines that may be used in making risk versus gain analysis for various boat missions.

A.2.a. Search and Rescue (SAR and Law Enforcement (LE))
For SAR missions, potential risks to the boat and crew shall be weighed against risks to the personnel and/or property in distress if the mission is not undertaken. Probable loss of the boat crew is not an acceptable risk.

Additionally, the individuals making the decision shall consider the effects of exposing people in distress to the additional risks associated with rescue operations, especially if the physical condition of those persons in distress is already impaired.

In the case of LE, potential risks to the boat shall be weighed against the risk of bodily harm to LE personnel, hostages, and innocent parties if the mission is not undertaken.

A.2.b. Saving Lives
The probability of saving human life warrants a maximum effort. When no suitable alternative exists and the mission has a reasonable chance of success, the risk of damage to or abuse of the boat is acceptable, even though such damage or abuse ma render the boat unrecoverable.

The possibility of saving human life or the probability of preventing or relieving intense pain or suffering warrants the risk of damage to or abuse of the boat if recovering the boat can reasonably be expected.

A.2.c. Saving Property
The Division is not in the business of saving property. However, if the value of the property to be saved is of unquestionably greater value than the coast of boat damage and the boat is fully expected to be recoverable, the risk may be worth it.

A.2.d. Law Violations
The possibility of recovering evidence and interdicting or apprehending alleged violators of the law does not warrant probable damage to or abuse of the boat.

A.3. Decision-Making: Go/No-Go
The decision to go or not to go on a mission in heavy weather is a difficult one to make. Just as the limitations placed on the boats guide decision, the personal limitations of the crew should be a guiding force. The time to make Go/No-Go decision does not stop once underway. The crew may find themselves in a situation where they may decide whether or not to continue with a mission. An example of this is after a rollover, knockdown or heavy lighting.

Risk assessment is a process that is never ending. Using risk assessment tools such as the GAR model found in *Chapter 4* of this manual, open communication between crew and VO, and open communication with SAR mission managers and boat crews. These are excellent ways to measure the level of risk and to mitigate hazards.

NOTE: The term "Knockdown" and "Rollover" apply to self-righting boats. A knockdown is when a boat has rolled in one direction 90º or greater but does not completely rollover (360º) to right itself. A rollover occurs when a boat rolls in one direction and rights itself by completing a 360º revolution.

Mission Planning for Heavy Weather

A.4. Description
No mission in heavy weather conditions should be a surprise. Thorough understanding of weather forecasting, area weather patterns, and significant weather systems in the area are required to be able to plan any mission.

The condition of the boat and its equipment, and the experience and capabilities of the crew should be the number one concern in mission planning. No VO can help another vessel or person in distress without a capable crew and vessel.

"Life saving vessels fulfill their function under conditions which, for other craft and equipment, are regarded as extreme, to be avoided, if possible. Thus, the concept of "acceptable risk of failure" cannot apply. It is when other vessels have failed that the lifesaving vessel must work," G. Klem, Senior Research Engineer. Norwegian Ship Research Institute.

A.5. Boat Readiness
Before leaving the moorings, the operator should ensure that:

- All required equipment is onboard and stowed properly. Loose gear underway in heavy weather creates a hazard for the boat crew and stability of the vessel.

- All systems are operating within required parameters. No restrictive discrepancies that could affect the mission or disabling discrepancies are present.
- There is no question in mind of the crew that the boat and its equipment are one hundred percent ready for operations.

A.6. Crew Readiness

Crew selection for heavy weather operations should be done with care. Operations in heavy weather or surf are fatiguing and stressful. Some factors to consider are:

- Experience level of VO. If a VO is uncertain or anxious about the conditions they may encounter, requesting a more experienced heavy weather VO to assist may be the better option.
- Experience level of crew: All operations in heavy weather have an increased level of risk. It may not be appropriate to take inexperienced crewmen without an experienced crewmember as a safety observer. The VO will need assistance to maintain crew control and communication, for safety.
- Physical condition of crew. Operations in heavy weather are extremely fatiguing and challenging physically. Crews should be well rested and in good physical condition before getting underway. Heavy weather operations are no place for a sick crewmember. If there is any doubt about the condition of a crewmember, they should be replaced if personnel allow.
- Mental condition of crew. Operations in heavy weather are extremely fatiguing and challenging mentally as well. Crews should be mentally prepared for the conditions they will encounter. Crewmen that are distracted by family crisis, personal conflict, or extreme apathy should not be the first pick for a heavy weather crew.
- Anticipated length of mission: Missions requiring boats to be underway in heavy weather for long periods of time are extremely fatiguing. If personnel permit, taking a second qualified VO to act as a relief should be considered. If no relief is available, recommending the use of another Division vessel that is able to operate in heavy weather for longer periods of time should also be considered. *Rescue One*, on Great Salt Lake, should be the primary vessel for heavy weather missions of a long duration.

A.7. Survival Equipment

Any crew operating in heavy weather must be properly equipped, as follows:

- Required hypothermia protective clothing.
- Helmet (helmet straps must be secured and adjusted properly).
- Personal survival equipment.
- Waterproof footwear and gloves are recommended.
- Eye protection may be warranted for visibility, particularly for persons wearing glasses, and will also protect against glass shards should a window be broken.

A.8. Weather

Heavy weather is defined as seas, swell, and wind conditions combining to exceed 5 feet and/or winds exceeding 30 knots. If heavy weather is forecasted, it should be considered when planning a mission. Reliable and up to the minute information is critical for planning. There are many sources of information available to the VO. Ensuring that the information is found and used is the responsibility of everyone involved in the mission.

NOTE: This definition of heavy weather is not intended to define a heavy weather situation for a specific boat type. Heavy weather for each specific boat type may be determined by the VO at any time.

A.8.a Weather Definitions

- Sea state is both the sea swell as well as the significant wave height of the wind waves.
- Significant wave height is the average height of the largest third of the wind waves observed or expected in an area.
- Combined seas is the realistic conditions encountered.
- More definitions are listed in *Chapter 12* of this Manual.

A.8.b. Weather Conditions

The weather is the deciding factor that makes heavy weather operations dangerous or impossible. Knowing what conditions the crew will be challenged with is extremely important. Some sources of information are:

- Message traffic from the National Weather Service.
- First-hand observations from shore prior to getting underway.
- The internet – There are many websites available.
- Other mariners that can be trusted to give accurate weather conditions.
- The disabled mariner. While many mariners are accurate as they can be, comparing observations from the mariner with other information available is always prudent. The stress of being in distress in heavy weather can often make large waves appear to be giants.

Piloting in Heavy Weather

A.9. Description

The distinction between "piloting" and "navigation" is outlined in many respected publications, including Dutton's *Navigation and Piloting* and Bowditch's *Practical Navigator.* This chapter is designed to offer techniques that are unique to operations in heavy weather situations.

The importance of sound piloting is well-described in Dutton's:

"Piloting requires the greatest experience and nicest judgment of any form of navigation. Constant vigilance, unfailing mental alertness, and a thorough knowledge of the principles involved are essential. In piloting waters there is little or no opportunity to correct errors. Even a slight blunder may result in disaster, perhaps involving the loss of life."

Working in areas close to shore and in shoal waters, the area of operation for small boats, means knowing the boat's position could result in inadvertent entry into a dangerous surf zone, shoal water or delay assistance to a vessel in distress. Heavy weather brings additional problems to navigation and piloting. Which are not found in calm conditions. Not the least of these is the mental approach to the problem. The physical exhaustion found in heavy weather can make it extremely difficult to concentrate, and greatly increase the chance of making a mistake.

A.10. Chart Preparation
A chart is the most important piece of navigational equipment onboard a boat. It can provide a good mental picture of the coastline and bottom contours.

Some thought and preparation should go into the chart before leaving the dock. Crewmembers can make chartlets or laminate charts of workable size. Laying out clearly readable track lines and courses, out of and into the harbor, with radar ranges, danger ranges, turn rangers, as well as bearings, will make piloting to open water safer. The prepared chart should be checked as well as used in calm conditions before it is used for heavy weather. Making the chart water-resistant using laminates or a chart case will help keep it useable in storm conditions.

Although it may sound trivial, the chart should be folded properly. A chart cannot be prepared for every possible position, and it is very possible a crewmember will have to plot a position on a chart, layout a track line, and go.

The crewmember will be unable to unfold the chart every time he or she needs the distance scale or compass rose. If possible, datum and ranges to datum should be on the same side of the folded chart. As much of the chart work as possible should be done before leaving the dock. Everyone has felt the urgency of getting underway immediately, but the crew ultimately responsible for the safe navigation of the boat and no level of urgency will be an excuse for running aground or colliding with another vessel.

A.11. Experience
Being prepared is not limited to having the proper or sufficient equipment aboard. Preparation for a heavy weather case involving piloting can begin months before the mission. The primary tool to ensure success in any piloting evolution is local knowledge. The ability to quickly match objects seen visually or on radar with charted objects will increase the VO's capabilities. Naturally, calm weather affords the best situation to study the area underway, but observing the AOR during heavy weather from land or sea will enable the VO to identify hazardous areas particular to inclement weather. Of course, none of the tools available are useful if the user's not well versed in how to use them. No amount of studying or classroom instruction can substitute for underway training. Every opportunity should be taken to pilot, no matter what the conditions may be. The wise VO "over-navigates" the boat during fair weather so that he or she can acquire the skills to navigation in poor weather without fear or nervous strain.

A.12 Electronic Piloting
With a chart, a compass, and a watch onboard, the basic requirements for navigation are available. However, with these basic tools, the crew is limited to dead-reckoning navigation, apart from the use of bearings to check the boats position. Often in heavy weather, the visibility is restricted and small boats do not carry hand bearing compasses making the use of visual bearings impossible. It is under these conditions that electronic aids can be most valuable.

A.12.a. Radar Ranges
One of the most under-utilized methods of piloting is radar ranges. Having a beam radar range at the DR position takes a great deal of the guesswork out of navigation. If there are predetermined ranges laid out, the crew will be able to see at a glance how far left or right of track the boat is, well before reaching the DR position. Having these ranges will also allow making constant minor changes to the course instead of major changes at each DR position. To simplify matters even more, distances should

be laid out fore and aft as well. Often, it is impossible to have a fixed object directly ahead or astern, but even an object 10º to 30º off the bow or stern will give an approximation of position up the track line. These fore and aft ranges are also critical in computing speed over ground (SOG) using the three—minute rule and its variations.

A.12.b. Datum
If tasked with piloting to datum, layout ranges from known points of land from floating aids to navigation to datum. Try to use ranges as close to directly ahead or astern and directly abeam as possible. As the boat approaches the position, it will be easy to determine if it is right or left and too far up or down the track. Then adjust the course as necessary.

A.12.c. GPS
GPS is an extremely accurate navigation tool and it can be a powerful tool to assist in piloting. The waypoint function as well as the Course Deviation Indicator (CDI) can be very useful. However, the tools must not take attention away from the environment and the situation at hand. Situational awareness must be maintained.

A.12.d. Depth Sounder
Using a depth sounder to confirm the position with charted depth of water is often difficult in heavy weather where aerated water can throw off the reading.

NOTE: The three-minute rule is used to determine speed in knots or distance in yards.
Distanced traveled in three minutes divided by 100.
Example-
Distance: 1000 yards
Time: 3 minutes
Speed: 10 knots

Section B. Heavy Weather Operations

Introduction
In heavy weather, the safety of the boat depends on the VO as much as the boat's design. The VO has a job, which requires a high degree of concentration if it is to be done well. Their job Is to assess the many factors affecting the boat and take appropriate action on the wheel, throttle, and other controls to ensure its safe transit. A larger than normal wave or one with a breaking crest can arrive with little warning and a critical situation can develop rapidly. At night, the situation is worse due to the very restricted visibility.

Heavy weather is demanding on both the VO and the crew and they must do all in their power to remain mentally and physically alert. Proper hypothermia protection and taking every opportunity to rest will reduce the strain on the boat crew.

Operations in heavy weather increase the level of risk, the possibility of causing injury to personnel, and damage to property.

In This Section

This section contains the following information:

Forces Affecting Boat Handling

B.1. Description

In heavy weather, the motion of the boat rolling, pitching, yawing affect handling of the boat. If these motions become excessive or combine, they may become uncomfortable or even dangerous. High winds affect boat handling and may amplify control problems.

B.2. Rolling

Rolling occurs when the boat is running beam to the seas. If the course requires running or turning broadside to heavy seas, the boat will roll heavily, possibly dangerously. In these conditions, it may be best to run in a series of tacks like a sailboat, changing course to take the wind and seas at a 45^{o} angle.

Sea breaks can exert considerable pressure on the side of the boat, which is restricted by the water on the lee side. This can produce a turning moment which if greater than the initial righting moment will result in a knockdown or rollover.

To turn sharply while exposing the boat to a beam sea for the least amount of time, the VO should slow down for a few seconds, then turn the helm hard over and apply power. This can be done effectively with a twin-screw boat by using the split-throttle maneuver.

B.3. Pitching

Pitching occurs when the boat is running bow into the waves. The bow of the boat rises over the waves and then drops rapidly into the trough. If the seas become too steep, speed should be decreased. This will allow the bow to rise, meeting the swell, instead of being driven hard into it. Changing course may be the better option to reduce stress on the crew and boat. Again 45º off the swell may give better control and a better ride.

If conditions become too hazardous, slow until the boat is making bare steerageway and meets the seas on the bow. Again, power should be used to negotiate the wave without sending the boat launching off the back of the seas.

B.4. Yawing

Yawing occurs when the boat is operating in following seas. The boat sheers off to port or starboard due to the action of the waves. The boat surfs down the face of the wave, slowing as the bow digs into the trough. The rudder loses control and the sea takes charge of the stern. At this stage, the boat may yaw so badly as to broach (to be thrown broadside out of control) into the trough. Once the wave clears

the stern, it lifts the bow of the boat and the stern begins to slide down the backside of the wave, allowing better control causing the boat to straighten out.

Severe yawing may result in a knockdown, pitch pole, or rollover. Extreme care must be taken when operating in a large following sea, constantly watching behind the boat. Slowing speed or changing course may reduce yawing.

B.5. High Winds

High winds can amplify conditions discussed in the previous section. It can make routine operations such as towing approaches extremely difficult. Overcoming the effect of wind requires practice and experience on the boat.

Towing in Heavy Weather

B.6. Description

Heavy weather towing is one of the most hazardous missions that may be undertaken. Maneuvering close enough to pass a towline and then controlling that vessel while towing is dangerous for both crews and boats. Towing is covered in *Chapter 17* of this Manual.

B.7. Vessel to be Towed

Before taking any vessel in tow, observed the conditions of the vessel. Is it taking on water? How is it riding? A vessel that is in poor condition may be severely damaged by the stresses of heavy weather towing. Some factors to look at are:

- Stability.
- Nature of Distress.
- Condition of crew.
- Types and condition of fittings.

NOTE: When conditions warrant, pass over emergency equipment, such as pumps or radios, before taking the vessel in tow.

B.8. Before Approaching

Before beginning the approach to the disabled vessel, the VO must ensure the crew and boat are prepared as follows:

Step	Procedure
1	Monitor engines prior to beginning the approach.
2	Ensure control of throttle.
3	If possible, circle the vessel in distress to assess the situation.
4	Brief the crew and assign duties.
5	Check the towing rig.
6	Determine the danger zone.
7	Observe conditions and see how it affects control of the boat.

B.9. Towing Approach

The towing approach requires maneuvering the boat close enough to the disabled boat, maintaining that position, and providing a stable platform long enough for the crew to safely pass the towing rig.

The towing approach in heavy weather is to set up down-swell of the disabled boat with the bow into the seas. When the crew is ready, the VO drives the boat into optimum position. (See **Figure 20-11**) It may be necessary to use more power than in calm conditions to get steerageway and make a straight-line approach. Conditions may require stopping below or above optimum position to pass a heaving line.

NOTE: The optimum position is the position taken by the towing vessel which allows the crew the maximum amount of time to pass the heaving line and put the tow line over without getting in a hurry. This position gives the VO the ability to see the tow rig attachment point and supervise crew while passing the tow rig.

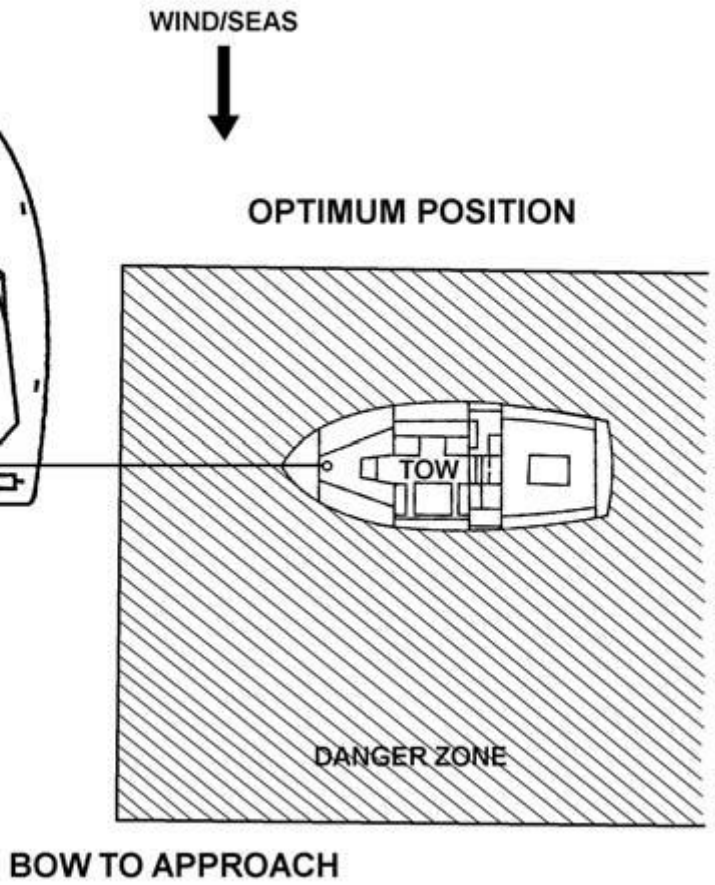

Figure 20-11
Optimum Position

WARNING: Risk from a running tow line is greatly increased in heavy weather conditions. Great care must be taken to reduce surging the towline through the towing bitt as the boats separate and are affected by the seas.

WARNING: Towing in surf conditions requires specific techniques and should only be attempted when removal of the crew is more dangerous than the potential damages form towing, whether to the disabled vessel or the towing vessel, or injury to personnel.

B.10. Towing Transition

The towing transition occurs once the towline is secured to the disabled vessel and the rescue craft maneuvers to pay out the towline to the desired length to take the vessel into stern tow. In heavy weather it can be one of the most hazardous periods. The VO must leave the safety of the maneuvering zone to put the tow behind while the crew is paying out line.

Some basic rules of transition are:

- Communicate with the crew.
- Begin the transition in optimum position (See **Figure 20-11**).
- Take the time necessary.
- Get distance between the boat and the disabled vessel.
- Try not to tow the disabled vessel until paying out the desired amount of towline.
- Pay out the towline while in the trough or quartering the swell to reduce surging of the towline.

WARNING: Constant watch should be kept on the towed vessel and any change in trim or the way the vessel rides should be investigated immediately.

B.11. Towing Astern

In heavy weather conditions, the best course to a safe haven is not always the shortest distance. A course that reduces shock-loading and gives the best ride should be chosen. Information found in *Chapter 17* about combination of forces and shock-load provides direction for towing astern.

WARNING: Towing during heavy weather conditions is very demanding and must be learned through training and experience. Throttle response (acceleration and deceleration) must be matched to the towed vessel's speed.

B.11.a. Towing in Following Seas

While towing in open waters, it is usually safer to change course to reduce the wave action. This will reduce the yawing and surfing of the towed vessel. Getting both boats in step will also dramatically reduce the forces on the towed vessel. Reducing speed or changing the scope of the towline will also lessen the forces on the towed vessel, which in turn are transferred to the towing vessel.

When approaching the coast, or nearing an inlet or bar, keeping the tow in step as water depth changes becomes very difficult. The VO should plan to approach with seas on the quarter to reduce shock-loading. The following techniques should be used to maintain control and reduce the forces affecting tow:

- Constantly adjust towing speed to prevent a tow from surfing on a wave or broaching.

- If a large wave approaches the stern of the tow, increase towing vessel speed to keep ahead of the tow as it is pushed by the swell.
- As a tow reaches the crest of a swell, reduce speed.
- Avoid shock-loading the towline. Keep the towline taut.
- Constantly watch the seas astern and the towed vessel until in sheltered waters or course is changed to reduce influence of the seas.
- Deploy the drogue.

B.11.1. Towing into Seas

Towing into heavy seas creates heavy strain on the towing vessel, the towing equipment, and the towed vessel. One of the most effective techniques to reduce strain is to reduce speed. Lengthening the towline and allowing a greater cantinary will reduce the shock of the seas reducing chafing, stress on the towed vessel, and shockloading.

The placement of the towline on the bow effects the ride of the disabled vessel by pulling it down and often allowing seas to wash over its bow. This can be extremely hazardous to the disabled vessel and affect its stability. Reducing towing speed might help by raising the disabled vessel's bow and reducing the amount of water taken over the bow.

B.11.c. Towing Beam to the Seas

Towing beam to heavy seas will reduce shock-loading and strain on the vessels but it increases the amount both vessels will roll in the seas. Great care should be taken when towing vessels with narrow beams or large stowage tanks on deck (Brine Shrimp "boomer" boats often will have full bags of cysts that can affect rolling when towing beam to the seas). Narrow beam boats have less stability and are prone to capsizing. Vessels with large stowage tanks such as brine shrimp cyst bags may experience free surface affect that will greatly affect their stability. Free surface effect is the movement of a liquid (fuel, water, cysts in a brine solution) to one side of a partially filled storage tank as the vessel rolls from side to side. This shifting of weight is very dangerous to a vessel's stability.

B.11.d. Shortening Tow

Shortening the tow should be accomplished in open waters where there is plenty of room to maneuver. It is most often don prior to approaching an entrance to a harbor. By shortening the tow, control of the vessel increases making turning and maneuvering in tight quarters easier.

Before beginning, the VO takes up a course 10º to 15º off the seas with the tow to windward. The wind should set the boat away from the towline. Speed is reduced until both vessels are stopped. This should set the boat up to put bow into the seas and have the towline off of the quarter. Once the bow is square, then the command is given to break the tow bitt. Keeping the bow square to the seas back and take in the amount of line required. It may be necessary to make more than one attempt to recover the line. Extreme care should be taken to prevent the towline from becoming fouled in the propellers.

Section C. Heavy Weather PIW Recovery

Introduction
Recovering a person from the water in heavy weather requires special precautions beyond the routine described in *Chapter 16, Person-In-The-Water Recovery.* It may be considered a given that a MOB/PIW evolution will bring the VO and the crew to a higher sense of awareness. However, due to the increased risk of operating a boat in heavy weather conditions, special considerations must be given to the level of experience and skill of the boat crew and the capabilities of the boat. It is up to the VO, in most cases, to act as he or she sees fit.

NOTE: Do not attempt a rescue in conditions that exceed the operational limitations of the boat and/or experience/skill level of the crew.

C.1. Man Overboard
The general MOB or PIW procedures is put in effect as soon as the alarm is sounded, but the nature of heavy weather adds complications.

Recovery of a PIW, as in a capsized pleasure craft, is much the same as for a MOB. However, the VO may be required to enter the surf/swell by going lateral to it, backing in to a beach, or running stern to the swell using techniques discussed in *Section B* of this chapter. The VO will position the boat down swell of the PIW and make the approach as discussed in this section.

C.1.a. Down Swell Run
If needed, the turn to run down swell and approach will be planned differently in heavy weather. The VO may not be able to turn the boat immediately after the alarm is given. Doing so may expose the bow of the boat to the swell enough that regaining control and getting the bow back into the seas might be very difficult.

The VO will push ahead a safe distance from the man overboard and station keep until the opportunity to turn presents itself. The turn is not made until the VO can do so without exposing the beam of the boat to the breaks or excessive swells. This is avoided by timing the turn to correspond with the lull in the breaks. Doing so allows the VO to take advantage of any window that may develop. Once the window has been identified, the VO turns, either port or starboard, using the techniques described in *Section B* of this chapter. If the water depth allows, the VO continues down swell past the MOB. When passing at a safe distance, an assessment is made as to the condition of the MOB (i.e., conscious and face-up, unconscious and face down); this will help decide how best to prepare for the final approach.

WARNING: Do not allow any crew to go forward at any time during this evolution. It puts them in great danger and decreases the crew's ability to communicate.

C.1.b. Approach
Once the run down swell is completed, the boat must be turned to make the approach. The turn should be made so as to simultaneously put the bow into the surf/swell and have the PIW directly in front of the boat, keeping in mind the turning radius of the boat and the effect strong winds may have, make adjustments as necessary. This may require some lateral movement down swell of the PIW. The

pointer must be able to communicate with the VO at all times. Positioning the pointer by the open bridge is recommended.

Once down swell, the VO must turn the boat quickly and avoid getting caught broadside of the surf/swell. A break taken on the beam may roll the boat.

After completing the turn into the swell or breaks, forward momentum is stopped and, if practical, station keep is commenced by using references on the beach, break-wall, and/or adjacent structures. Doing this will give you time to consider the following:

- Boat position in relationship to PIW.
- Set and drift of both the bot and the MOB.
- Wind direction.
- Reestablishing crew responsibilities (if needed).
- Sending a crewmember to recovery area.

WARNING: A breaking wave or steep swell can surf a PIW into the side of the boat or move them astern of it!

C.1.c. The Recovery

When making the final approach, the VO must adjust the speed to avoid launching the boat off the back side of a wave. He/she should use the bow bitt or other stationary object on the bow as a sight and aim the boat at the PIW. Speed should be reduced to bare steerageway while nearing the PIW. This approach is made so that the PIW is not in danger of being struck by the boat. Timing is essential! If the VO is able, he/she should wait for a lull to make the approach.

The crew must keep the VO informed of the PIW's relationship to the boat at all times. This can be done by using reference points on the boat and calling distance off the hull.

C.1.c.1. Recovery of a Conscious Person from the Water

Ideally, the boat should be stopped with the PIW at arm's length from the recovery area. This allows the crewmembers to simply reach out and pull in the person for recovery. In the event the person is too far away to reach by hand, he or she may be able to swim or be tossed a rescue heaving line and pulled to the recovery area. All options must be considered, keeping in mind that a person suffering from hypothermia and/or exhaustion may not be able to assist when being pulled from the water. Also, using a rescue heaving line in the surf is very risky. The crewmember tending the line must remain alert to keep the line under control at all times, and advise the VO when the line is in the water.

WARNING: Backing down must be done before the PIW gets to the recovery area so that the boat has no way on during recovery.

C.1.c.2. Recovery of an Unconscious PIW

Recovery of an unconscious PIW form the surf presents an even greater challenge. Because PIW is unable to swim or hold on to the rescue heaving line, the VO must maneuver the boat so that the PIW is taken alongside. Again, crew communications is critical. The VO must steer the boat straight for the PIW and as he or she begins to disappear under the bow flair, turn slightly to port or starboard (depending on which side is best for recovery), and windward of the PIW if possible. At this point, the

VO will lose sight of the PIW under the bow flair. It is now the pointer's responsibility to inform the VO of the location of the PIW, the distance off the hull, and how far the PIW is passing down the hull. When the pointer reports the PIW is approaching the recovery area, the VO should begin glancing down at the water, watching for the PIW to appear. When the PIW is in sight, the VO may need to make a final speed adjustment. Foam or bubbles passing down the hull can help determine the boat's speed. Having all way-off when the PIW is approaching the recovery area is important for two reasons:

- It is very difficult to maintain a handhold on a person when the boat is still moving ahead.
- Having to back down with the person near the recovery area is dangerous, and the discharge from backing down may push the person farther away from the boat. Again slow down well before the person is at the recovery area.

To do this, the VO may back down on both engines or on the engine opposite the PIW. Backing down on the opposite engine will kick the recovery area toward the PIW. However, the VO must not allow the bow to fall off the swell. The use of the boat hook must not be ruled out if the PIW is too far away to retrieve by hand. It is better to use a boat hook and recover on the first approach than to back down or run stern to the surf/swell to make another approach. There may only be one chance to make the rescue – it has to be good!

C.2. Use of a Surface Swimmer

Using a surface swimmer in heavy weather or surf is extremely dangerous and should only be used as a last resort. Having a member of the crew enter the water presents different problems.

- Reducing crew size on an already minimal crew makes it difficult to retrieve the PIW.
- The likelihood of the tending line becoming fouled in the propeller(s) is greatly increased.

C.3. Multiple PIW's

For multiple PIW's the question becomes "which PIW is recovered first?" This is a hard question to answer and requires the VO's best judgment. Once on scene, an accurate assessment will dictate the VO's response. Consideration should be given to the following:

- Are one or more PIW's injured?
- Are PIW's wearing PFDs?
- How close are the PIWs to the beach or break-water?
- How old are the PIWs and what is their physical condition?

Using the above criteria may aid the VO in making this difficult decision.